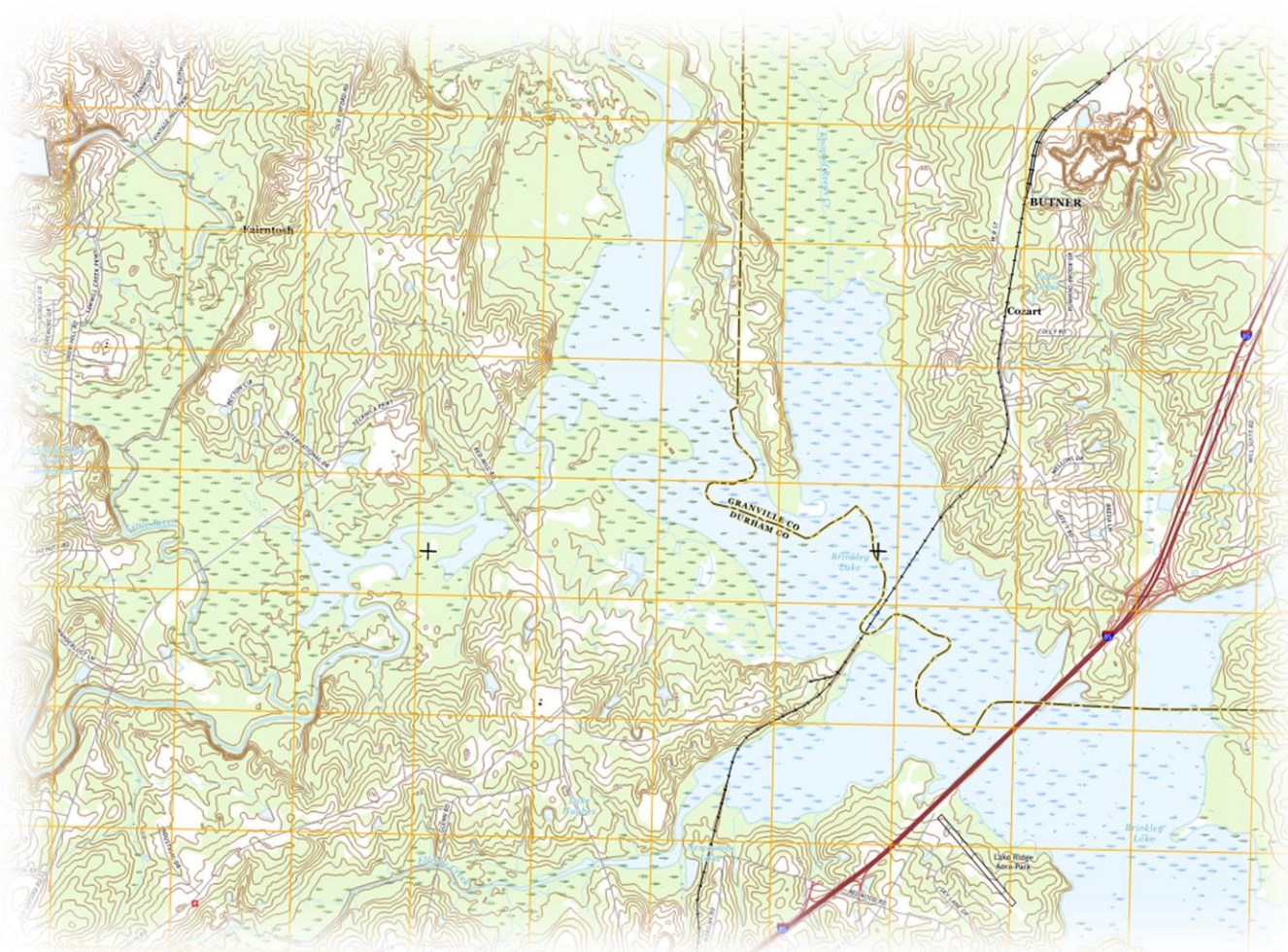


UNRBA Board of Directors

# Monitoring Program Status Update

May 15, 2018



# Routine Monitoring Update

# Routine Monitoring Status

| Date           | Sample Collection | Sample Analysis | Data Review | Posted to Database |
|----------------|-------------------|-----------------|-------------|--------------------|
| Aug – Dec 2014 | ✓                 | ✓               | ✓           | ✓                  |
| Jan – Dec 2015 | ✓                 | ✓               | ✓           | ✓                  |
| Jan – Dec 2016 | ✓                 | ✓               | ✓           | ✓                  |
| Jan – Dec 2017 | ✓                 | ✓               | ✓           | ✓                  |
| January 2018   | ✓                 | ✓               | ✓           | ✓                  |
| February 2018  | ✓                 | ✓               | ✓           | ✓                  |
| March 2018     | ✓                 | ✓               |             |                    |
| April 2018     | ✓                 | ✓               |             |                    |
| May 2018       | ✓                 |                 |             |                    |
| June 2018      |                   |                 |             |                    |

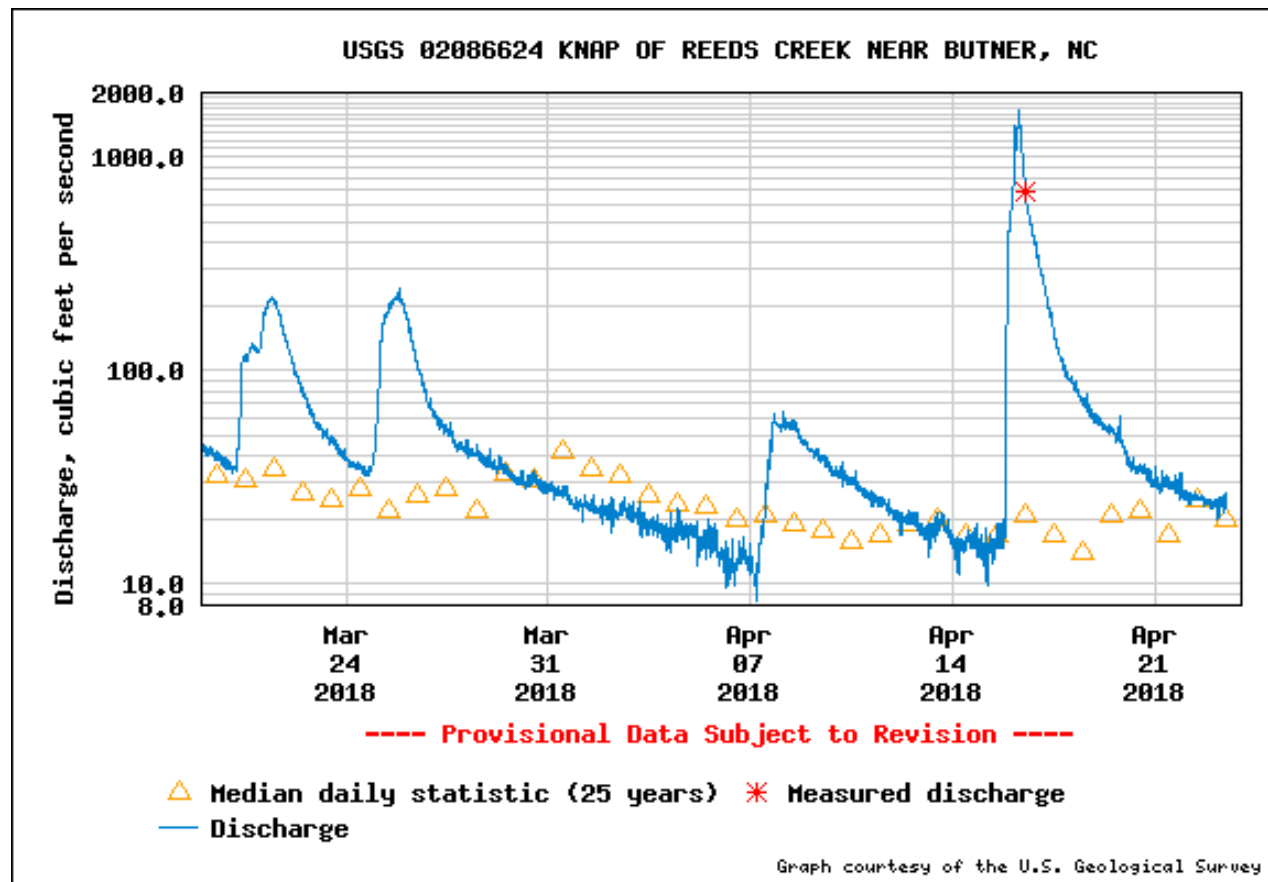
The UNRBA has now generated 44 months, 3 full growing seasons, and 3 full calendar years of water quality data.

Only 6 months remaining in the planned data collection window for the modeling effort of the re-examination.

# Special Studies Update

# High Flow Sampling

- Five events so far in FY2018
  - January 23
  - January 29
  - March 21
  - April 16
  - April 27



# Sediment Study

- Dr. Marc Alperin (UNC) is completing his report on sediment sampling and analysis
  - Summarized in the Annual Report
- Results to be provided to the modeling team
- Recommendations provided by Dr. Alperin, Dynamic Solutions, Jay Sauber, and BC on sediment chamber study locations for EPA

# FY2018 Annual Report

DRAFT

Upper Neuse River Basin Association Monitoring Program  
Annual Report

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Prepared for

Upper Neuse River Basin Association, NC

April 2018

DRAFT for REVIEW

This is a draft and is not intended to be a final representation  
of the work done or recommendations made by Brown and Caldwell.  
It should not be relied upon; consult the final report.



5340 Wade Park Boulevard, Suite 200

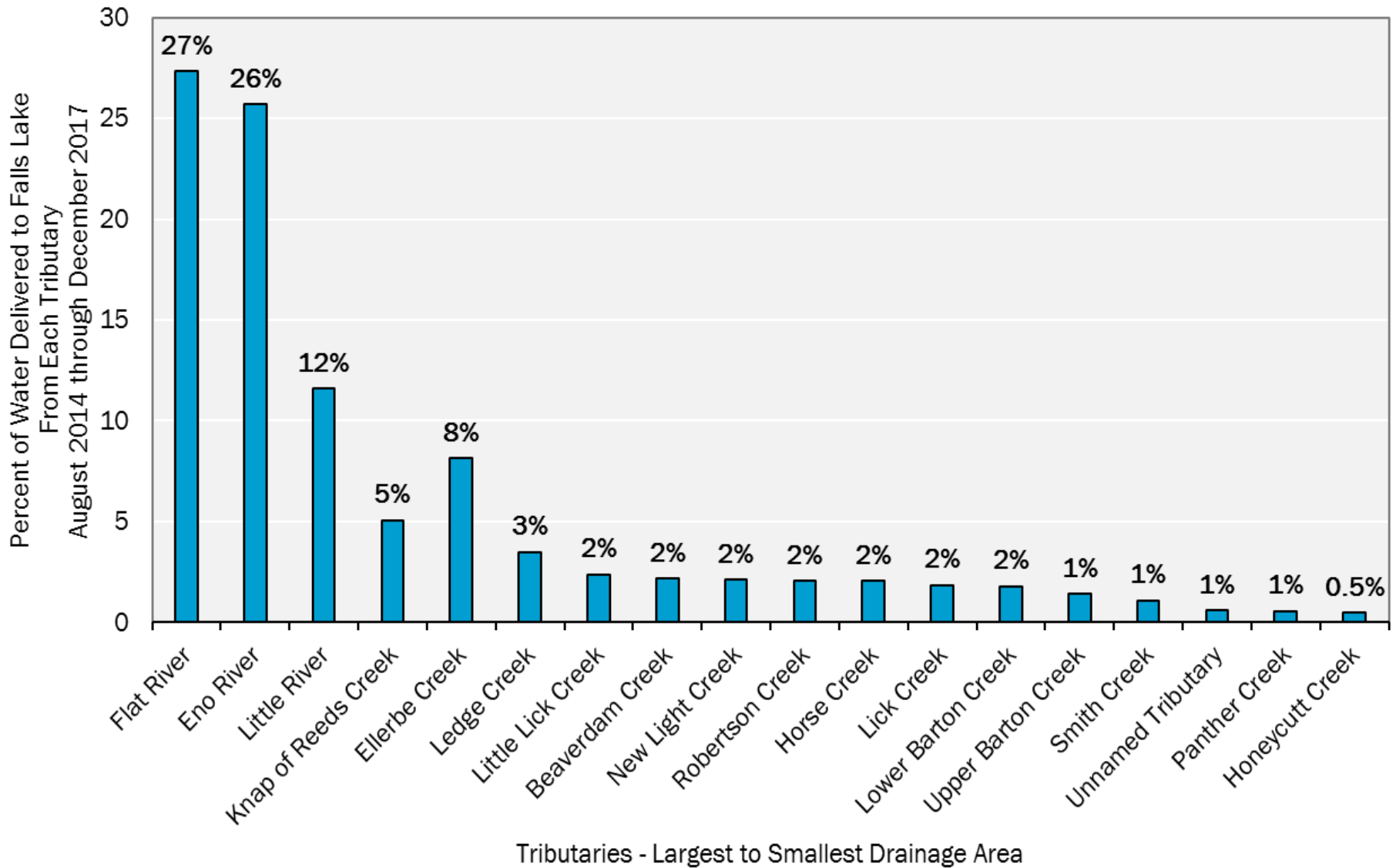
Raleigh, NC 27607





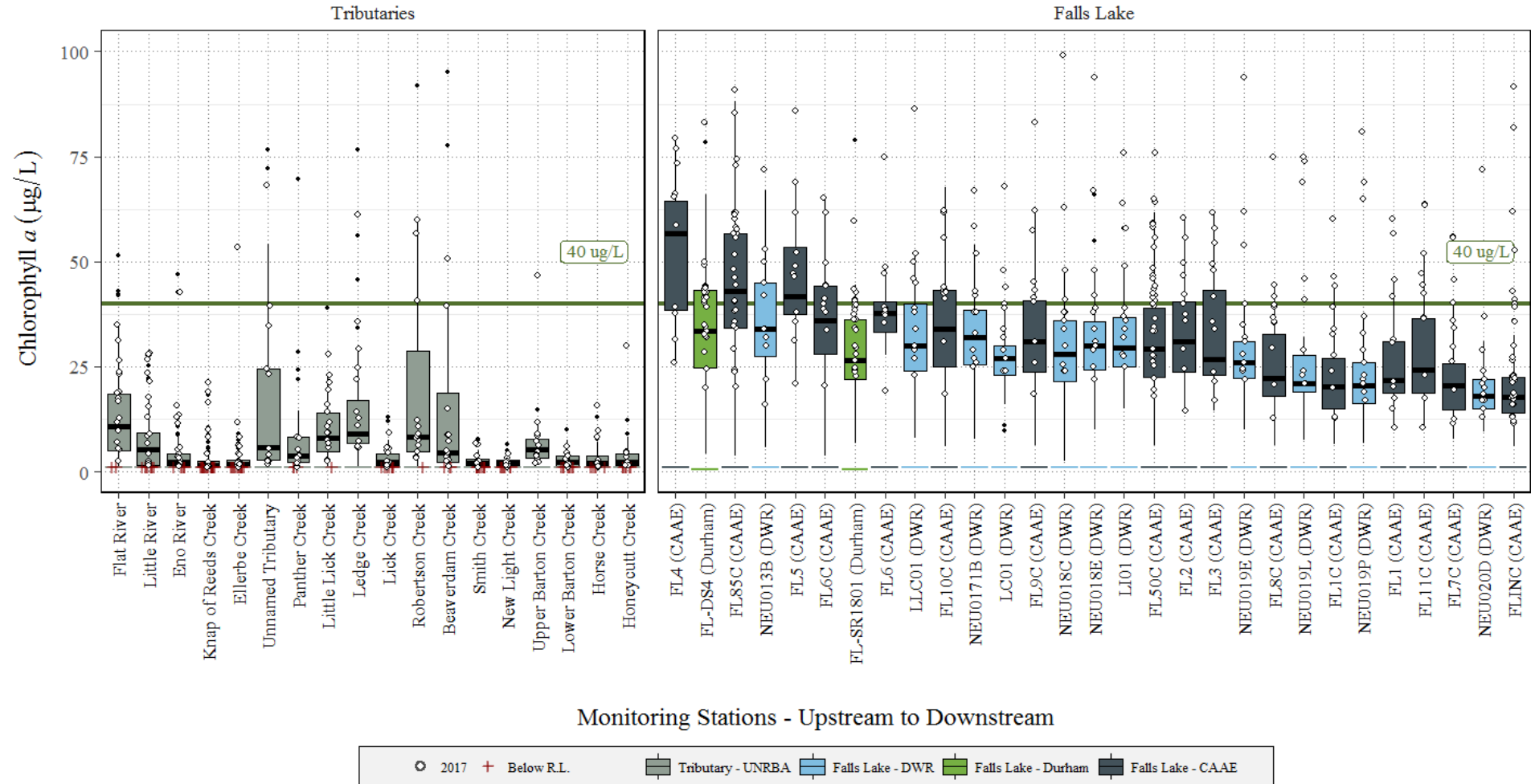


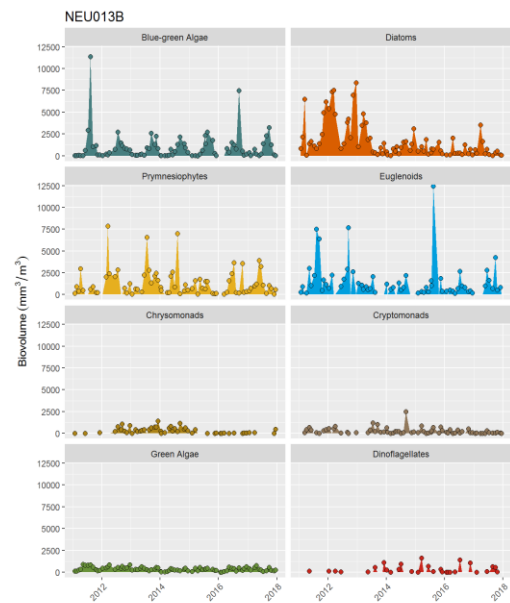
# Hydraulic Loading from Tributaries



# Chlorophyll a

Chlorophyll a (2014-2017)

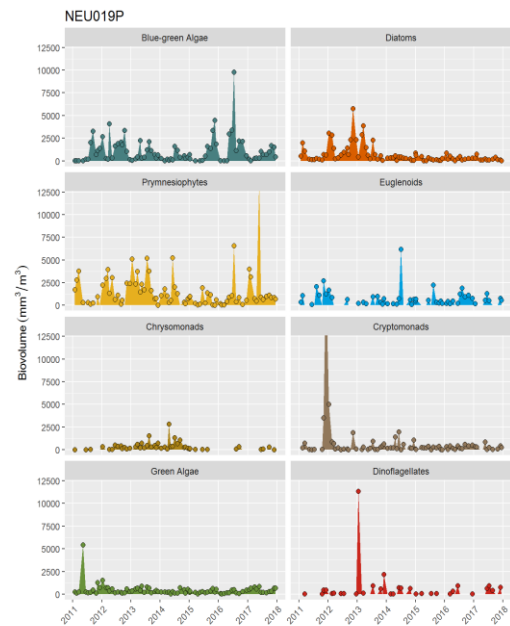




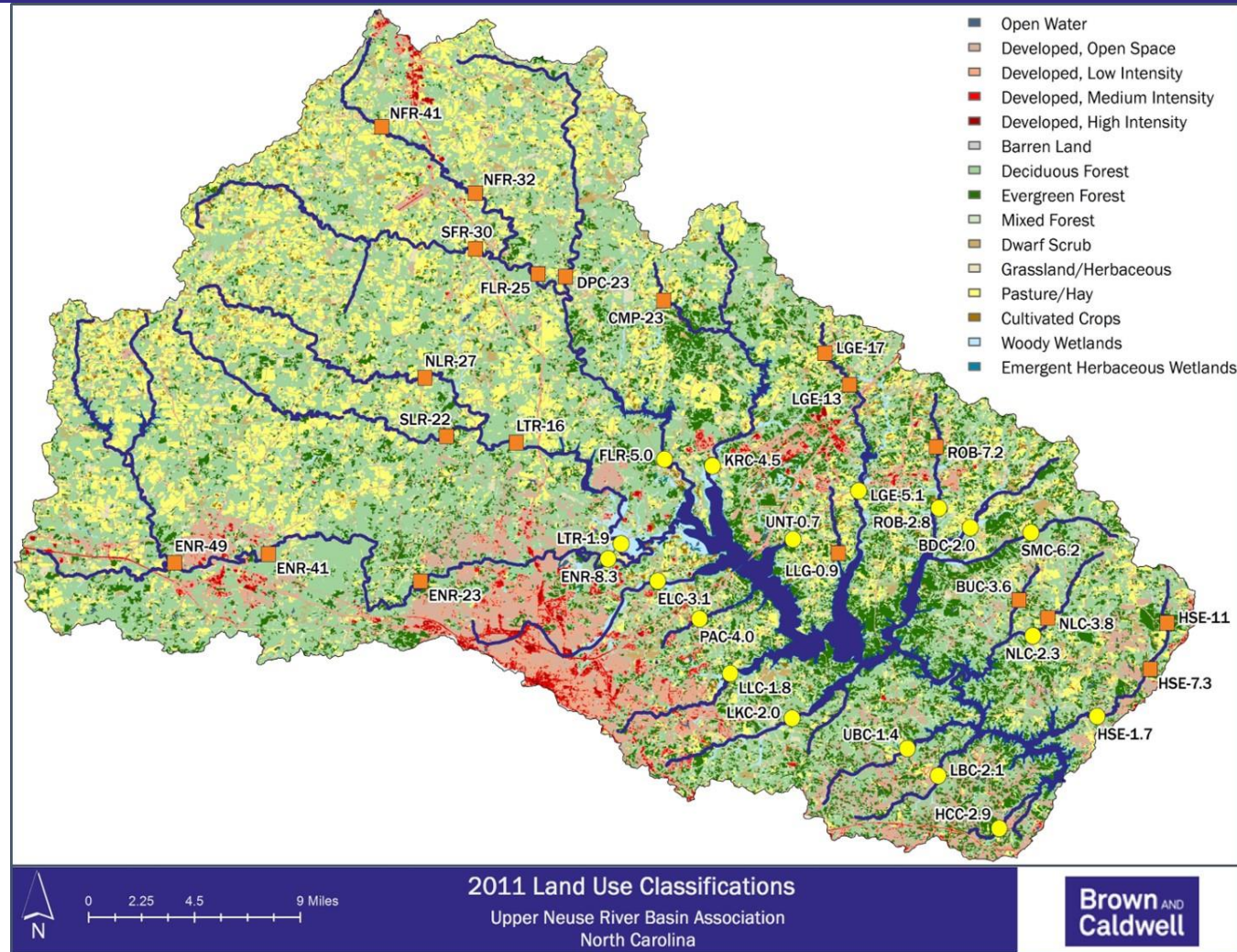
**NEU018E (mid-lake)**



# Algal Groups



# Land Cover and Water Quality



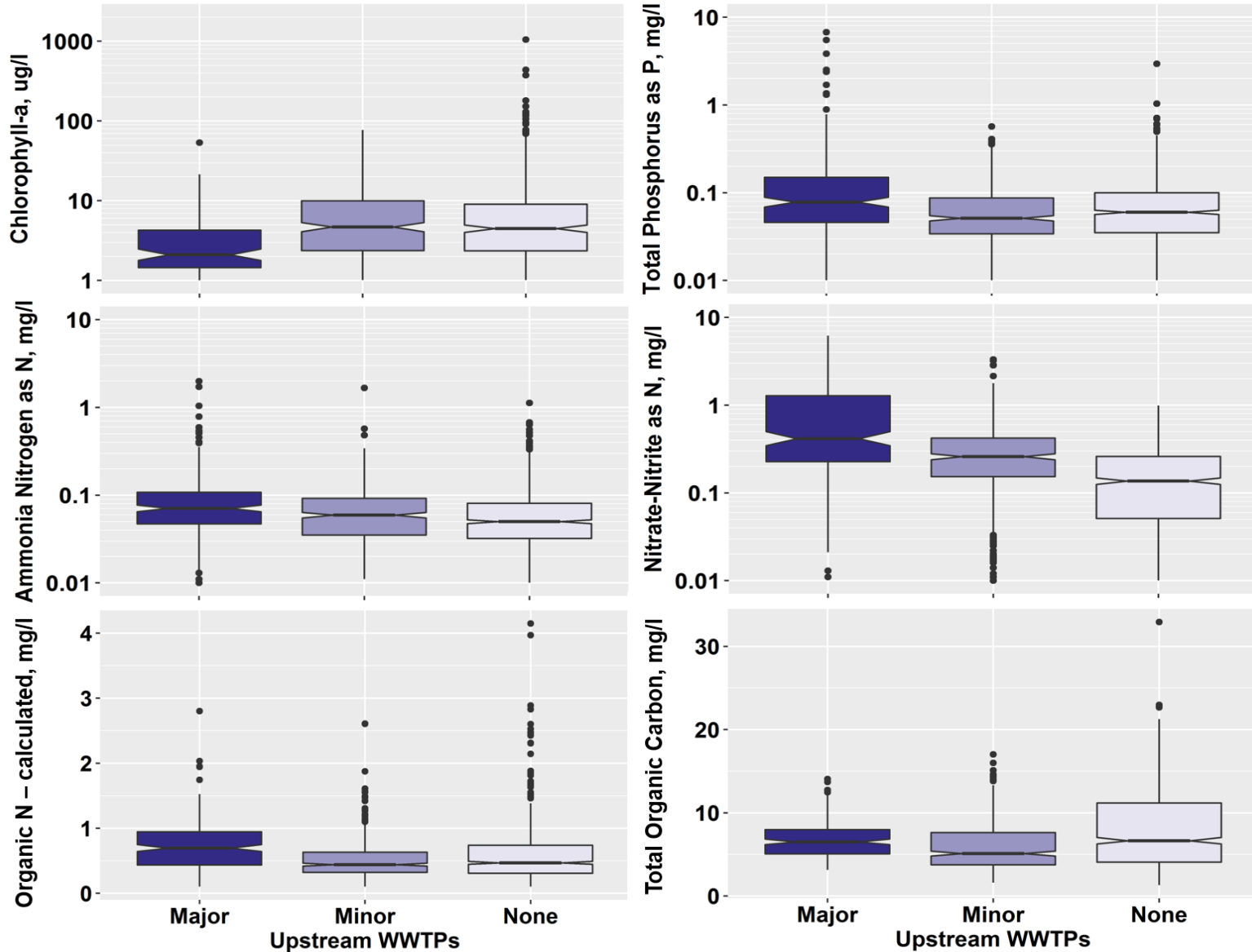
## Positive correlations:

- % developed land and conductivity
- % herbaceous land and TOC
- % wetland cover and TOC, TKN and chl-a

## Negative correlations:

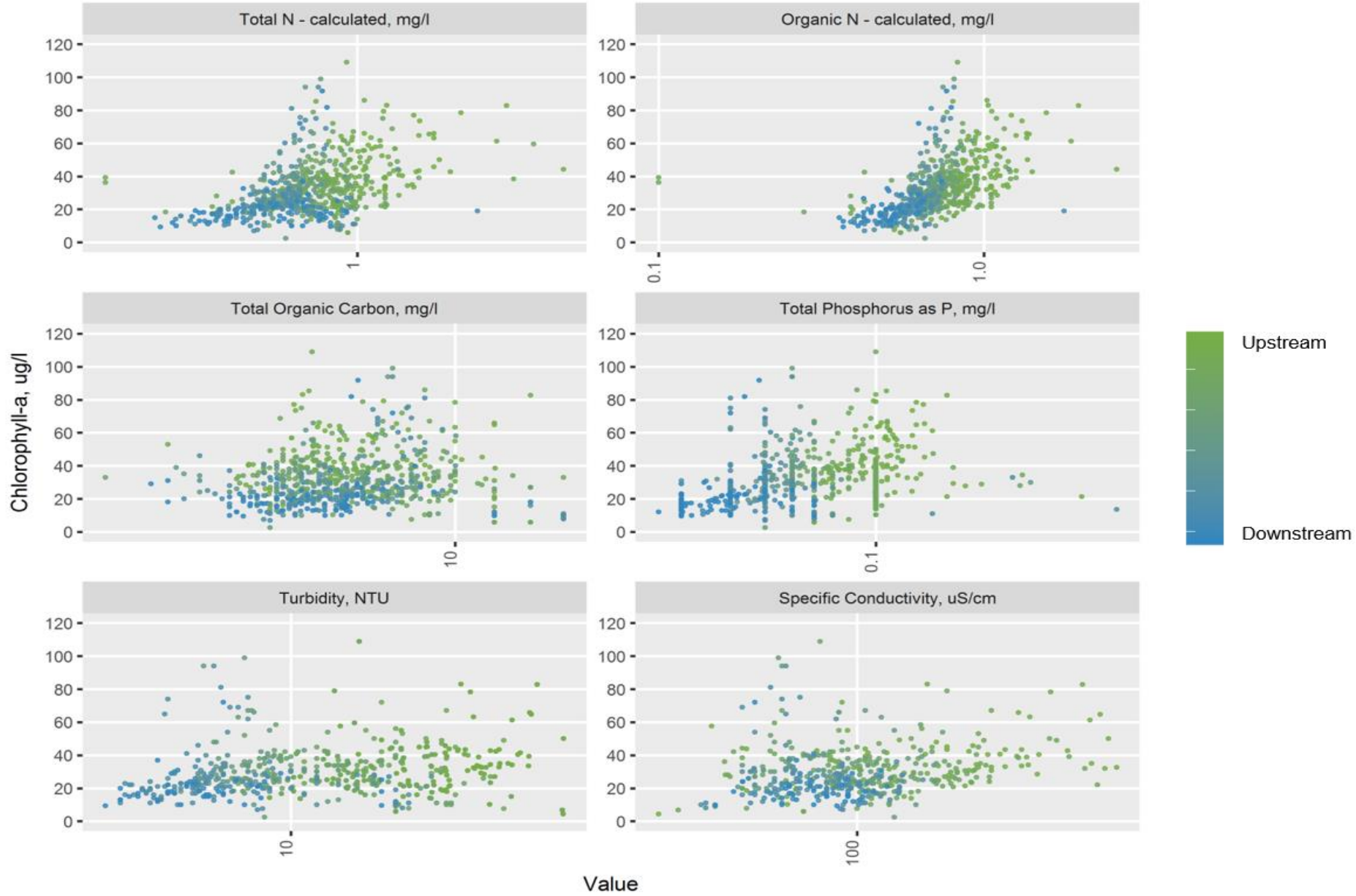
- % forested land and TOC
- % wetland cover and pH and DO

# Treatment Facilities and Water Quality

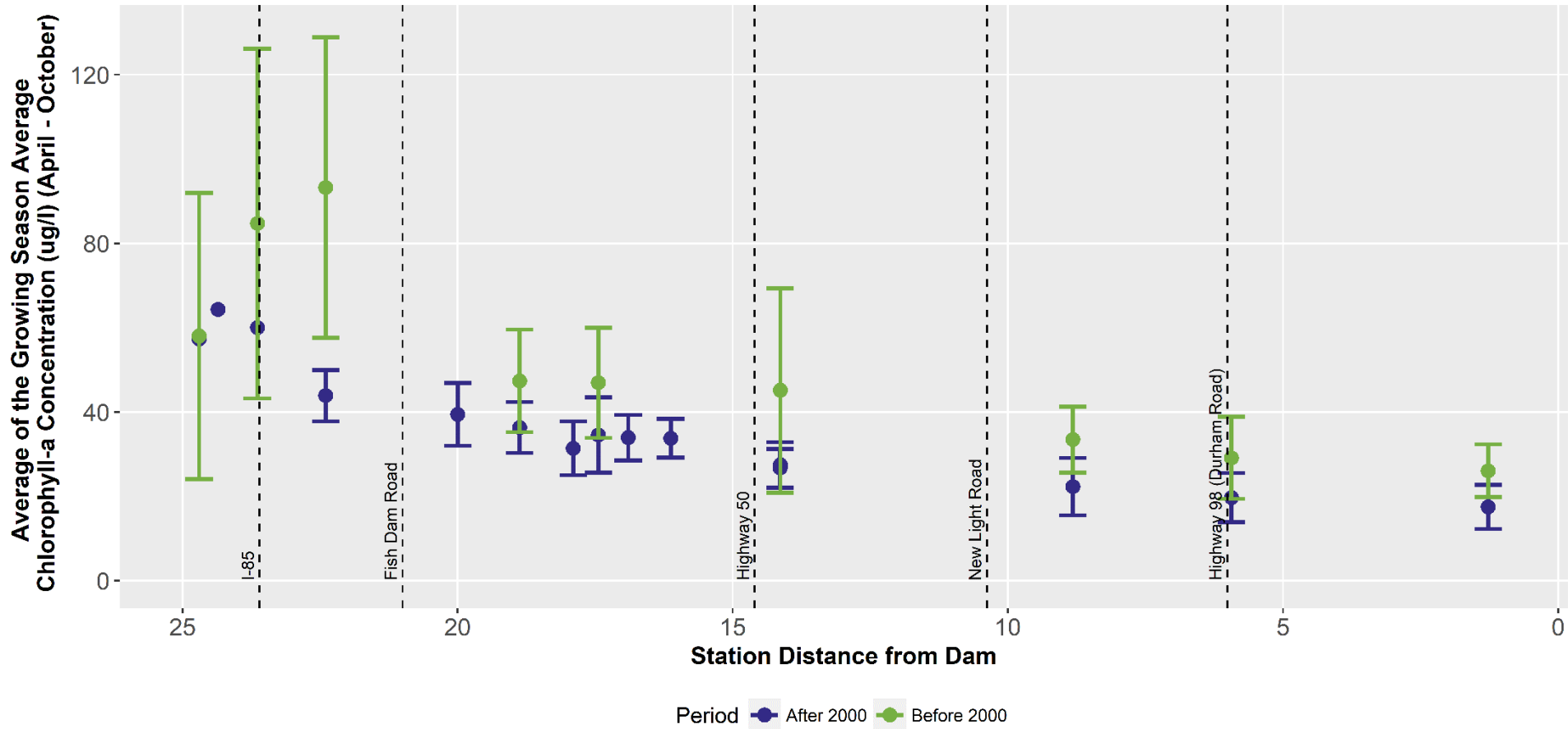




# Relationships between Chl a and other parameters



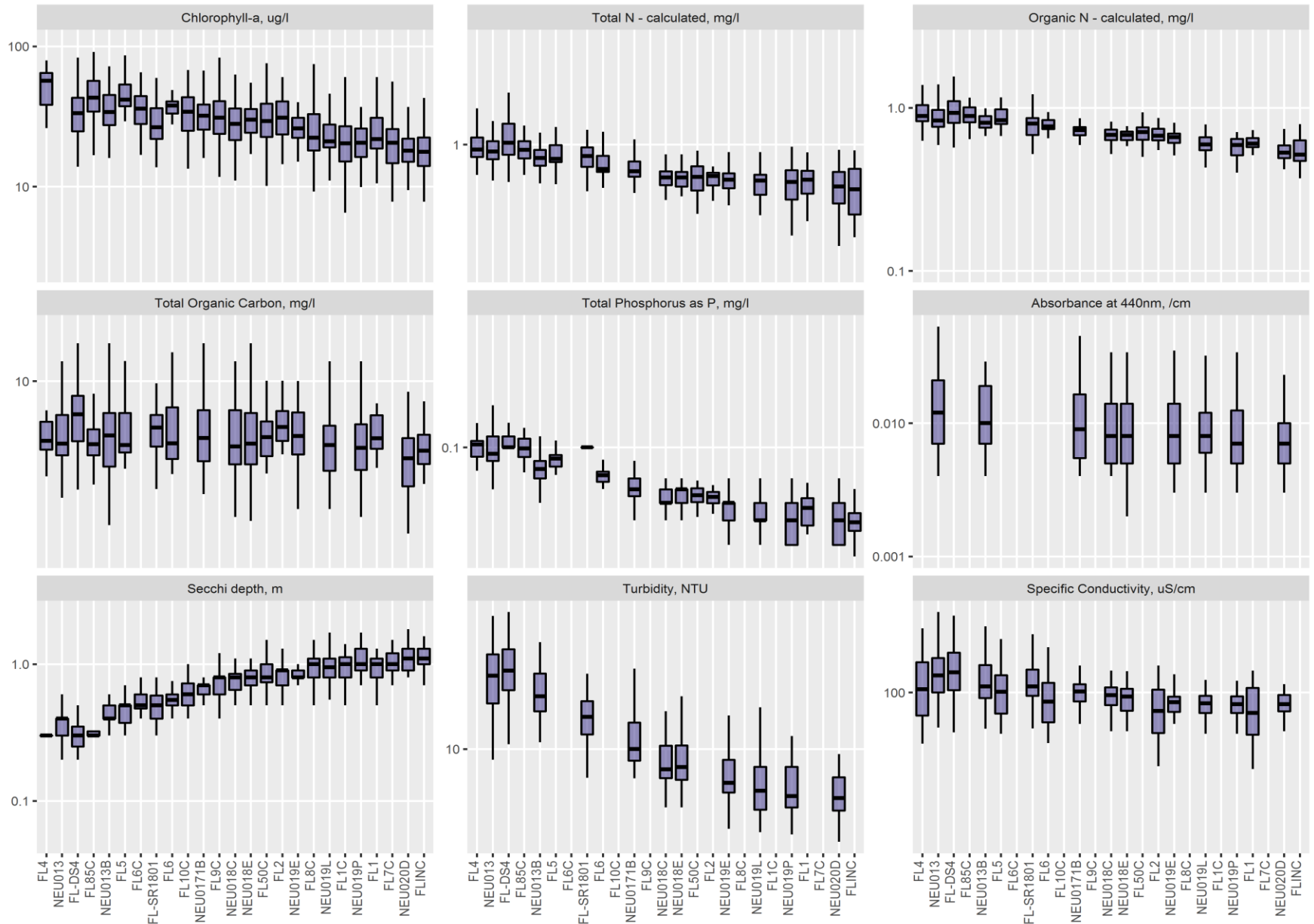
# Change in Chl a levels over time



\*Only Stations with at least 3 samples per season are included

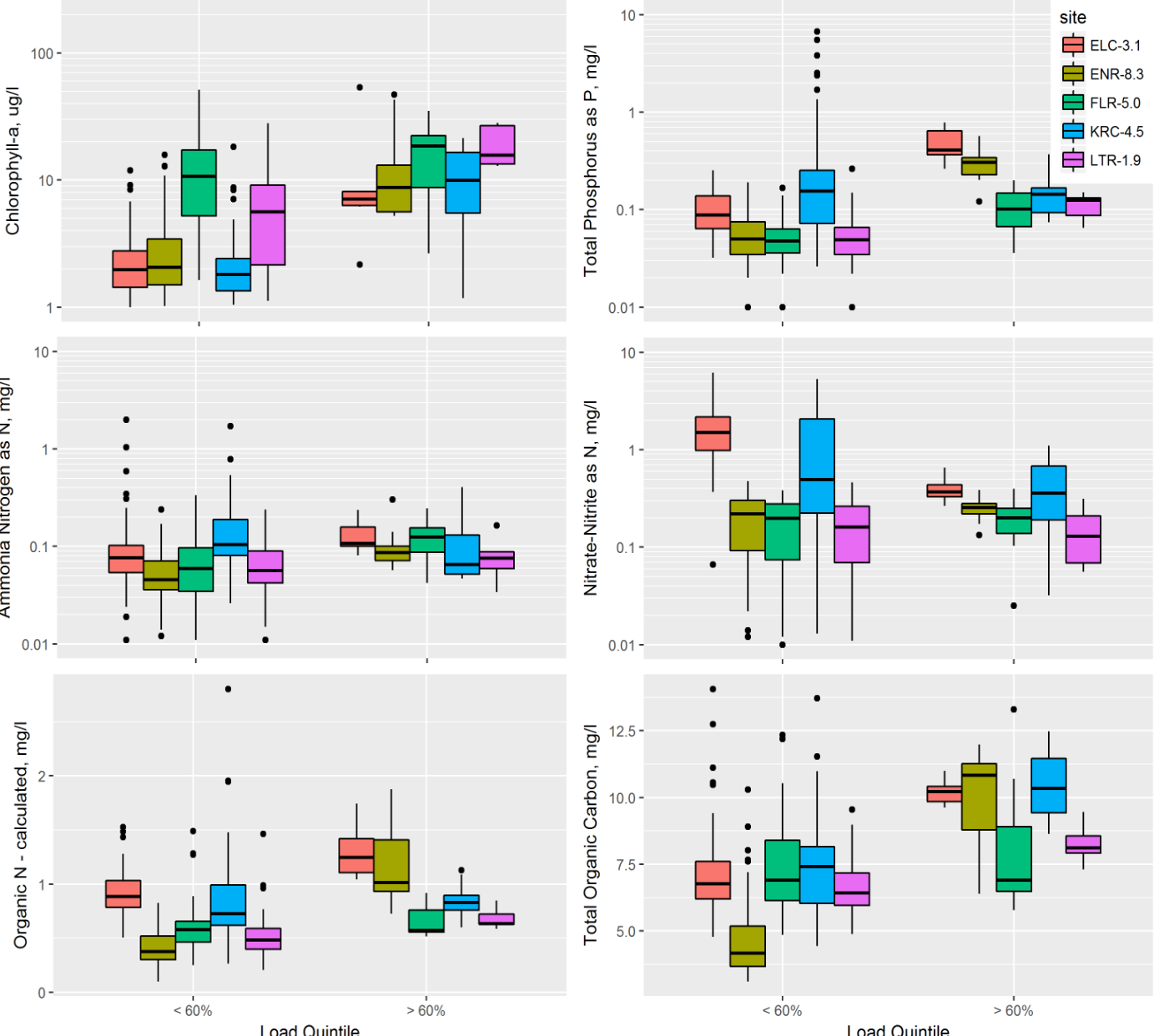


# Upstream to Downstream Water Quality Patterns

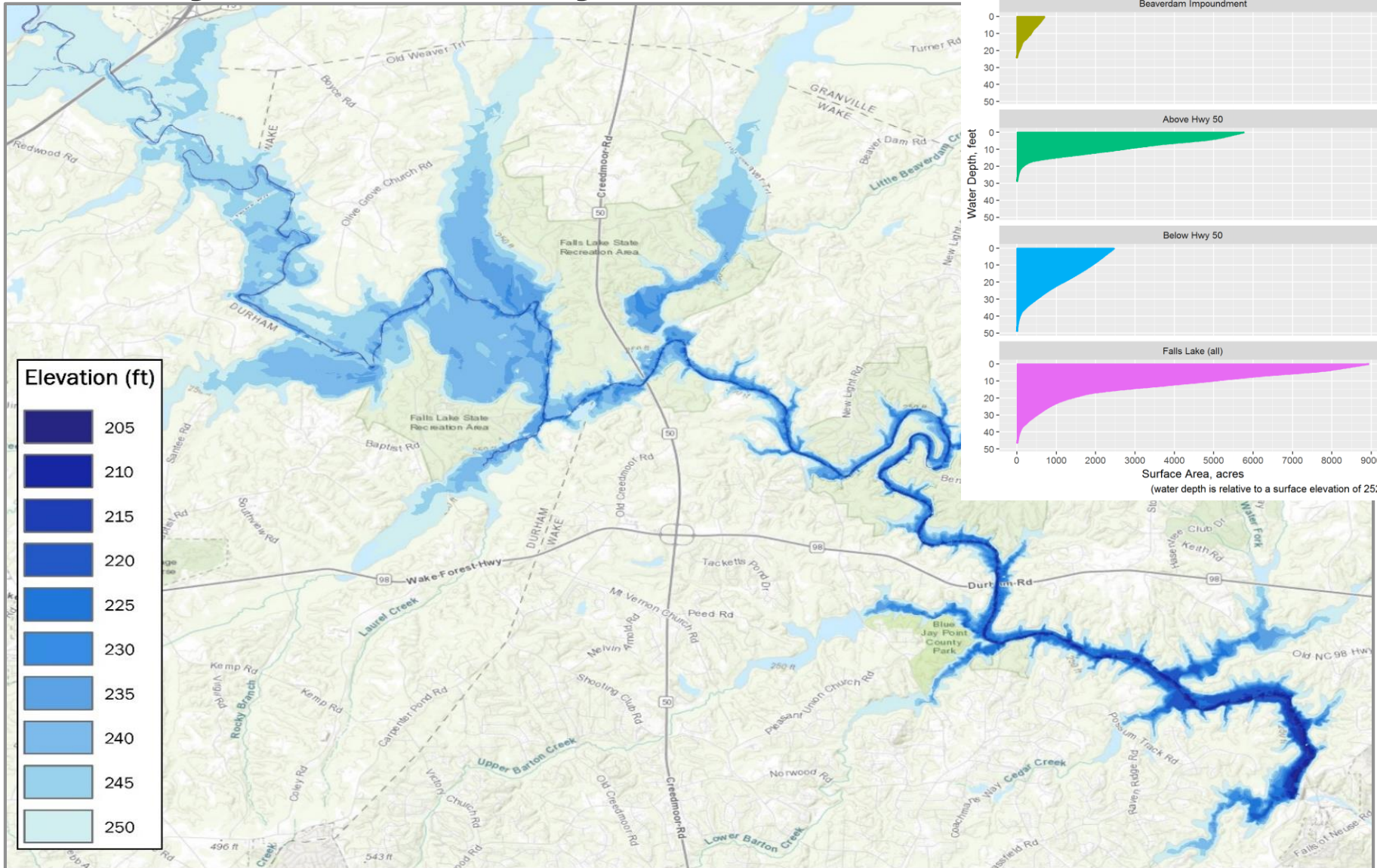


Monitoring Stations - Upstream to Downstream

# High Flows and Water Quality



# Bathymetric Survey



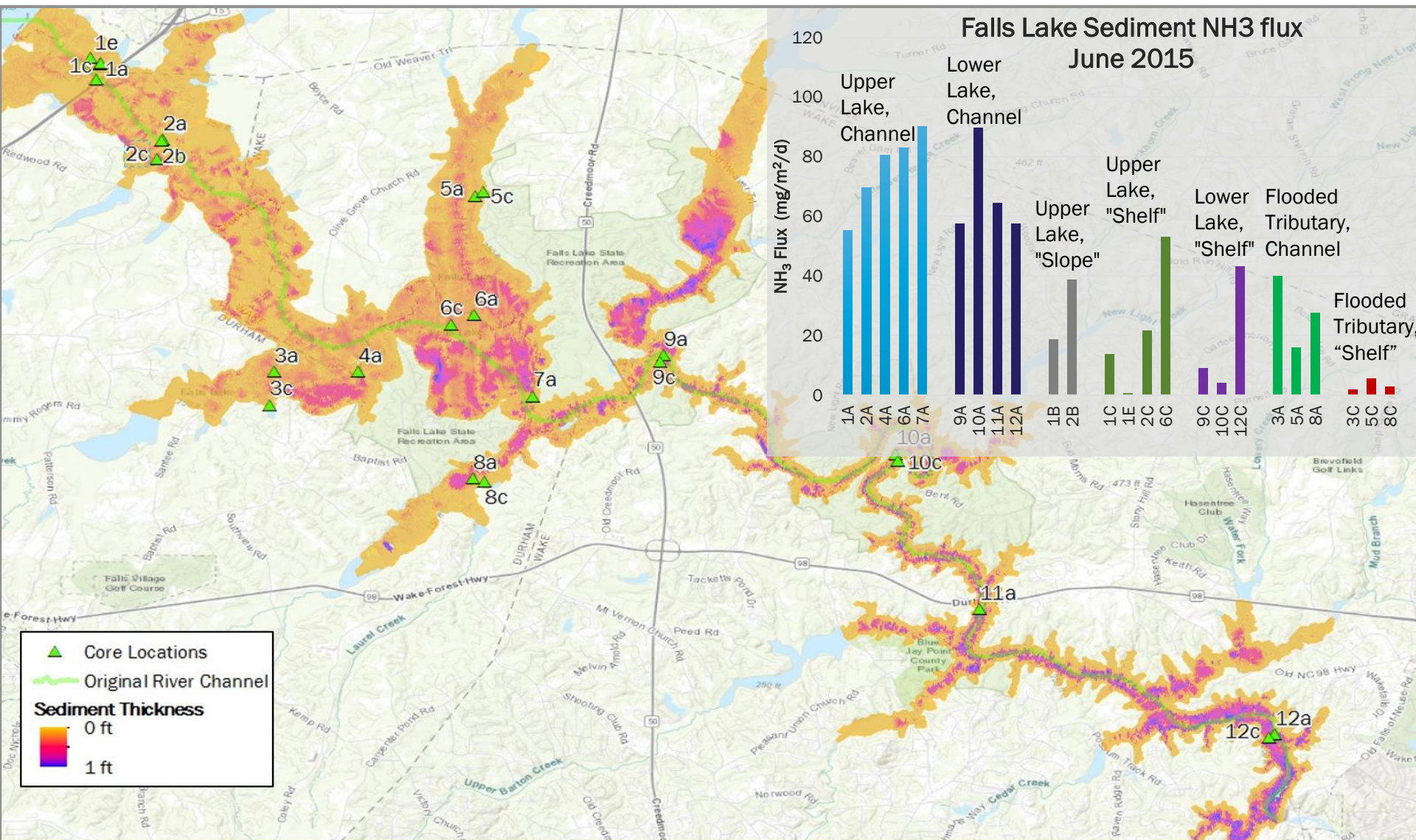
0 0.5 1 2 Miles

**Falls Lake Bathymetry**  
 Upper Neuse River Basin Association  
 North Carolina

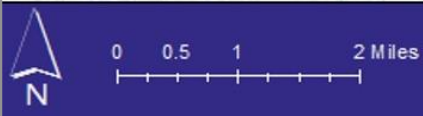
**Brown AND Caldwell**



# Sediment Evaluation



Core Locations  
 Original River Channel  
**Sediment Thickness**  
 0 ft  
 1 ft



## Falls Lake Sediment Thickness

Upper Neuse River Basin Association  
North Carolina



# Quality Assurance/Quality Control

- 94 percent of sampling events have been completed as planned
  - Most missed events were due to dry conditions
  - Some were due to inaccessibility from flooding or snow
- The Annual Report provides uncertainty statistics derived from laboratory QA data that allow users to estimate the margin of error in the monitoring results

# Recommendations

- The current Routine Monitoring program should be continued through October 2018.
- Data acquisition for modeling support should be considered complete at that time.
- A final monitoring report for modeling use should be completed in 2019 (February-March).

The UNRBA Executive Director established a work group to consider the potential costs and benefits of a water quality monitoring program beyond October 2018.

The work group is discussing options that could provide some level of ongoing data acquisition, while ensuring adequate funding is available for the modeling effort.



