



Nutrient Loadings and Trends in the Jordan Lake Watershed

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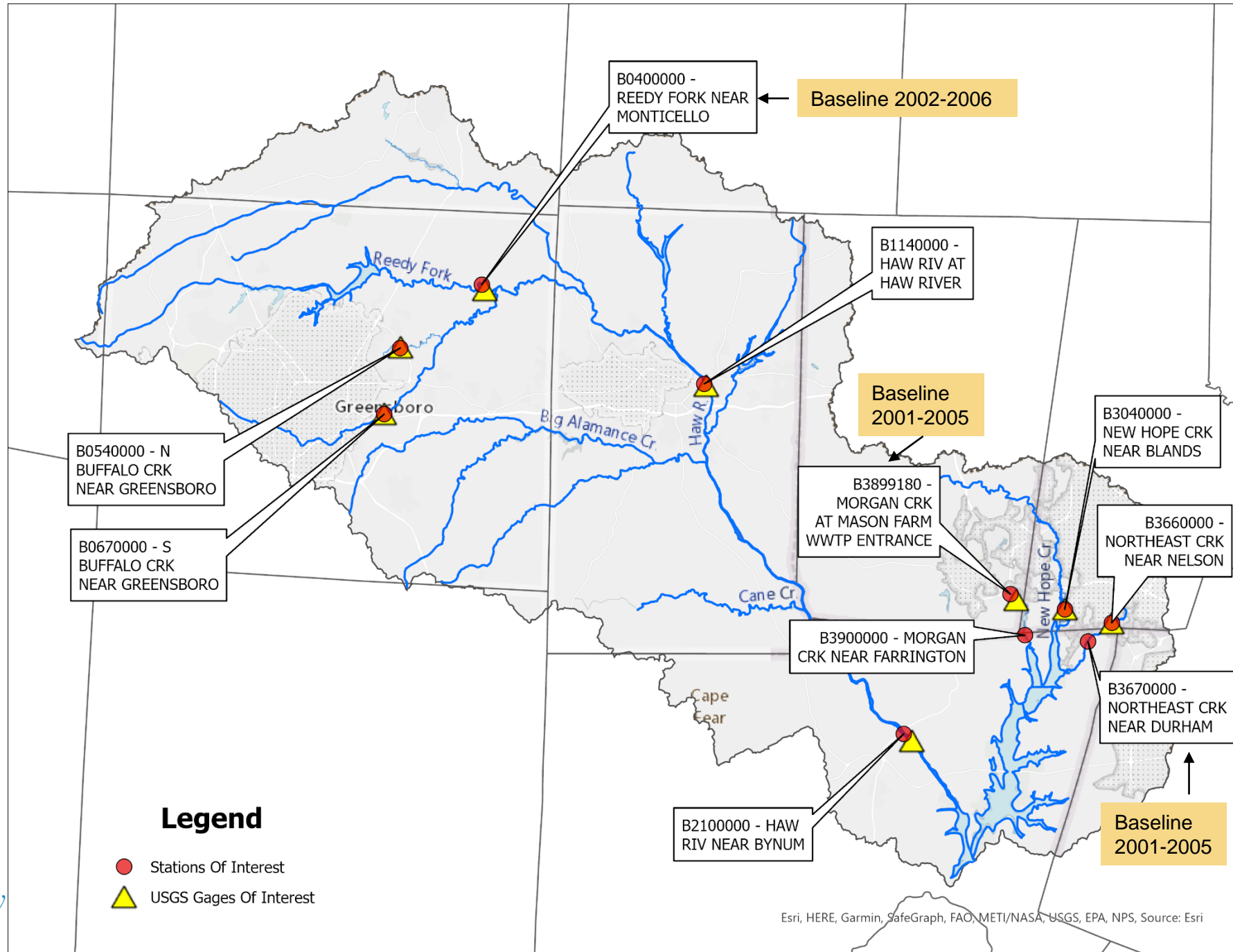
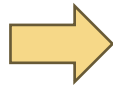
November 2, 2023



Objective

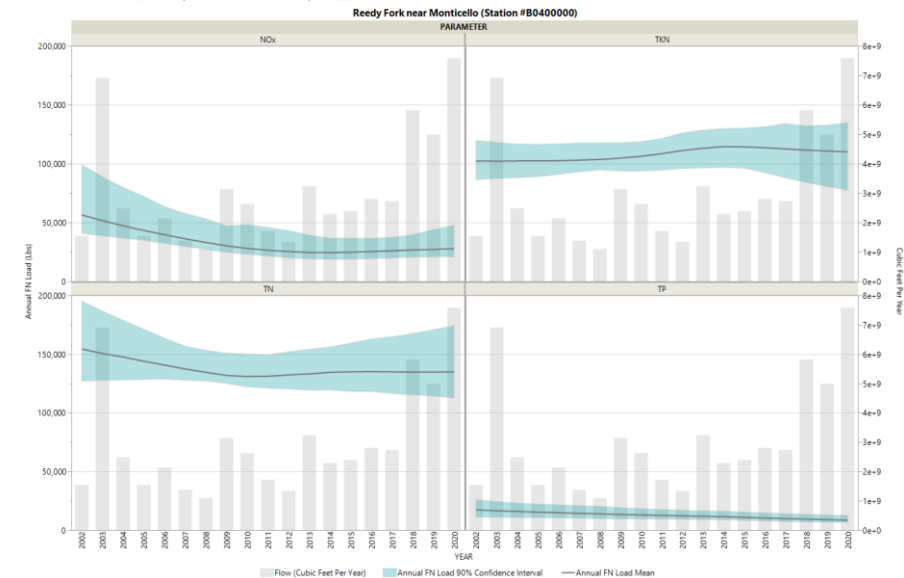
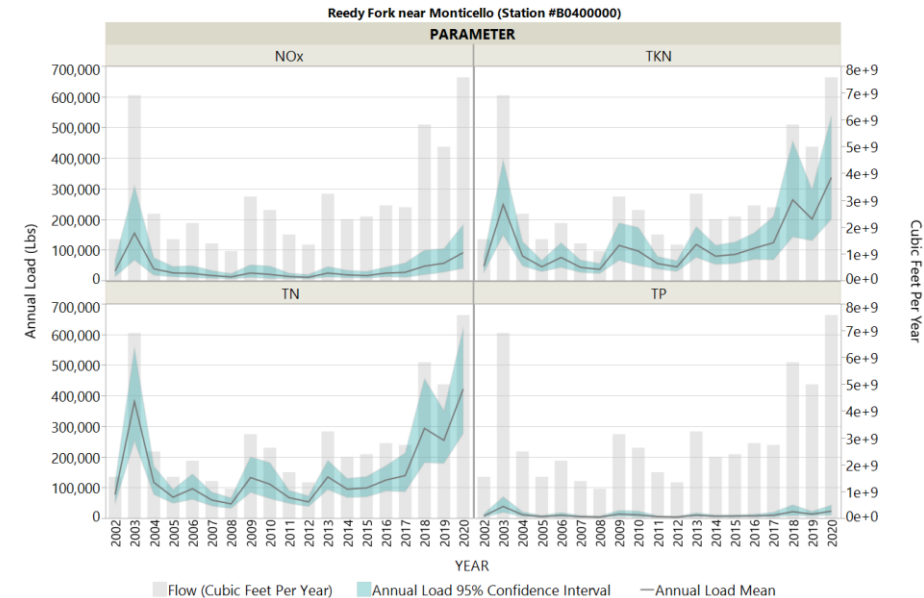
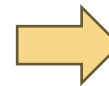
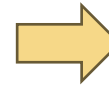
- Evaluate change in nutrient loading from the baseline period (1997-2001) to 2016-2020.
- Create a StoryMap of the findings.

Selected stations with flow used for the analysis.



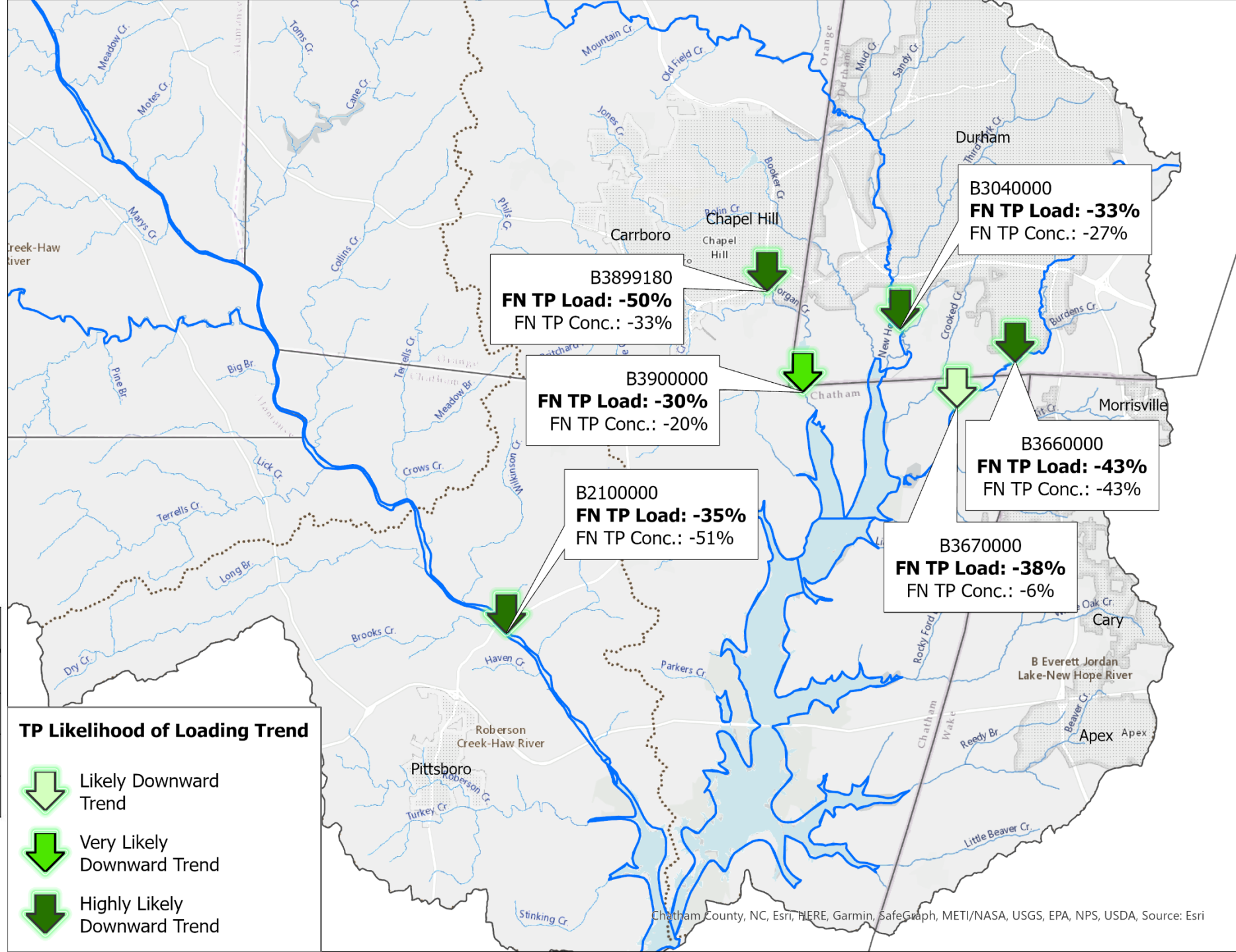
Methods

- USGS Loadest:
 - Develops regression models to estimates monthly loads.
 - Preserves flow history, good for understanding actual delivered loads.
- Weighted Regressions on Time, Discharge, and Season (WRTDS):
 - Reduces or eliminates the influence of year-to-year streamflow variability on estimates of trends in concentration and load.
 - More useful to observe nutrient changes from the watershed.






Flow Normalized TP Loading Change

Baseline
vs
2016-2020



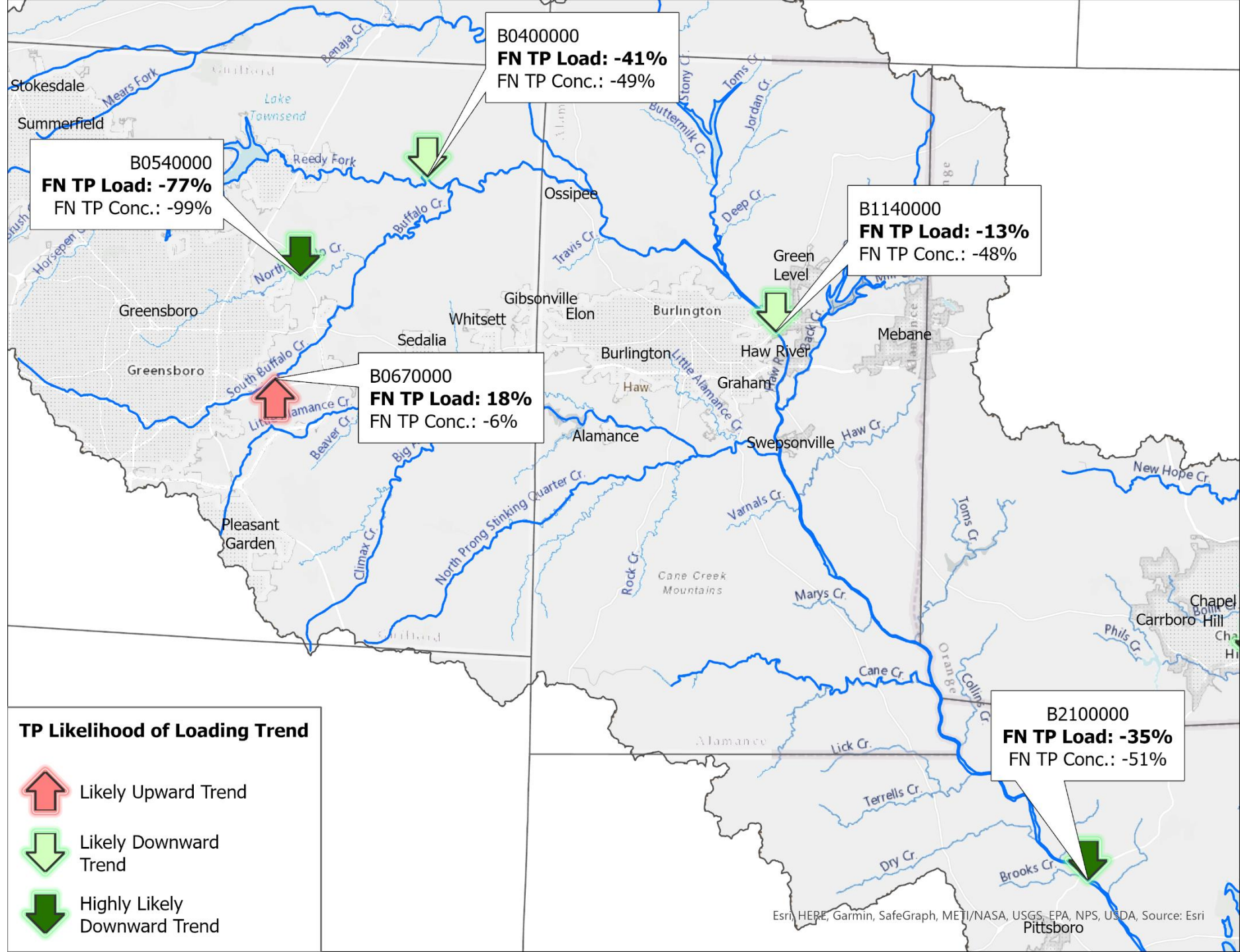
Likelihood designation	Range of likelihood values
Highly likely	0.95 to 1.00
Very likely	0.90 to <0.95
Likely	0.67 to <0.90
Uncertain (About as likely as Not)	0.50 to <0.67

TP Likelihood of Loading Trend

-  Likely Downward Trend
-  Very Likely Downward Trend
-  Highly Likely Downward Trend

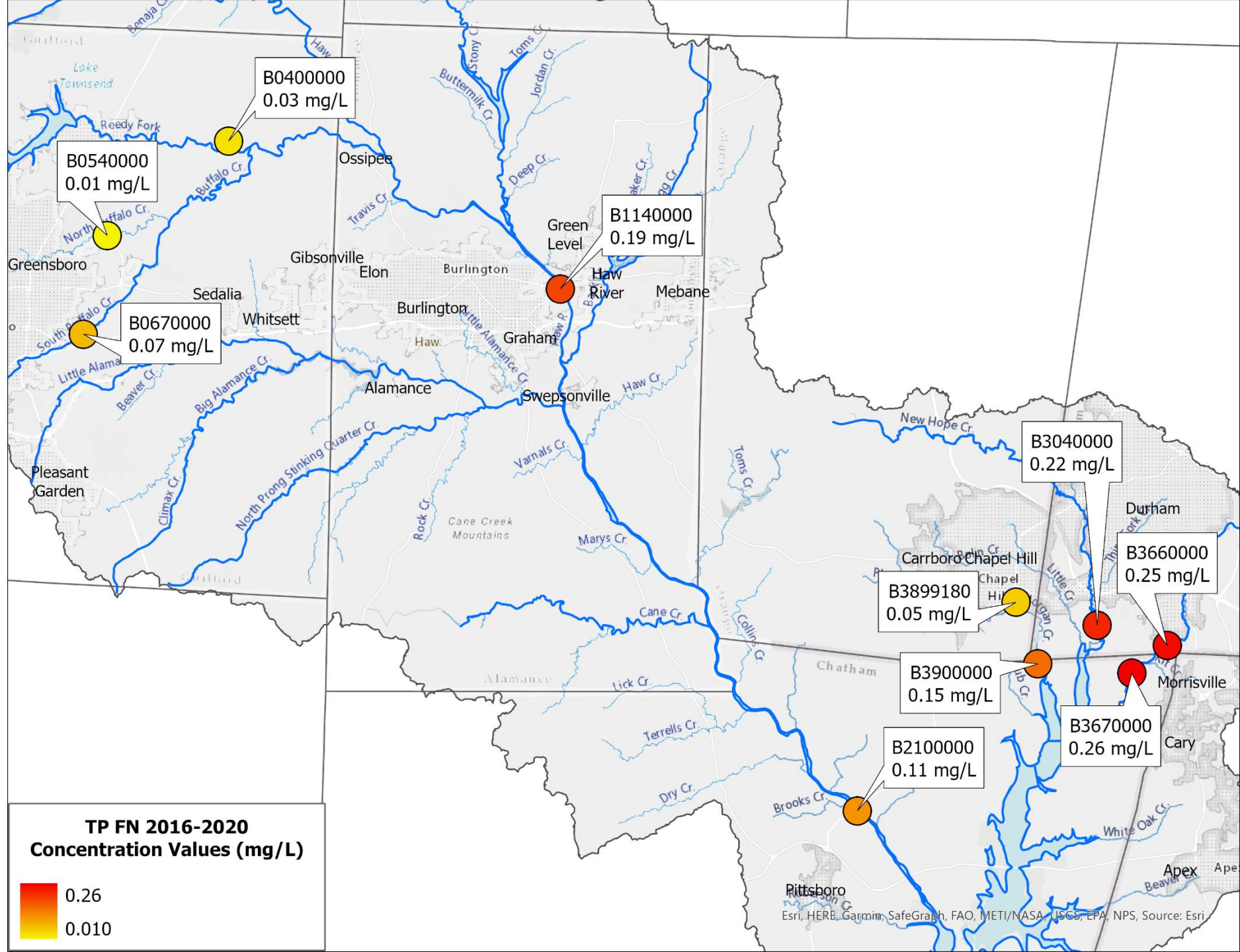
Flow Normalized TP Loading Change

Baseline
VS
2016-2020



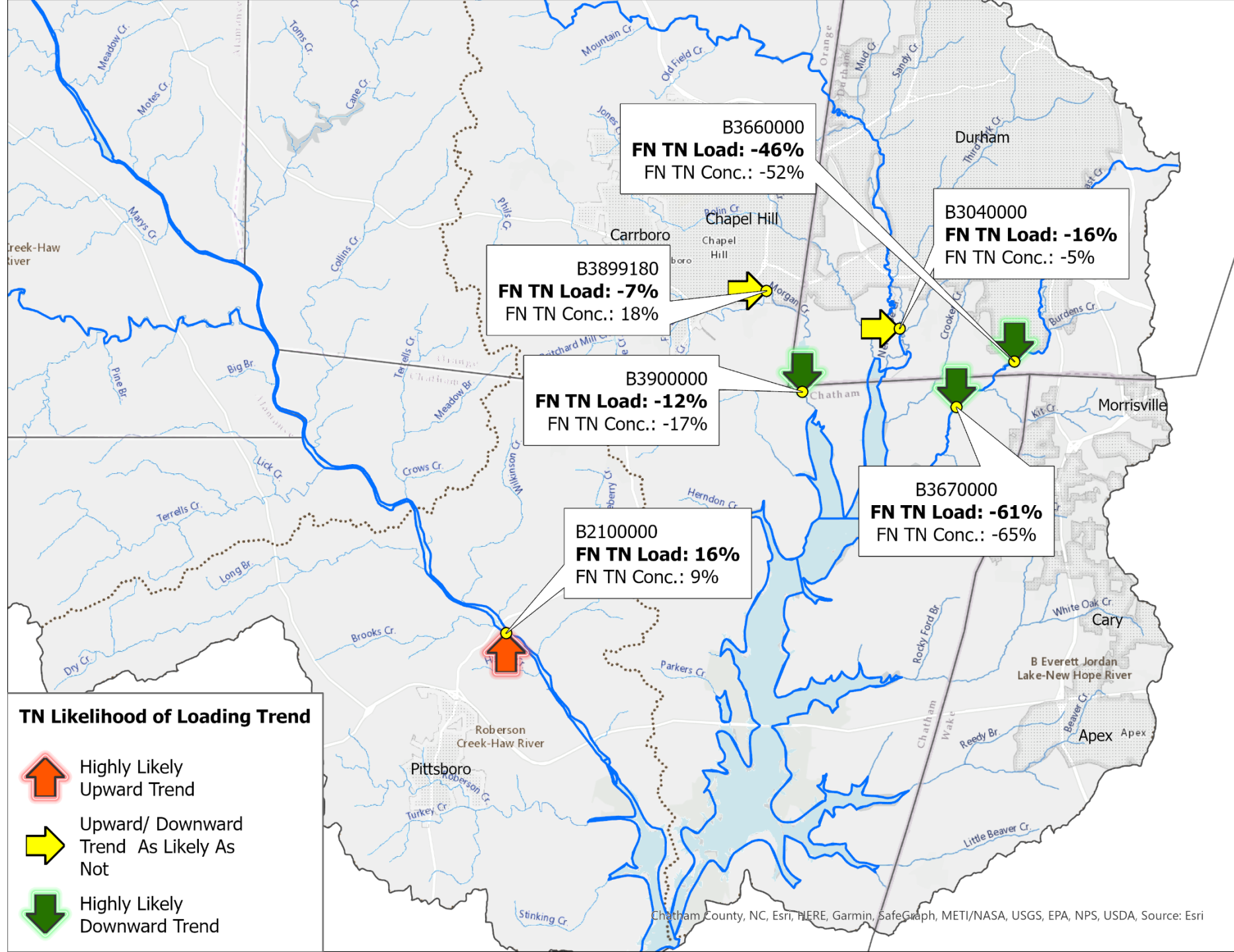
Flow Normalized TP Mean Concentrations

2016-2020



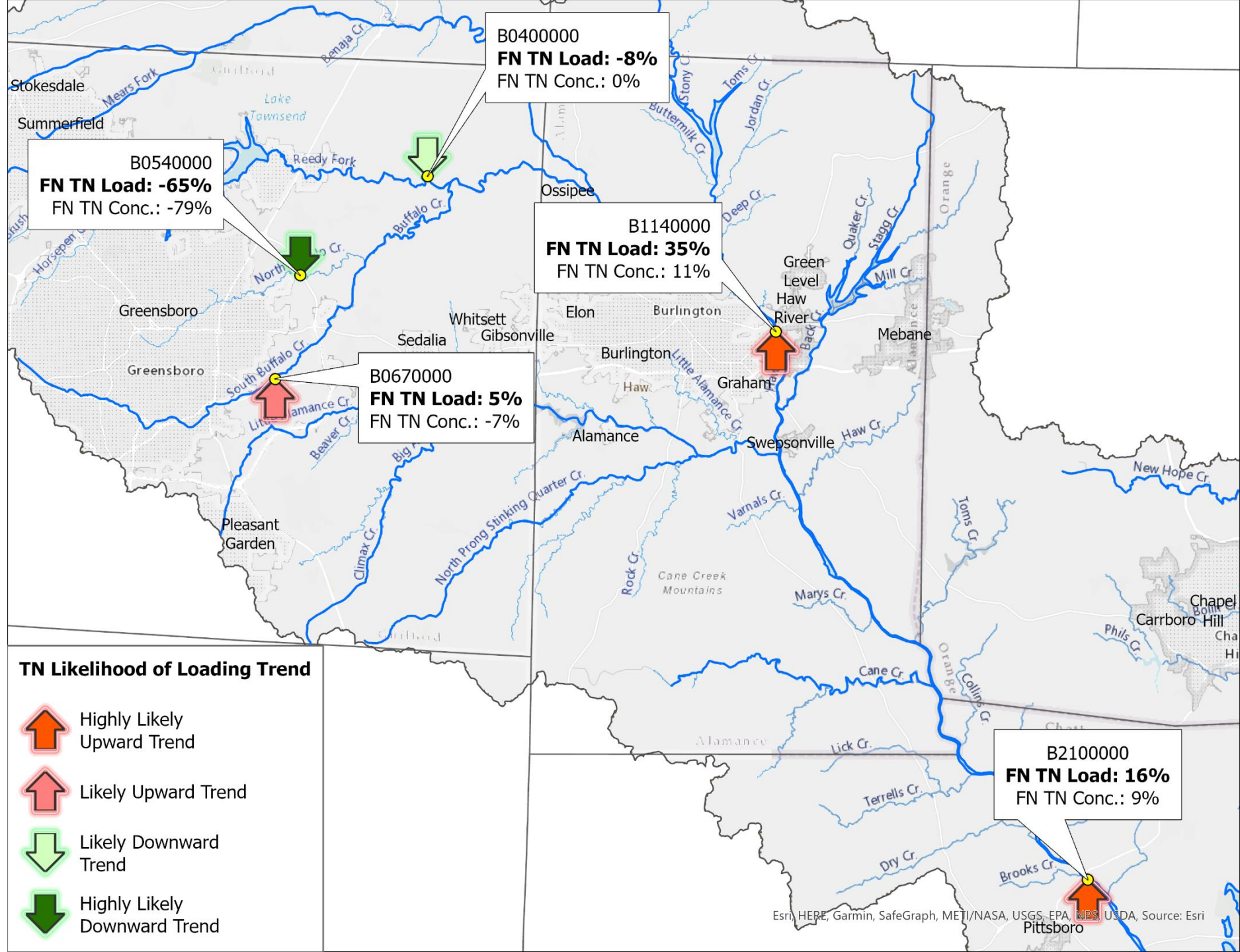
Flow Normalized TN Loading Change

Baseline
VS
2016-2020



Flow Normalized TN Loading Change

Baseline
VS
2016-2020

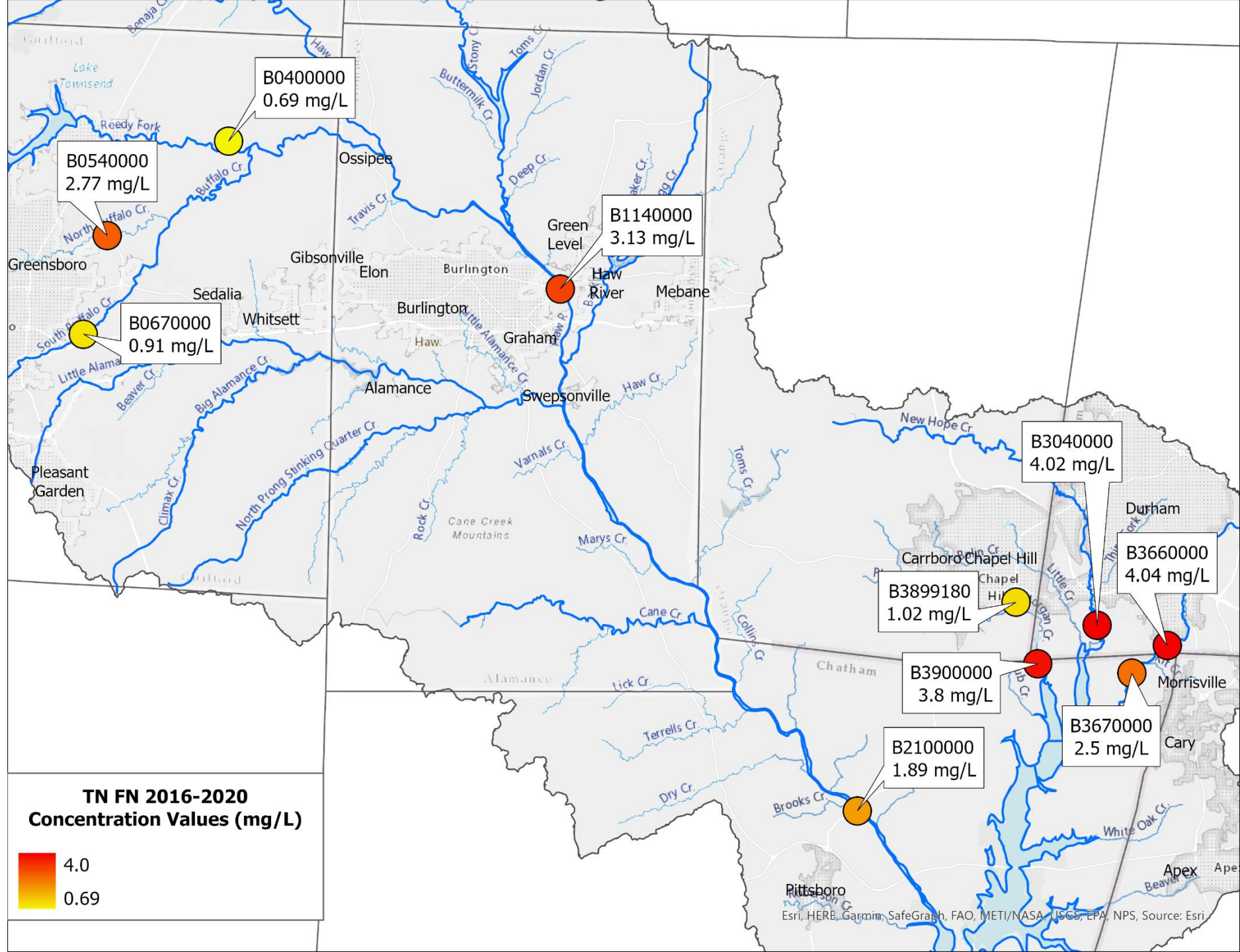


TN Likelihood of Loading Trend

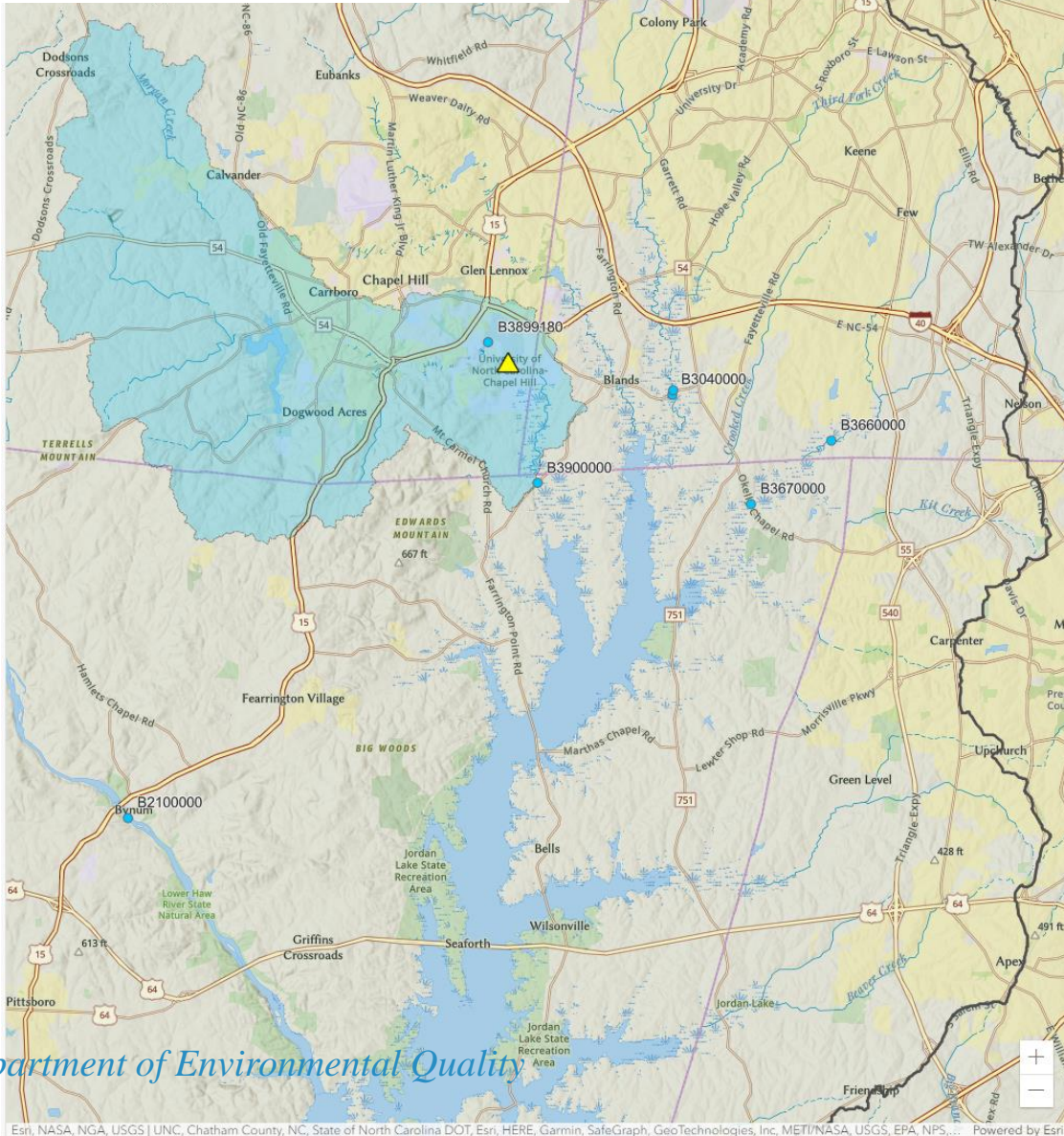
-  Highly Likely Upward Trend
-  Likely Upward Trend
-  Likely Downward Trend
-  Highly Likely Downward Trend

Flow Normalized TN Mean Concentrations

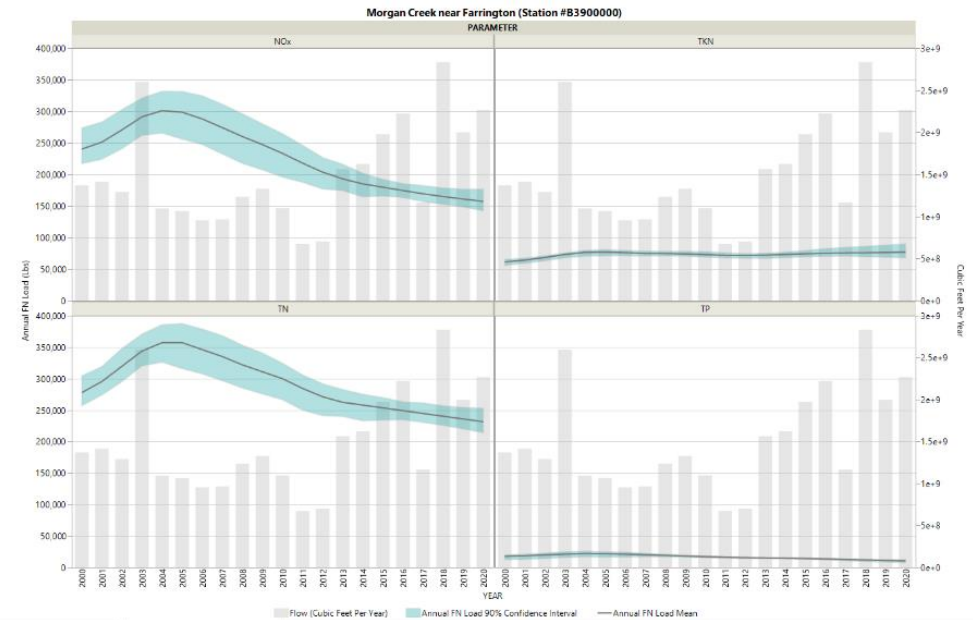
2016-2020



FN Nitrogen Loading Morgan Creek B3900000



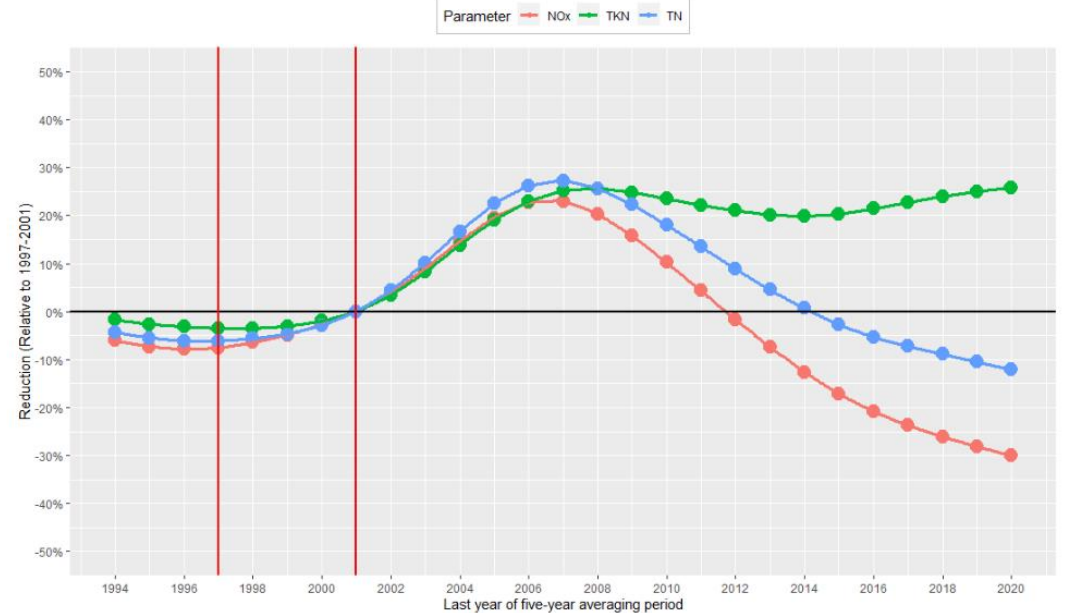
WRTDS Flow-Normalized Loads



Loadest Estimated Loads | **WRTDS FN Loads**

WRTDS Flow-normalized nitrogen load reduction for long-term flow conditions relative to the earliest 5-year averaging period

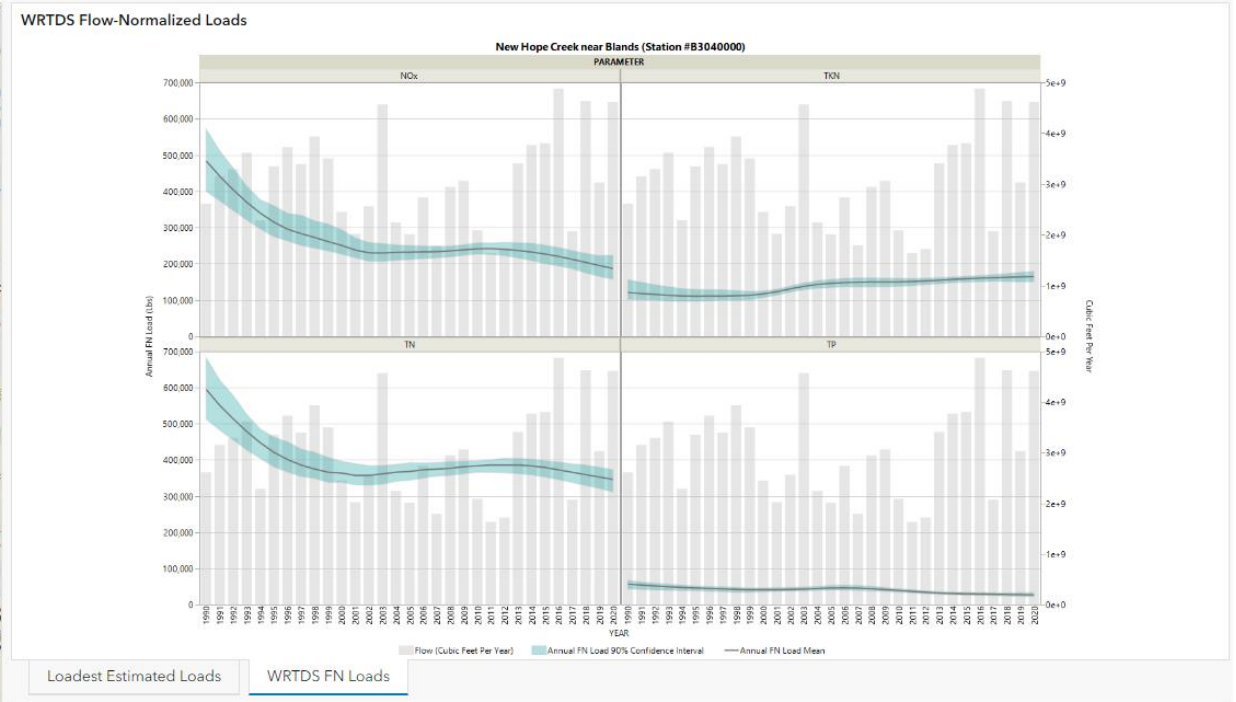
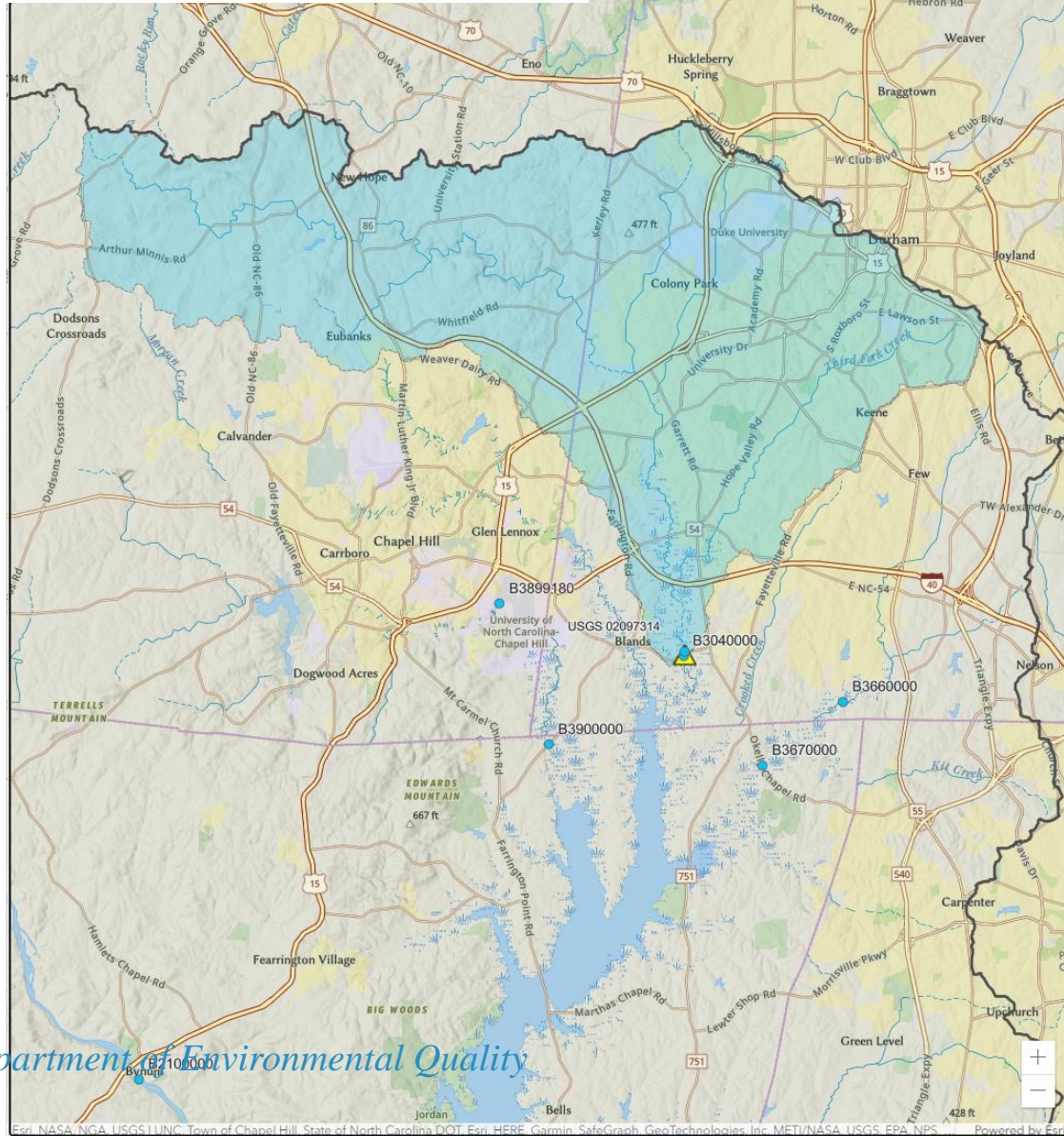
Figure 10a. Morgan Creek at SR 1726 near Farrington (B3900000)



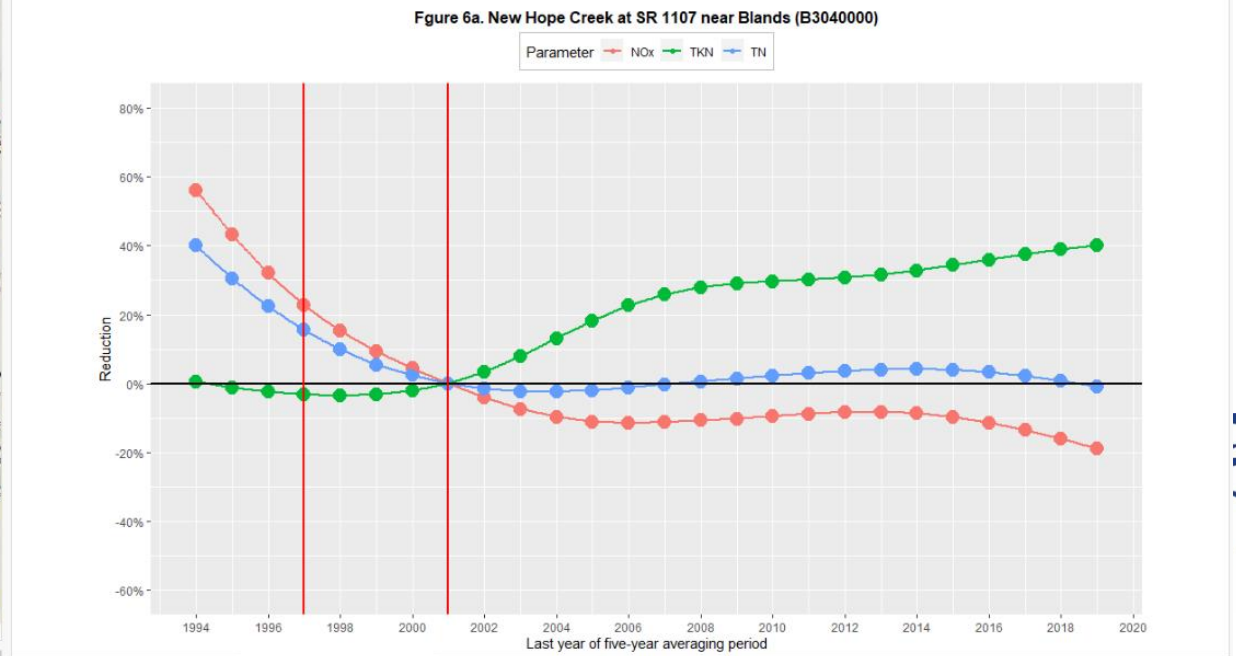
FN Annual % N Change | **FN 5-Year N % Change** | FN Annual % P Change | FN 5-Year P % Change



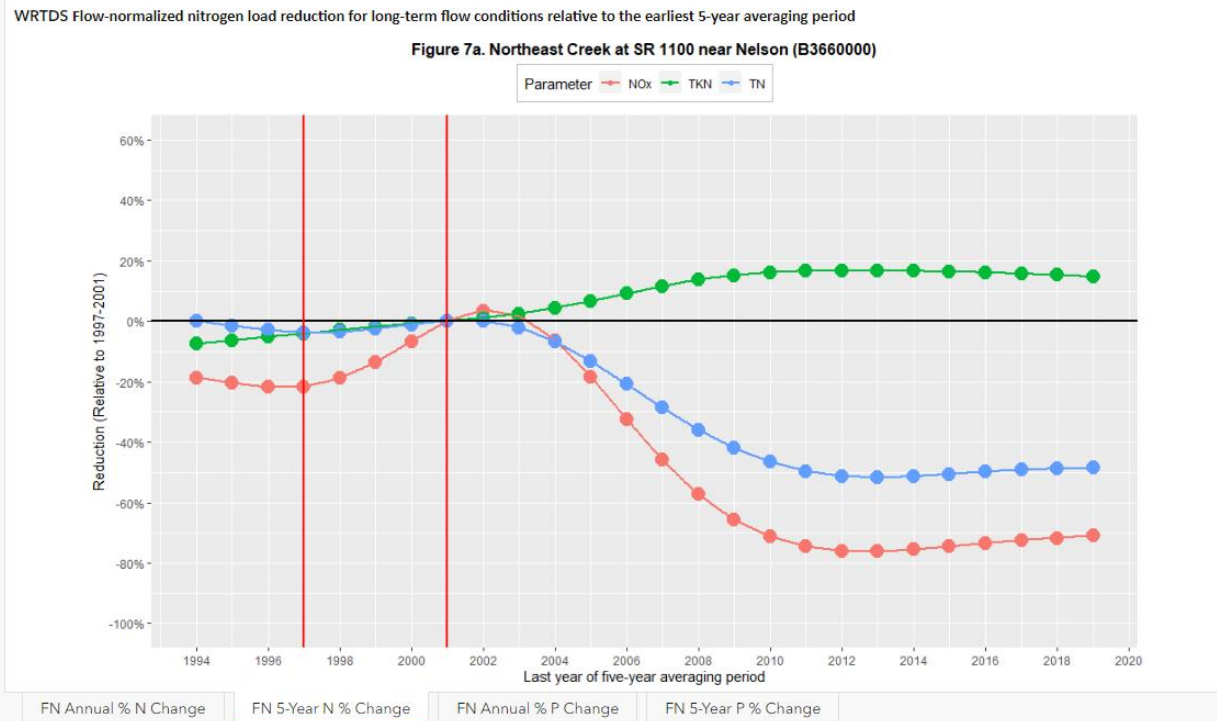
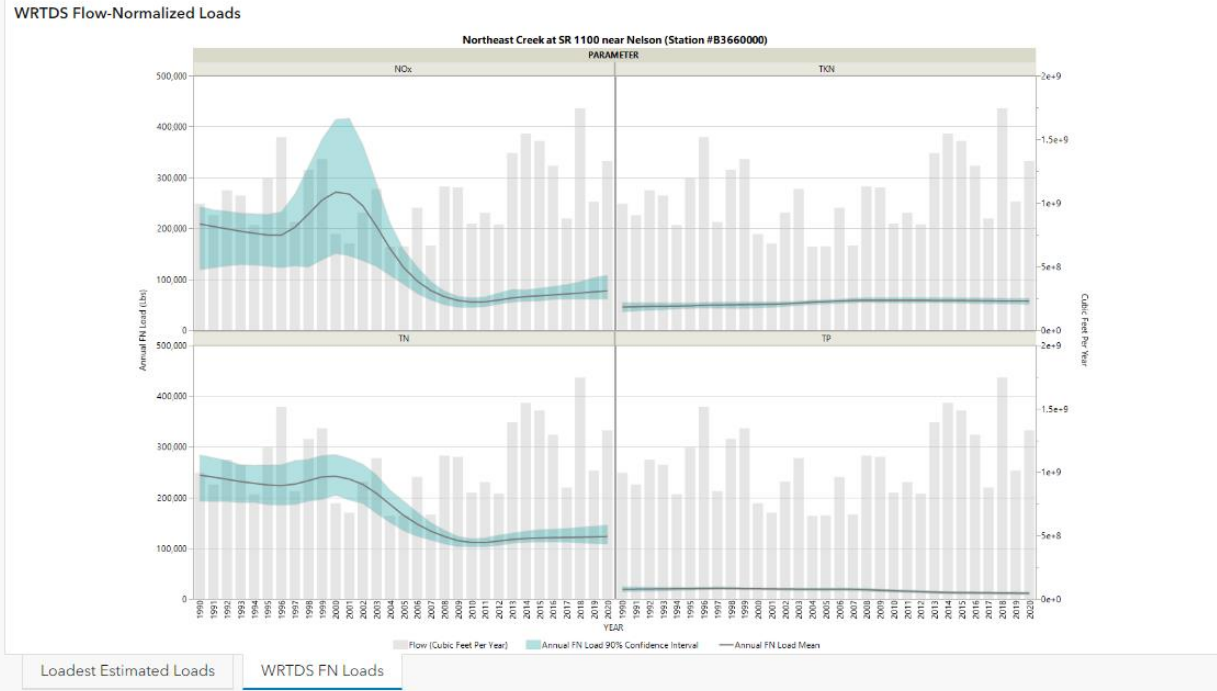
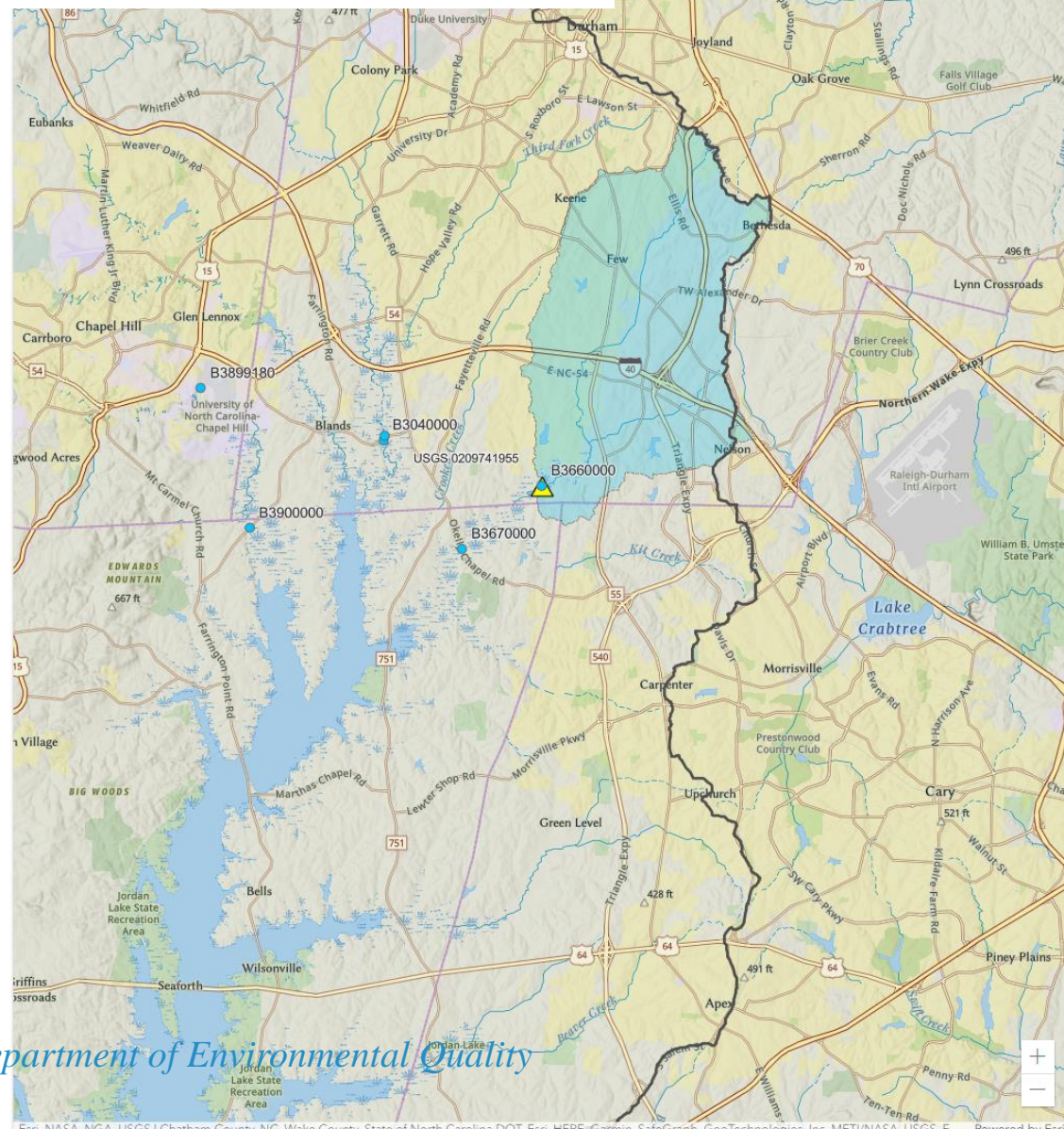
FN Nitrogen Loading New Hope Creek-B3040000



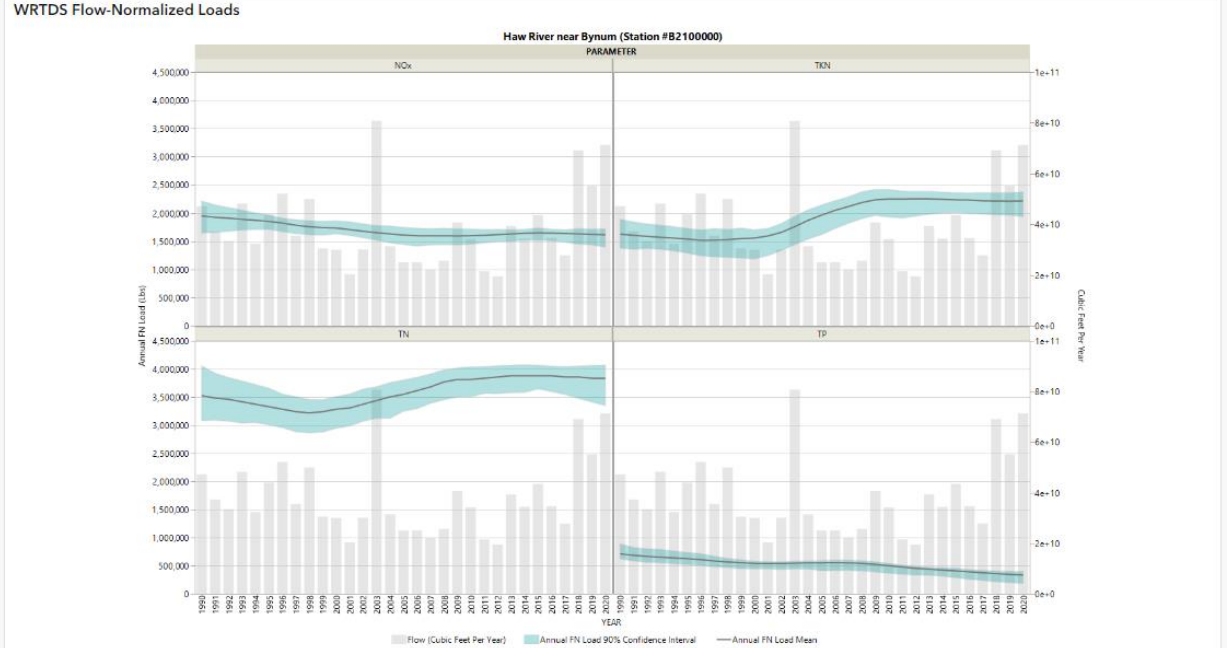
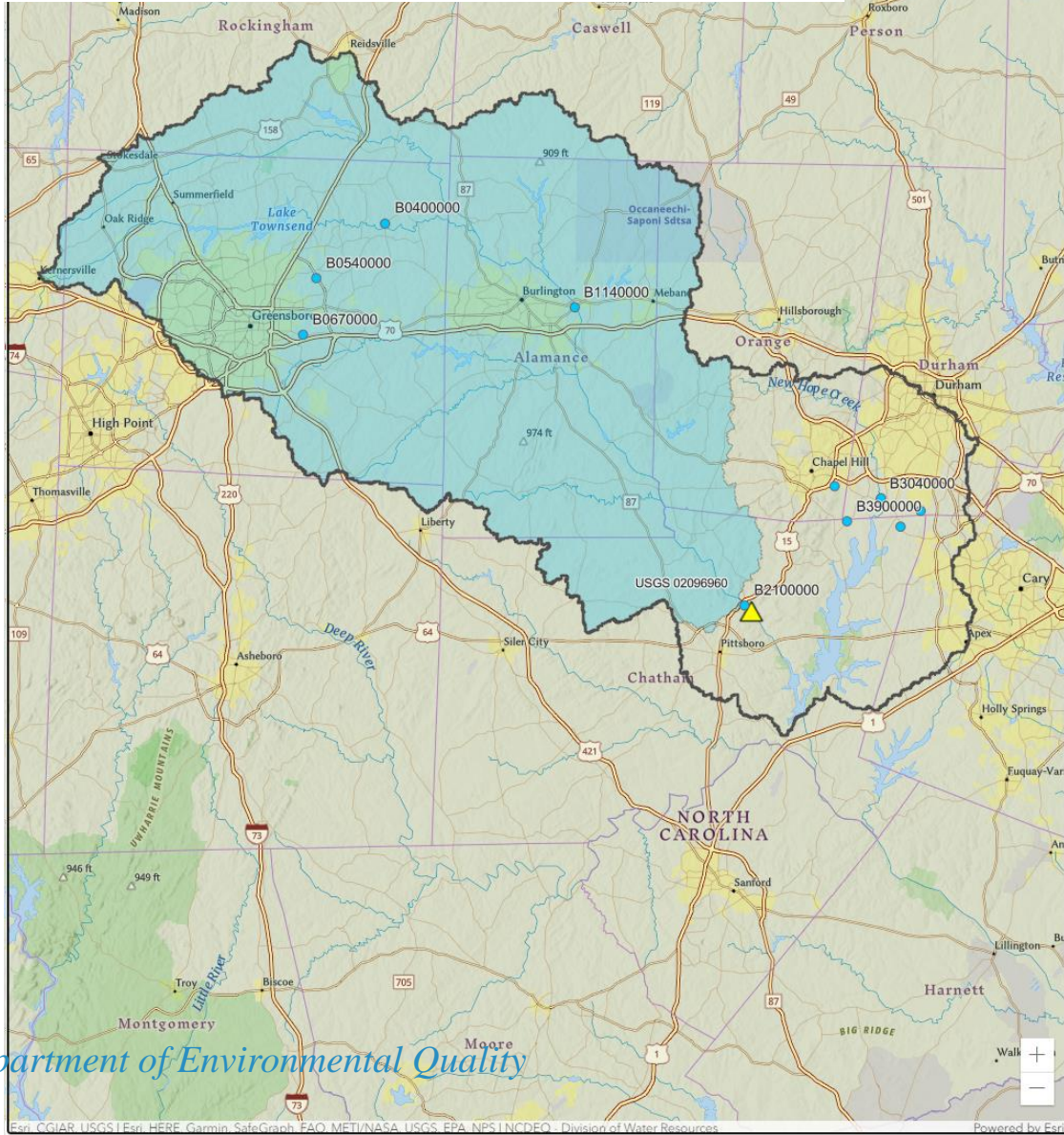
WRDTS Flow-normalized nitrogen load reduction for long-term flow conditions relative to the earliest 5-year averaging period



FN Nitrogen Loading Northeast Creek – B3660000



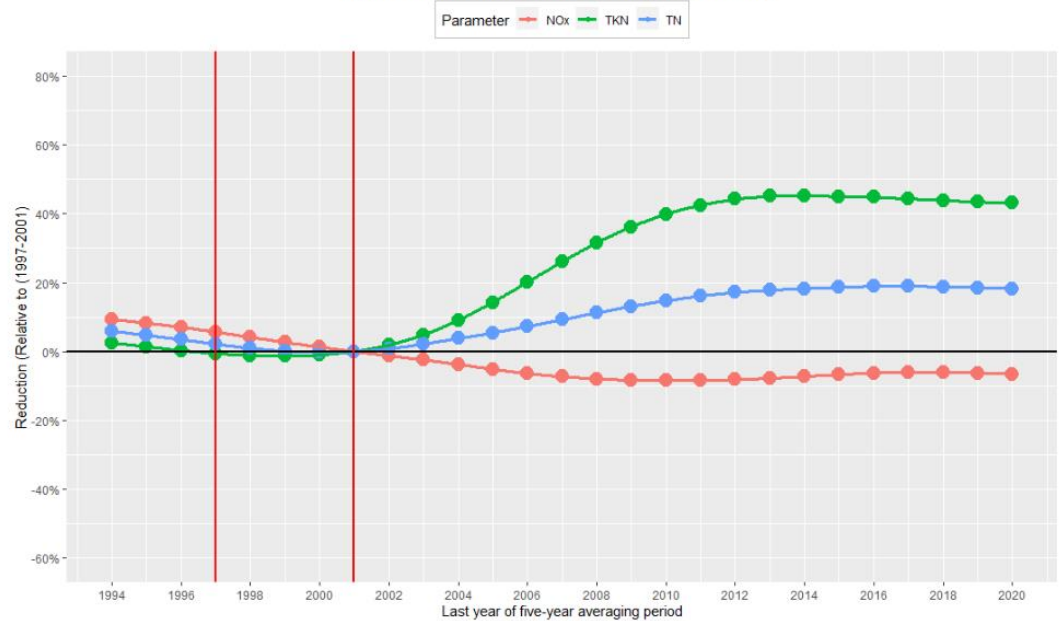
FN Nitrogen Loading Haw River near Bynum – B2100000



Loadest Estimated Loads **WRDS FN Loads**

WRDS Flow-normalized nitrogen load reduction for long-term flow conditions relative to the earliest 5-year averaging period

Figure 5a. How River at SR 1713 near Bynum (B2100000)

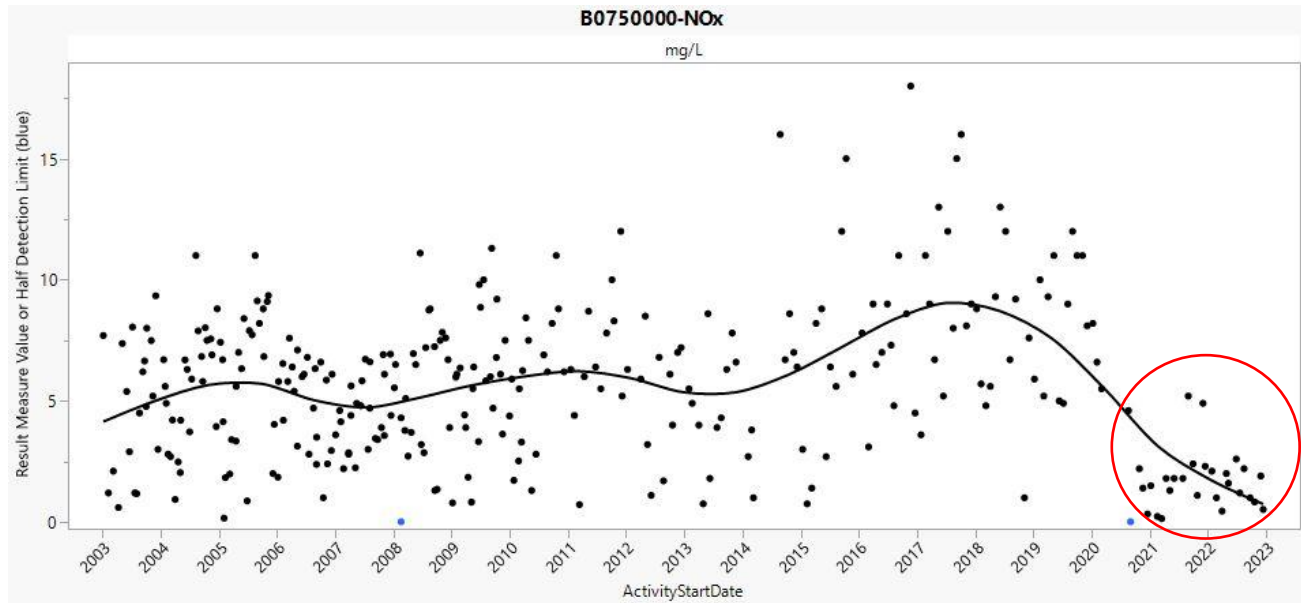


FN Annual % N Change **FN 5-year N % Change** FN Annual % P Change FN 5-year P % Change



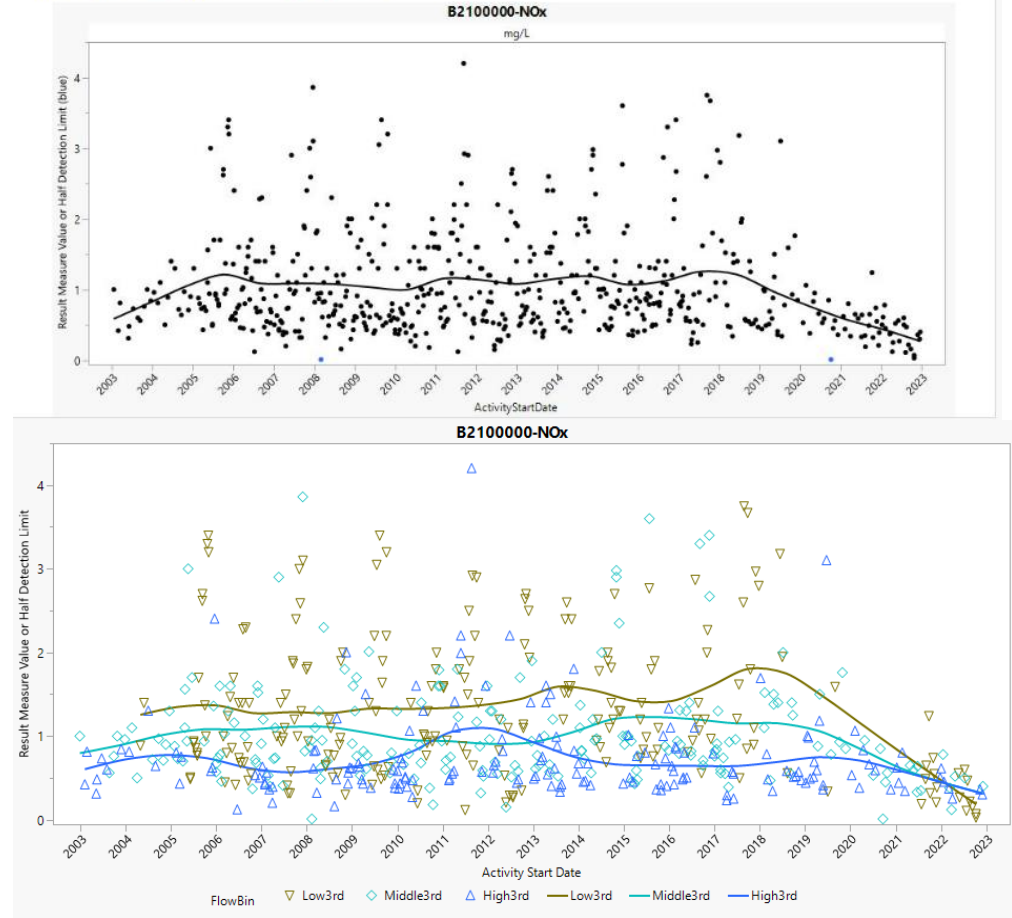
2021-2022 Data Update

B0750000 – S. Buffalo Creek at Harvest Road



B2100000 - Haw River near Bynum

Overall Time-Series (non-detects shown in blue)



Thank you

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Jordan Loading and Trends Storymap:

- Google “Jordan nutrient trends”
- Or visit the “Special Studies” -> “Trends and Loading” section of the DWR Modeling and Assessment website.



Department of Environmental Quality

