North Carolina Department of Environment and Natural Resources

Pat McCrory
Governor

John E. Skvarla, III
Secretary

November 3, 2014

MEMORANDUM

TO: THE ENVIRONMENTAL REVIEW COMMISSION
The Honorable Mike Hager, Co-Chair
The Honorable Ruth Samuelson, Co-Chair
The Honorable Brent Jackson, Co-Chair

FROM: Neal Robbins, Director of Legislative Affairs

SUBJECT: Basinwide Hydrologic Models

DATE: November 3, 2014

Pursuant to G.S. 143-355(o).9 and updated in S.L. 2010-143 section 2(o)(9), the Department shall report to the Environmental Review Commission on the development of basinwide hydrologic models no later than November 1, of each year. If you have any questions or need additional information, please contact me by phone at (919) 707-8618 or via e-mail at neal.robbins@ncdenr.gov.

cc: Mitch Gillespie, Assistant Secretary for Environment, NCDENR
Tom Reeder, Director of Water Resources, NCDENR

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-707-8600 \ Internet: www.ncdenr.gov

North Carolina Department of Environment and Natural Resources
Division of Water Resources

STATUS REPORT TO THE GENERAL ASSEMBLY
ON
DEVELOPMENT OF BASINWIDE HYDROLOGIC MODELS
OCT. 1, 2013 THROUGH SEPT. 30, 2014

Executive Summary

The North Carolina General Assembly directed the N.C. Department of Environment and Natural Resources to develop basinwide hydrologic models, as recommended by the Environmental Review Commission. Session Law 2010-143 requires that the department report to the Environmental Review Commission on the development of basinwide hydrologic models no later than Nov. 1 of each year.

The priority for model development by the department is based on three factors:

1. The degree to which a river basin or a portion of a river basin is experiencing, or will be likely to experience, water supply shortages;
2. Whether the ecological integrity of surface waters in the river basin is threatened, or will likely become threatened; and
3. A river basin for which an existing hydrologic model has not been developed by the department or others.

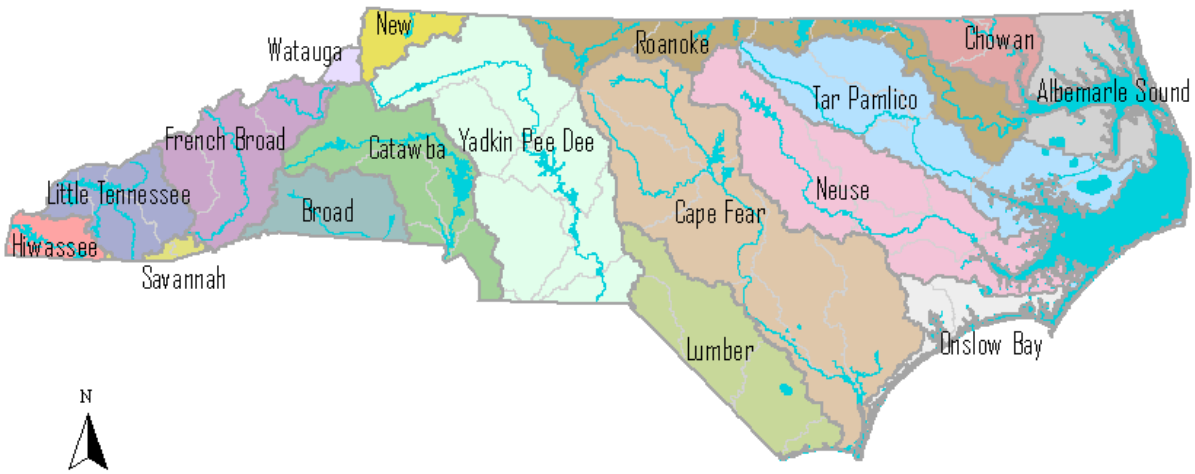
All models under development include the incorporation of the water shortage response plans for water systems. Stakeholder meetings are held in each river basin at specific stages of the model development process. The purpose of these meetings is to provide information to water systems and other stakeholders about the collection of model input data and how the model is constructed. Stakeholders have the opportunity to review all of the information in the model related to their water system for accuracy. The N.C. Division of Water Resources (DWR) also provides model demonstrations. A meeting is held in each basin upon model completion to provide training for interested parties in using the completed river basin hydrologic model. In addition, DWR offers a training opportunity during the comment period associated with the Environmental Management Commission model approval process.

Model Development Schedule

In accordance with the priorities established in Session Law 2010-143, the Department has updated the following table for river basin model development. The table lists the name of the river basin along with the year when the hydrologic model for that basin is proposed to be completed. The map below shows the river basins for which basinwide hydrologic models will be developed.

Year	River Basin Hydrologic Models
2011	**Broad and Tar models completed**
2012	**Broad receives EMC approval; Cape Fear and Neuse combined model begun**
2013	**Catawba, Roanoke, Cape Fear and Neuse combined models completed**
2014	**Tar, Catawba, Roanoke and Cape Fear and Neuse combined model to be presented to EMC for approval. Lumber and Yadkin Pee Dee model schematic is under development**
2016	**French Broad, Hiwassee, Little Tennessee and Watauga**
2017	**Albemarle Sound, Chowan, New, Onslow Bay, and Savannah**

North Carolina River Basins



South Carolina is developing hydrologic models for all of the South Carolina river basins. DWR will consult with South Carolina to determine if it is in our best interest to adjust modeling schedules in order to cooperate jointly on the remaining shared river basins, which include the Lumber, Yadkin Pee Dee and Savannah River basins.

Completed Models

The N.C. Division of Water Resources completed three river basin hydrologic models prior to the enactment of the 2010 legislation. The three models are the Roanoke River basin hydrologic model that was first completed in 1995; the Cape Fear river basin model that was completed in 2003; and the Neuse river basin model that was completed in November 2009. The Cape Fear and Neuse models have been updated with the most current information and additional functions. The updated versions have the ability to be run together as one model to assist in the analysis of

alternatives for the next round of water supply allocations from the B. Everett Jordan Reservoir. The updated combined Cape Fear and Neuse model has been completed and validated by the division. It is anticipated that the model will be presented to the EMC for approval at some point in 2014. The updated version of Roanoke River basin hydrologic model was completed in 2013 and will be used to study the reallocation of water supply in Kerr Lake, which was required in Session Law 2012-200. The Roanoke River basin hydrologic model will be presented to the EMC for approval at some point in 2014. The Broad River Basin model was completed in 2011 and received EMC approval in 2012.

The Tar River Basin hydrologic model has been completed. As requested by the Greenville Utilities Commission, their hydrodynamic model of the lower Tar River has been made available with the Tar River Basin model. EMC approval should be completed in 2014.

The Catawba-Wateree River basin model has also been completed. The Catawba-Wateree River basin model is jointly funded by the Catawba Wateree Water Management Group, North Carolina and South Carolina. The completion of the Catawba-Wateree model satisfies a provision of final resolution of the North Carolina/South Carolina Supreme Court case. It is anticipated the model will be presented for EMC approval in 2014.

Models Being Developed

The Lumber and Yadkin Pee Dee model schematic is under development. It is anticipated that this model will be completed in 2016.

Ecological Flows Science Advisory Board

Session Law 2010-143 also mandated that the department create a Science Advisory Board to assist the department in characterizing the natural ecology of the different river basins and to develop procedures for determining the flows necessary to maintain ecological integrity in surface waters. The Ecological Flows Science Advisory Board was convened according to the guidelines in the legislation, and its first meeting was held in November 2010. The Science Advisory Board met monthly or bi-monthly. All meetings were open to the public and participation was also available through webinars. The board issued a final report in November 2013. The report and more information on ecological flows, Ecological Flows Science Advisory Board, meeting summaries, presentations, and recordings of the meetings are available on the division's website at: http://www.ncwater.org/?page=366.

Summary

This document serves as the fourth report to the Environmental Review Commission on the development of basinwide hydrologic models by the department from October 1, 2013 through September 30, 2014, as required by the session law. A similar status report on the development of river basin hydrologic models will be provided by November 1 of each year.