2013 Annual Water Supply Report

Environmental Review Commission

January 15, 2014

Overview

- Organization Changes/Consolidation of DWR & DWQ
- Water Efficiency
- Water Supply Assistance to Local Governments
- Hydrologic Modeling
- Ecological Flows
- Coastal Plain Aquifers
- Interbasin Transfers
- Jordan Lake Pilot Test

Organizational Changes

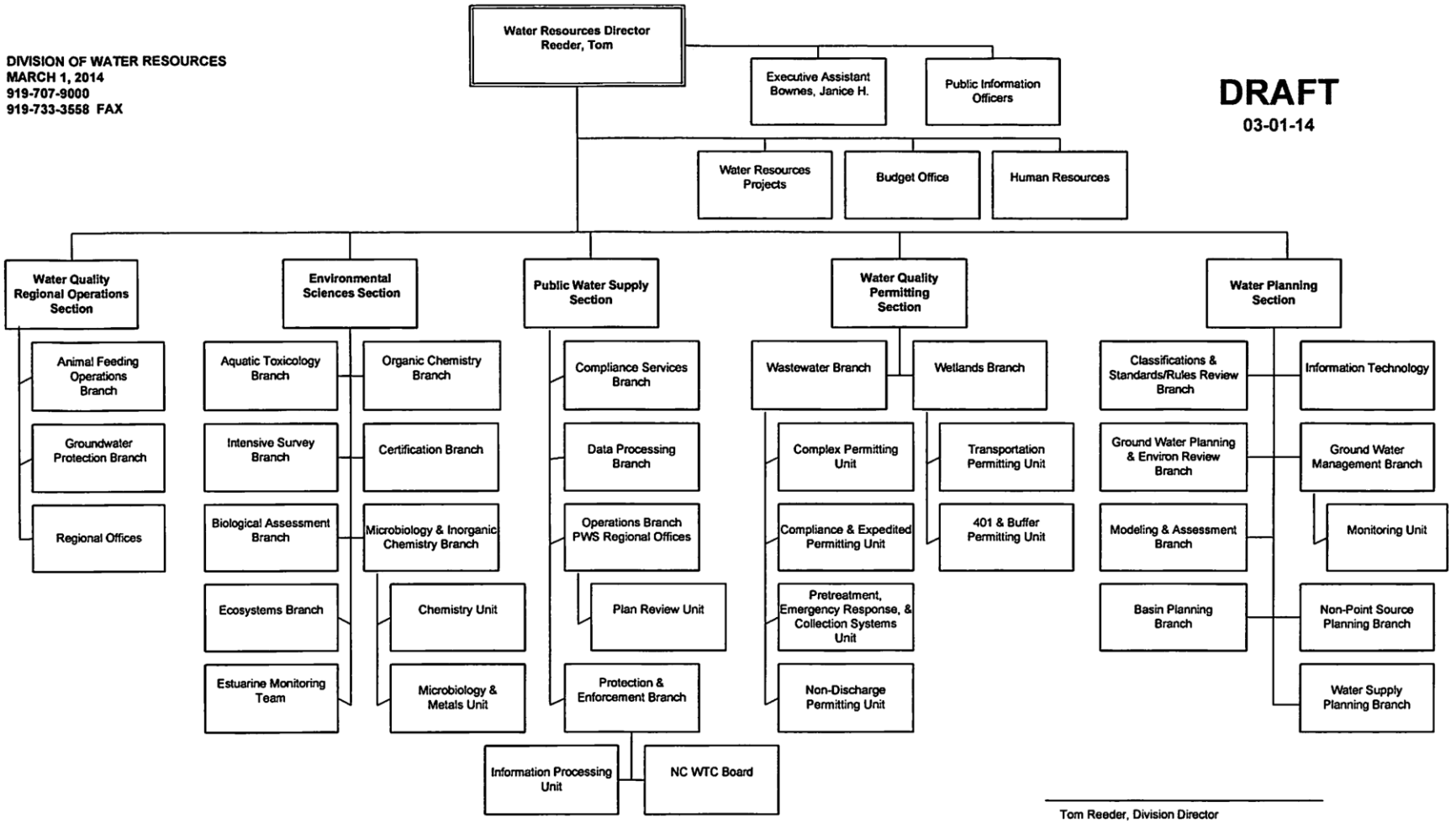
- Stormwater programs moved to Division of Energy, Mineral, and Land Resources (DEMLR)
- Division of Water Infrastructure (DWI) created
  - Clean Water State Revolving Fund (wastewater)
  - Drinking Water State Revolving Fund
  - Community Block Dev Grant – Infrastructure (DOC)
- Remaining personnel in DWR & DWQ consolidated

DWR – DWQ Consolidation

- Consolidation effective Aug 1, 2013 – 497 total positions
- Reduction of 68 positions (14% of total) by Mar 1, 2014
- Total annual savings of approx. $4M (appr/receipts/fed)
- Breakdown of reduced positions
  - 46 Vacant (approx 15 individuals relocated within Division)
  - 22 Occupied
    - 11 employees volunteered
    - 6 additional employees eligible for retirement
    - 2 requested not to be relocated
    - 3 we are still working to relocate within DENR

DIVISION OF WATER RESOURCES
MARCH 1, 2014
919-707-9000
919-733-3558 FAX

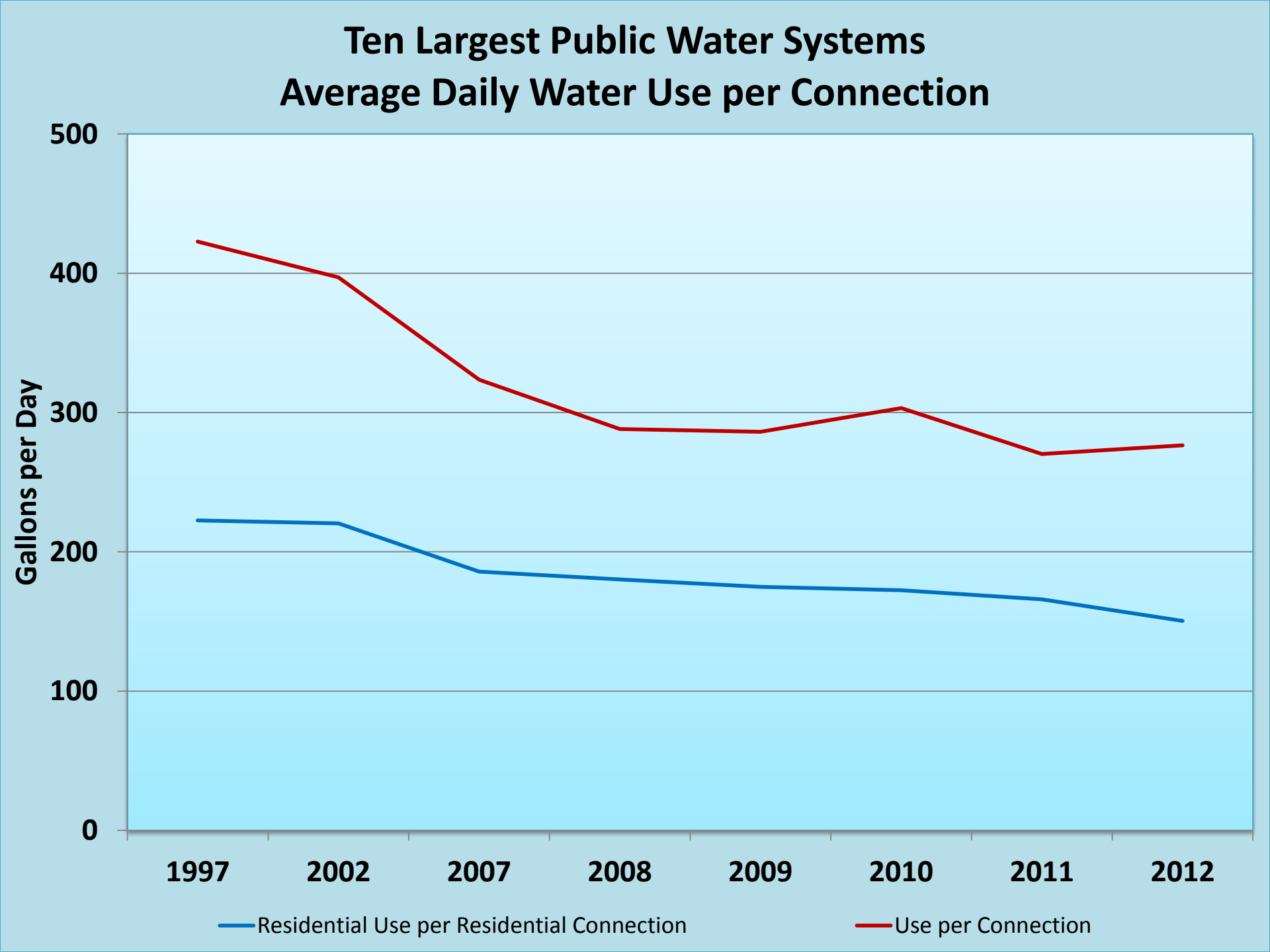
DRAFT
03-01-14



Tom Reeder, Division Director

Water Efficiency

Getting maximum benefit from existing water resources in North Carolina


Ten Largest Public Water Systems
Average Daily Water Use per Connection
Gallons per Day
500
400
300
200
100
0
1997
2002
2007
2008
2009
2010
2011
2012
Residential Use per Residential Connection
Use per Connection

DWR Efficiency Activities

- Water Efficiency BMP Manual
- Water Audit Workshops
  - 6 workshops throughout NC
  - Attended by 92 water system personnel

Water Systems in NC with > 30% Unaccounted for Water*

- 24 systems with 31 – 50% unaccounted for water
- Reduced from 37 systems last year

*Based on Local Water Supply Plan data

Systems with > 30% Unaccounted for Water

Fairfield Sapphire	Danbury	Boonville
Sugar Mountain	Tryon	Beech Mountain
Stumpy Point WSD	Sparta	Bakersville
Mount Airy	Goldston Gulf SD	Graham
Waynesville	Chimney Rock Water Works	Banner Elk
Crossnore	Lake Lure	Franklinton
Asheville	Warrenton	Lumberton
Enfield Water System	Greene County RWS	Blowing Rock

DWR Assistance to Water Systems for Future Water Supply Needs

Water System	Type of Water Supply Project
Cape Fear Public Utility Authority & Lower Cape Fear Water & Sewer Auth.	Unknown. Additional water needed to meet maximum day demands.
Raleigh	Reallocation of Falls Lake
Greenville Utilities	Surface water intake / modeling
Cleveland County	New reservoir on First Broad
Moore County	Surface water intake/Existing reservoir
Marshall	New groundwater wells
Louisburg	Expand existing facility
Union County	Surface water intake / IBT

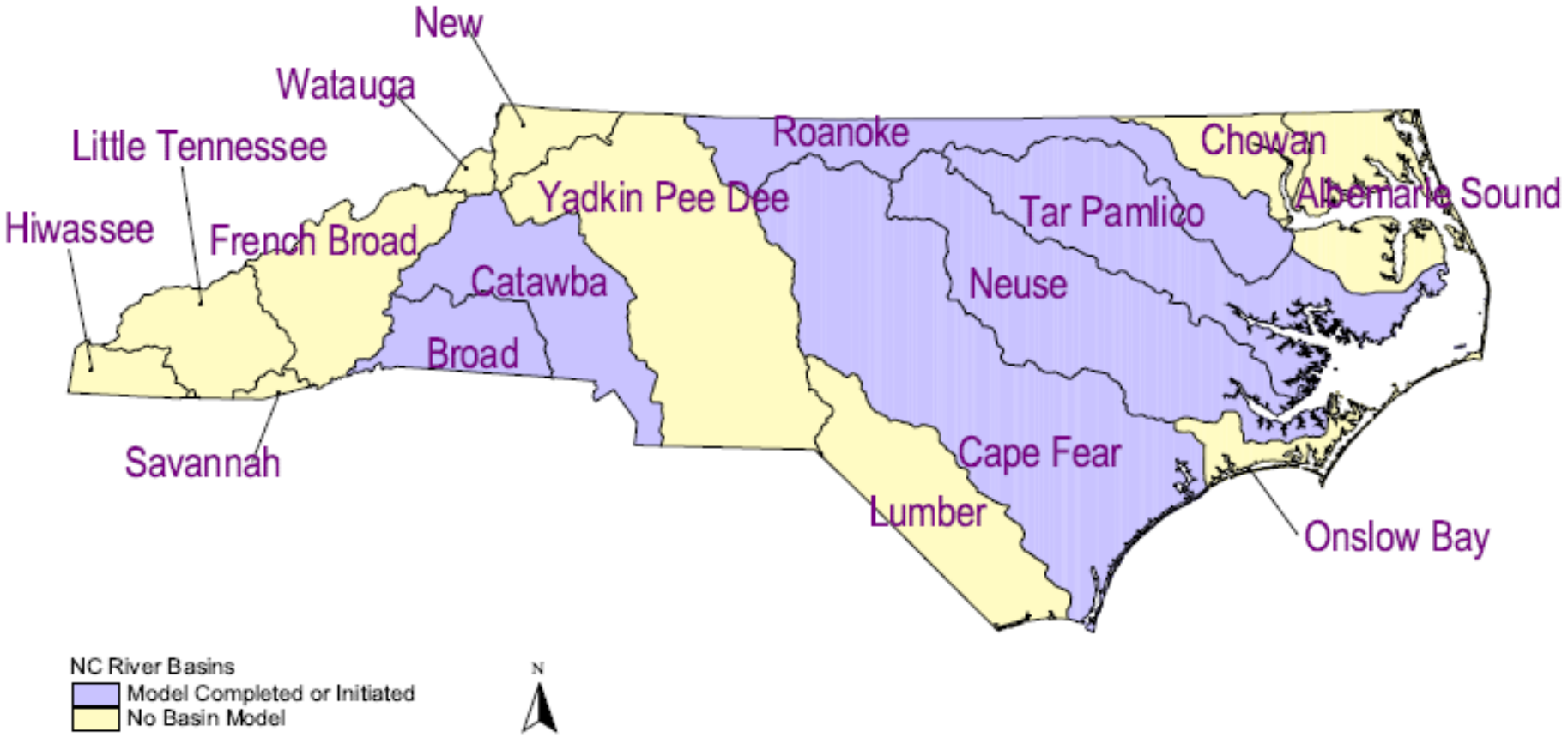
Hydrologic Model Development Status

(Mandated by SL 2010-143)

River Basin	Status	Type of Model
Neuse[1]	Completed	OASIS
Cape Fear[1]	Completed	OASIS
Tar-Pamlico	Completed	OASIS
Broad	Completed	OASIS
Roanoke	Underway	OASIS
Catawba	Underway	CHEOPS
Yadkin – Pee Dee	Sched. for 2014	OASIS
Lumber	Sched. for 2014	OASIS
French Broad / Watauga	Sched. For 2015	OASIS
Little Tenn. / Hiwassee	Sched. For 2015	OASIS

[1]A combined Cape Fear-Neuse model was developed in 2013

North Carolina River Basin Model Development Status



Integrated Watershed Planning

- Outcome of DWR-DWQ Consolidation
- Allows for the analysis of water quantity and water quality data at the same time
- Quantity, or flow, is the master variable. Water quality is dependent upon flow.
- Integrated planning is the most efficient & scientific tool for long-term water resource management
- Will be implemented in Tar-Pamlico Basin Plan due out in early 2014

Ecological Flows

- Ecological Flows Science Advisory Board (SAB) mandated in SL 2010-143
- Ecological Flow SAB completed work in Nov 2013
- Report submitted to DENR
- Recommendations are non-regulatory
- Incorporated in to planning & modeling process
- Will provide NC with one of the strongest water resource modeling programs in the US

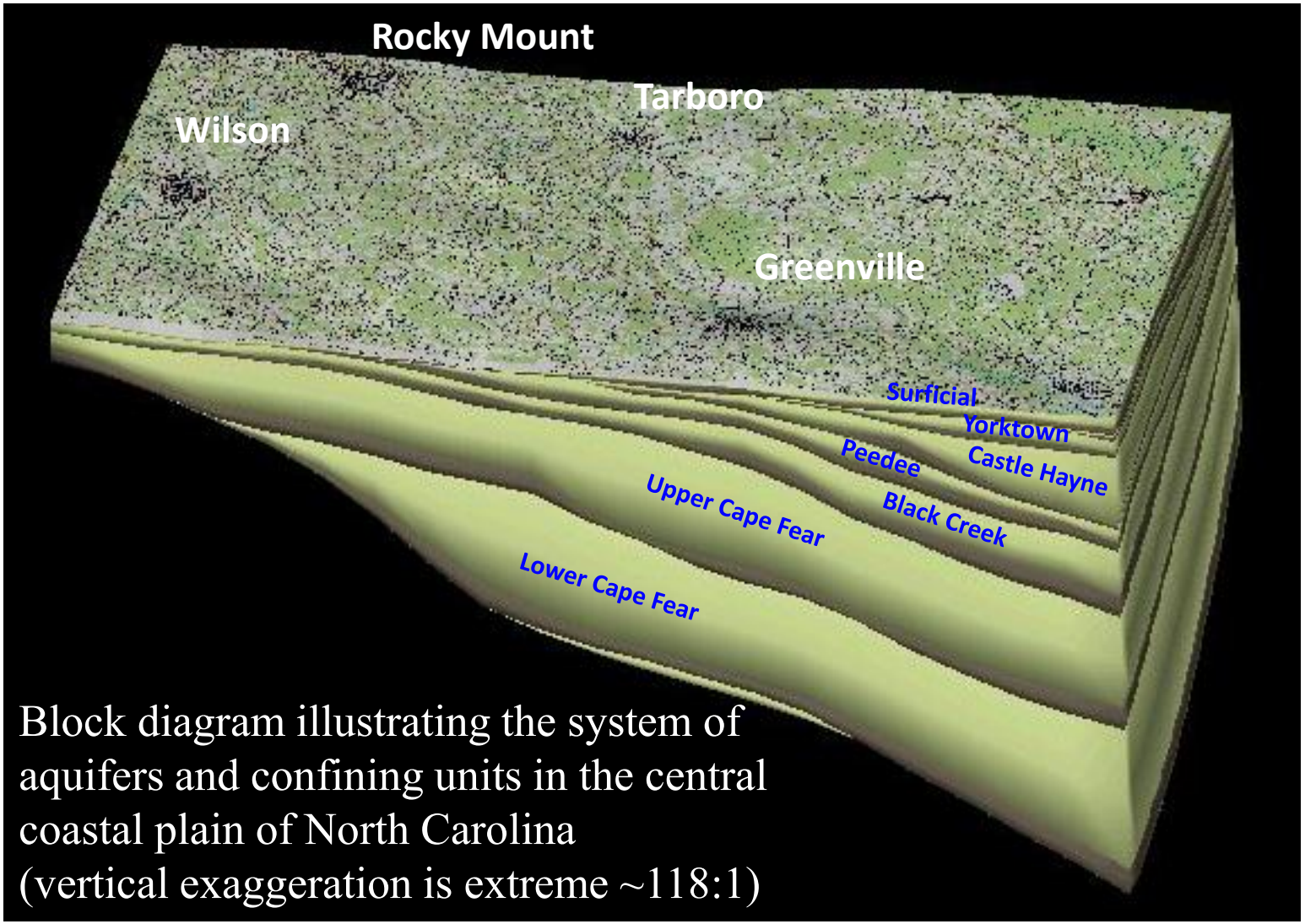
Ecological Flows Recommendations

- Maintain 80-90% flow by in waters
  - Incorporated into hydrologic models
- Consider use of biological-response model
  - Model developed by RTI
  - More suitable for site-specific analysis
- Adopt adaptive management approach
  - Continue data collection & analysis
  - Validate current approach
  - Make future modifications as required

Central Coastal Plain Capacity Use Area (CCPCUA)

- Water withdrawal permits in the 15 county area for withdrawals > 100,000 gallons/day
- Phased reductions in use of the endangered aquifers
- Local & regional investments in alternative water sources and water treatment

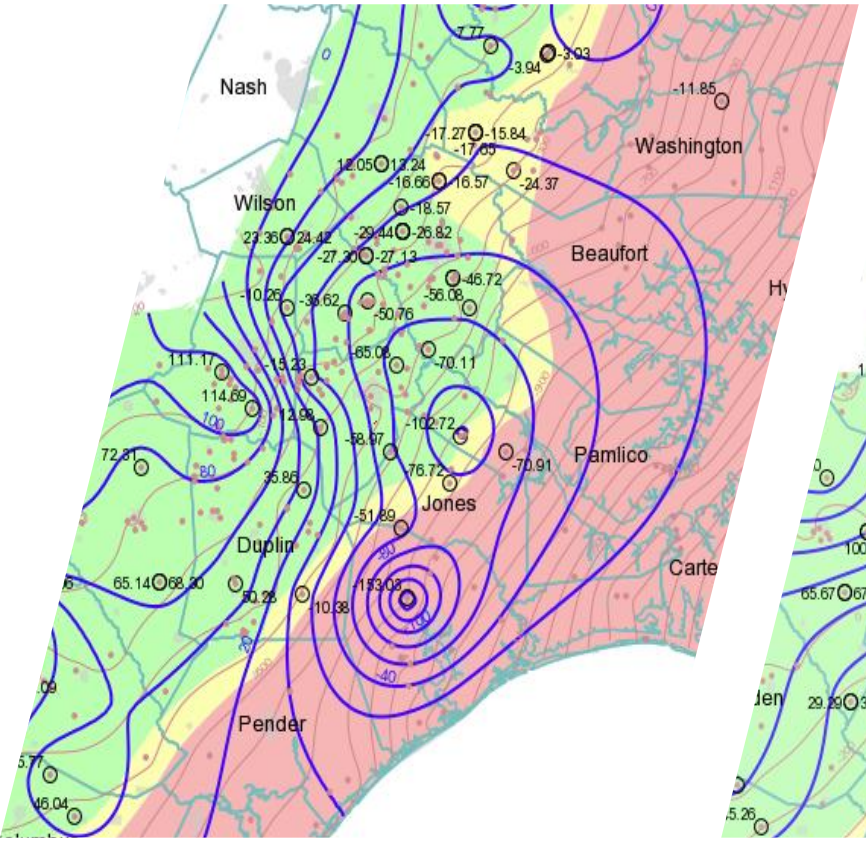
Central Coastal Plain Aquifers



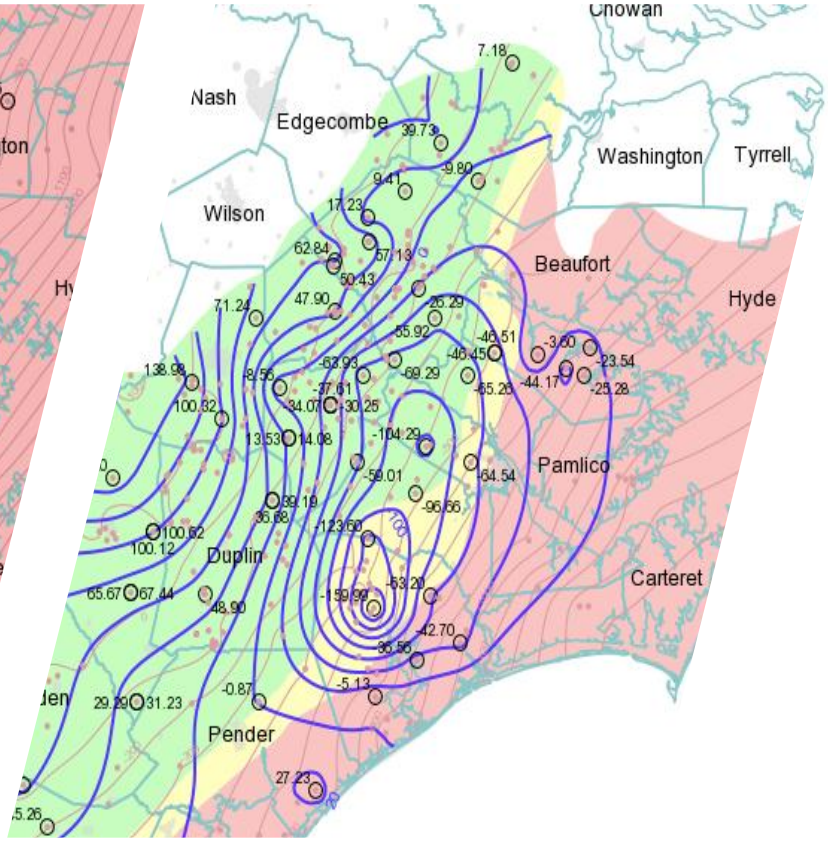
Block diagram illustrating the system of aquifers and confining units in the central coastal plain of North Carolina
(vertical exaggeration is extreme ~118:1)

Central Coastal Plain Aquifer Depletion

Upper Cape Fear Aquifer 2012



Black Creek Aquifer 2012

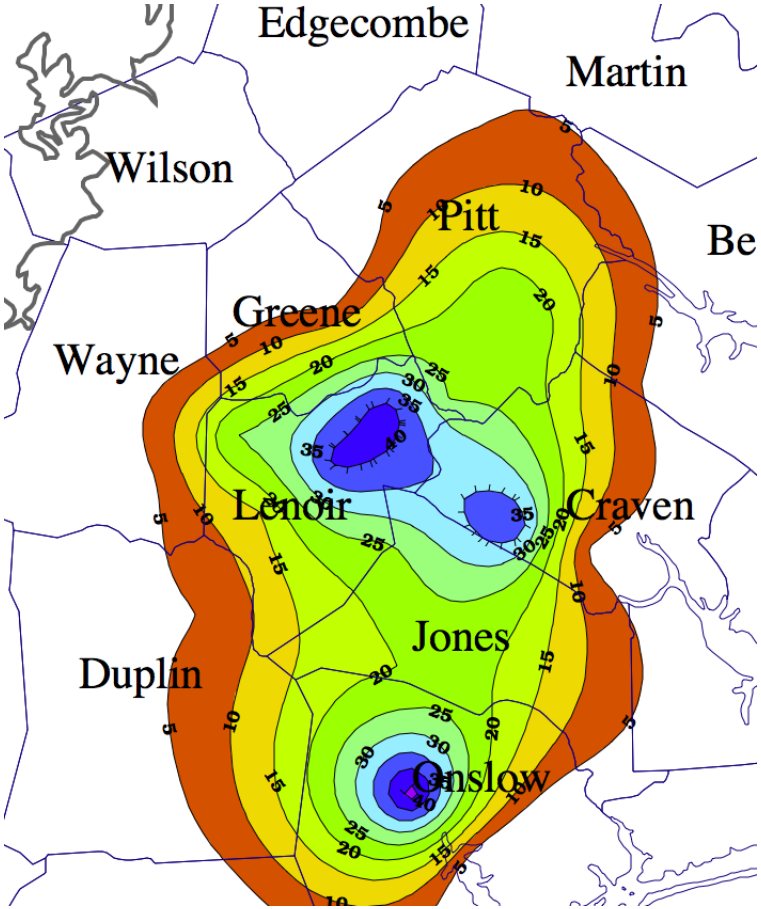


Cone of depression – contoured area of low water pressure in each aquifer

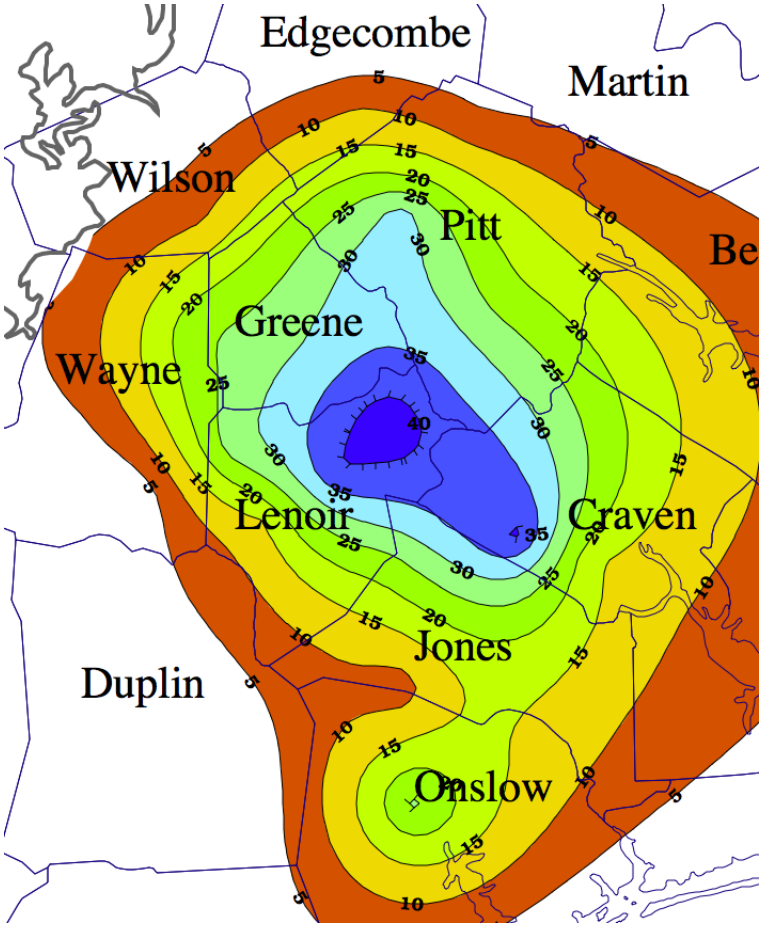
Salt water encroachment – yellow and pink areas on each map

Cretaceous Aquifer Rebound

Up to 40 feet of recovery from November 2007 through August 2013



Black Creek Aquifer



Upper Cape Fear Aquifer

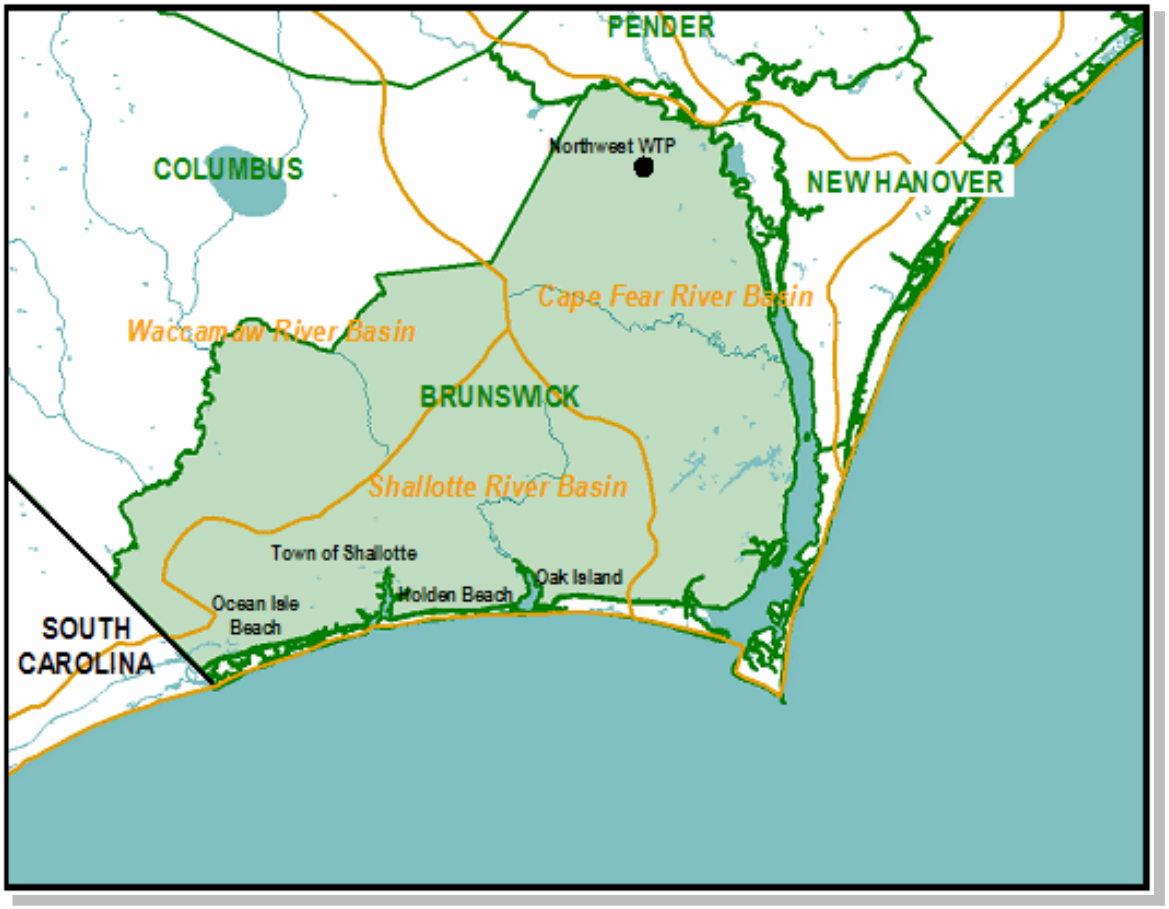
Adapting the CCPCUA Program

- Endangered aquifers showing recovery with phased withdrawal reduction permit program
- DWR is now using temporary permits to ease reductions for permit holders who's wells meet certain conditions

Interbasin Transfer (IBT) Update

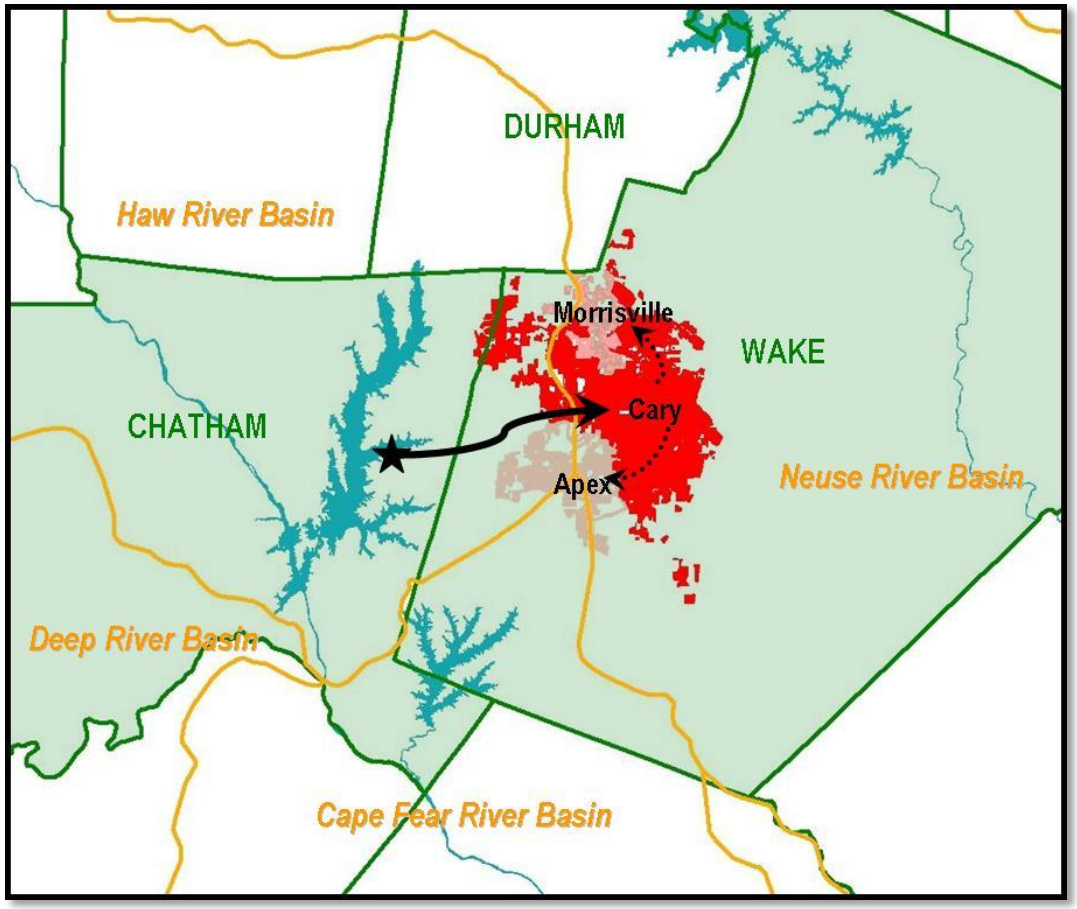
- SL 2013-388 facilitated 2 non-controversial IBTs
  - Brunswick County
  - Modification of existing IBT for Cary

Brunswick County IBT



IBT Certificate issued November, 2013. The request was for increase approved IBT amount from 10.5 million gallons per day to 17 million gallons per day from Cape Fear basin to Waccamaw and Shallotte Basins.

Cary/Apex/Morrisville IBT Modification

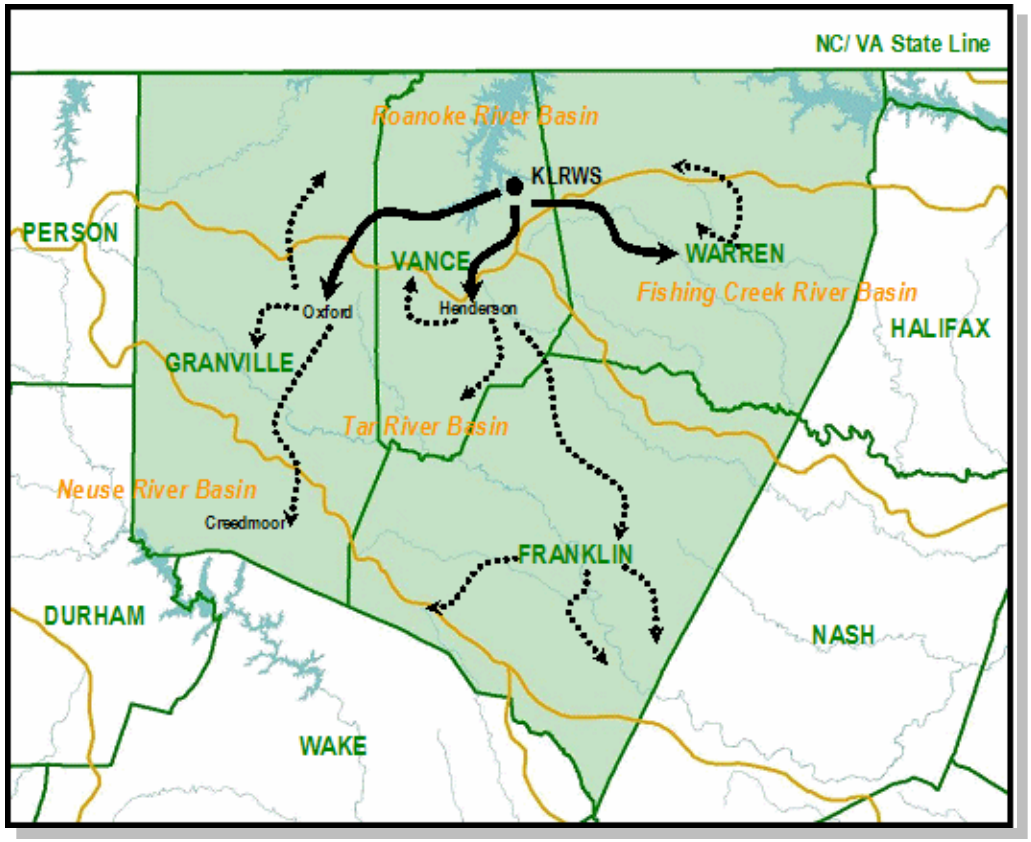


- Request to increase IBT transfer from approximately 24 million gallons per day to 35 million gallons per day from Haw Basin to Neuse Basin.
- NOI submitted September 2013.
- Environmental document is currently being developed.

Pending IBTs

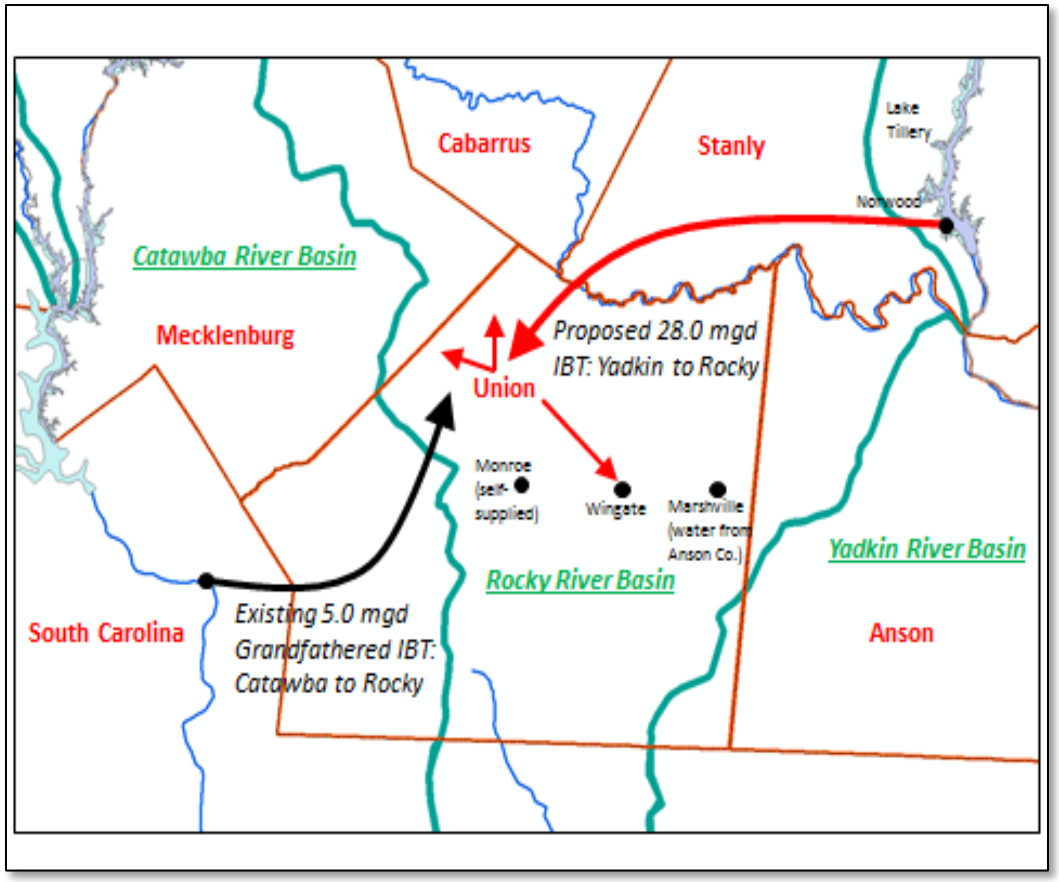
- Kerr Lake Regional Water System
- Union County

Proposed Kerr Lake Regional Water System IBT



- Request to transfer approximately 26 million gallons per day from Roanoke Basin to Tar, Fishing and Neuse Basins.
- Running Draft Roanoke River Basin OASIS model.
- Draft EIS expected in 2014.

Proposed Union County IBT

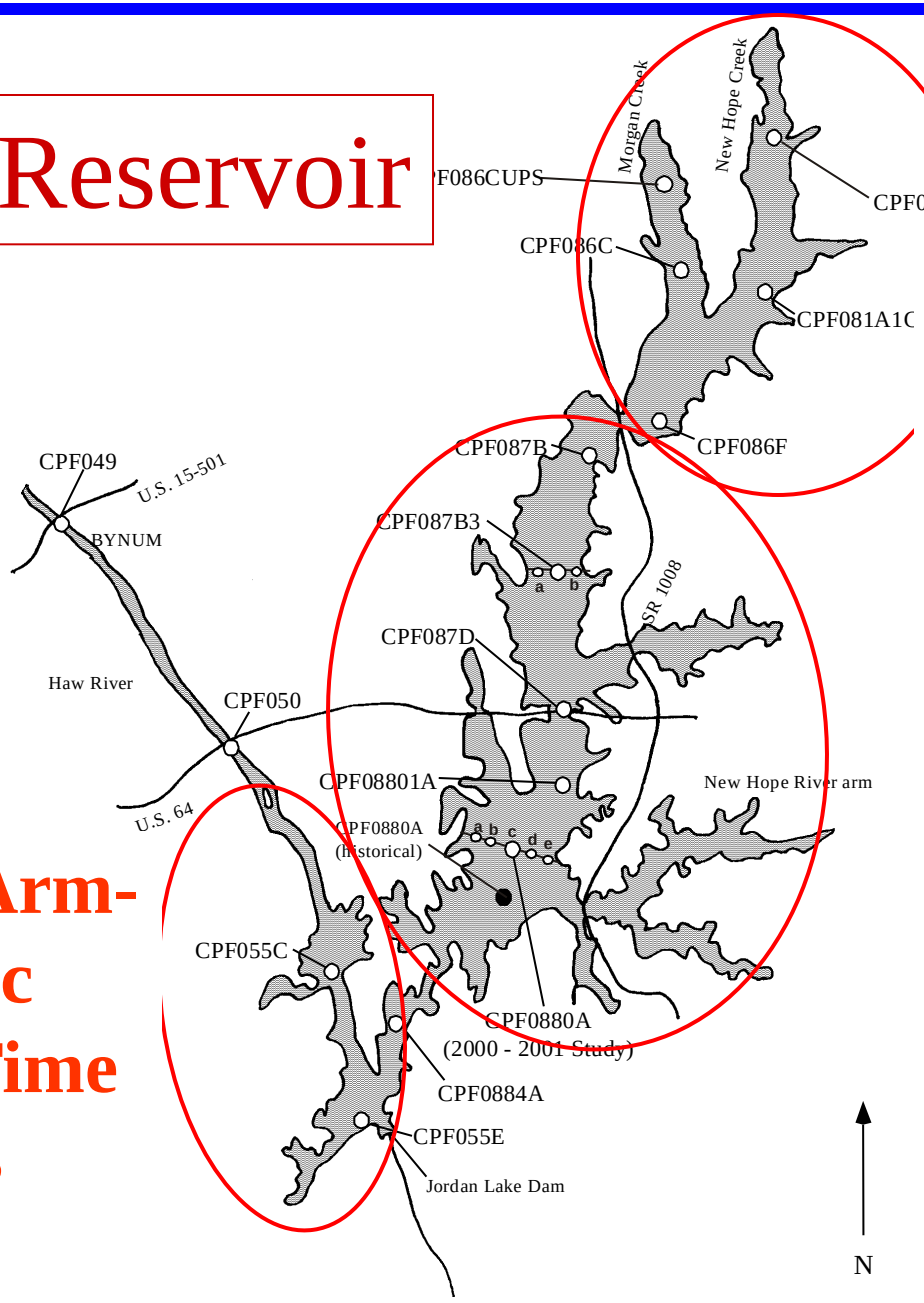


- Request to transfer approximately 28 million gallons per day from Yadkin Basin to Rocky.
- Notice of Intent submitted August 2013 and three public meetings held in October 2013.
- Environmental Impact Statement document is currently being developed.

Jordan Lake Water Quality Improvement Demonstration Project

- Jordan Lake is currently impaired due to chlorophyll a (algae) exceedances in the summer months
- A contributing factor is the presence of cyanobacteria and Harmful Algae Blooms (HABs)
- HABs require nutrients and stagnant water
- HABs produce toxins, odors, high pH, low dissolved oxygen and can result in fish kills
- HABs restrict the development of zoo plankton and other organisms that can naturally control chlorophyll a

Jordan Reservoir



Upper & Lower New Hope Arms- Hydraulic Retention Time = 418 Days

Haw River Arm- Hydraulic Retention Time = 5 days

Jordan Lake Water Quality Improvement Demonstration Project

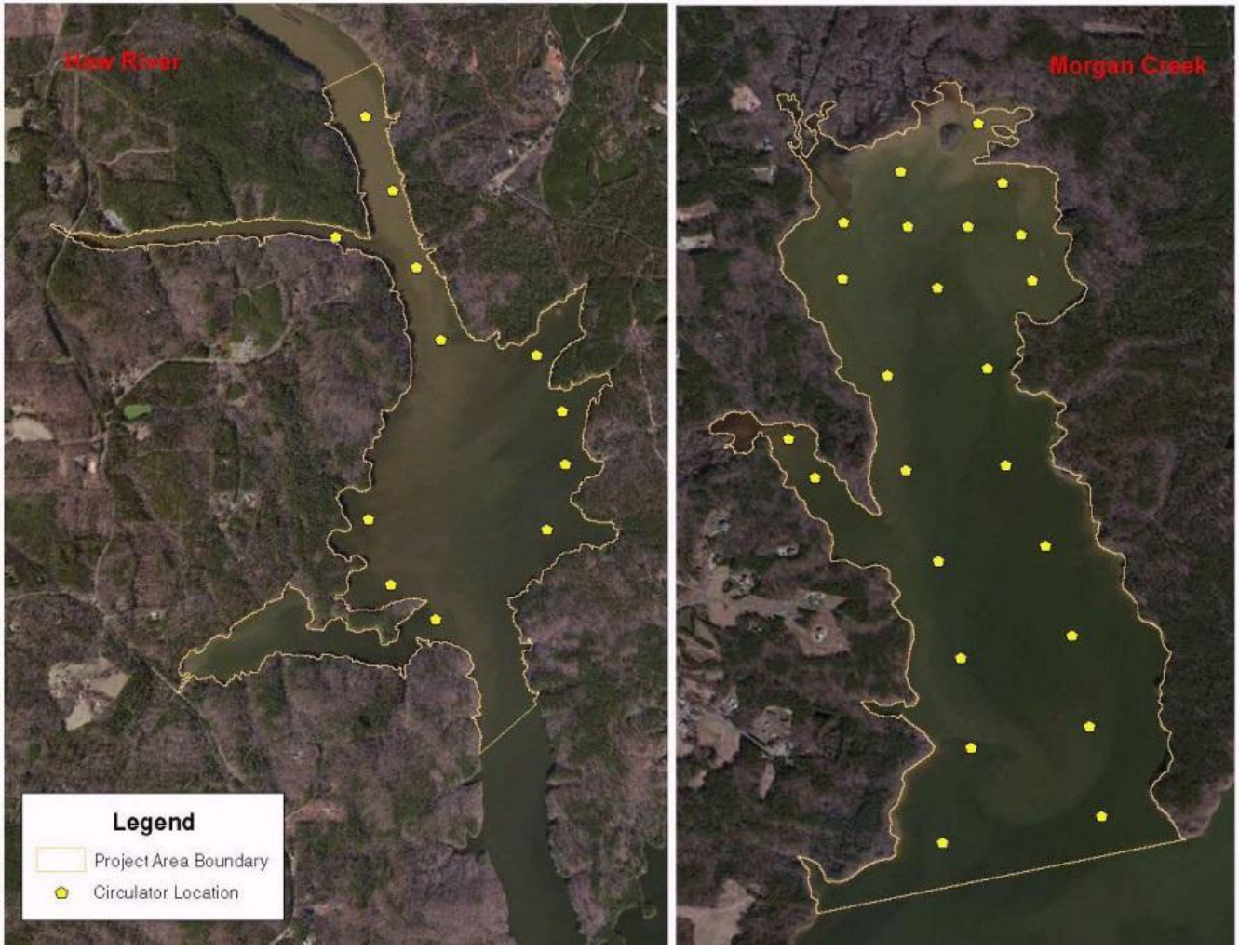
The Proposal

Provide long flow circulation of water in the lake to reduce the areas of stagnant water, breaking the HAB cycle

"SolarBees" will be deployed to provide circulation in Morgan Creek and Haw River arms of the lake.

Jordan Lake Water Quality Improvement Demonstration Project

Deployment



Jordan Lake Water Quality Improvement Demonstration Project

Project Milestones

January 2014 – Finalize 2 year lease w/ Medora Corp

March 2014 – Deploy 36 Solarbee Units in the Haw River and Morgan Creek Arms of Jordan Lake

April 1, 2014– All units in place and operational

October 1, 2015 – Interim Report due to Environmental Review Commission

April 1, 2016 – Final Report due to Environmental Review Commission

Contact Information

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DWR
Division of Water Resources