

**Department of Environment and Natural Resources  
Division of Water Resources**

**STATUS REPORT TO THE GENERAL ASSEMBLY ON  
DEVELOPMENT OF BASINWIDE HYDROLOGIC MODELS  
OCT. 1, 2010, THROUGH SEPT. 30, 2011**

**Introduction**

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. Under the session law, the first report is due no later than Nov. 1, 2011.

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.

**Model Development Schedule**

In accordance with the priorities established in Session Law 2010-143, the department has drafted 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. A map showing the North Carolina river basins for which basinwide hydrologic models will be developed is shown below.

**Completion**

<b>Year</b>	<b>River Basin Hydrologic Models</b>
<b>2011</b>	<b>Tar and Broad</b>
<b>2012</b>	<b>Cape Fear, Roanoke and Neuse Updates</b>
<b>2013</b>	<b>Hiwassee and Little Tennessee</b>
<b>2014</b>	<b>French Broad and Lumber</b>
<b>2015</b>	<b>New and Watauga</b>
<b>2016</b>	<b>Catawba and Savannah</b>
<b>2018</b>	<b>Albemarle Sound, Chowan and Onslow Bay</b>
<b>2019*</b>	<b>Yadkin-Pee Dee</b>

## North Carolina River Basins



\*The Yadkin-Pee Dee is scheduled for completion in 2019, but if the Federal Energy Regulatory Commission issues new licenses for the Yadkin and Yadkin-Pee Dee Hydroelectric Projects in that basin, priority for model development for the Yadkin-Pee Dee would be elevated and the basin model completed much sooner.

### Completed Models

The N.C. Division of Water Resources completed three river basin hydrologic models prior to the enactment of the 2010 legislation. The Cape Fear river basin model was completed in 2003 and the Neuse river basin model was completed in November 2009. The Cape Fear and Neuse models are being updated with the most current information and additional functions. The updated versions will 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 Roanoke River basin hydrologic model was first completed in 1995 and the updated version will be completed in 2012.

### Models Being Developed

Currently, the division is developing two additional river basin hydrologic models. The division will complete models for the Tar River Basin and the Broad River Basin by the end of 2011. After completion, these two models are scheduled for EMC review and approval later this year, or in early 2012. Work began on these models in spring 2010. Improved features of these two new models will include the incorporation of the water shortage response plans for water systems, as well as location place holders for future ecological flow determinations. Three stakeholder meetings were held in each river basin at specific stages of the model development process. The purpose of these meetings was to provide information to water systems and other stakeholders on collection of model input data and how the model was constructed. Stakeholders had the opportunity to review all of the information in the model related to their water system for accuracy. DWR also provided model demonstrations and gave representatives of each water system an opportunity to review a model simulation of their system. A fourth meeting will be held in each basin upon model completion to provide training for interested parties in using the completed river basin hydrologic model.

## **Ecological Flows Science Advisory Board**

Session Law 2010-143 also required the department to 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 has met six times so far in 2011, with two additional meetings scheduled for the remainder of this year. All meetings are open to the public and participation is also available through webinars. The board's work will continue through 2012 and possibly beyond. More information on ecological flows or the Ecological Flows Science Advisory Board, meeting summaries, presentations and recordings of the meetings is available on the division's website at [http://www.ncwater.org/Data\\_and\\_Modeling/eflows/](http://www.ncwater.org/Data_and_Modeling/eflows/).

### **Summary**

This document serves as the first report to the Environmental Review Commission on the development of basinwide hydrologic models by the department from Oct. 1, 2010, through Sept. 30, 2011, as required by the session law. A similar status report on the development of river basin hydrologic models will be provided by Nov. 1 of each year.