Water Resources 101

River Basin Management

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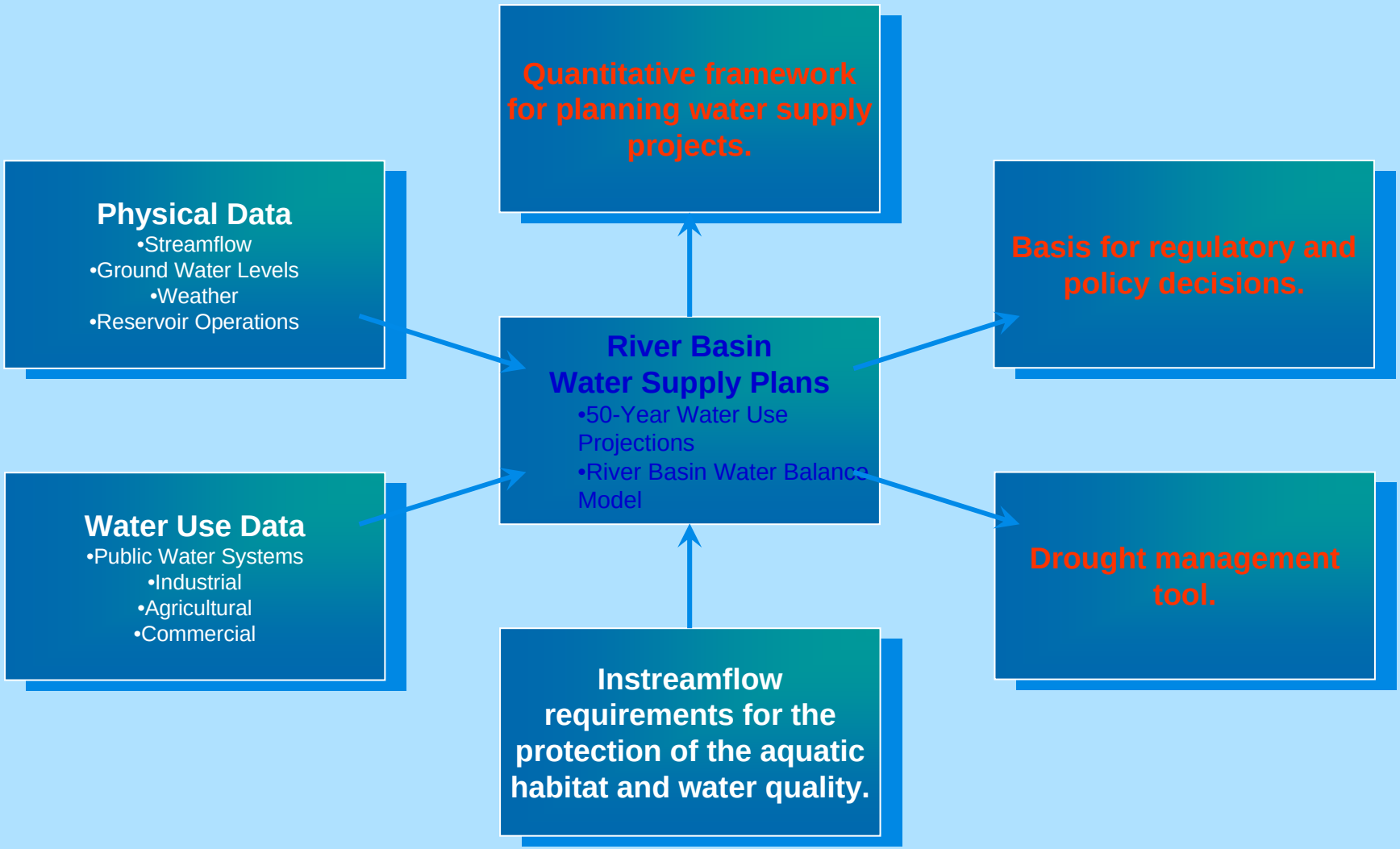
River Basin Management Section
March 5, 2008

Does North Carolina have an adequate water supply?

Water Supply Strategy



River Basin Water Supply Plans

Why the Basin Approach?

- **"The river basin is widely acknowledged to be the most appropriate unit area for water resource planning and development because it is a natural, specifically limited area that acts as a unique hydrologic system."**

  Margaret S. Peterson,

  Hydraulic Engineer, US Army, Corps of Engineers, retired in Water Resource Planning and Development

DENR Strategic Plan

- **Strategic Direction 3 – River Basin Management**

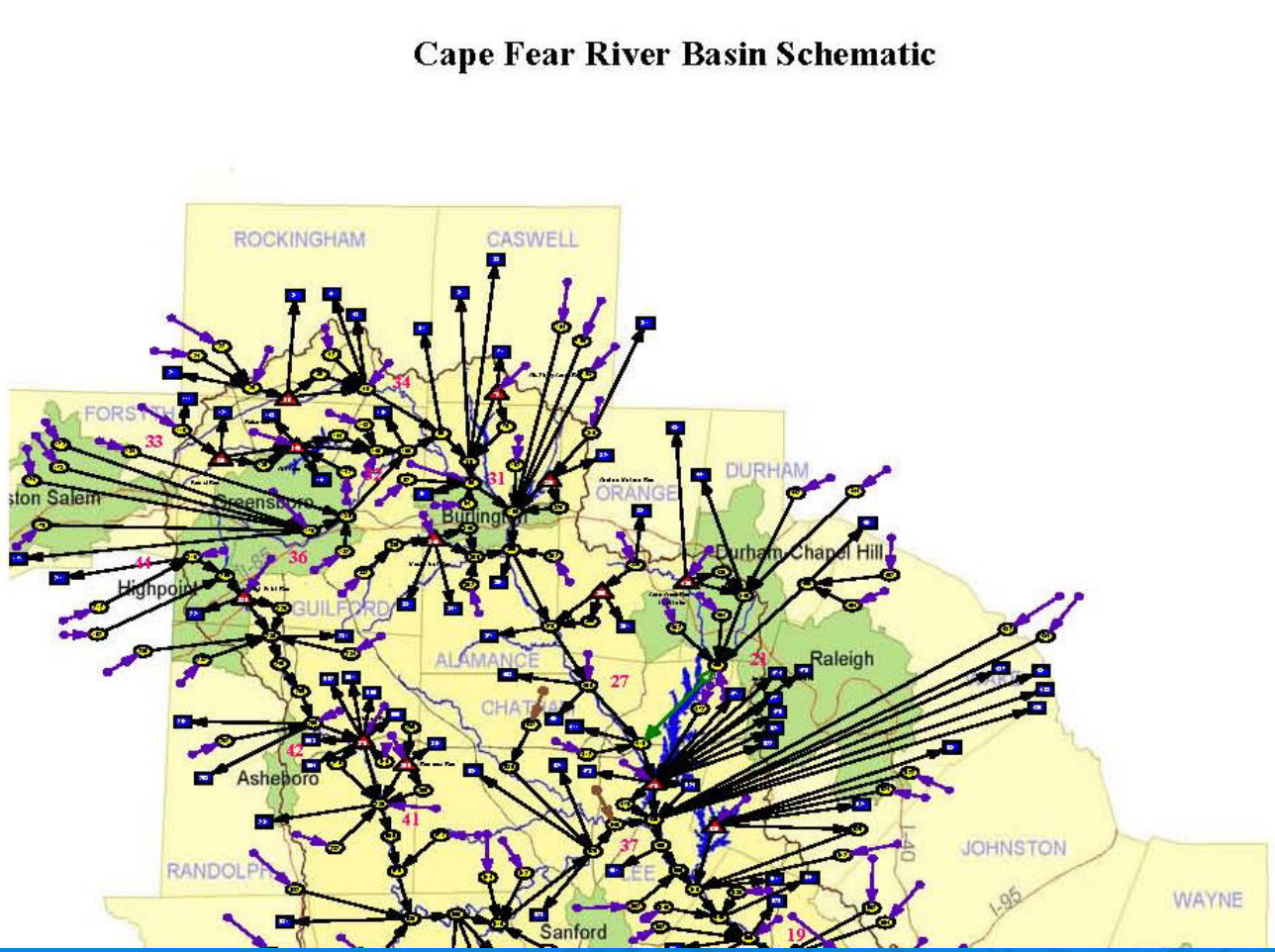
In each of the state's 17 major river basins, use river basin planning and management as the framework for protection of water quality, development of safe and reliable drinking water supplies, and the conservation and enhancement of natural resources.

One of DENR's Strategic Objectives for
MANAGING RIVER BASINS FOR MULTIPLE BENEFITS

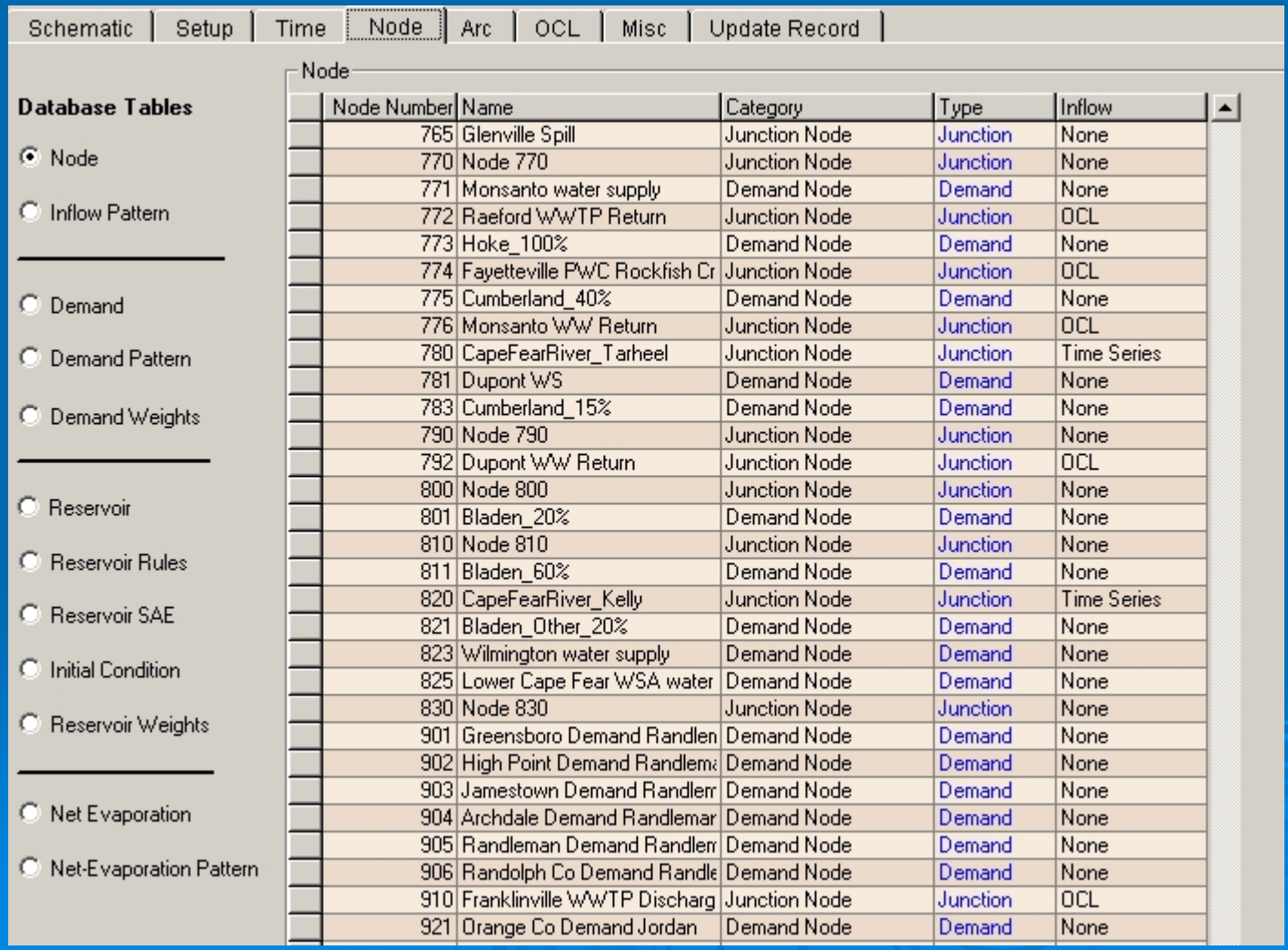
One of the Objectives

Develop 50-year river basin water supply plans in partnership with local governments and other water users, to guide the development of local and regional water supply projects to meet each basin's future water supply needs. Over time, transition local water supply plans onto the same schedule as the plan for the river basin in which the water system is located.

Model Schematic

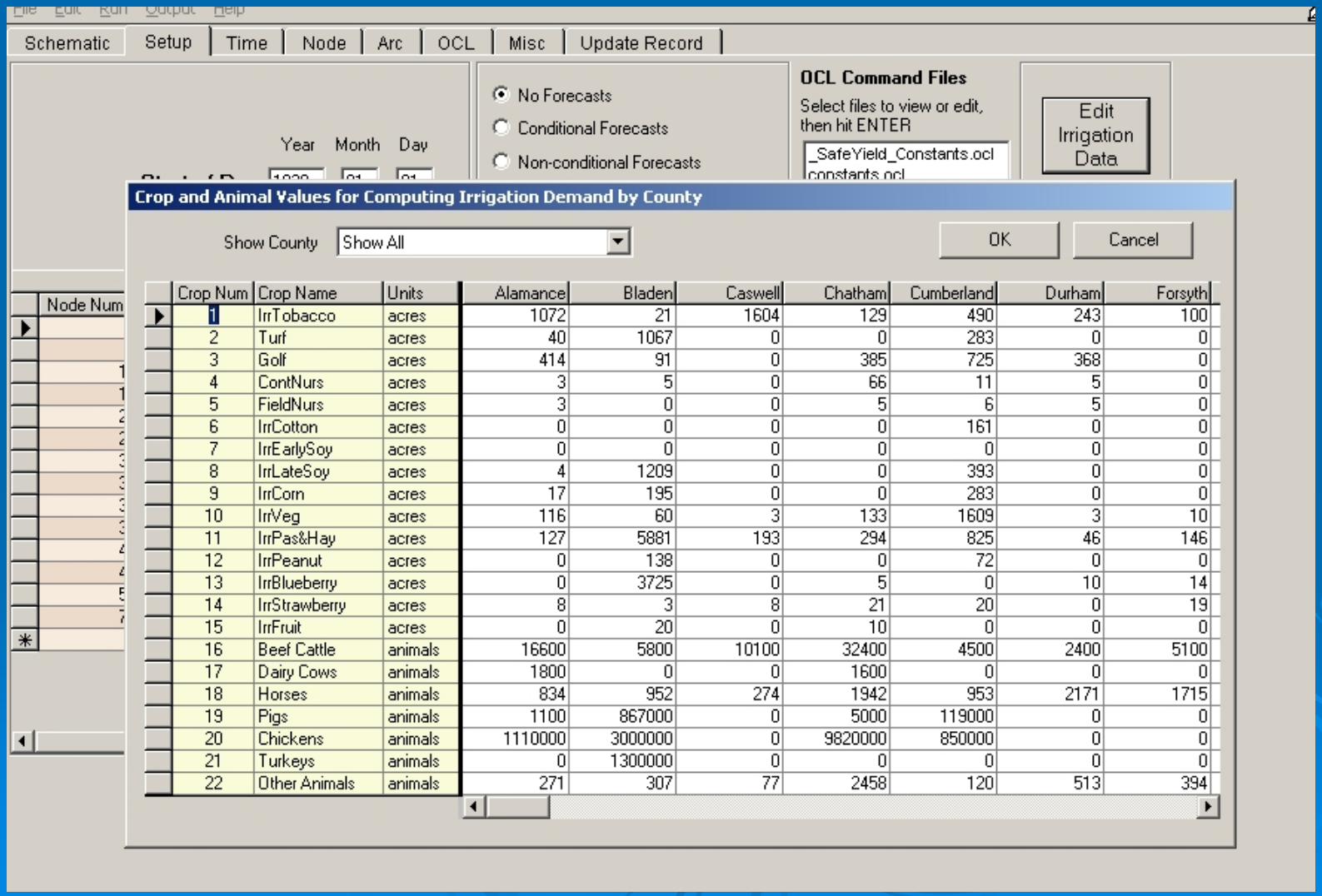


Model Input



Node Number	Name	Category	Type	Inflow
765	Glenville Spill	Junction Node	Junction	None
770	Node 770	Junction Node	Junction	None
771	Monsanto water supply	Demand Node	Demand	None
772	Raeford WWTP Return	Junction Node	Junction	OCL
773	Hoke_100%	Demand Node	Demand	None
774	Fayetteville PWC Rockfish Cr	Junction Node	Junction	OCL
775	Cumberland_40%	Demand Node	Demand	None
776	Monsanto WW Return	Junction Node	Junction	OCL
780	CapeFearRiver_Tarheel	Junction Node	Junction	Time Series
781	Dupont WS	Demand Node	Demand	None
783	Cumberland_15%	Demand Node	Demand	None
790	Node 790	Junction Node	Junction	None
792	Dupont WW Return	Junction Node	Junction	OCL
800	Node 800	Junction Node	Junction	None
801	Bladen_20%	Demand Node	Demand	None
810	Node 810	Junction Node	Junction	None
811	Bladen_60%	Demand Node	Demand	None
820	CapeFearRiver_Kelly	Junction Node	Junction	Time Series
821	Bladen_Other_20%	Demand Node	Demand	None
823	Wilmington water supply	Demand Node	Demand	None
825	Lower Cape Fear WSA water	Demand Node	Demand	None
830	Node 830	Junction Node	Junction	None
901	Greensboro Demand Randlen	Demand Node	Demand	None
902	High Point Demand Randlem	Demand Node	Demand	None
903	Jamestown Demand Randlen	Demand Node	Demand	None
904	Archdale Demand Randlemar	Demand Node	Demand	None
905	Randleman Demand Randlen	Demand Node	Demand	None
906	Randolph Co Demand Randle	Demand Node	Demand	None
910	Franklinville WWTP Discharg	Junction Node	Junction	OCL
921	Orange Co Demand Jordan	Demand Node	Demand	None

Irrigation Input



Crop Num	Crop Name	Units	Alamance	Bladen	Caswell	Chatham	Cumberland	Durham	Forsyth
1	IrrTobacco	acres	1072	21	1604	129	490	243	100
2	Turf	acres	40	1067	0	0	283	0	0
3	Golf	acres	414	91	0	385	725	368	0
4	ContNurs	acres	3	5	0	66	11	5	0
5	FieldNurs	acres	3	0	0	5	6	5	0
6	IrrCotton	acres	0	0	0	0	161	0	0
7	IrrEarlySoy	acres	0	0	0	0	0	0	0
8	IrrLateSoy	acres	4	1209	0	0	393	0	0
9	IrrCorn	acres	17	195	0	0	283	0	0
10	IrrVeg	acres	116	60	3	133	1609	3	10
11	IrrPas&Hay	acres	127	5881	193	294	825	46	146
12	IrrPeanut	acres	0	138	0	0	72	0	0
13	IrrBlueberry	acres	0	3725	0	5	0	10	14
14	IrrStrawberry	acres	8	3	8	21	20	0	19
15	IrrFruit	acres	0	20	0	10	0	0	0
16	Beef Cattle	animals	16600	5800	10100	32400	4500	2400	5100
17	Dairy Cows	animals	1800	0	0	1600	0	0	0
18	Horses	animals	834	952	274	1942	953	2171	1715
19	Pigs	animals	1100	867000	0	5000	119000	0	0
20	Chickens	animals	1110000	3000000	0	9820000	850000	0	0
21	Turkeys	animals	0	1300000	0	0	0	0	0
22	Other Animals	animals	271	307	77	2458	120	513	394

DWR
Division of Water Resources

Model Benefits

- Determine the impacts of either new or increases in existing water withdrawals or wastewater discharges.
- Provide a scientifically defensible means of generating daily stream flows for ungaged stream segments.
- Develop safe yield estimates for run-of-the-river intakes and water supply impoundments.
- Develop and test drought management plans.

Basin Planning Advantages

- Projections of long range water needs
- Estimates of future wastewater treatment needs
- Identifies potential supply problems
  - due to growth or drought
- Guidance for regionalization and investments
- Ability of resource to meet future needs
- Water quantity evaluated on river basin scale like water quality

River Basin Coordination

- Long-Range Planning
- Short-Term Drought Response

Regulation of Surface Water Transfers

What is the law and how does it impact water use?

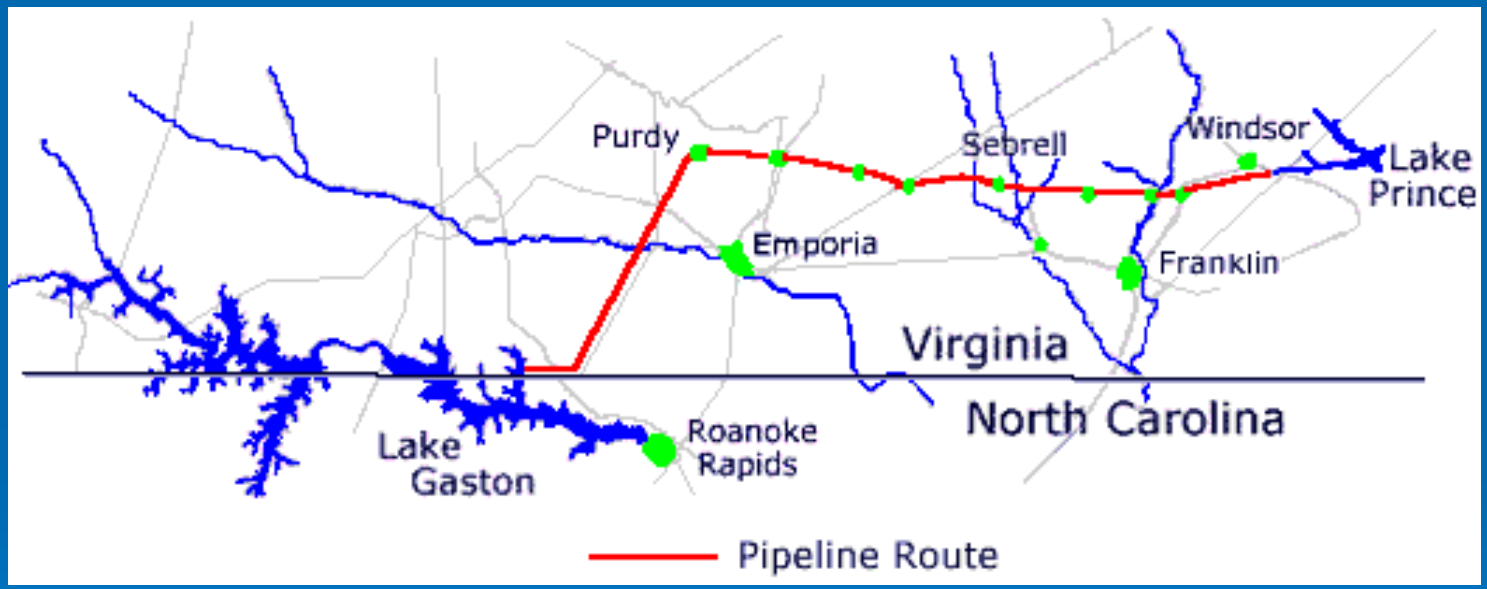
What is an Interbasin Transfer?

An interbasin transfer is the movement of ***surface water*** from one river basin into another.

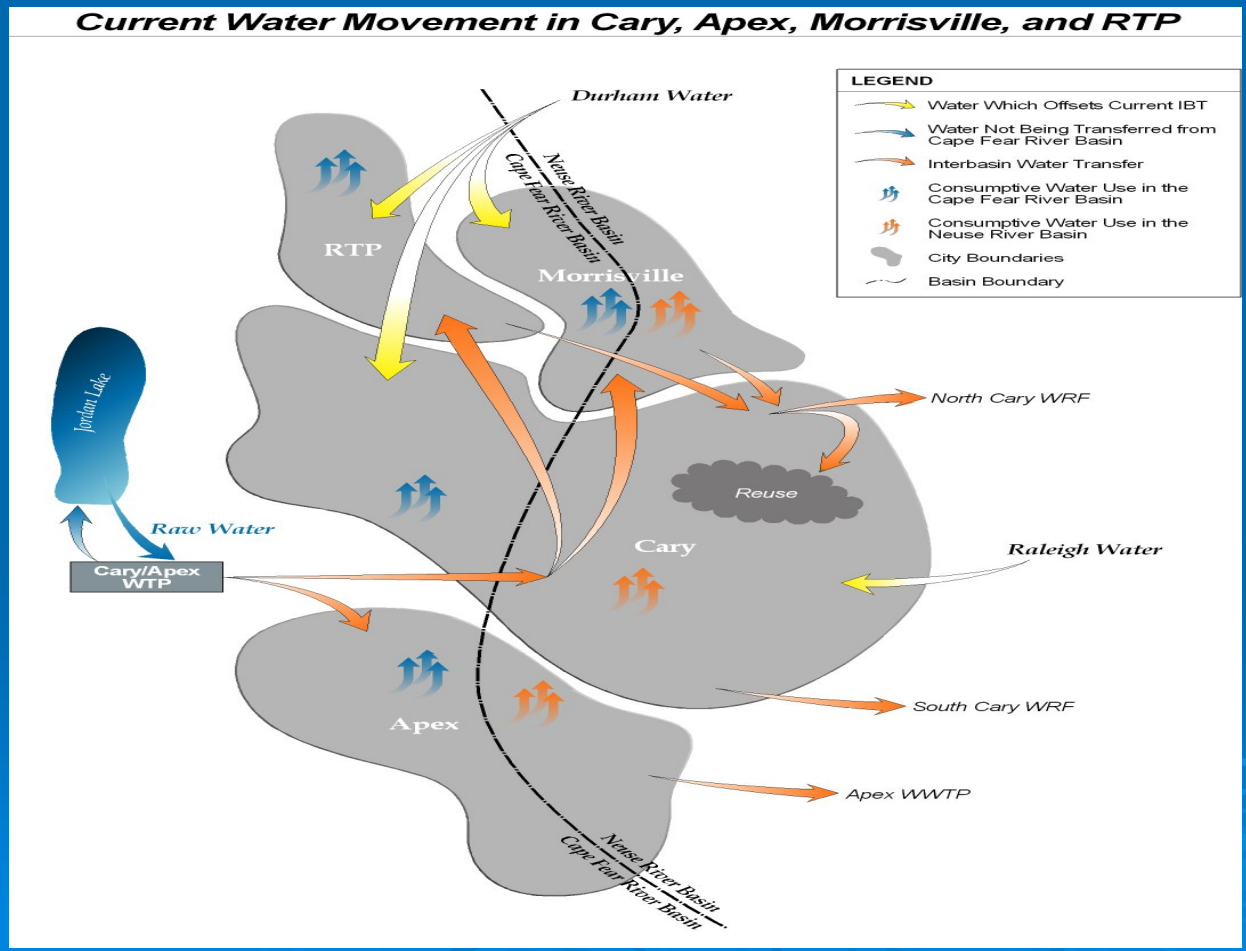
The purpose of the Interbasin Transfer Law is to take a pause to be sure it is good public policy before moving water from one river basin into another.

The Interbasin Transfer Law does **NOT** prohibit transfers.

The image most people have when they think about interbasin transfer.



The NC reality.



What is Regulation of Surface Water Transfers?

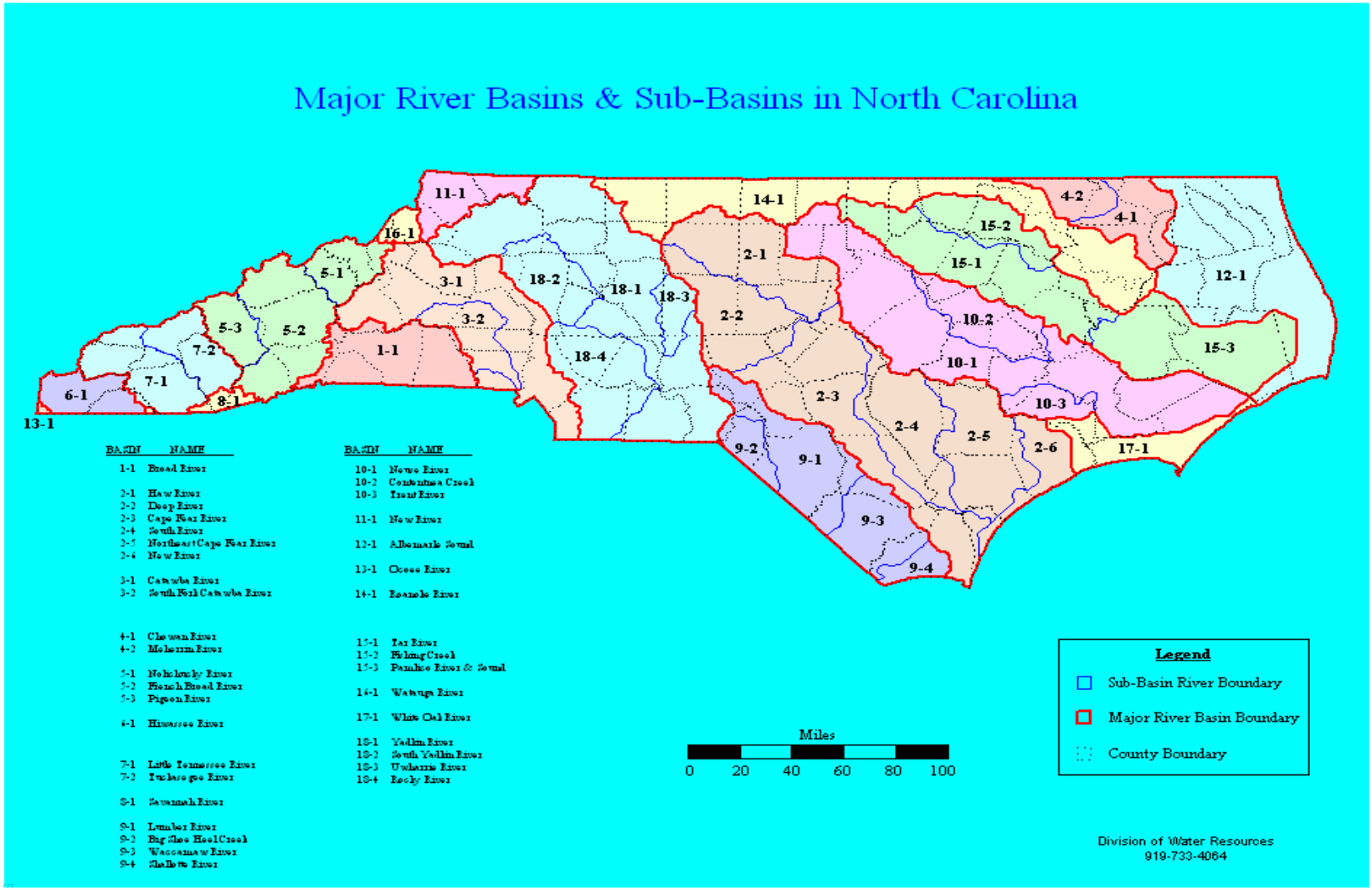
- An Environmental Permit?
- Pseudo-Rule Making?
- A planning process?
- Pseudo-Property Right?

Regulation of Surface Water Transfers

North Carolina Statute G.S. 143-215.22G & G.S. 143.215.22I
North Carolina Administrative Code Section T15A:02G.0400

- Effective January 1994 (Modified in 1997, 1998, & 2007)
- EMC certification required for:
  - New transfers of 2 MGD or more (maximum daily demand)
  - Increase in transfer capacity of facilities that existed or under construction on 7/1/1993
- Sound basis for evaluating transfer requests
- Three certifications issued since enacted
  - 1998 Greensboro Emergency Certification (never used)
  - July 2001 - Cary/Apex/Morrisville/Wake County (for RTP South)
  - March 2002 - Charlotte-Mecklenburg Utilities
  - January 2007 - Concord/Kannapolis

Interbasin Transfer Basin Definitions



Impacts

- Higher Costs – How Much?
  - Potentially higher cost alternatives.
- Better Documentation
  - Local Water Supply Plans
  - Determination of grandfathered capacity
- Permit Process
  - Coordination with other agencies
  - SEPA
  - More time and cost
- Compliance Monitoring
  - Reporting of water-use and wastewater information
    - Modified billing system to include basin information

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Questions?