Biscayne Bay Southeastern Everglades Ecosystem Restoration
(WQ Subteam)

DRAFT - Water Quality Evaluation

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Use cursor keys for navigation, press "O" for a slide Overview

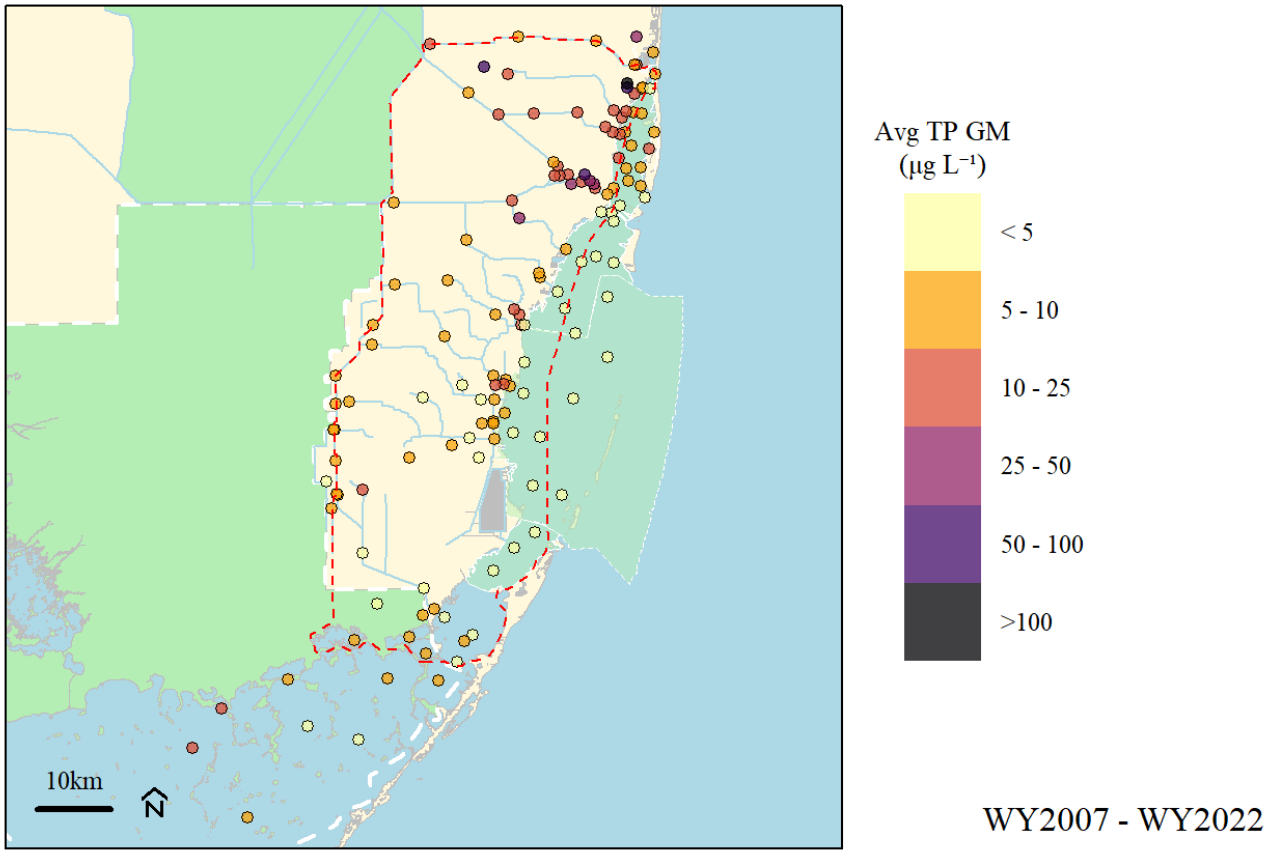
Objective

- Review and evaluate existing surface water quality across the BBSEER project area using available data.

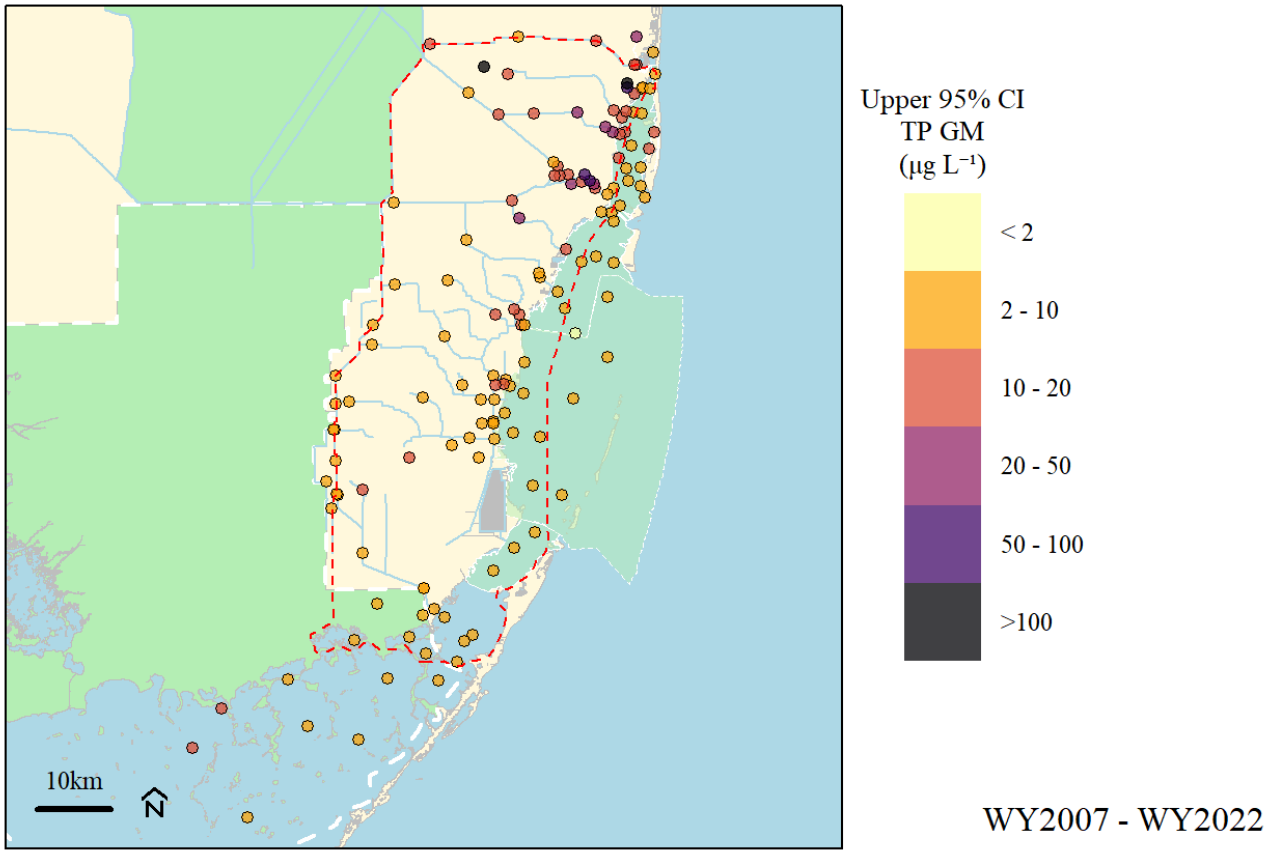
Approach

- Evaluate data from SFWMD (DBHydro) and Miami-Dade County's Division of Environmental Resources Management between May 2006 to April 2022 (WY2007 - 2022).
- Calculate annual geometric mean (AGM) Total Phosphorus (TP) and Total Nitrogen (TN) concentrations
    - Must have at least three years of continuous data, and
    - a minimum of 4 samples per year with at least one sample in wet and dry seasons
    - where possible (for structures) GM were calculated using data on days with observed discharge (some adjustment is possible).
- Average AGM and upper 95% confidence interval values were calculated for each monitoring location
- Mann-Kendall trend and Thiel Sen slope were also evaluated

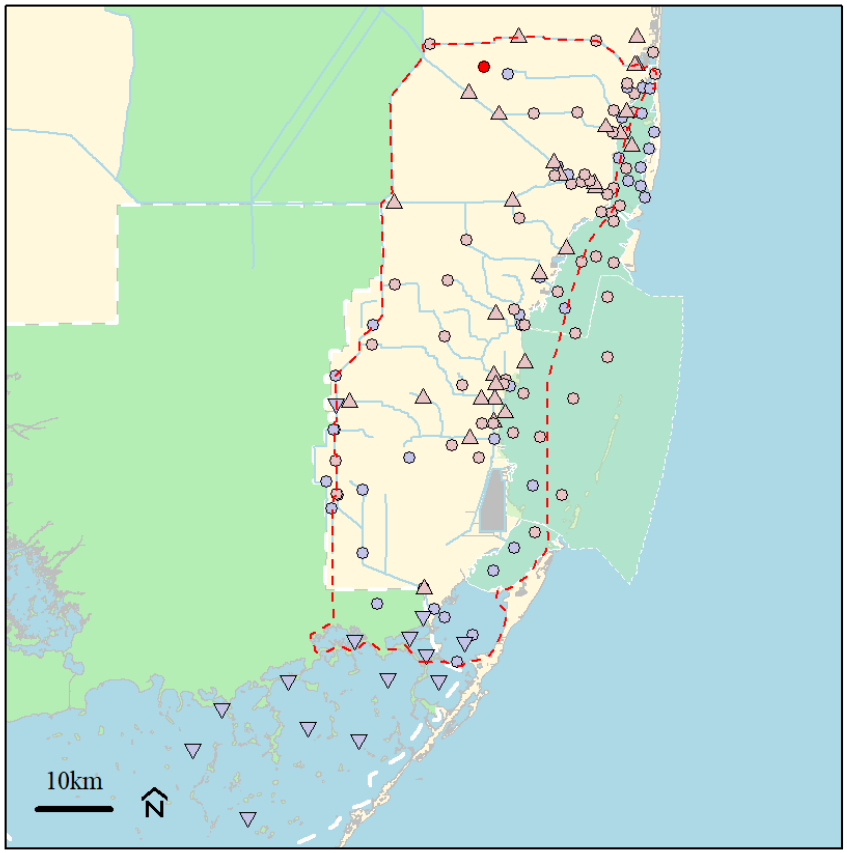
Total Phosphorus - Average AGM



Total Phosphorus - Upper 95% CI of Avg AGM



Total Phosphorus - Long Term Trend



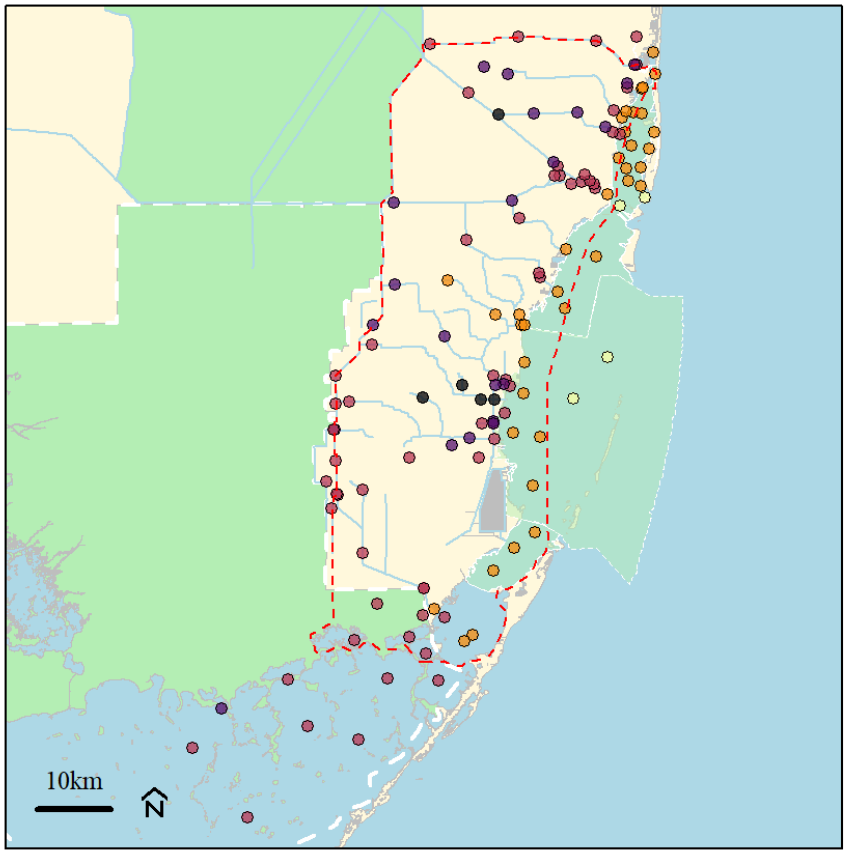
TP GM
Thiel-Sen Slope
(µg L^{-1} Y^{-1})

- < -0.03
- -0.03 - -0.02
- -0.02 - -0.01
- -0.01 - 0.00
- 0.00 - 0.01
- 0.01 - 0.02
- 0.02 - 0.03
- > 0.03

- Sig. Increasing
- No Trend
- Sig. Decreasing

WY2007 - WY2022

Total Nitrogen - Average AGM



Avg TN GM
(mg L^{-1})

< 0.25

0.25 - 0.50

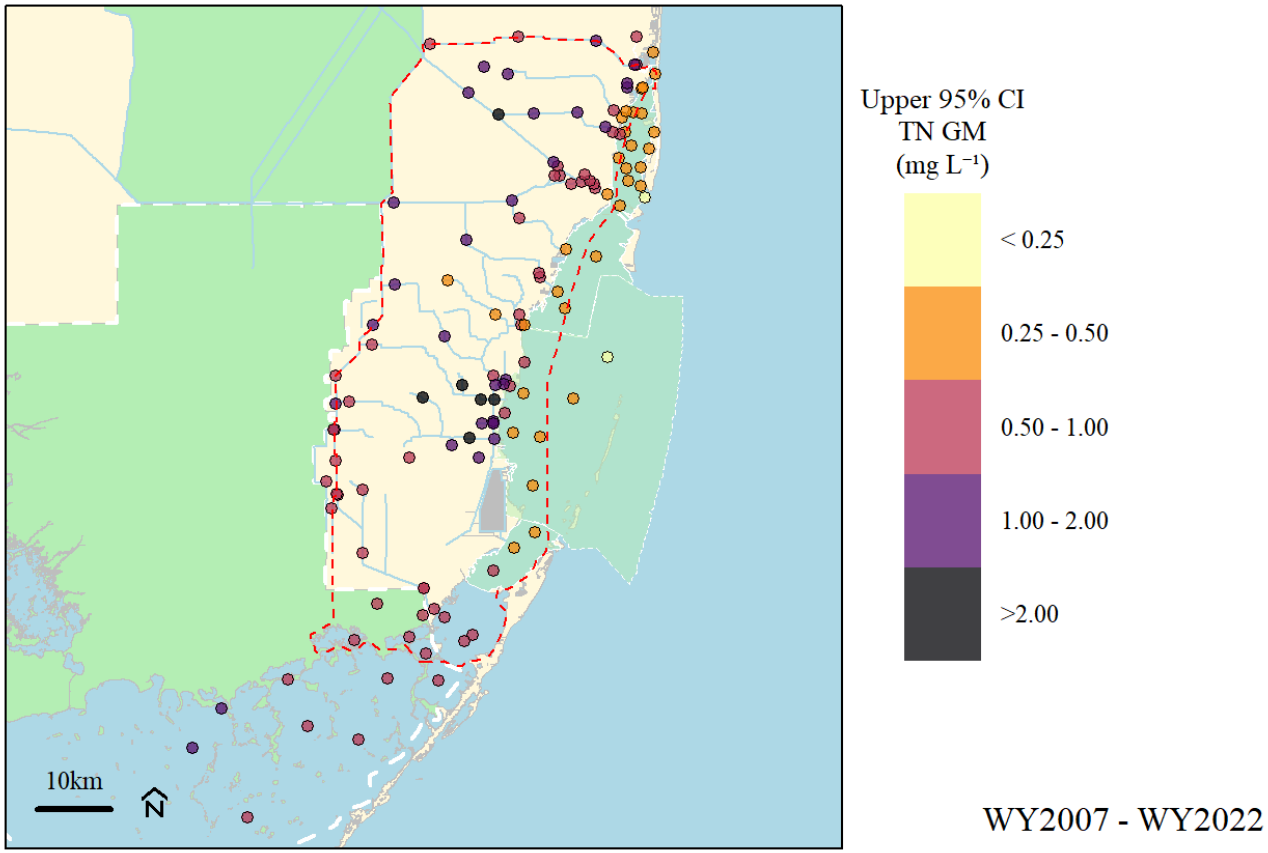
0.50 - 1.00

1.00 - 2.00

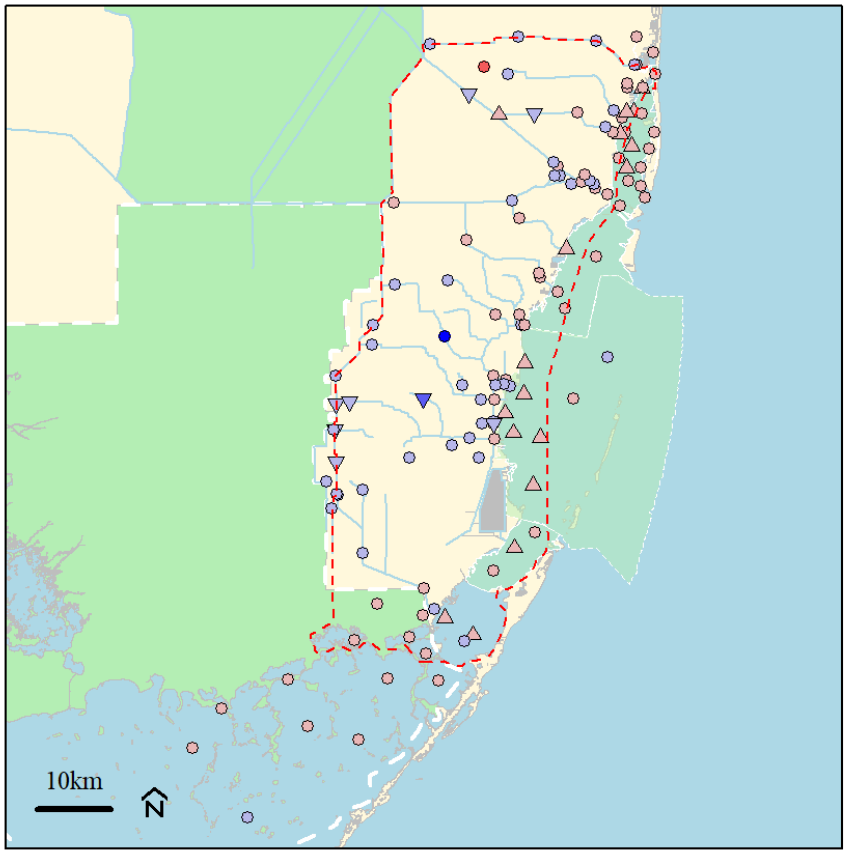
>2.00

WY2007 - WY2022

Total Nitrogen - Upper 95% CI of Avg AGM



Total Nitrogen - Long Term Trend



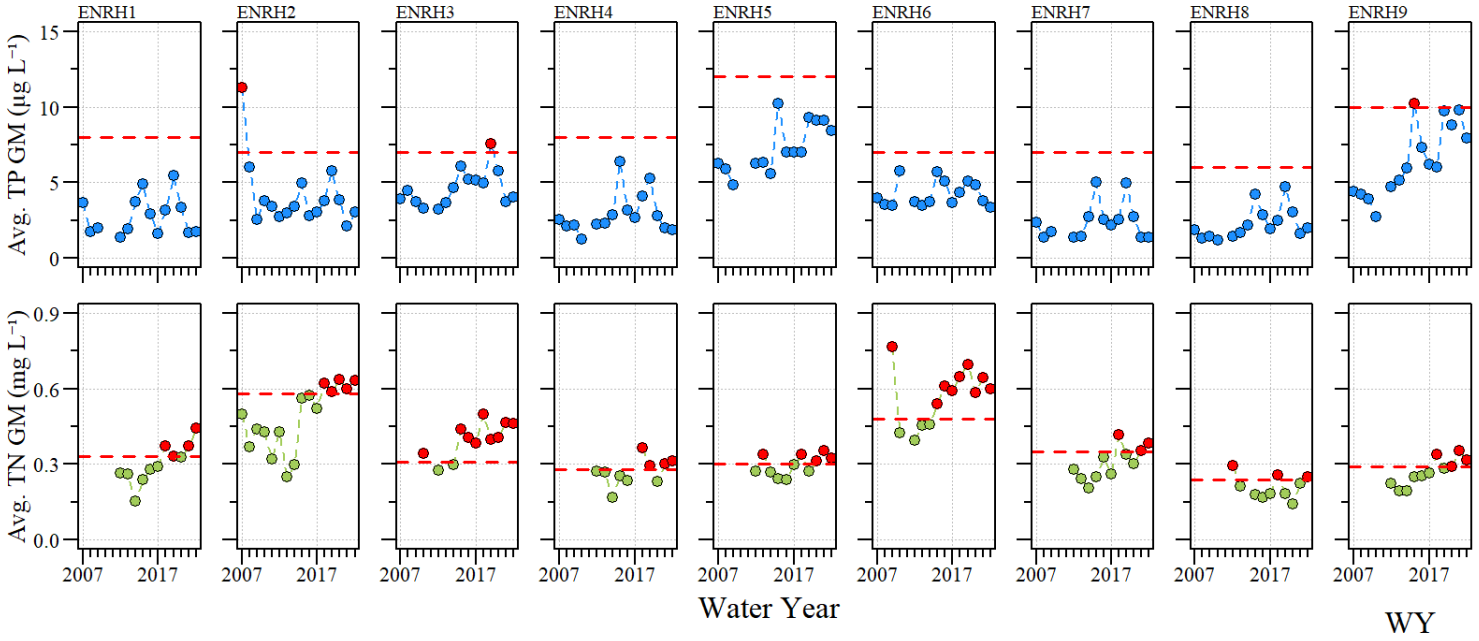
TN GM
Thiel-Sen Slope
(mg L^{-1} Y^{-1})

- < -0.2
- -0.2 - -0.1
- -0.1 - 0.0
- 0.0 - 0.1
- 0.1 - 0.2
- > 0.2

- Sig. Increasing
- No Trend
- Sig. Decreasing

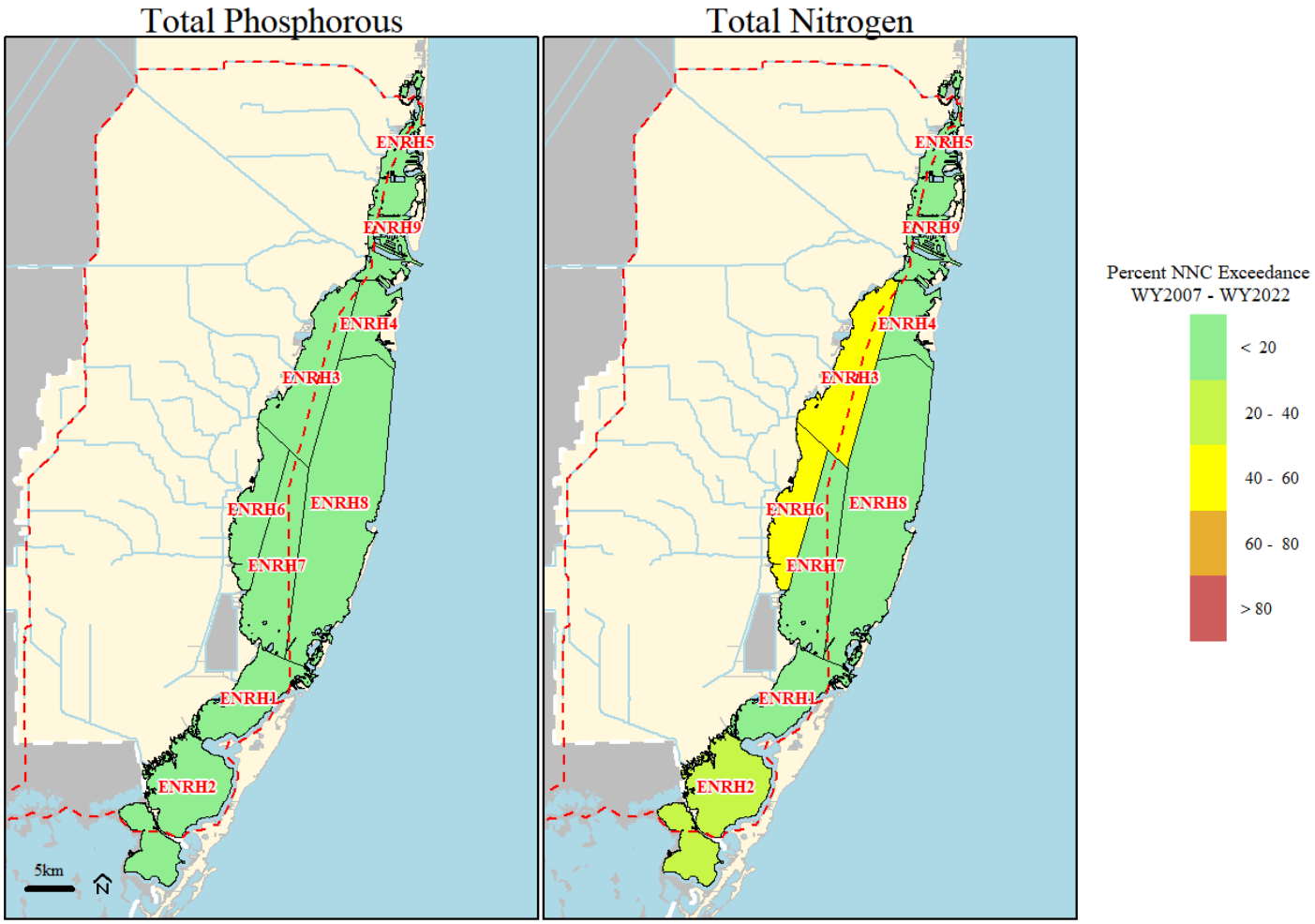
WY2007 - WY2022

Biscayne Bay NNC



- Numeric Nutrient Citeria based on Estuary Segements outlined in 62-302.532 FAC
  - Spatially averaged GM concentration by NNC Segment, not to be exceed 1 in 3 years
  - Each segment has a specific NNC for TN, TP and Chl-a

Biscayne Bay NNC



Summary

- High level look at surface water quality by integrating multiple data sets together (>100 monitoring locations used)
- Very little difference in average and upper 95% CI geometric mean TP and TN concentrations (w/ some exceptions)
- Significant monotonic changes in TP and TN concentrations were detected
    - 31 locations significantly increases TP concentration (most in coastal region)
    - 14 locations significantly decreasing TP concentration (S332C & FLAB sites)
    - 17 locations significantly increases TN concentration (most in Biscayne Bay)
    - 8 locations significantly decreasing TN concentration (L31N and Biscayne Bay)
- Some locations did not see statistically significant changes but remarkable change overtime (i.e. BS11)
- Some locations did not see change over time (i.e. near zero slope) but concentrations remain relatively elevated.
- Additional evaluation is needed (including additional data sources if possible)

Acknowledgements

Data

South Florida Water Management District (DBHYDRO)

Miami-Dade Department of Environmental Resources Management via FDEP STORET/WIN

Slides

- Slide deck - HTML | PDF |
- RMarkdown Source

Draft Work Product
In support of BBSEER planning