Nothing Compares
NORTH CAROLINA

River Basin Water Resources Plan/ Hydrologic Model Development Process

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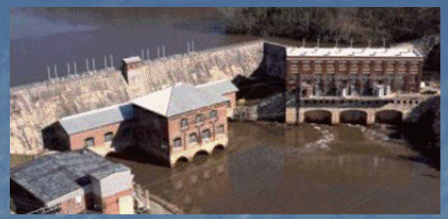
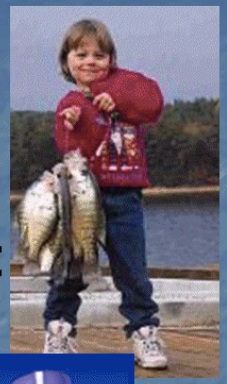
NCDEQ - DWR

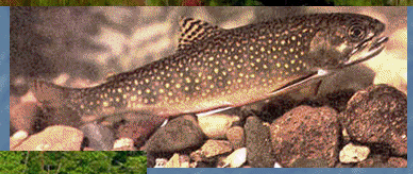
April 10, 2018

Department of Environmental Quality

Why Need River Basin Plans

Water Resources Plans support



- Sustainable management
- Reliable, quantitative methods for planning
- Objective management and regulatory decision making







3 Critical Questions

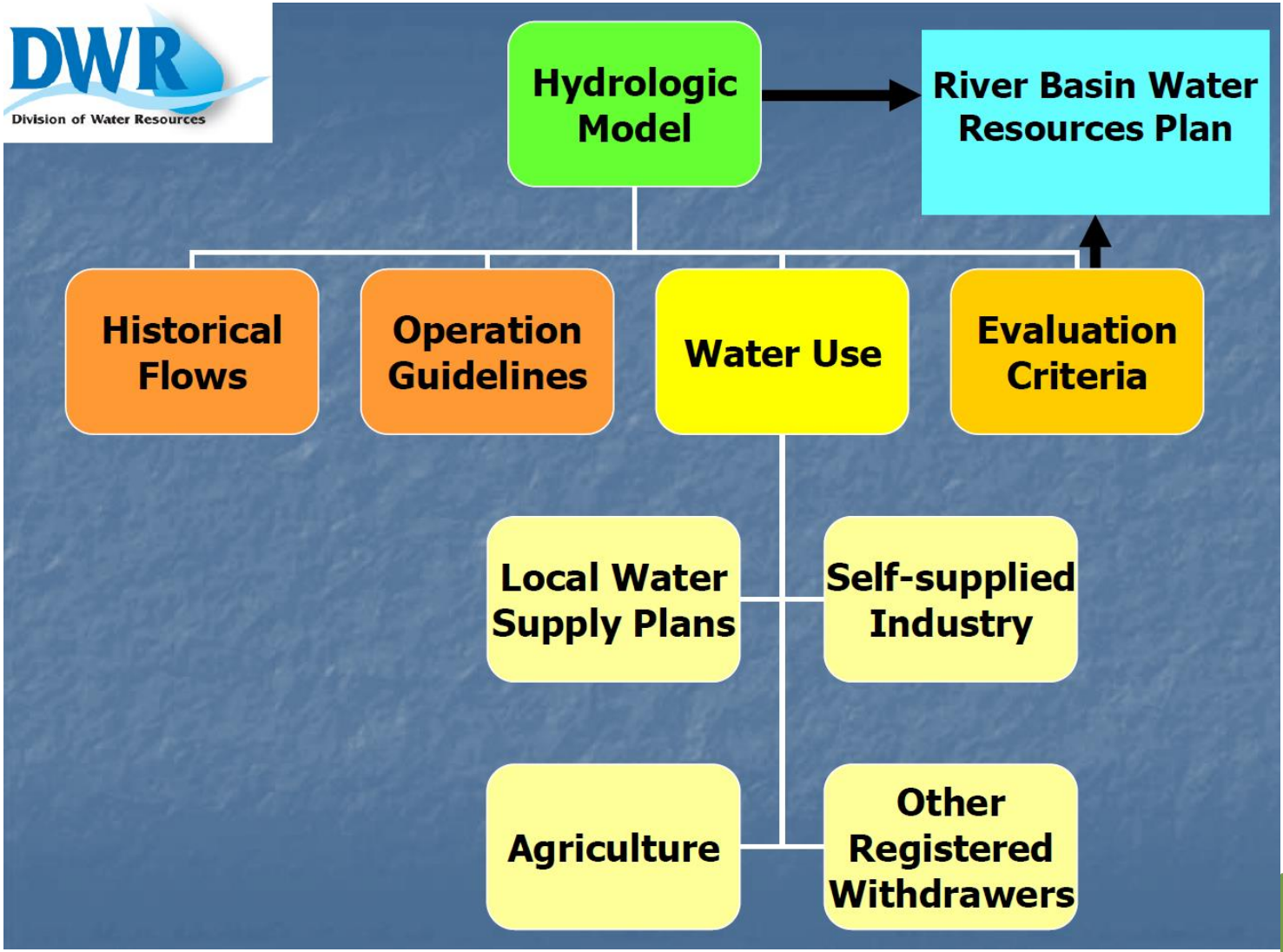
- Water Resources Plan Combine **–**

Water Use Data + Hydrologic Model

- The model shall specifically be designed to predict the places, times, frequencies, and intervals at which any of the following may occur:

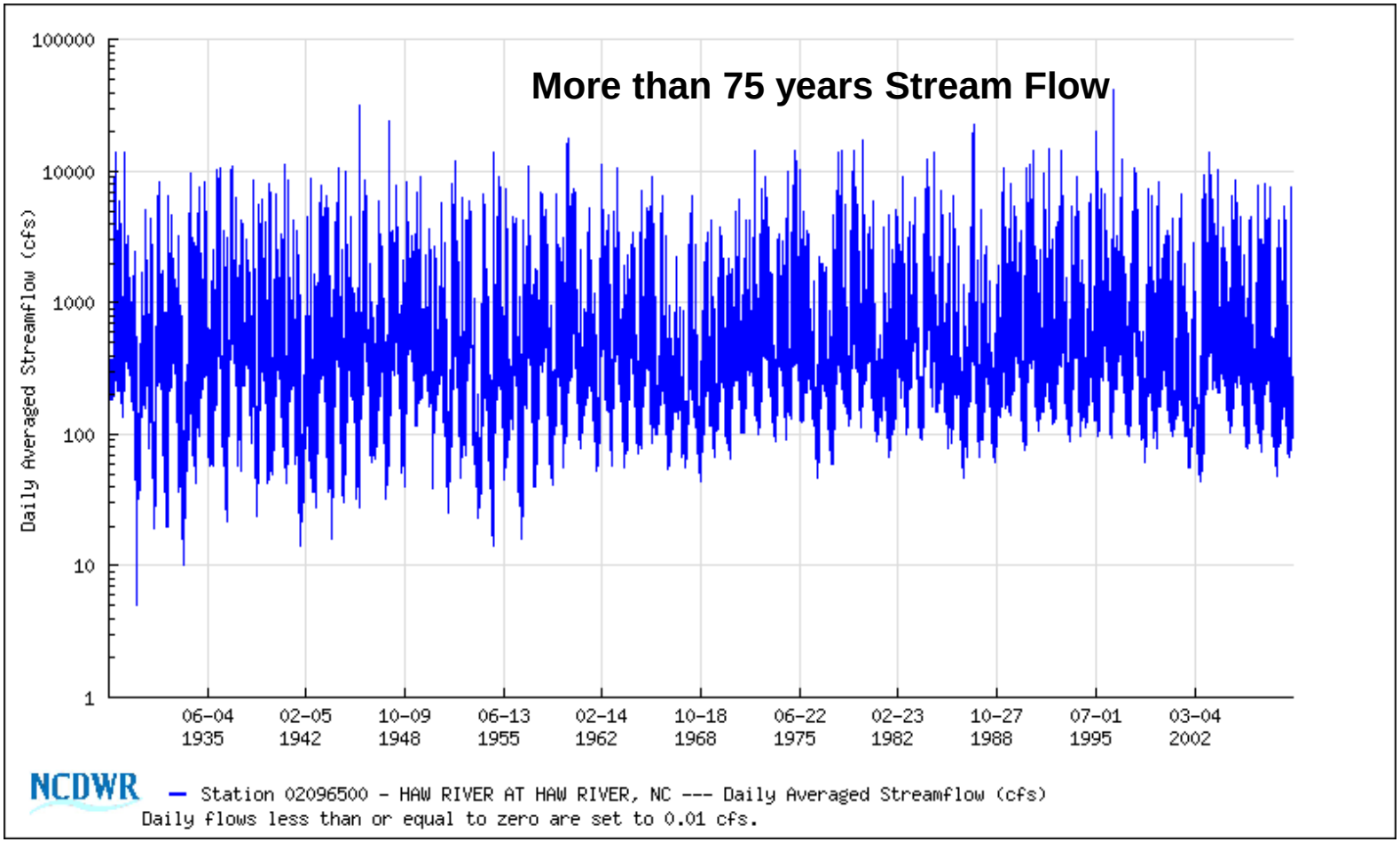
1. ***Yield may be inadequate to meet all needs.***
2. ***Yield may be inadequate to meet all essential water uses.***
3. ***Ecological flow may be adversely affected***

Process Components



Process Components

Historical Flows



Process Components

Operations Guidelines

- **Quantity and timing of specific flows**
  - **Aquatic habitats**
  - **Water quality protection**
  - **✓Intake coverage**
  - **Recreation**
- **Reservoir water level limits and timing**
  - **Structural limits**
  - **Aquatic habitat protection**
  - **✓Intake coverage**
  - **Boat ramp access**
  - **Authorized purposes and storage allocations**

Process Components

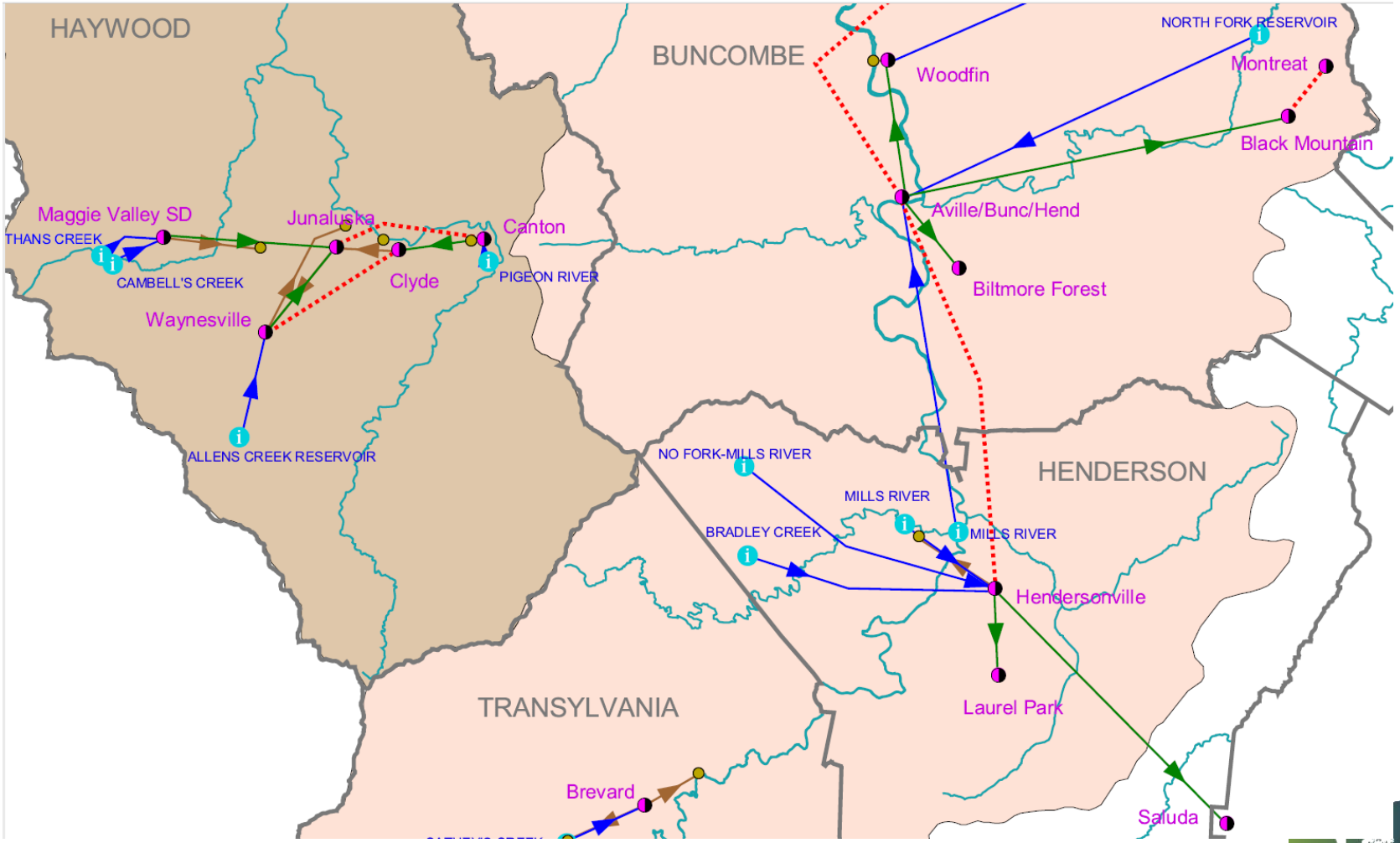
Water Use

- **Water Withdrawal Registrations**
  - **Agriculture > 1,000,000 gallons per day**
  - **Non-agriculture > 100,000 gallons per day**

- **Local Water Supply Plans**
  - **Local Government Water Systems**
  - **Other Large Community Water Systems**

Process Components

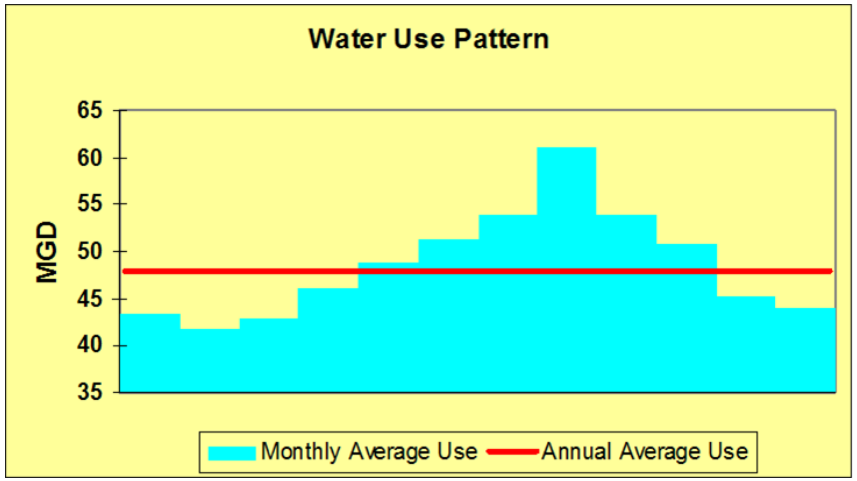
Water Use



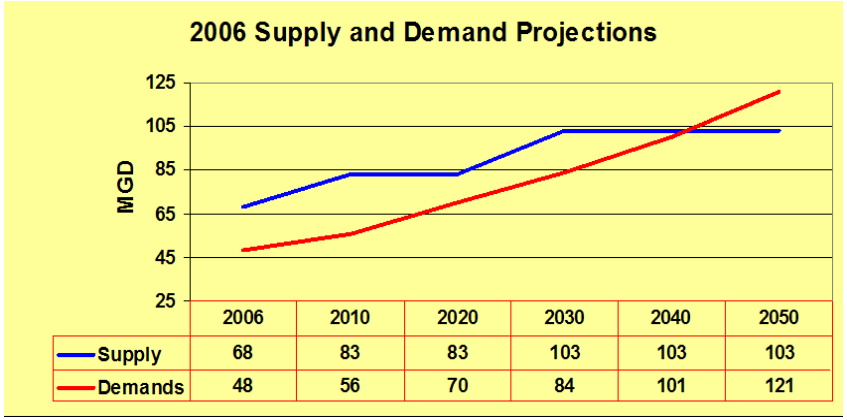
Process Components

Water Use

Seasonal Use Pattern / Avg Annual Demands

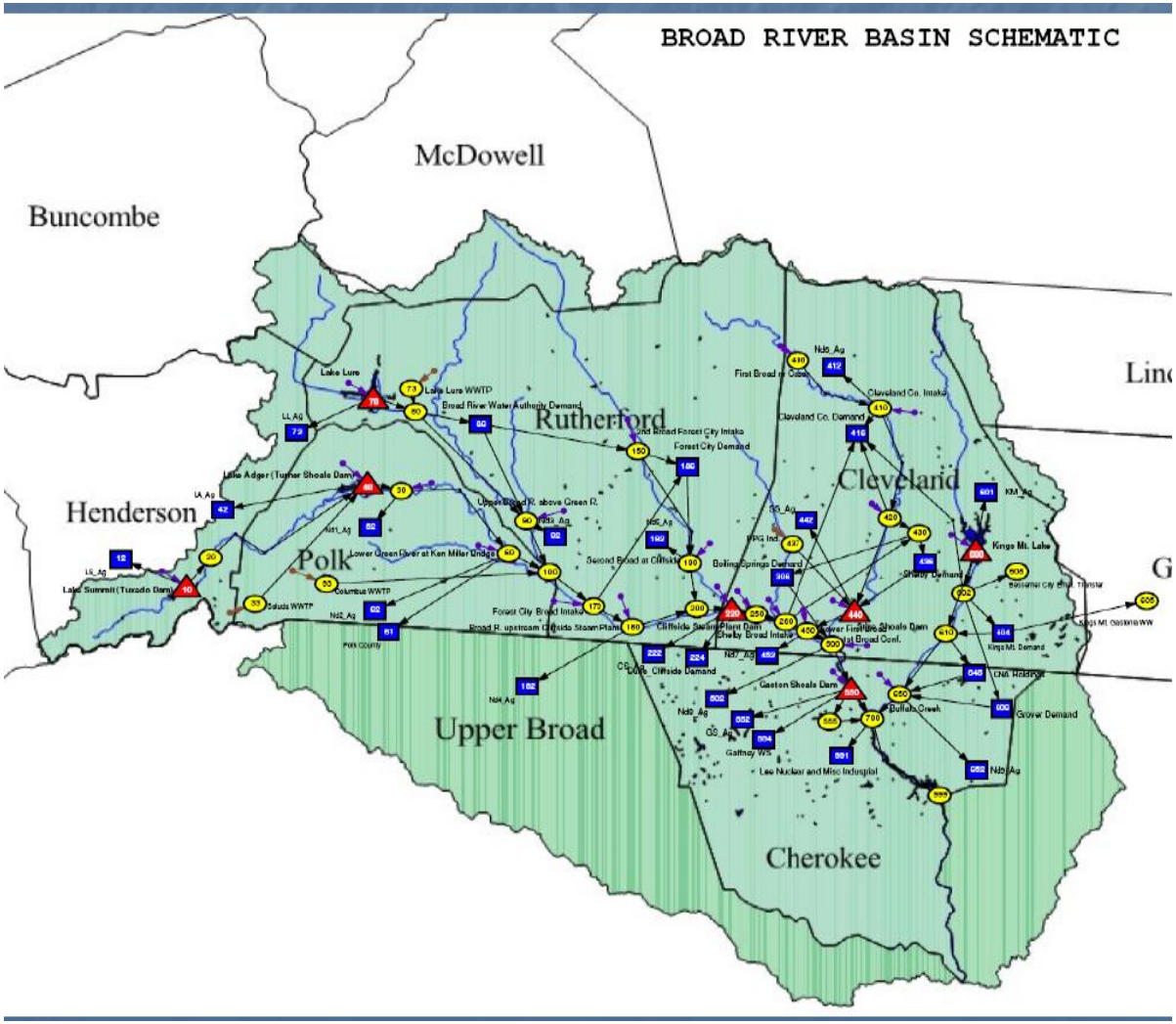


50 yr Projected Demands



Process Components

Hydrologic Model



Process Components

Hydrologic Model

Major Assumptions

- Future withdrawals will come from current intake locations
- Future wastewater discharges will be same percent of withdrawals at the same locations
- Sellers will continue to meet buyers' needs
- Future flows will be within the range of flows in the historical record
- Local utilities are the best judges of future system growth

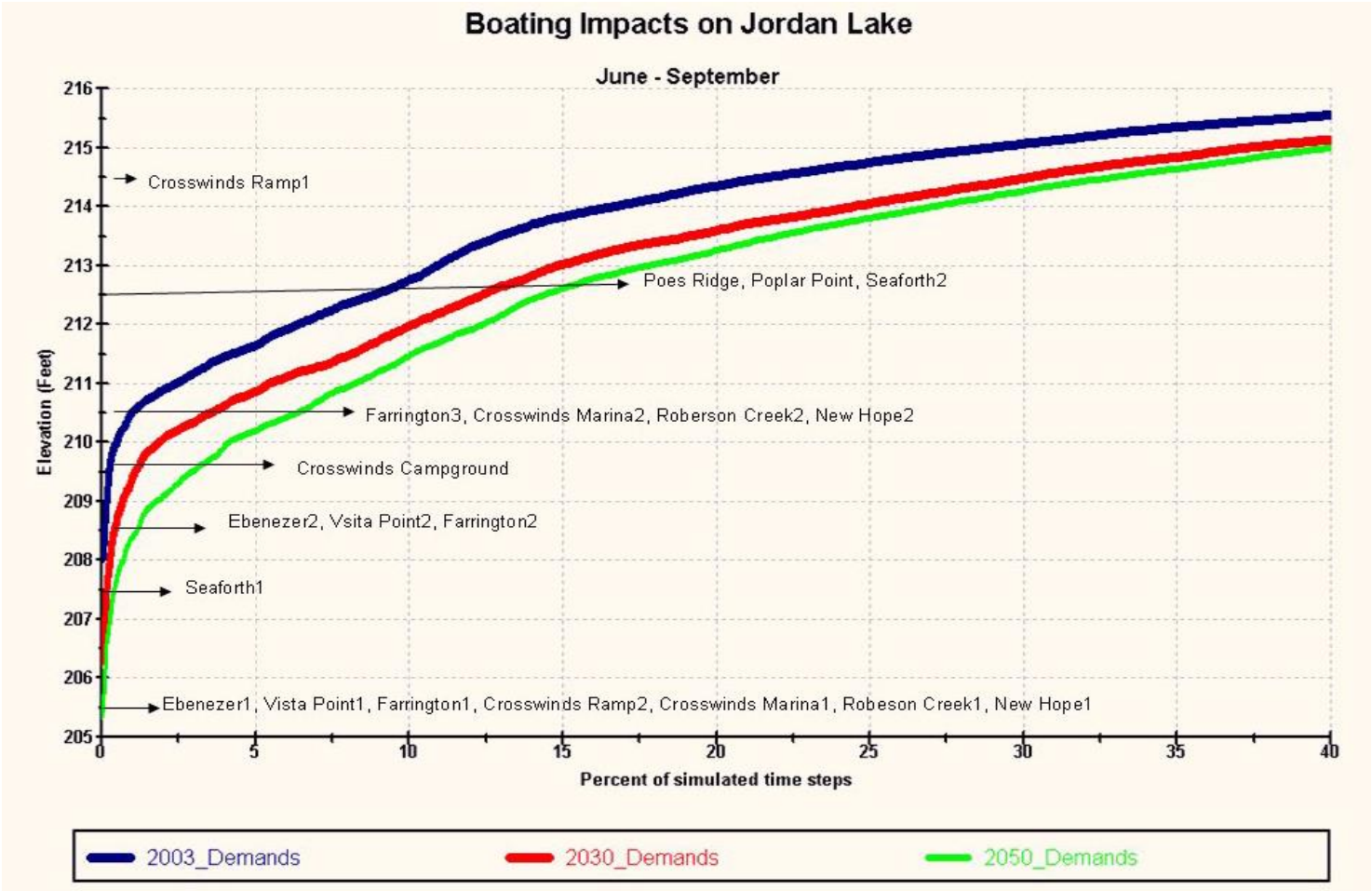
Process Components

Evaluation Criteria

Process Components

Evaluation Criteria

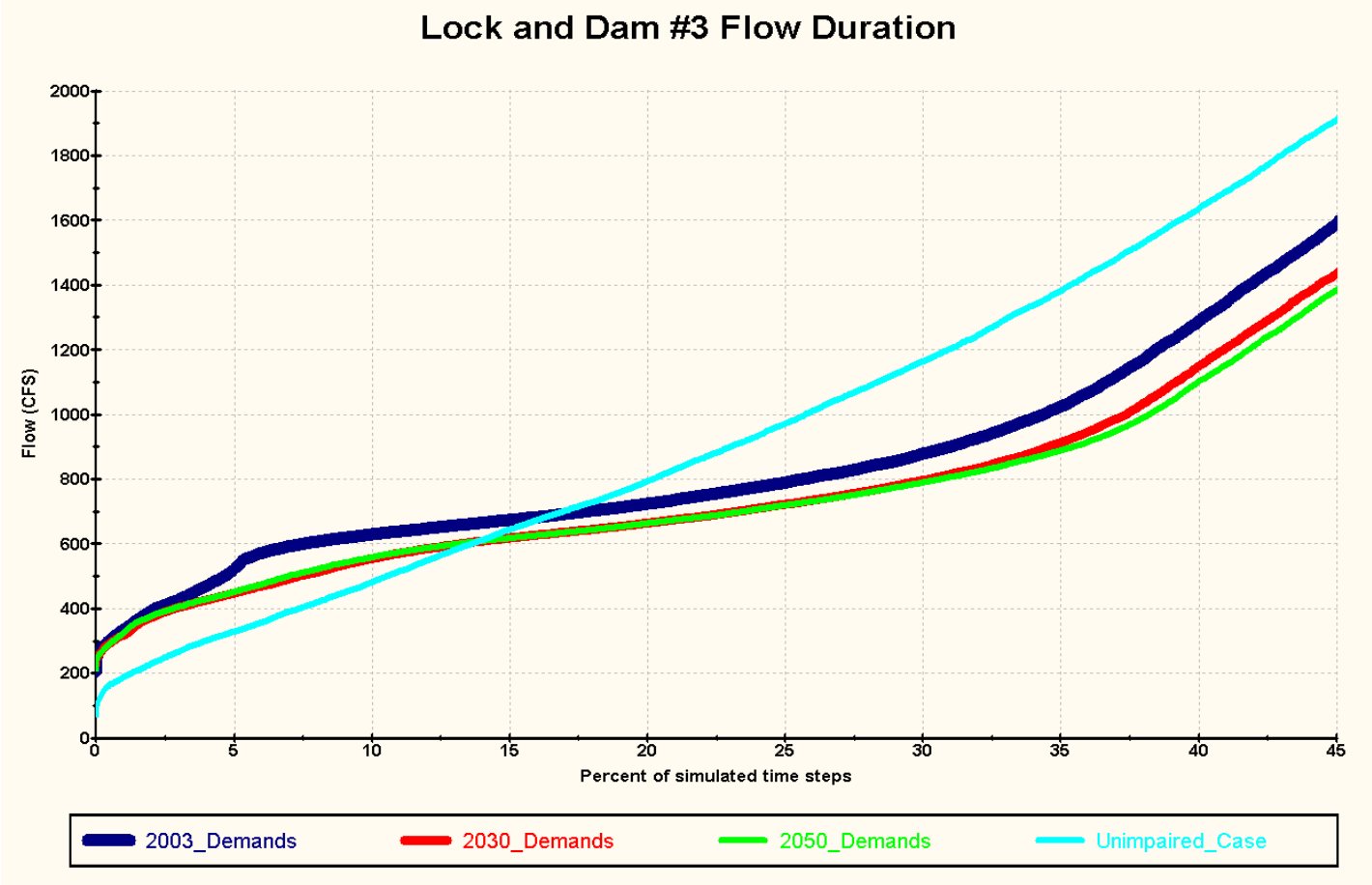
- **Reservoir Water Levels**



Process Components

Evaluation Criteria

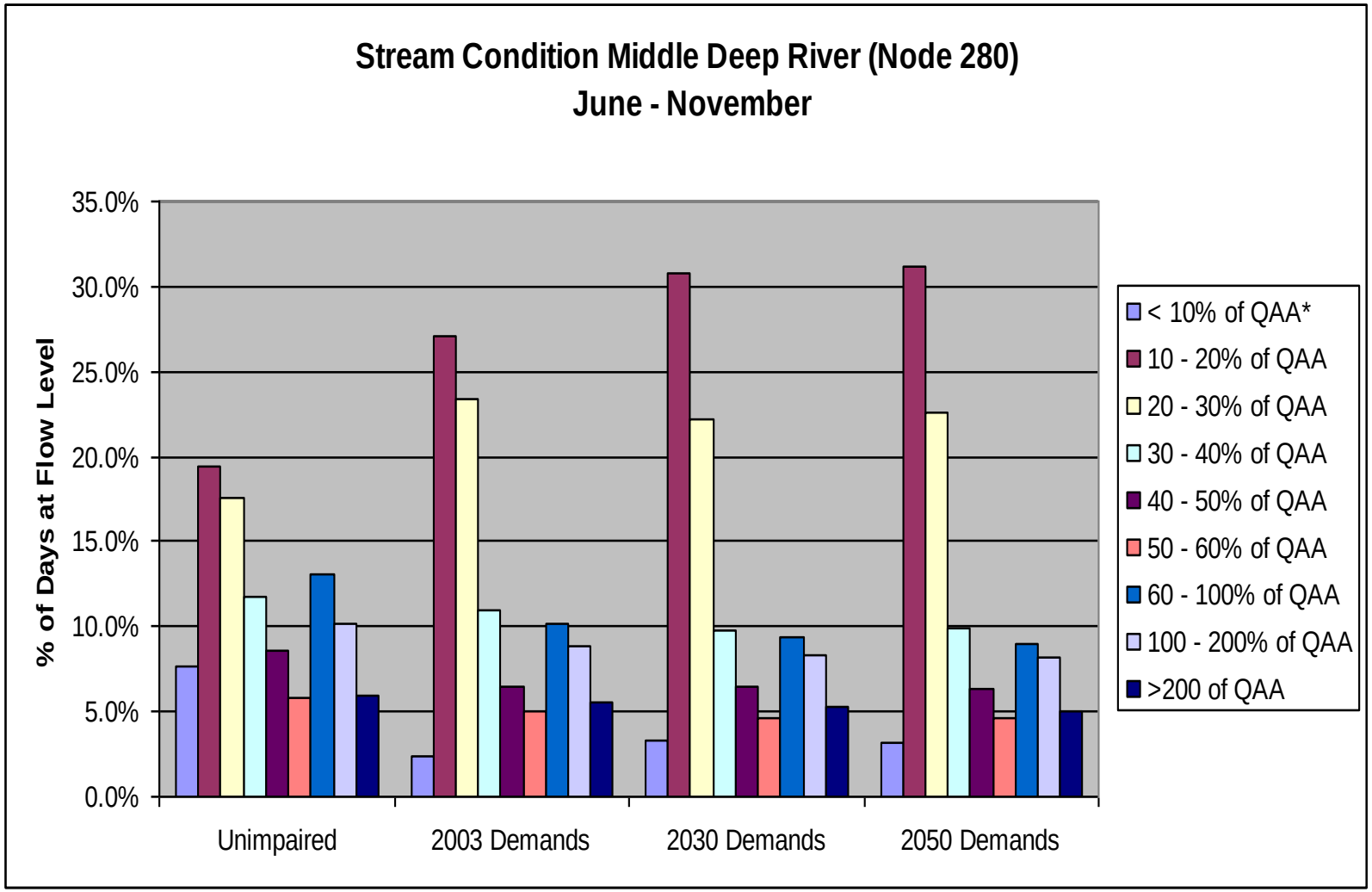
- **Stream Flows**



Process Components

Evaluation Criteria

- **Flow Regime Changes**



Process Components

Evaluation Criteria

- **Water Supply Deficits**

Table 4-3: Water Supply Demand & Deficits Predicted by the Neuse River Basin Hydrologic Model, 2050 Scenario

Model Scenario / Water Systems	2050 Average Demand (mgd)	2050 Average Deficit (mgd)	Longest Deficit Period (Days)	Years Demand Not Fully Met Out of 78
Orange-Alamance	0.21	0.14	30	2
Hillsborough	2.76	1.84	30	2
Piedmont Minerals	0.25	0.16	30	2
Raleigh	129.23	86.18	124	36
Durham	40.92	29.13	60	5
SGWASA	10.01	8.7	79	14

Longest Deficit (Days) = The greatest number of consecutive days over the entire 78 year record that the full water supply demand may not be met.
Years Demand Not Met = The number of years out of a total of 78 annual flow patterns that the full water supply demand may not be met.
Systems in Red are those for which a deficit is predicted in any scenario seven or more years out of the 78 year record.

Process Components

Evaluation Criteria

3 Critical Questions – Evaluation Criteria

- **What is the answer to each of the evaluation questions?**
- **Are there areas where there may be problems meeting expected demands?**
- **When can we expect to have shortages and how can we adapt when there is a shortage?**

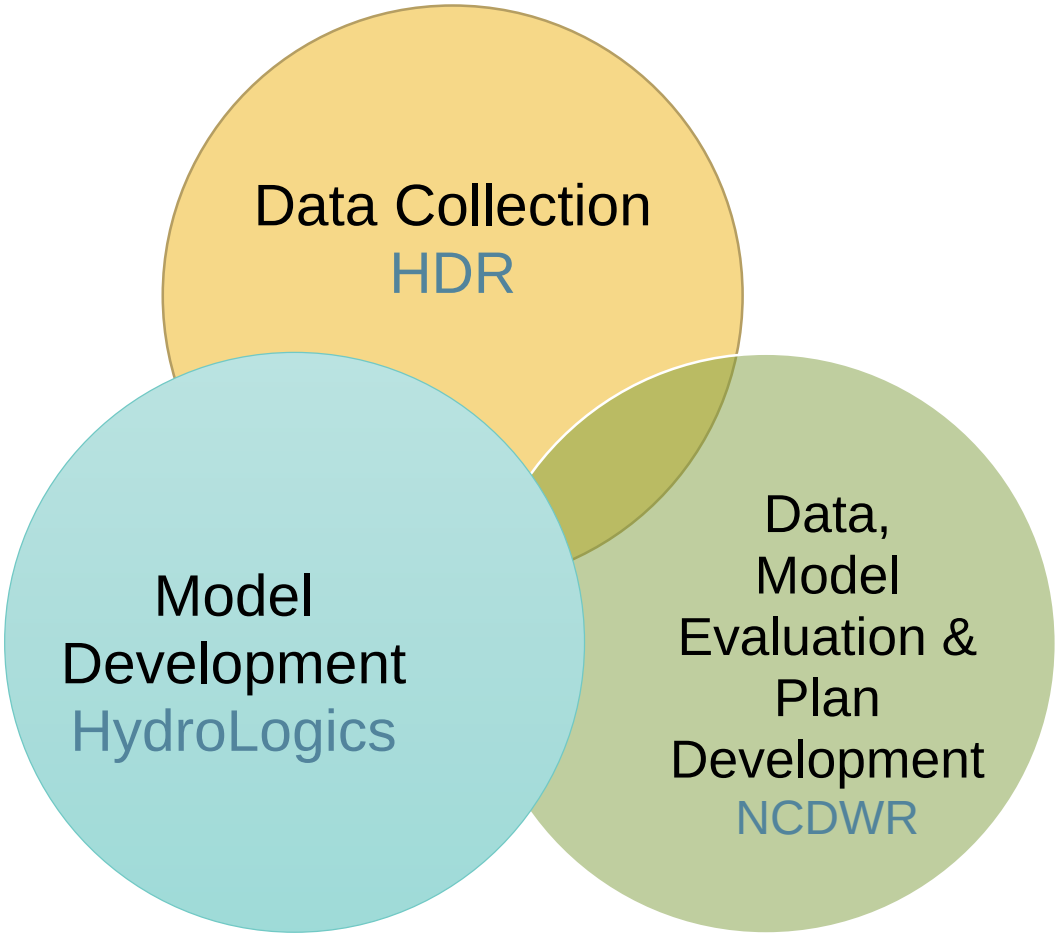
Process Components

Evaluation Criteria

Identify Potential Risks :

- Would a reasonable reduction in demands avoid the identified problems?
- Could an alternative source meet expected demands?
- What happens if future droughts are longer or more severe?
- What happens if we can not discharge the same percent of wastewater?

Project Organization



Model Development Tasks and Your Participations

- Task 1- Inflow Data Development
  - Historic Data Collection
  - Impairment Data
- *Task 2 - OASIS Application Development*
- Task 3 - Organize and Conduct Meetings
  - Coordinate with stakeholders
  - Meetings
- *Task 4 – Deliverables*
- Task 5 - Training and Installation
  - Model on DWR's server
  - Access with account for users

Project Participants

- List of General Stakeholders
  - Municipal and Community water users
  - Industrial and Agricultural users
  - Other users
  - NGOs
  - River Keepers
  - Agencies
  - Institutions

Project Contacts

- Basin Webpages
  https://www.ncwater.org/Data_and_Modeling
- Contacts at NCDWR
  - E-mail to staff for questions or concerns
  - dwr-french-broad-staff@lists.ncmail.net
  - dwr-new-watauga-staff@lists.ncmail.net

- E-mail list serve Subscriptions for Stakeholders
  - https://lists.ncmail.net/mailman/listinfo/dwr-french-broad-model
  - https://lists.ncmail.net/mailman/listinfo/dwr-new-watauga-model

- Model Development Project Lead at DWR
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  (919) 707-9028

Division of Water Resources

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