

Cape Fear River Basin Hydrologic Model Update

July 14, 2010

Funding

- Good News – General Assemble provided \$150,000 for the model update.
- Bad News – Time delay for startup because of the State contracting procedures.

Overview

- Original estimated cost \$75,000 and 6 months to complete.
- Current estimated cost \$120,000 and 6 months to complete.

Cost Breakdown

Inflows

- Inflow updates (Oct 2004 to Sept 2009) - \$30,000
 - Includes collection of data for precipitation, river gage flows, reservoir operations, municipal/industrial/irrigation demands, and municipal/industrial wastewater discharges.
- Inflow verification - \$20,000
 - Inflows checked and adjusted by comparing computed and historic elevations/flows from reservoirs.
- Questions
 - Why stop the update at 9/2009?
 - The Neuse inflows need to be updated to match the Cape Fear. Neuse currently ends at 4/30/2008.

Update Model Components - \$12,500

- Update and simplify drought protocol for Jordan Lake
- Update operating rules for all systems, including interconnections (e.g., OWASA)
- Update reservoir storage/area/elevation and rule curve data
- Review and update demand and discharge patterns
- Adjust weighting on storage, instream flows, and demands to ensure objectives are prioritized in order set by Technical Review Committee
- Simplify run configurations by standardizing demand year scenarios and forecast runs by having user adjust entries in the constants table
- Update and add output files
- Questions
 - The original component updated included the updated information on Harris Lake and mainstem skimming.

Update Other Model Components

- Add Siler City reservoir node and operating rules - \$750
- Add Buckhorn dam and lock and dams as reservoirs - \$250
- Incorporate all municipal drought plans and add model switch to allow user to turn all plans on or off - \$9,000
- Sensitivity analysis (inflows and net evaporation) - \$4,000
- Evaluate system sensitivity to climate change through
 - (a) uniform adjustment of inflows and net evaporation (e.g., 10% reduction) contained in the data input file
 - (b) use of alternative data input files provided by DWR that contain statistically-adjusted time series of inflow and net evaporation data.
- Link withdrawals with discharges and allow user to uniformly adjust the withdrawals by a constant multiplier - \$3,000
- Combine Cape Fear and Neuse models - \$5,000
 - To facilitate evaluation of regional operations.
- Add common directory feature - \$3,000
 - To reduce storage on the server by eliminating duplicate runs in each user directory, and to simplify run version control.

Instream Flow Nodes

- Add instream flow nodes (up to twenty) and inflows to all nodes - \$20,000

STREAM	SITE
BACK CREEK	DS OF SR 1936 UPPER SITE, 1 TR DS OF SR 2123
BIG ALAMANCE CREEK	DS OF NC 62 NR ALAMANCE
BLACK RIVER	WRC RAMP OFF SR 1100 NR IVANHOE
CAPE FEAR RIVER	RAVEN ROCK STATE PARK, FISH TRAPS
DEEP RIVER	US OF US 220 NR RANDLEMAN
DEEP RIVER	DS OF PROPOSED RANDLEMAN RESERVOIR
DEEP RIVER	RAMSEUR, US OF WWTP
HAW RIVER	DS OF SR 1002 NR ALTAMAHAW
HAW RIVER	HYDRO DIVERSION AT GLENCOE
HAW RIVER	HYDRO DIVERSION AT BYNUM
LITTLE RIVER	US OF NC 24,87 AT MANCHESTER
NORTHEAST CAPE FEAR RIVER	DS OF NC 50,41 NR CHINQUAPIN
REEDY FORK	DS OF SR 2732
ROCKFISH CREEK	DS OF US 301 NR HOPE MILLS
ROCKY RIVER	DS OF LOWER WS DAM AND US OF SR 1004 2 SITES
ROCKY RIVER	DS OF SR 2170 NR BONLEE
SOUTH RIVER	DS OF US 701 NR GARLAND

Administration Costs

- *Update documentation and DWR server files – \$7,500*
 - Includes summary of inflow verification efforts, with emphasis on Jordan Lake, use of model weighting, update of previous model documentation, and update of server files.
- *Technical Review Committee meetings (four) - \$5,000*

Contingencies

- Cost associated with EMC approval.
- Cost to add ground water withdrawal impacts.

HB 1743 - Improved Modeling

- Model. – Each basinwide hydrologic model shall:
 - a. Include surface water resources within the river basin
 - a. groundwater resources within the river basin to the extent known
 - b. transfers into and out of the river basin that are required to be registered under G.S. 143-215.22H
 - c. other withdrawals
 - d. ecological flow, instream flow requirements
 - e. projections of future withdrawals
 - f. an estimate of return flows within the river basin
 - g. inflow data
 - h. local water supply plans,
 - i. other scientific and technical information the Department deems relevant.

HB 1743 - Improved Modeling

- **Model. – Each basinwide hydrologic model shall:**
 - 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.**

Next Steps

- State Contracting
 - Need certified budget – Sometime in August
 - Scope of Work
 - DENR & State Contracting
- DWR Data Collection
 - Water Withdrawal Data
 - Check the storage-storage-area data.
- Work with the EMC on model approval process.
- No meetings scheduled – email updates.

Contact Information

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Questions

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