



North Carolina Department of Environment and Natural Resources

Beverly Eaves Perdue
Governor

Dee Freeman
Secretary

MEMORANDUM

TO: ENVIRONMENTAL REVIEW COMMISSION
Commission Counsel Jeff Hudson
Commission Counsel Jennifer McGinnis

JOINT LEGISLATIVE COMMISSION ON GOVERNMENTAL OPERATIONS
The Honorable Thom Tillis, Speaker of the House of Representatives
The Honorable Phil Berger, President Pro Tempore

FROM: Kari Barsness
Director of Legislative and Intergovernmental Affairs

SUBJECT: State Water Supply Plan Annual Report

DATE: August 22, 2011

Pursuant to General Statute 143-355(n), the Division of Water Resources shall submit to the Environmental Review Commission and the Gov Ops a report on the State Water Supply Plan by September 1 of each year. Please consider the Division of Water Resources 2011 State Water Supply Plan Annual attached as the formal submission of this report.

If you have any questions or need additional information, please contact me by phone at (919) 715-4189 or via e-mail at kari.barsness@ncdenr.gov.

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Department of Environment and Natural Resources

Division of Water Resources

**STATUS REPORT TO THE GENERAL ASSEMBLY
ON
WATER SUPPLY PLANNING
AUGUST, 1 2010 THROUGH JULY 31, 2011**

Executive Summary

Assuring a sustainable water supply for the citizens of North Carolina is the primary mission of the N.C. Division of Water Resources (DWR). To carry out this responsibility, the division administers several monitoring, planning and regulatory programs.

In partnership with the United States Geological Survey (USGS), the division monitors the availability of water across the state through a network of monitoring wells and stream gages. DWR monitors water withdrawals using data reported under mandatory registration and reporting programs. Additional information is received from annual water use reporting by withdrawers required to register their withdrawals and water systems required to submit a local water supply plan, as well as special data requests during drought conditions. Beginning in 2009, DWR also began receiving summaries of an annual survey of agricultural water users conducted by the N.C. Department of Agriculture and Consumer Services (DA&CS).

The division administers the local water supply planning program, which was established after serious droughts in the 1980s disrupted local water supplies. DWR provides assistance to community water systems with the preparation of their local water supply plans. The information contained in these local plans, combined with data from other sources, provides the water use information that is critical for the development of hydrologic models. Basin-specific hydrologic models simulate surface water volumes as water moves downstream. The models support the development of river basin water resources plans. The division is preparing long-term water resource plans for each of the state's 17 major river basins in partnership with local governments, water users and other stakeholders. The long-term water resources plans will provide valuable information for local and state decision makers for the preparation of drought response plans and the management of sustainable water supplies to support economic development while maintaining environmental quality.

The division also monitors and regulates water withdrawals associated with the transfer of surface water between designated river basins and water use in designated capacity use areas. As staff to the Environmental Management Commission, DWR processes applications from water users that wish to transfer more than 2 million gallons per day of surface water between designated river basins and makes recommendations to the commission. DWR conducts evaluations of resource conditions, oversees rule development and issues water withdrawal permits in designated capacity use areas. In addition, DWR chairs the Drought Management Advisory Council, manages drought response activities and is the lead agency for the Department of Environment and Natural Resources for the relicensing of hydroelectric projects. All of these activities affect and are affected by water supply planning issues.

Overview

The Division of Water Resources is required to report, by Sept. 1 of each year, to the Environmental Review Commission and the Joint Legislative Commission on Governmental Operations on the development of the state water supply plan by G.S. 143-355(n). The state water supply plan compiles the information and water use projections contained in the local water supply plans submitted under G.S. 143-355(l). It identifies potential problems in meeting expected water demands in order to assure the availability of adequate supplies of water to protect the public health and support economic growth. These issues are addressed

from a river basin perspective with potential conflicts and shortages identified using hydrologic models that simulate surface water availability within each basin

This report provides a summary of division activities that support water resources planning and the maintenance of sustainable water supplies for the citizens of the state.

Highlights

During the period covered by this report, DWR:

- Added 17 wells and eight stations to the groundwater monitoring network,
- Managed 237 active groundwater withdrawal permits and registrations of 49 other water withdrawers in the Central Coastal Plain Capacity Use Area, which facilitated the continued recovery of the water level in these critical aquifers,
- Established the Ecological Flow Science Advisory Board and held five meetings of the board,
- Revised the computer-based local water supply plan submission program to address requirements added by recent legislation,
- Coordinated the issuance of a interbasin transfer certificate by the Environmental Management Commission to transfer surface water out of the Tar River basin to Greenville, Farmville, Winterville and Greene County, collectively,
- Is approaching the completion of river basin hydrologic models for the Broad and Tar River basins,
- Is updating existing river basin hydrologic models for the Cape Fear, Neuse and Roanoke River basins,
- Collected data on water usage for 2010 from 518 water systems required to prepare a local plan and on 1,159 other registered water withdrawers,
- Assisted 530 local water systems in preparing a water shortage response plan that meets the minimum criteria set by legislation,
- Characterized water supply issues and threats related to climate variability as part of the department's [climate change initiative](#),
- Commenced the implementation of Session Law 2011-374 (House Bill 609), which authorizes the division to partner with local governments in the development of water supply reservoirs and other water supply sources.

Monitoring Water Resources

The division maintains groundwater and surface water monitoring networks directly and in partnership with federal agencies. The data from these networks provide essential information on the conditions of water resources throughout the state. North Carolina cooperates with the USGS to maintain stream gage sites with near-real time data collection capabilities. The division also maintains an extensive network of ground water monitoring wells. More than two-thirds of these wells have data recorders that collect daily water level information that is collected and processed quarterly. Much of the ground water monitoring and data collection focuses on improving the understanding of the complex aquifer structures in the Coastal Plain.

The ongoing support of the General Assembly has allowed the division to continue improving the data on aquifer conditions in the Coastal Plain by expanding the monitoring well network.

Since 1998, DWR has added 166 wells at 47 monitoring stations in the Coastal Plain, bringing the total number of active wells to 307 at 78 monitoring stations in the 15 counties in the Central Coastal Plain Capacity Use Area. The monitoring well network provides vital data for evaluating aquifer conditions and the success of the Central Coastal Plain Capacity Use Area rules. The division will continue to expand the monitoring well network statewide, as funds permit, to improve data for groundwater management. Data on [groundwater conditions](#) are available on the division's website.

The division has joined with the State Climate Office at N.C. State University, the U.S. Army Corps of Engineers, the U.S. Geological Survey and other data collection agencies to develop a uniform database to store and disseminate water resources data. Water resource data are available on the division's website at www.ncwater.org.

Monitoring Water Use

For almost two decades, North Carolina has required registration of large surface water and groundwater withdrawals. Owners of agricultural operations must register their water use if the sum of withdrawals for their facilities is 1 million gallons, or more, on any day. Currently there are approximately 73 owners that have registered agricultural water use. Owners of non-agricultural operations must register their water use if the sum of withdrawals is 100,000 gallons, or more, on any day. Currently there are approximately 921 owners that have registered non-agricultural water use. Registrations must be updated at least every five years. The 550 local government water systems and community water systems that regularly serve 1,000 or more service connections, or 3,000 or more individuals, meet the registration requirement by submitting a local water supply plan.

Rules governing water use during droughts, which became effective in 2007, require anyone who must register a water withdrawal to annually report water use data. Of the registered users not required to prepare a local water supply plan, DWR collected data on water usage in 2010 for 1,159 facilities. Water use data submitted directly to DWR are supplemented by survey data submitted to the DA&CS, which summarizes data by county and river basin for unregistered agricultural operations that withdraw 10,000 gallons of water, or more, per day. DA&CS's [2010 data summary](#) is based on information submitted by 1,420 agricultural operations.

Local Water Supply Planning

After the serious droughts in the 1980s, the General Assembly enacted legislation to require water supply planning at the state and local level. The intent of the action was to assure the availability of adequate supplies of good quality water to protect public health and to support economic growth. Units of local government that supply, or plan to supply, water to the public and other large community water systems are required by G.S. 143-355(l) to develop local water supply plans. These local plans describe current water use and future water needs and identify the water system's expected future sources of water. The plans provide valuable information about how much water communities are using and how much they anticipate needing in the future. Information contained in the local plans supports local, regional and

statewide water supply planning and is available on the division's website at www.ncwater.org.

Local water supply plans are reviewed for internal consistency and consistency between interdependent water systems. Completed plans are to be adopted by the water system's local governing board and must be updated at least every five years. Passage of Session Law 2008-143 expanded DWR's plan review responsibility to include plan approval and also established approval criteria. The first set of plan updates to face approval review will be the 2012 plans to be submitted in 2013. The department has developed approval criteria for these plans in consultation with representatives of local government water systems.

Session Law 2010-150 added a requirement that a local plan must be revised when a water system's foreseeable future water needs reaches 80 percent of its available supply, or when its seasonal demand exceeds 90 percent. A methodology to identify systems that meet these criteria has been added to the online submission program and guidelines to assist water systems in complying with these requirements have been prepared.

The number of water systems that are required to prepare a local plan changes over time as existing water systems merge and new ones are formed. Since the first round of local plans describing conditions in 1992, DWR has received submissions from 664 planned and operating water systems. In 2010, 550 water systems met the criteria requiring them to develop a local water supply plan. Of these, 518 systems submitted annual water use figures for 2010.

North Carolina Water Supply Planning

The General Assembly mandated development of a North Carolina Water Supply Plan, or state plan, at the same time that it acted to require preparation of local water supply plans. The local water supply plans were intended in part to provide information necessary for an evaluation of potential water supply conflicts in the state plan. As mandated by law, the state plan summarizes information contained in the local water supply plans. The first version of the state plan was based on information from local plans submitted in the 1992, 1997 and 1999 water withdrawal registrations. It summarized water use by major river basin and identified areas of concern where water availability, or conflicts between users, could limit the ability to meet water demands. The analysis of potential limitations on the ability of water systems to satisfy expected demand was based primarily on the staff's understanding of expected population growth and general water availability. The [N.C. Water Supply Plan](#) is available on the division's website.

In the process of developing the state plan, the division's staff identified a need for more specific water availability information to inform the analysis. To this end, the division began work on computer-based hydrologic models that could simulate historical water resource conditions and characterize natural variations in water availability. The ability to identify when and where water demand may exceed available water resources provides valuable information to support sustainable water supply planning and effective drought response planning. Currently, the division uses computer models that simulate surface water availability in combination with water withdrawal data to provide a more reliable analysis of

potential water supply conflicts in each river basin. The river basin summary sections of the N.C. Water Supply Plan will be updated as the river basin models and analyses are completed.

The current models still lack a major component that must be included in any comprehensive river basin model. To date, there is insufficient data and analysis to identify the volumes and patterns of water flows needed to protect the ecological integrity of aquatic resources. Session Law 2010-143, passed in July 2010, supports the division's approach by mandating development of river basin hydrologic models. It also recognized the importance of addressing ecological flow needs in the models and established a Science Advisory Board to recommend methodologies to use. A summary of the board's work to date and information related to identification of [ecological flows](#) is available on the division's website.

Planning for Future Water Needs

To further the goal of assuring the availability of adequate supplies of water in the future, the Division of Water Resources is developing a river basin water resources plan for each of the major river basins in the state. These plans will support the management of the state's river basins and provide reliable, quantitative tools to plan for sustainable water use and support objective management and regulatory decisions.

Data submitted to the division through the water supply planning program, the water withdrawal registration program, capacity use area reporting requirements and annual water use reporting provide critical information for the river basin planning program.

River basin water resources plans provide a basin analysis of estimated future water supply withdrawals using a computer-based hydrologic model that simulates water flow in a basin. The hydrologic model provides a tool to analyze the effects of future water withdrawals and wastewater discharges over the range of river flow variability that occurred in the historical record. By analyzing the water needs expected in 2050, and evaluating these future demands with respect to known flow variability, DWR is able to identify areas where supplies may not be adequate to meet projected demands, as well as when and where water use conflicts may develop. The river basin water resources plans and associated hydrologic models will provide the division, local governments and other water users a reliable, quantitative framework within which to plan for sustainable and cost-effective water sources to meet future needs.

The first of these plans was the [Cape Fear River Basin Water Supply Plan](#), developed in 2002 as a tool for the analysis of allocations of water supply storage in B. Everett Jordan Reservoir. The prototype hydrologic model was updated with the technical and financial support of water users in the basin that recognized the value of the model as a water supply planning tool. A draft of an updated Cape Fear River Basin Water Supply Plan based on the updated model and water demand projections was developed. A [summary](#) of the modeling results is available on the division's website. Before the updated plan was finalized, the division received a request to initiate a new review of allocations and options for water supply storage in Jordan Lake reservoir from a group of Triangle communities. To support this effort, the Cape Fear and Neuse River hydrologic models are being updated to expedite the analysis of regional water supply management options.

In July 2010, the division released the [Neuse River Basin Water Resources Plan](#) showcasing a revised format intended to be the prototype for future basin plans. Water demand projections for 20 years and 40 years in the future were analyzed using the newly developed Neuse River Basin Hydrologic Model. The model includes a 76-year record of hydrologic conditions that includes high-flow and low-flow conditions including several significant droughts, and the drought of record for the basin.

As noted in previous reports, models were constructed for the Catawba and Yadkin River basins in conjunction with the relicensing of the hydropower projects on these rivers. The division worked closely with the utility companies and other interested parties in these basins to estimate long-term water supply needs that were then included in the modeling of proposed management options for the future. These analyses formed the basis of settlement agreements included with the hydropower license applications submitted to the Federal Energy Regulatory Commission (FERC). The [Catawba River Basin Water Supply Plan](#) was based on this relicensing work. The water supply components of the modeling will be reviewed when FERC issues new licenses for the hydropower projects and finalizes the management schemes that will apply for the next several decades. The models developed for these basins will be reviewed and, if they can be revised to meet the criteria established by Session Law 2010-143, they will become the basis of future water resource planning by the department.

The Division of Water Resources, and the Division of Water Quality (DWQ), are working together to coordinate basin planning efforts. DWQ has been developing basinwide water quality plans since the early 1990s. These plans provide valuable information on current water quality conditions and the areas that require additional management efforts to protect the water quality of the state's surface water resources. DWR's river basin water resources plans evaluate quantity-related aspects of surface water resources. They identify possible changes to stream flows as the population grows and water withdrawals increase in the future. Staff members of both divisions are exploring ways to combine the information from both sets of plans to improve overall water resource management. A coordinated document, discussing the relationships of the findings in the Neuse River Basinwide Water Quality Plan and the Neuse River Basin Water Resources Plan, will be available later this year.

Planning for Water Shortages

After the 1998-2002 drought, the General Assembly enacted new requirements for water shortage response planning. Session Law 2002-167 added requirements for water systems to describe in their local water supply plan how the water system will respond to drought and other water shortage emergencies and continue to meet essential public water supply needs during the emergency. In 2007, the Environmental Management Commission adopted rules providing guidance on what information should be included in these water shortage response plans. Session Law 2008-143 strengthened the requirement for water shortage response plans and gave the department authority to approve or disapprove the plans. If a plan fails to include the required elements and is disapproved, the submitting water system is required to implement default water conservation measures set out in 15A NCAC 02E .0600 during extreme and exceptional drought conditions.

DWR developed protocols for the review of water shortage response plans in consultation with representatives of local governments and water utilities. The division has notified 530 systems that their plans meet the minimum criteria established.

Water resources in the state are evaluated weekly by the N.C. Drought Management Advisory Council. The technical committee of the council regularly monitors water resource conditions and consults weekly with the authors of the U.S. Drought Monitor to ensure that the weekly drought status accurately portrays conditions in North Carolina. The results of these evaluations can be seen at the [N.C. Drought Management Advisory Council's](#) website.

Hydropower Facility Relicensing

The Federal Energy Regulatory Commission (FERC) licenses non-federal hydroelectric generation projects on navigable waterways. Several existing hydroelectric projects in North Carolina have license applications currently pending before the commission: Duke Energy's Catawba-Wateree Hydro Project and Nantahala Area Projects; Alcoa Power Generating Inc.'s Yadkin Project; and Progress Energy Carolinas Inc.'s Yadkin-Pee Dee River Project. The FERC has not issued new licenses for these projects and the applications remain under review. In some cases, the final decision on relicensing has been affected by legal challenges. Since the old licenses have expired, these projects are operating under annual licenses that extend the operating rules in the old licenses on a year-to-year basis. When and if the new licenses are issued, the ecological flows and recreational opportunities included in the negotiated settlement agreements will be implemented.

Regulation

Central Coastal Plain Capacity Use Area (CCPCUA)

The Water Use Act of 1967 provides a mechanism for regulating water withdrawals in areas where water use must be coordinated to protect its availability. The law allows the Environmental Management Commission to designate a capacity use area if water use has grown to the extent that competing uses must be managed, or the ability of the water resource to replenish itself is threatened.

The CCPCUA is the only designated capacity use area in the state. The rules governing its management became effective on Aug. 1, 2002. The rules, which were designed to gradually reduce groundwater withdrawals from the endangered Black Creek and Upper Cape Fear aquifers, apply in 15 designated counties in the central Coastal Plain. The rules encourage development of alternative sustainable sources of water and regulate groundwater withdrawals through a permitting system. Anyone withdrawing more than 100,000 gallons a day of ground water must apply for and receive a permit from the Division of Water Resources. Currently, 237 active permits for groundwater withdrawals exist in the CCPCUA. In addition, 49 registered water withdrawers do not need a permit, but withdraw between 10,000 and 100,000 gallons in a day. The division continually monitors conditions in the affected aquifers and regularly updates the Environmental Management Commission. Public water supply systems in the central Coastal Plain have made significant progress toward meeting reduction goals through development of regional water authorities and other water-

sharing arrangements. Steps taken to reduce withdrawals from the depleted aquifers have already shown measurable benefits.

In Sept. 2008, the Neuse Regional Water and Sewer Authority began providing water to member communities from a new surface water treatment plant on the Neuse River. The new facility made it possible for several communities that had previously relied on ground water to switch to a surface water source. Start-up of the new facility has produced demonstrable improvements in [regional groundwater levels](#). DWR monitoring indicates that ground water levels have already risen by up to 40 feet in some areas. These improvements reinforce the premise of the capacity use area rules that by reducing ground water withdrawals, aquifers are allowed to recover. Water level recoveries are also occurring near the cities of Jacksonville and New Bern, where well fields in the Castle Hayne aquifer and treatment plants came on-line in 2010. Additional information on the [CCPCUA](#) and the associated rules are available on the division's website at www.newater.org.

Interbasin Transfer of Surface Water

Many communities in North Carolina are located on or near the high ground that creates the boundaries between river basins. Other communities are located in the headwaters of river basins where the limited water supply has proven to be inadequate as the economy and population of the state has grown. In these situations, municipal water systems may need to move water between river basins. Carefully regulated interbasin transfers can be the most practical, economical and environmentally sound way to provide water and sewer service to the residents of some communities and to support economic growth.

In 2007, the General Assembly made significant changes to the laws regulating surface water transfers. Session Law 2007-518 expanded public notice requirements for proposed interbasin transfers and specified additional criteria to be considered by the Environmental Management Commission in deciding whether to grant an interbasin transfer certificate. The changes became effective on Aug. 31, 2007.

Session Law 2010-155 again changed the effective date of the 2007 requirements for some applicants. For proposed interbasin transfers intended to supplement ground water supplies in the CCPCUA, the effective date was moved to Jan. 1, 2013. The 2010 legislation also created a new classification of an isolated river basin and made the 2007 requirements effective on July 1, 2020, for proposed transfers of surface water into those basins. [Session Law 2011-298](#) provides an exemption to the requirement to obtain permission from the Environmental Management Commission for up to 8 million gallons per day of surface water transferred to supplement ground water sources in the CCPCUA.

For purposes of the interbasin transfer laws, the 38 river basin boundaries are defined in G.S. 143-215.22G and delineated on an associated map. Session Law 2008-198 extended the basin lines for interstate river basins into neighboring states for the purposes of implementing the notice requirements set out in G.S. 143-215.22L. Details of the [Interbasin Transfer Program](#) and the statutory requirements are available on the division's website.

While many communities move water between river basins most do not exceed the 2 million gallons per day threshold, or the transfers were grandfathered in the legislation. Only five interbasin transfer certificates have been issued under G.S. 143-215.22I and the precursor legislation. Charlotte Mecklenburg Utilities has a certificate to transfer up to 33 million gallons per day from the Catawba River to the Rocky River basin. Cary, Apex, Morrisville and Wake County jointly hold a certificate to transfer up to 24 million gallons per day from the Haw River basin to the Neuse River basin. The Piedmont Triad Regional Water Authority has permission to transfer up to 30.5 million gallons per day from the Deep River to the Haw River and Yadkin River basins. The cities of Concord and Kannapolis received permission to transfer up to 10 million gallons per day from the Catawba River basin and 10 million gallons per day from the Yadkin River basin into the Rocky River basin. In November 2010, the Environmental Management Commission granted a certificate allowing transfers for Greenville, Farmville, Winterville and Greene County. The certificate, granted with conditions, allows transfers of up to 8.3 million gallons per day from the Tar River to the Contentnea Creek basin and 4 million gallons a day from the Tar River to the Neuse River basin.

The completion of the Neuse Regional Water and Sewer Authority's surface water treatment facilities on the Neuse River allowed member communities to reduce ground water pumping within the CCPCUA. This change in water supplies would have required the Authority to obtain an interbasin transfer certificate if they had not been granted relief by the General Assembly. Session Law 2011-298 declared that an interbasin transfer certificate is not required for a transfer of water from one river basin to another river basin to supplement ground water supplies in the 15 counties designated as the Central Coastal Plain Capacity Use Area. The exemption expires once the cumulative amount of water transferred for this purpose exceeds 8 million gallons per day and additional transfers beyond that will require a certificate.

Pending Interbasin Transfer Requests

The Kerr Lake Regional Water System has indicated it intends to submit a petition requesting an increase in its existing 10 million gallons per day interbasin transfer. The regional water system will request an increase to 24 million gallons per day. The system proposes to transfer water withdrawn from Kerr Lake on the Roanoke River to public water systems in the Tar, Neuse and Fishing Creek river basins. DWR expects to receive a draft Environmental Impact Statement for this proposed transfer increase by the end of 2011.

Brunswick County has submitted a notice of intent to apply for an expansion of its grandfathered interbasin transfer. The county currently receives surface water from the Cape Fear River through the Lower Cape Fear Water and Sewer Authority and provides treated water to customers in the Cape Fear, Waccamaw and Shallotte river basins. Preliminary discussions indicate they would likely be requesting an increase from the grandfathered transfer amount of 10.44 million gallons per day to 19.29 million gallons per day. A draft Environmental Impact Statement is expected sometime in 2012.

Implementation of Session Law 2011-374

Session Law 2011-374 expanded the responsibilities of the department with regards to identifying water supply needs and appropriate sources to meet those needs. It mandates that the department cooperate with units of local government on these projects based upon the execution of a formal agreement between the parties. In addition, it designates the department as the primary state agency to cooperate with other state and federal agencies in the planning and development of water supply sources and water storage projects in the state.

Local governments may request departmental assistance and enter into a negotiated agreement with the department. The department will then coordinate the work necessary to identify the preferred water supply alternatives adequate to meet the long term needs documented in the local government's local water supply plan. The selected alternative sources must meet criteria specified in the legislation as well as requirements specified in the North Carolina Environmental Policy Act (NCEPA). If the suite of options from which a preferred alternative will be chosen includes projects that will require federal approvals, then the alternatives analysis will have to satisfy the appropriate federal decision-making criteria.

A preferred alternative selected by the department will be binding on all state agencies and will be recognized by the Department of Administration as satisfying the requirements of the NCEPA and any other state permits requiring assessments of alternatives. The department may also assist the local government in the pursuit of the federal permits necessary to implement the preferred alternative. If the local government entity is a regional water system it will also have the option to request that the department become a co-applicant for all required federal approvals necessary to implement the preferred alternative.

The Division of Water Resources is developing a protocol to implement the provisions of this legislation. Local governments will be notified in August 2011 of this new option available to assist them in developing sustainable water sources to meet their long-term water supply needs.