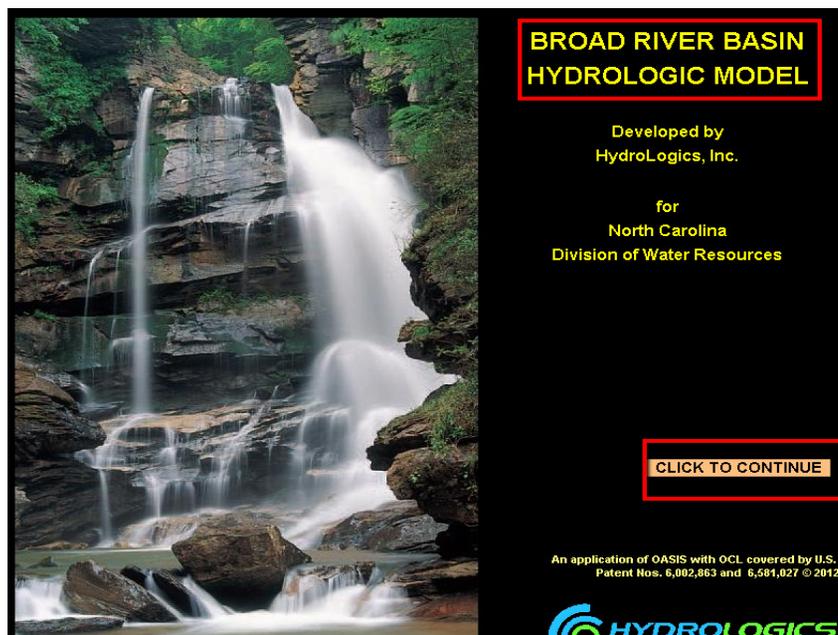


Broad River Basin Model



September 12, 2012

Water Allocation Committee

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



Managing Water Resources to Support
North Carolina's Future

Staff Recommendations

- Based on the public comments and staff validation of the model, the DWR recommends that the Water Allocation Committee approve the Broad River Basin Model for forwarding to the full Environmental Management Commission.
- Staff also requests that the Water Allocation Committee recommend that the Environmental Management Commission approve the model.

Improve River Basin Modeling – SL 2010-143

- (3) Model. – Each basinwide hydrologic model shall:
- a. Include surface water resources within the river basin, groundwater resources within the river basin to the extent known by the Department, transfers into and out of the river basin that are required to be registered under G.S. 143-215.22H, other withdrawals, ecological flow, instream flow requirements, projections of future withdrawals, an estimate of return flows within the river basin, inflow data, local water supply plans, and other scientific and technical information the Department deems relevant.
 - b. Be designed to simulate the flows of each surface water resource within the basin that is identified as a source of water for a withdrawal registered under G.S. 143-215.22H in response to different variables, conditions, and scenarios. The model shall specifically be designed to predict the places, times, frequencies, and intervals at which any of the following may occur:
 1. Yield may be inadequate to meet all needs.
 2. Yield may be inadequate to meet all essential water uses.
 3. Ecological flow may be adversely affected.
 - c. Be based solely on data that is of public record and open to public review and comment.
- (6) Approval and modification of hydrologic models.



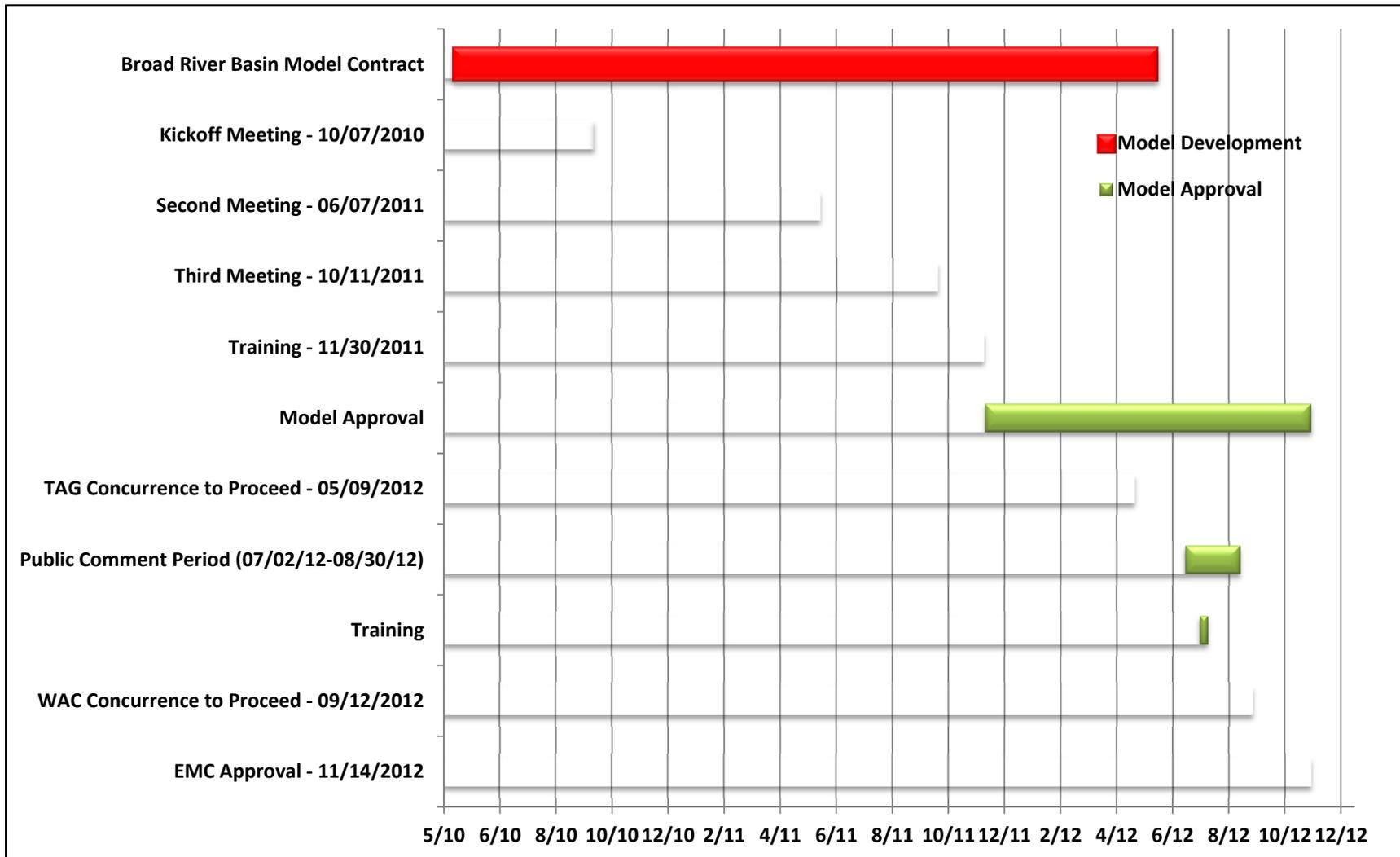
Broad Hydrologic Model

- Basin models required by Session Law 2010-143 (G.S. §143.355(o))
- DWR uses OASIS for meeting the requirements of SL2010-143.
 - OASIS is a patented, mass balance, water resources simulation/optimization model.
 - ***Change-in-Storage = Inflow - Outflow***
- Uses Operations Control Language (OCL) to communicate operating policies to the model

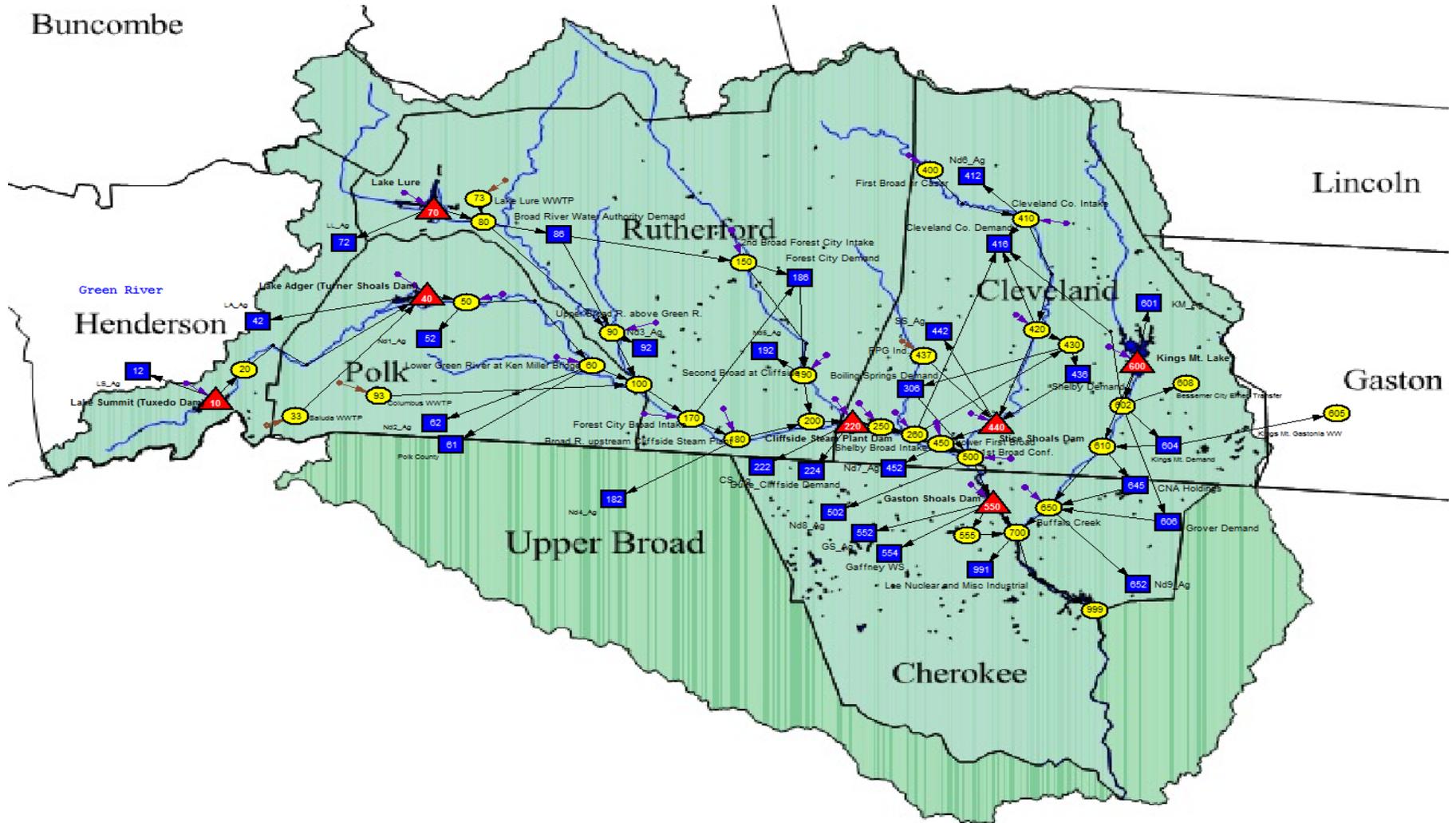
Applications of Broad OASIS Model Alternatives Evaluation – “What if?”

1. Evaluation of the combined basinwide effects of current and future water supply demands.
2. Evaluation for Interbasin transfer permit applications.
3. Model will be on the DWR server and available to stakeholders and their consultants.
 - Development of individual water supply plans.
 - A platform for developing risk-based triggers for water shortage response plans.
 - SEPA impact analysis.

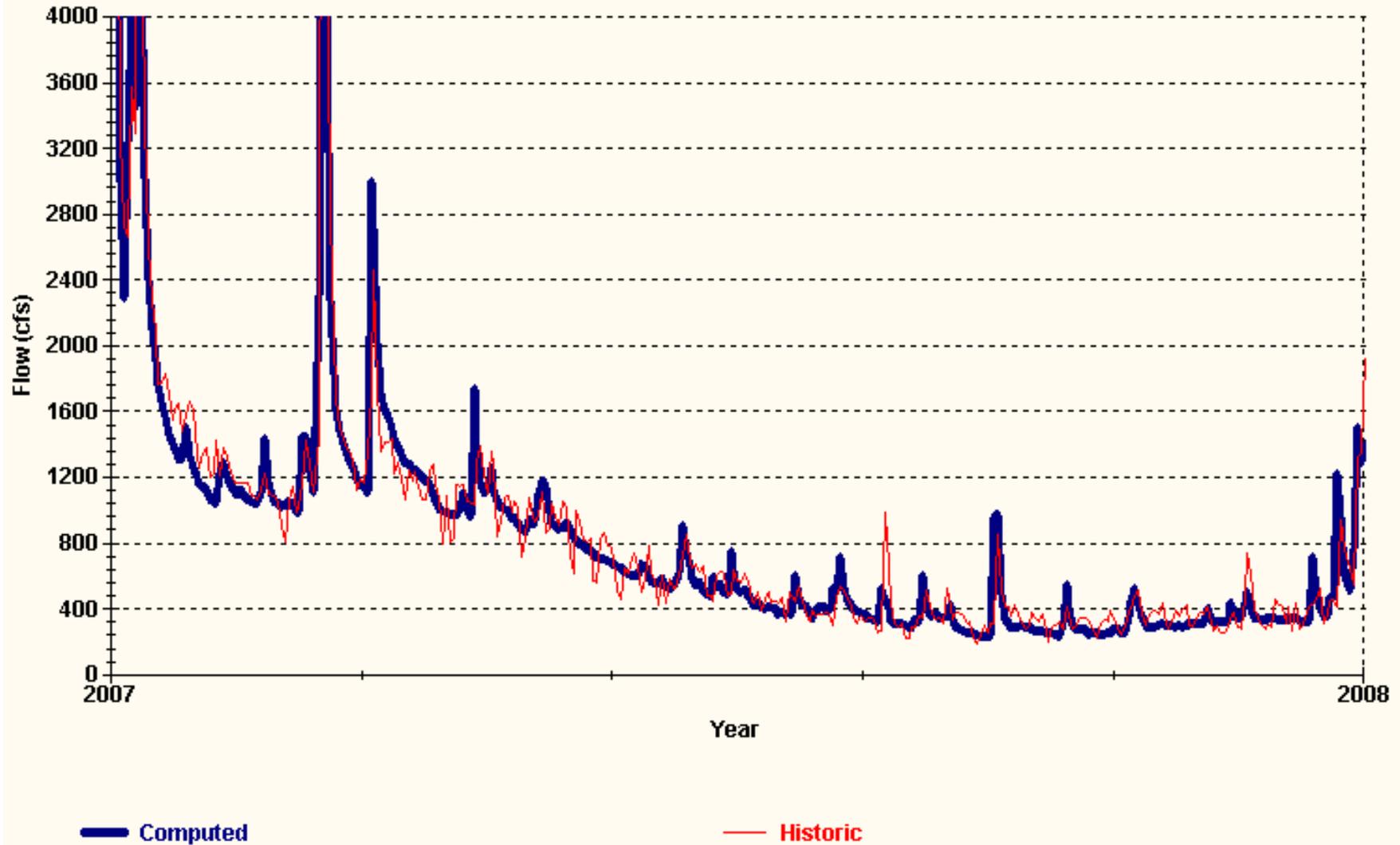
Broad River Basin Modeling Process



Model Schematic



Flow at arc 250.260 -- Broad R. Boiling Springs Gage Flow



Public Notice

In July 2012 the DWR published a Public Notice recommending that The Environmental Management Commission approve the Broad River Basin Hydrologic Model. This notice provided a 60-day public comment period ending on August 30, 2012 as well as opportunities for model training.

Comments made by Duke Energy

- 1. Raise the lower rule for Lake Summit from 2005.60 to 2007.60 year-round. This will more closely reflect how the lake is operated.
- 2. Raise the upper rule for Gaston Shoals to 605.20 year-round. Currently, the upper rule is set to 604.20 for a few periods during the year. By license, this lake is operated within either the top foot or top two feet depending on the time of year. The lower rules for Gaston Shoals in the model are accurate for all time periods.

Staff Recommendations

- Based on the public comments and staff validation of the model, the DWR recommends that the Water Allocation Committee approve the Broad River Basin Model for forwarding to the full Environmental Management Commission.
- Staff also requests that the Water Allocation Committee recommend that the Environmental Management Commission approve the model.

Questions?

- **Broad Model Website -**
[http://www.ncwater.org/Data and Modeling/Broad/](http://www.ncwater.org/Data_and_Modeling/Broad/)
- **Broad Model Report -**
[http://www.ncwater.org/Data and Modeling/Broad/background/03 BRBM
_Modeling the Broad River Basin Operations with OASIS.pdf](http://www.ncwater.org/Data_and_Modeling/Broad/background/03_BRBM_Modeling_the_Broad_River_Basin_Operations_with_OASIS.pdf)
- **Model Training Signup -**
[http://www.ncwater.org/Data and Modeling/Broad/training.php](http://www.ncwater.org/Data_and_Modeling/Broad/training.php)

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