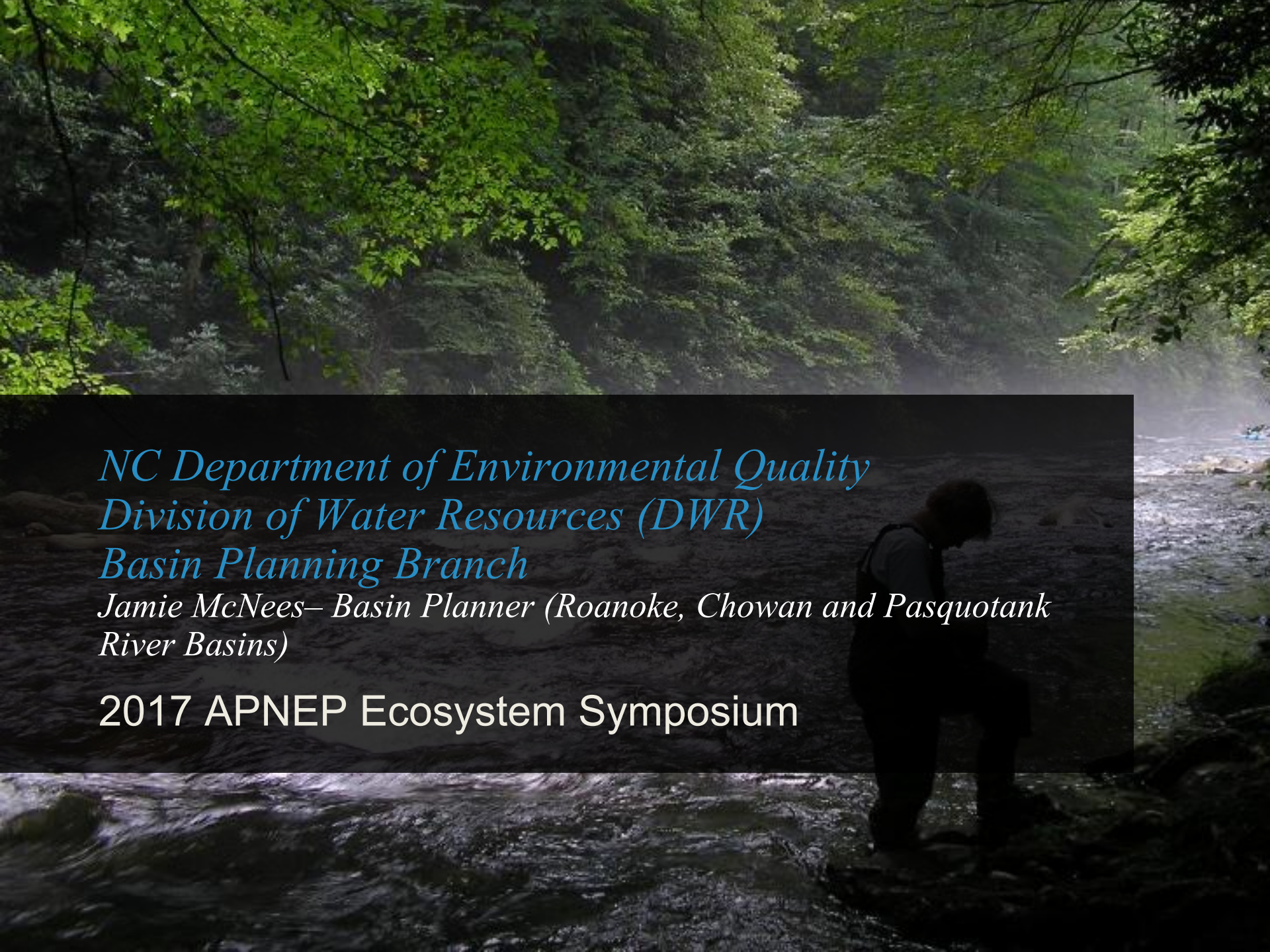


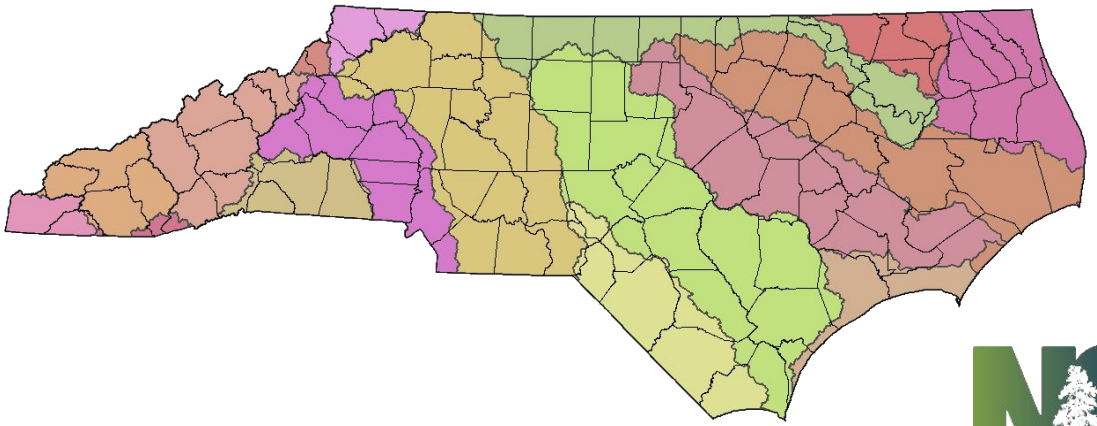
NC Department of Environmental Quality
Division of Water Resources (DWR)
Basin Planning Branch

Jamie McNees– Basin Planner (Roanoke, Chowan and Pasquotank River Basins)

2017 APNEP Ecosystem Symposium

Basin Planning

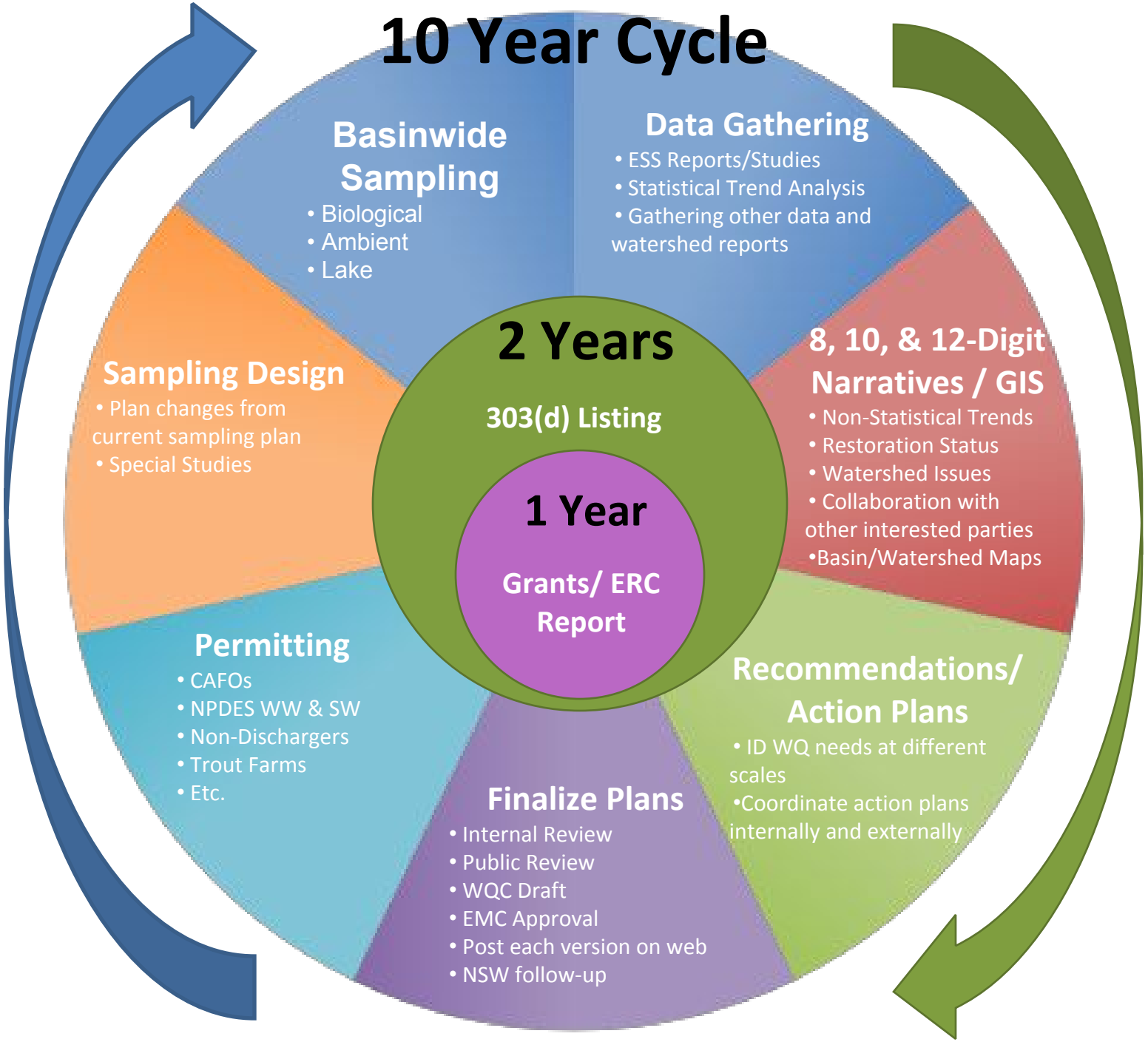
- Watershed based approach to river basin water resource management
- Considers the cumulative impacts to all activities across a river basin (point and nonpoint sources of pollution)
- Basin plan required every 10 years (General Statute 143-215.8B)



Water Resource Basin Plans

- Primary vehicle for consolidating data collected and issues identified by all water related state agencies
- Provide a single location to present the water quality and water quantity related evaluations developed by state agencies
- Provide a platform for state agencies to highlight water related issues that are important to each agency's mission

10 Year Cycle



Basin Plan Schedule

Of North Carolina's 17 river basins, **five** water resource plans are currently under development:

- Cape Fear
- Chowan
- Pasquotank
- White Oak
- Watauga

River Basin	Last EMC Approved Plan	Next Plan Update	NPDES Permits Renewal Year	Biological Basinwide Monitoring	Quantity Model	Quality Model/ Strategy
Chowan	2007	2018	2017	2020	n/a	NSW
Pasquotank	2007	2018	2017	2020	n/a	NCDP
Watauga	2007	2018	2017	2018	OASIS^	
White Oak	2007	2018	2017	2019	n/a	New R.-NSW
Broad	2008	2018/ 2019	2018	2020	OASIS	
Neuse	2009	2018/ 2019*	2018	2020	OASIS	NSW
Cape Fear	2005	2018	2016	2018	OASIS	Haw R.-NSW; Mid CF - NCDP
Yadkin	2008	2018	2018	2016	Proposed	NCDP
Lumber	2010	2019	2019	2016		
Catawba	2010	2019	2020	2017	CHEOPS	
French Broad	2011	2020	2020	2017	OASIS ^	
New River	2011	2020	2016	2018	OASIS ^	
Hiwassee	2012	2021	2017	2019	TVA	
Little Tennessee	2012	2021	2017	2019	TVA	
Roanoke	2012	2021	2017	2019	OASIS	216 Study
Savannah	2012	2021	2017	2019	n/a	
Tar-Pamlico	2015	2023	2019	2017	OASIS	NSW

NSW = Nutrient Sensitive Waters, NCDP = Nutrient Criteria Development Plan,
*** NSW Strategy and regulatory update prior to NPDES permits renewal; Full plan completion 2019.**
n/a – currently hydrologic models are not being developed for coastal areas.
OASIS^ – Contracts underway to develop Quantity model; Proposed model development by local water management group.

Stream Classifications and Use Protections

Designated uses are based on **stream classifications**

- Class **C & SC** – Protection and propagation of aquatic life; fish consumption; secondary recreation (fishing and boating)
- Class **B & SB** – Protection for primary recreation (swimming)
- Class **WS** – Water supply (I, II, III, IV, V)

Supplemental Classifications include NSW, CA, ORW, HQW, TR, Sw, SA, PNA, UWL

Aquatic Life Protections – Including propagation and survival



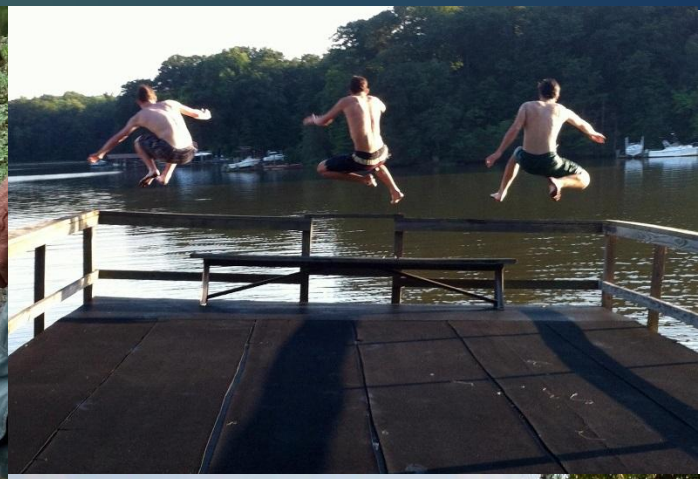




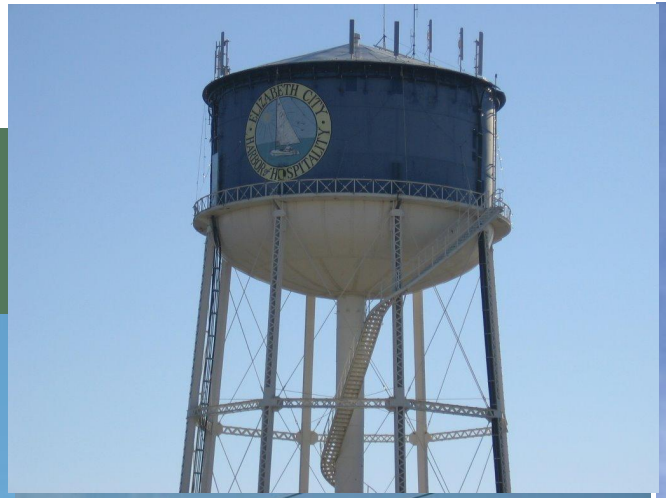




Primary and Secondary Recreation



Instream Uses – Water Supply



Instream Uses-Other

Water Quality

Data Collected

Aquatic Life

- **Biological** (aquatic macroinvertebrates & fish)
- **Chemical/Physical** (ambient monitoring)
  - ✓ DO, pH, Turbidity, Chl *a*, Metals,+ others

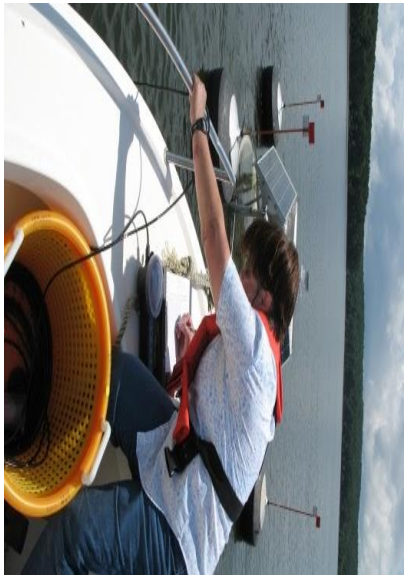
Recreation

- **Bacteria** (Fecal Coliform & Enterococcus)
  - ✓ Swimming Advisories & Shellfish Closures

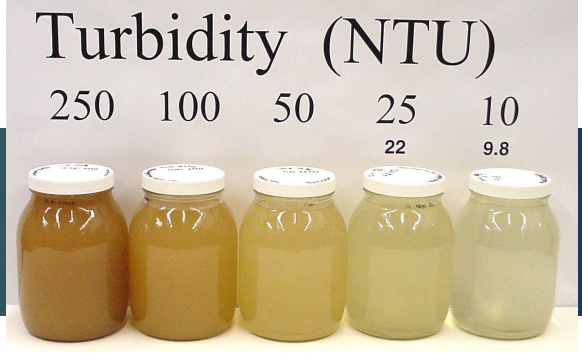
Fish Consumption (DHHS)

- **Fish Tissue** (Mercury, PCBs, Dioxins)

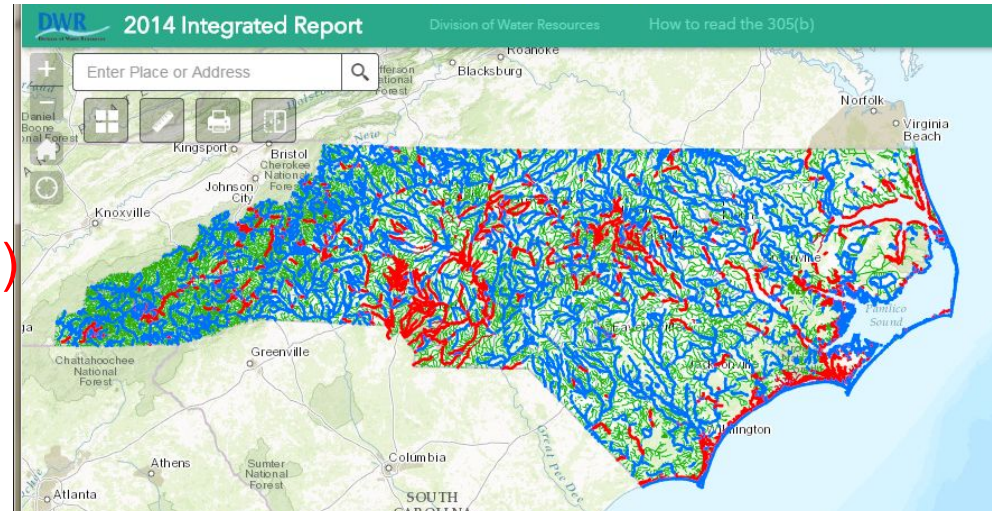
(http://epi.publichealth.nc.gov/oee/fish/advisories.html)



Surface Water Quality Assessment



- Waters are assessed based on parameters of interest and determined to be:
  - **Supporting**
    (meeting standards/criteria)
  - **Impaired**
    (exceeding standards/criteria)
  - **Data Inconclusive**
    (data does not allow for an assessment to be made)
  - **No Data**



- Data that is collected is used to generate the Integrated Report (303(d)/305(b))

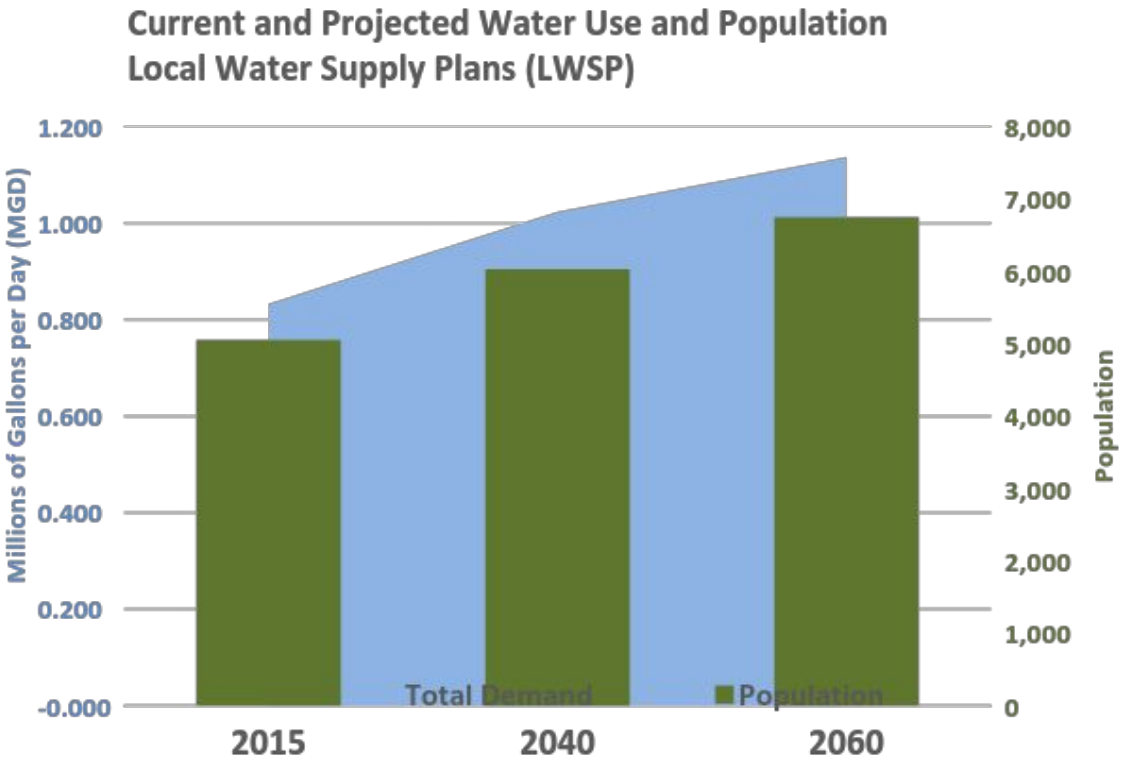
http://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/surface-water-standards#WQSTables

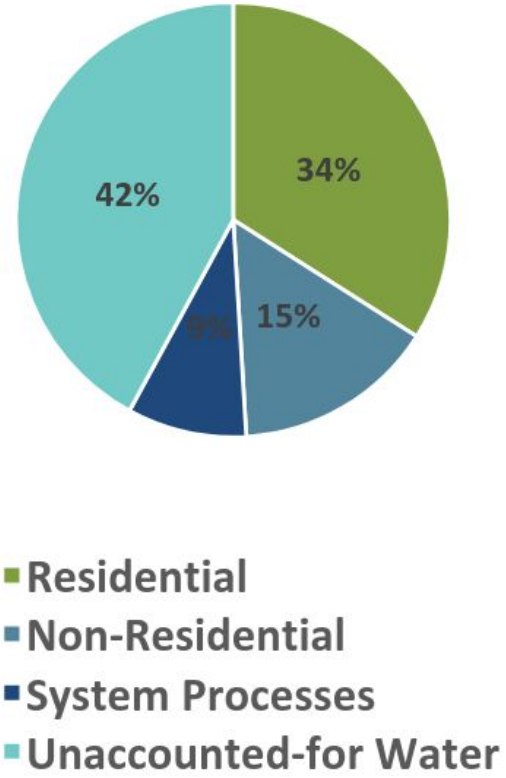
Surface Water Quality Assessment

Highlight problems in the basin that can be addressed by:

- TMDL development → permit action
- Development of a management strategy
- Development of watershed group to work at the local level on voluntary actions
  - Install BMPs
  - Initiate conservation/preservation (land acquisition, local ordinances, etc.)

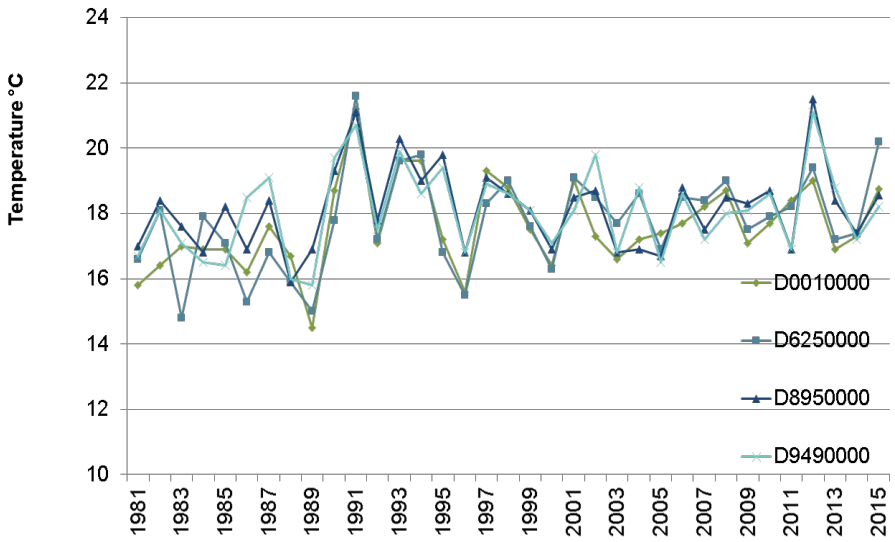
Water Quantity

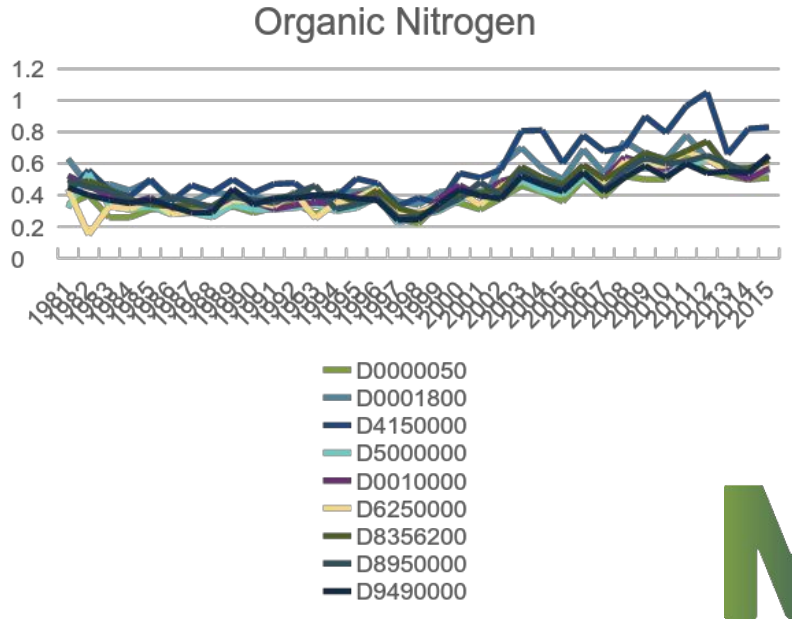




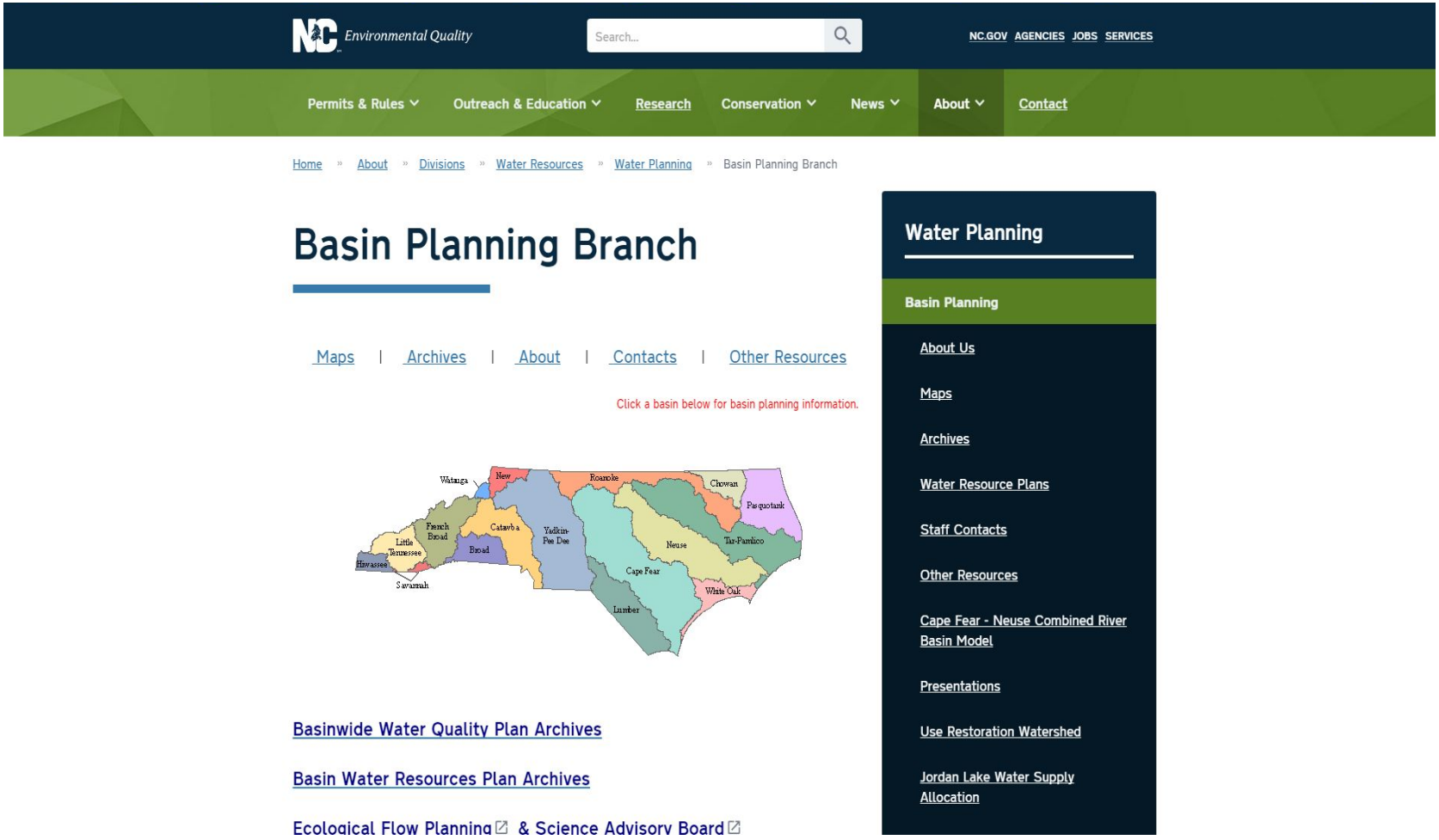
Chowan River Basin Issues

- Algal blooms since 2015
- Increasing organic nitrogen – sources unknown
- Increasing temperature throughout mainstem of the Chowan River





Basin Planning Branch



http://deq.nc.gov/about/divisions/water-resources/planning/basin-planning

Watauga River Basin Water Resources Plan (draft 2017): Story Map

Overview | Population | Land Cover | Stream Flow | Monitoring Data | Watauga River Headwaters | Dutch Creek | Cove Creek | Beech Creek | Beaverdam Creek | Elk River | Basin Planning Website

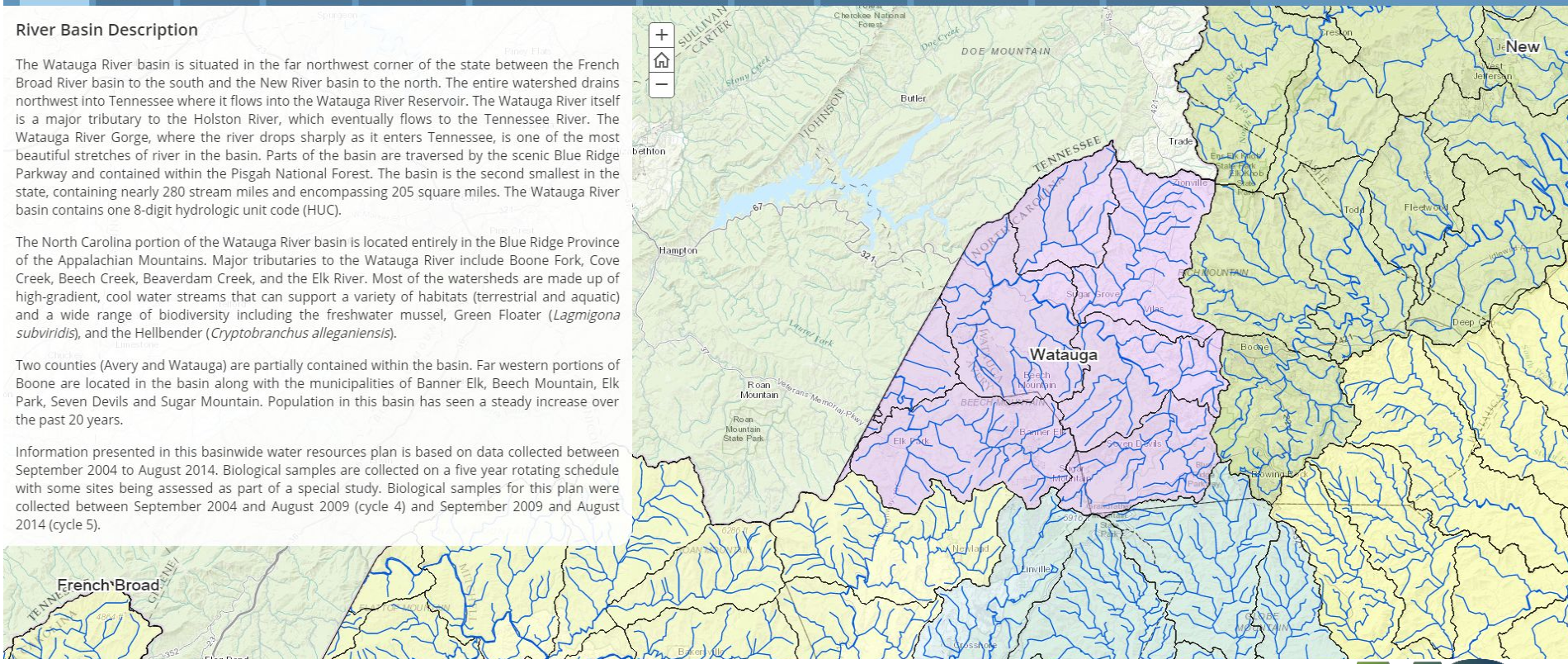
River Basin Description

The Watauga River basin is situated in the far northwest corner of the state between the French Broad River basin to the south and the New River basin to the north. The entire watershed drains northwest into Tennessee where it flows into the Watauga River Reservoir. The Watauga River itself is a major tributary to the Holston River, which eventually flows to the Tennessee River. The Watauga River Gorge, where the river drops sharply as it enters Tennessee, is one of the most beautiful stretches of river in the basin. Parts of the basin are traversed by the scenic Blue Ridge Parkway and contained within the Pisgah National Forest. The basin is the second smallest in the state, containing nearly 280 stream miles and encompassing 205 square miles. The Watauga River basin contains one 8-digit hydrologic unit code (HUC).

The North Carolina portion of the Watauga River basin is located entirely in the Blue Ridge Province of the Appalachian Mountains. Major tributaries to the Watauga River include Boone Fork, Cove Creek, Beech Creek, Beaverdam Creek, and the Elk River. Most of the watersheds are made up of high-gradient, cool water streams that can support a variety of habitats (terrestrial and aquatic) and a wide range of biodiversity including the freshwater mussel, Green Floater (*Lagmigona subviridis*), and the Hellbender (*Cryptobranchus alleganiensis*).

Two counties (Avery and Watauga) are partially contained within the basin. Far western portions of Boone are located in the basin along with the municipalities of Banner Elk, Beech Mountain, Elk Park, Seven Devils and Sugar Mountain. Population in this basin has seen a steady increase over the past 20 years.

Information presented in this basinwide water resources plan is based on data collected between September 2004 to August 2014. Biological samples are collected on a five year rotating schedule with some sites being assessed as part of a special study. Biological samples for this plan were collected between September 2004 and August 2009 (cycle 4) and September 2009 and August 2014 (cycle 5).



Watauga River Basin Water Resources Plan (draft 2017): Story Map

Watauga River Basin Water Resources Plan (draft 2017)

No issues detected × A story map

Overview | Population | Land Cover | Stream Flow | Monitoring Data | Watauga River Headwaters | Dutch Creek | Cove Creek | Beech Creek | Beaverdam Creek | Elk River | Basin Planning Website

A story map

esri

Surface Water Quality Data: Watauga River Basin

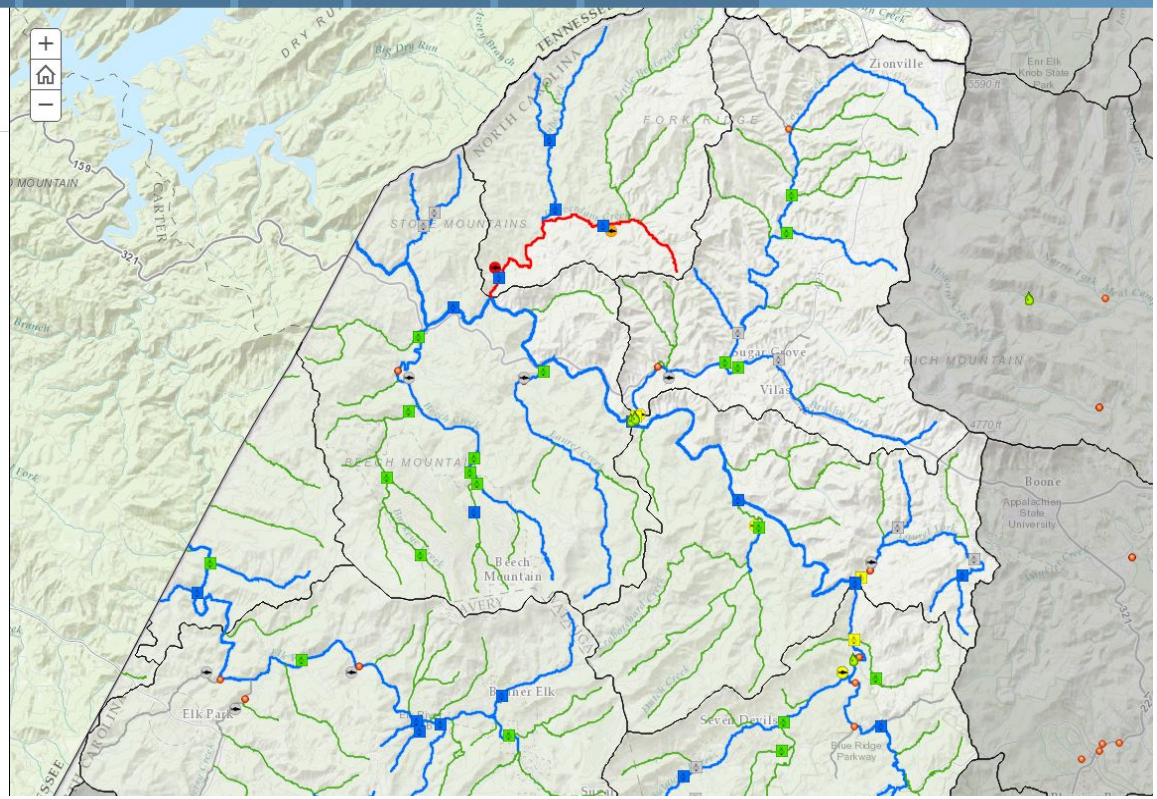
Biological and Ambient Data

Biological (benthic and fish community) samples are given a bioclassification (or rating) based on the data collected at the site by DWR biologists in the Water Sciences Section (WSS) Biological Assessment Branch (BAB). These bioclassifications are Excellent, Good, Good-Fair, Not Impaired, Not Rated, Fair and Poor. They include measurements for diversity, abundance and the number of pollution tolerant or intolerant species found within a particular waterbody.

Ambient monitoring data are analyzed based on the percent of samples exceeding the state standard for individual parameters for each site within a five-year period. In general, if a standard is exceeded in greater than 10% of samples taken for a particular parameter, that stream segment is Exceeding Criteria for that parameter. If it is less than 10%, then that stream segment is Meeting Criteria for that parameter. Standards for fecal coliform bacteria are the exception to the rule.

Each biological sample (benthic and fish community) and each ambient parameter is assessed independently and assigned a category based on its rating or percent exceedance. Each monitored stream segment is given an overall category number which reflects the highest individual parameter category. The table below illustrates how bioclassifications for biological samples and ambient data are translated into categories.

Biological Ratings (Bioclassifications)	Water Quality Assessment North Carolina Standards (EPA Categories)	Ambient Monitoring Data
Excellent		



Questions

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919.707.9118