Biscayne Bay Southeastern Everglades Ecosystem Restoration
(WQ Subteam)

DRAFT - Water Quality Evaluation - Load Estimates

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

Objective

- Evaluate structure surface flow and load across Round 2 Alternatives

Approach

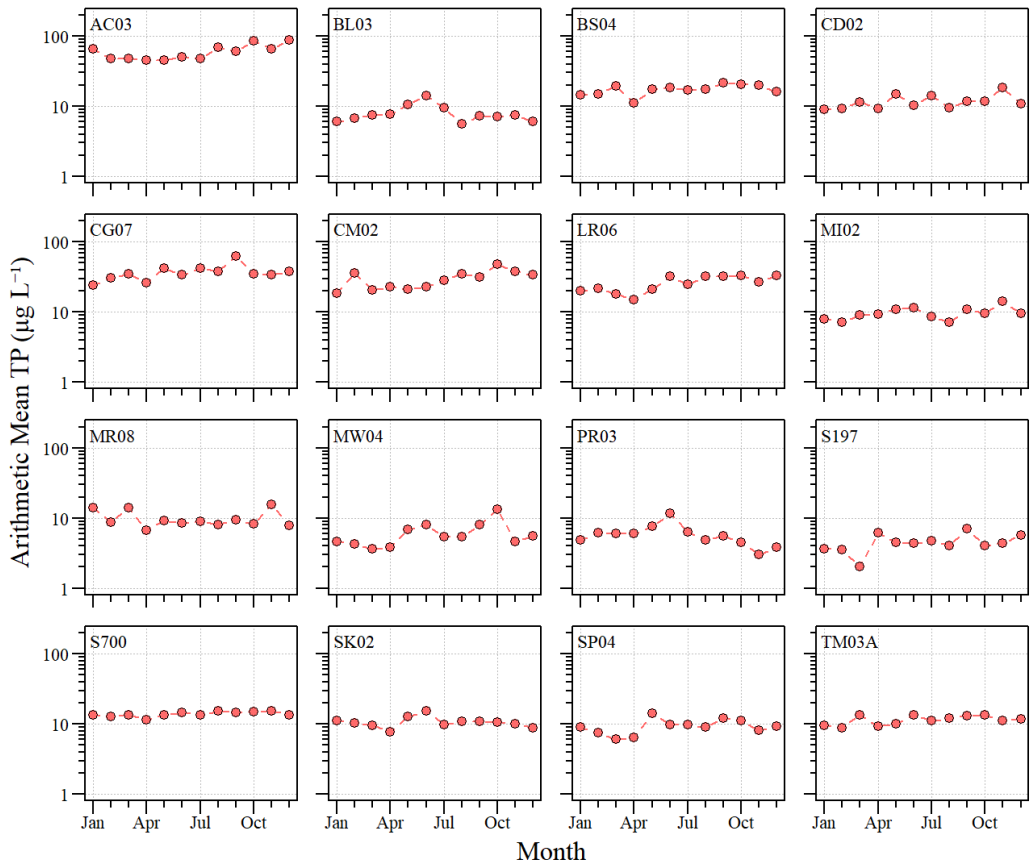
- Pair observed WQ data with existing (and expected) structures using monthly mean nutrient concentrations and RSM modeled discharge volumes
- WQ data from WY 2013 to 2022 was considered for monitoring locations.
- Calculate monthly loads (i.e. flow $\times$ concentration)
    - Evaluate annual loads and compare to FWOi
- Average annual loads and average % differences estimated for each structure, downstream NNC segment and RSM transect (ST01, ST02 and ST03)

Download WQ-Structure List as .xlsx

Download Monthly Mean WQ as .csv

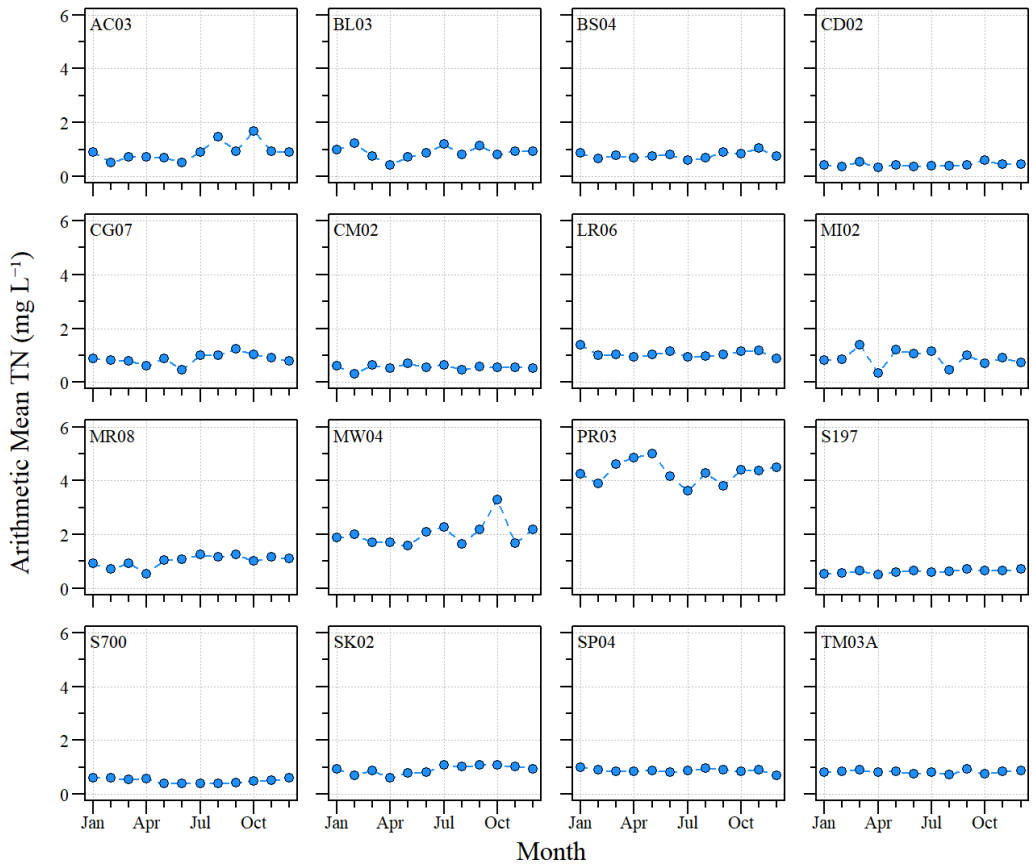
Download Annual Loads as .csv

Total Phosphorus



- Some sites had high monthly variability (i.e. AC03) over the observed period

Total Nitrogen

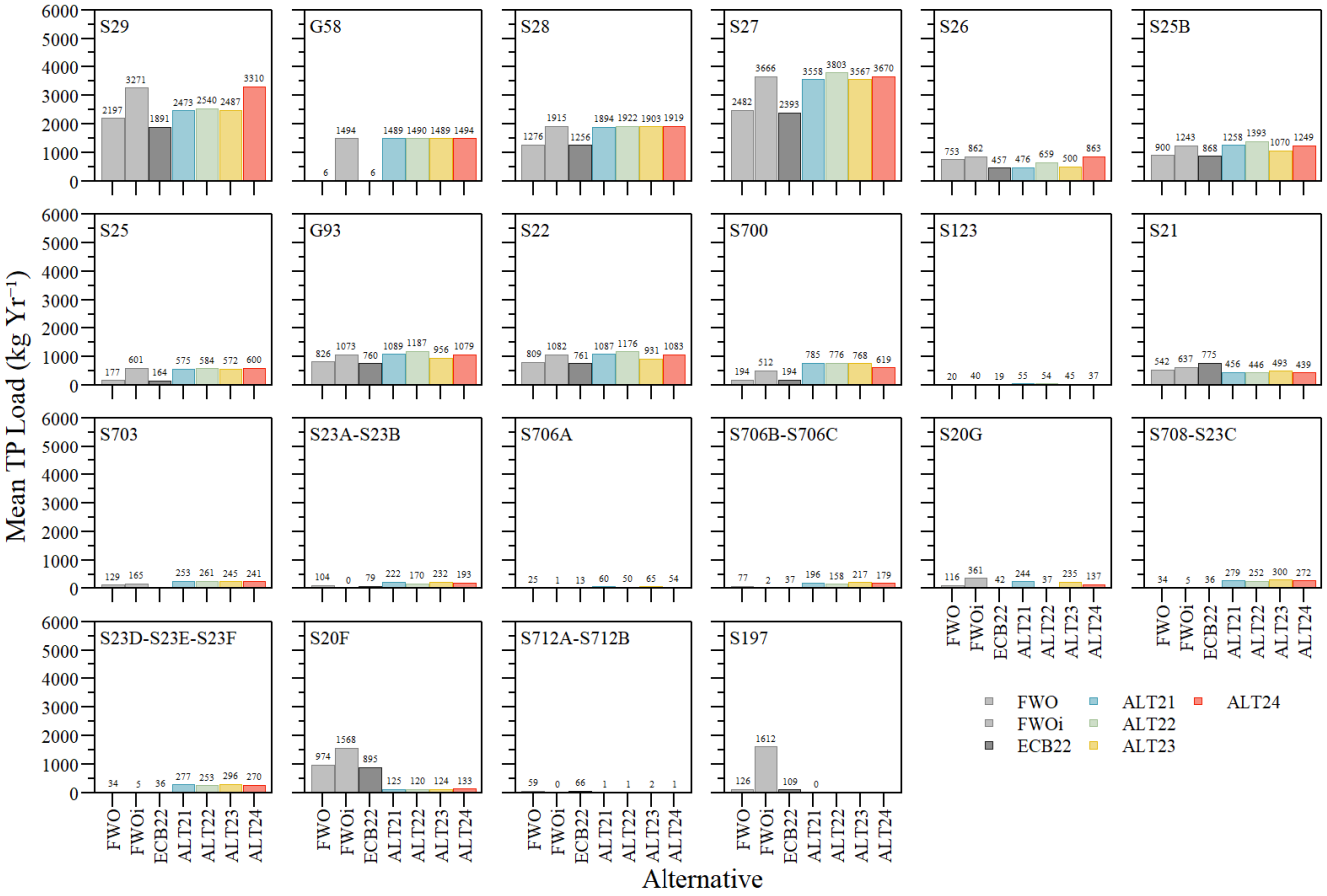


- Some locations had relatively limited data (low sample size within a month) or missing data (i.e. AC03 no April data)

Choose Your Own Adventure

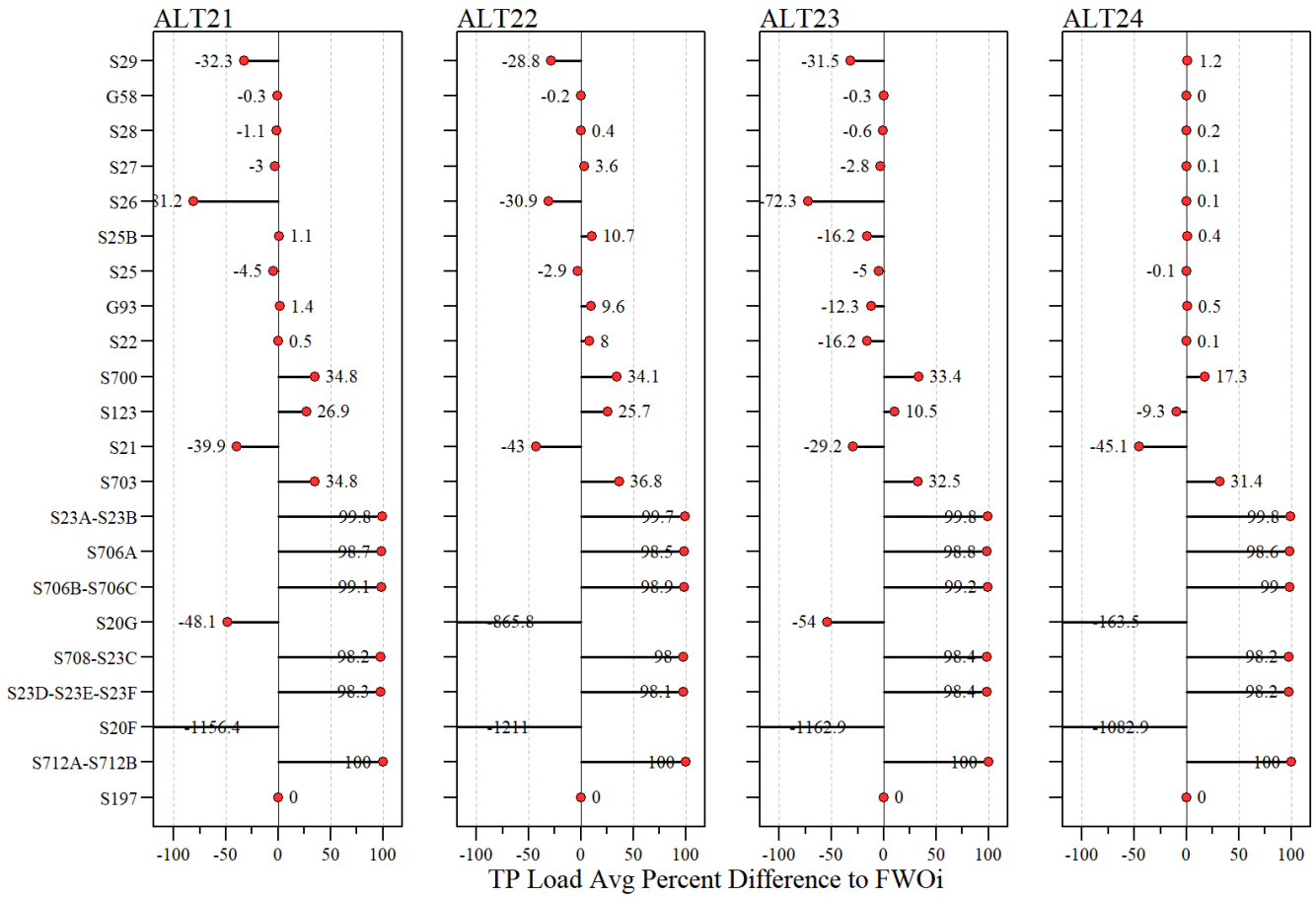
- By Structure
- By NNC Segment
- By RSM Transect

By Structure - TP



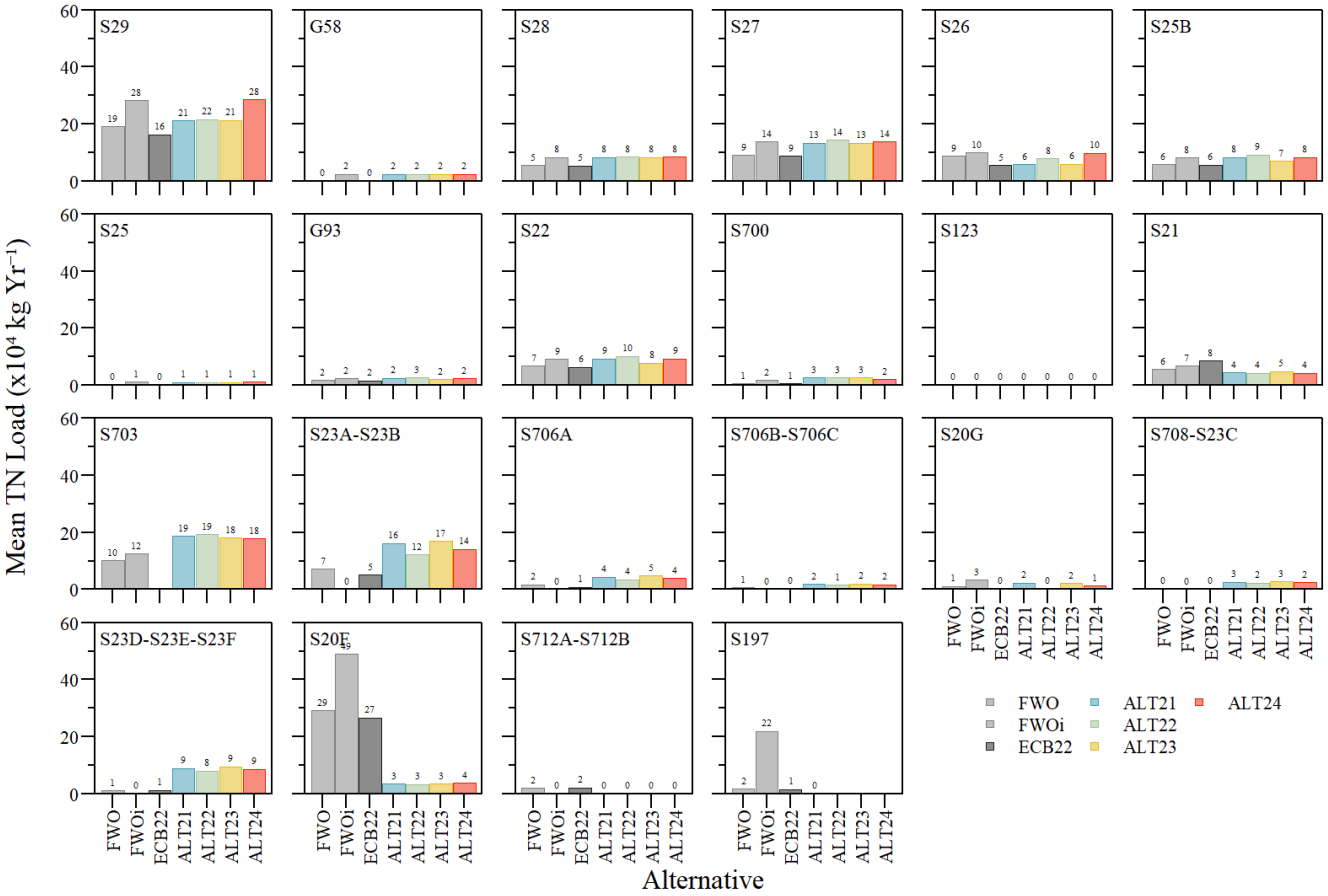
Average annual TP load by structure using monthly (fixed) TP concentrations

By Structure - TP



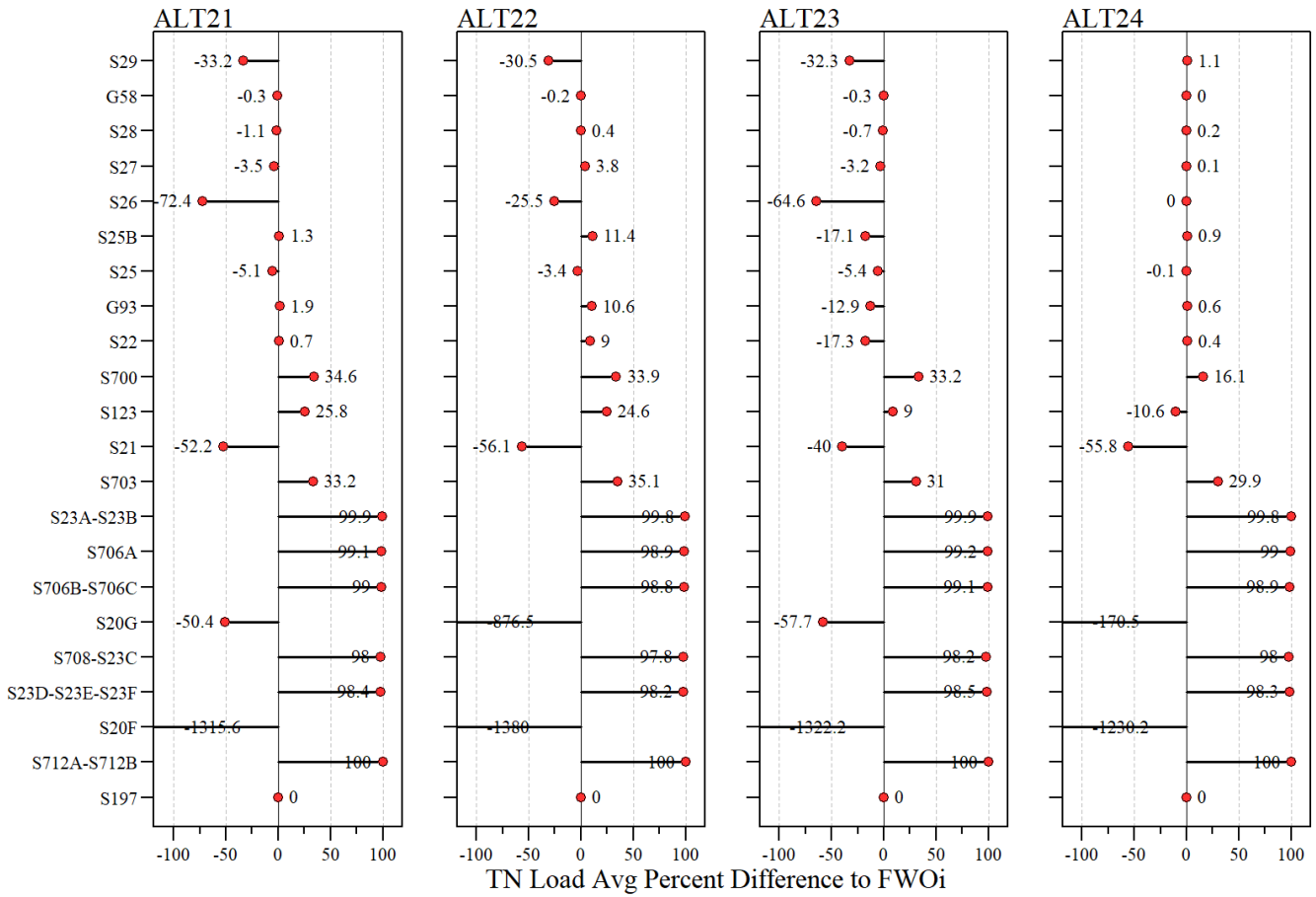
Average percent difference relative to FWOi TP loads

By Structure - TN



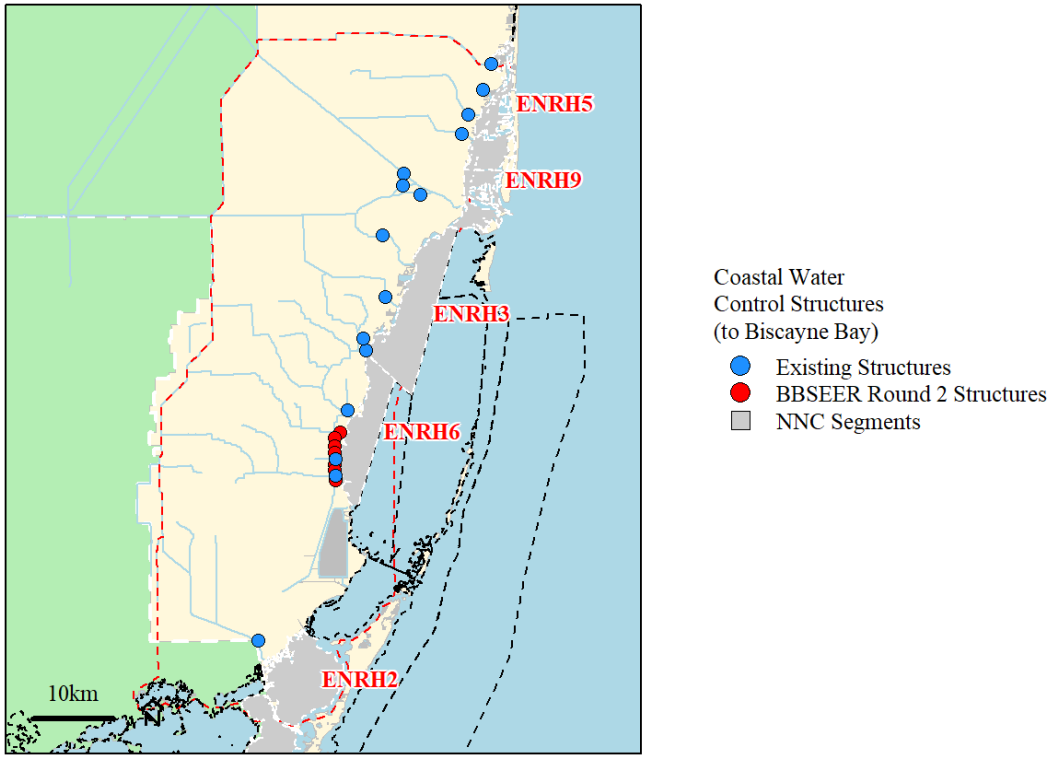
Average annual TN load by structure using monthly (fixed) TN concentrations

By Structure - TN



Average percent difference relative to FWOi TN loads

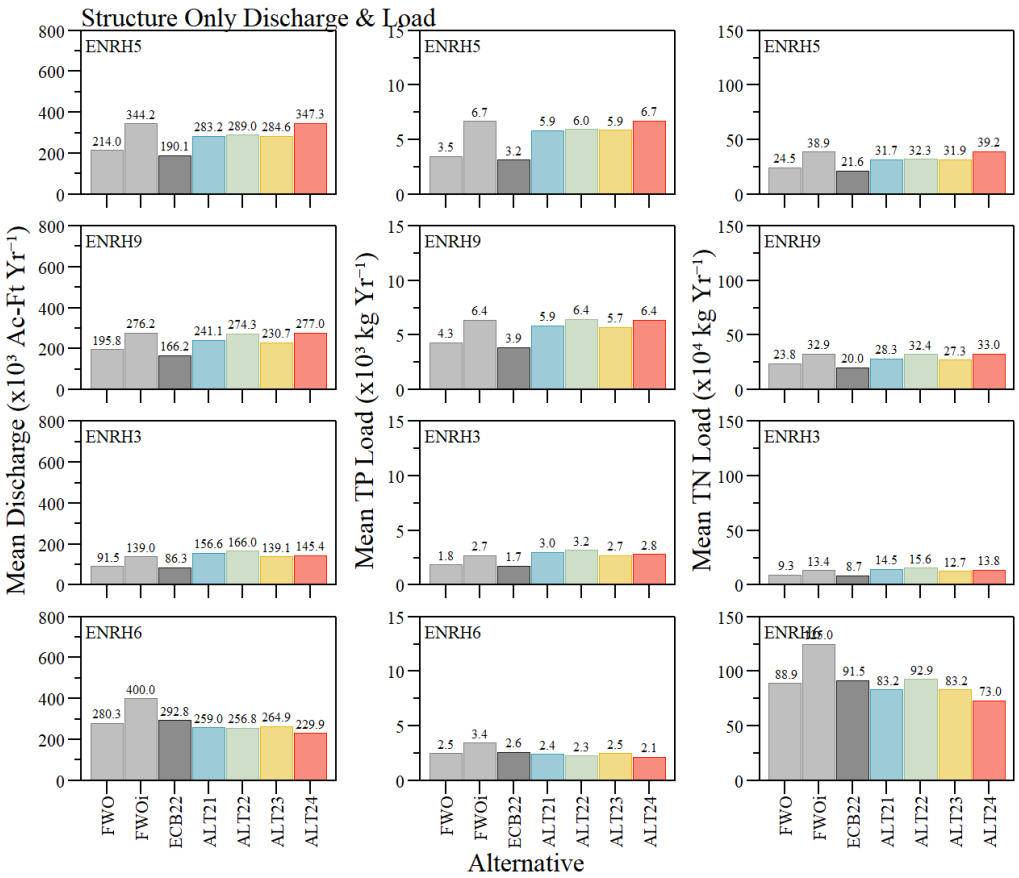
Coastal Structures - Estuary Nutrient Region



Coastal structures relative to NNC segments. This analysis focuses on ENRH5, 9, 3 and 6. ENHR2 was excluded since S197 will be removed in all alternatives.

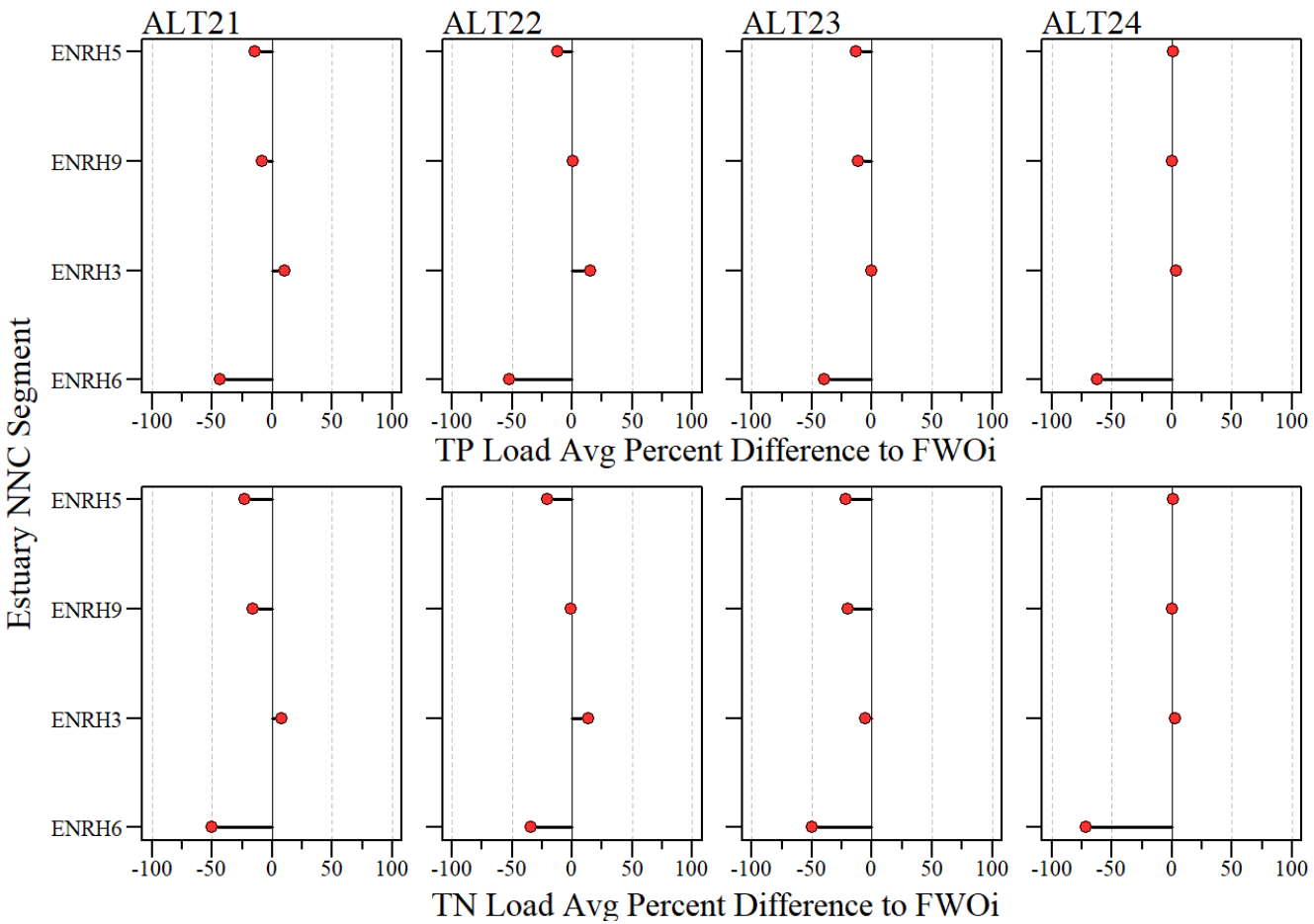
Back to the start of adventure

By NNC Region



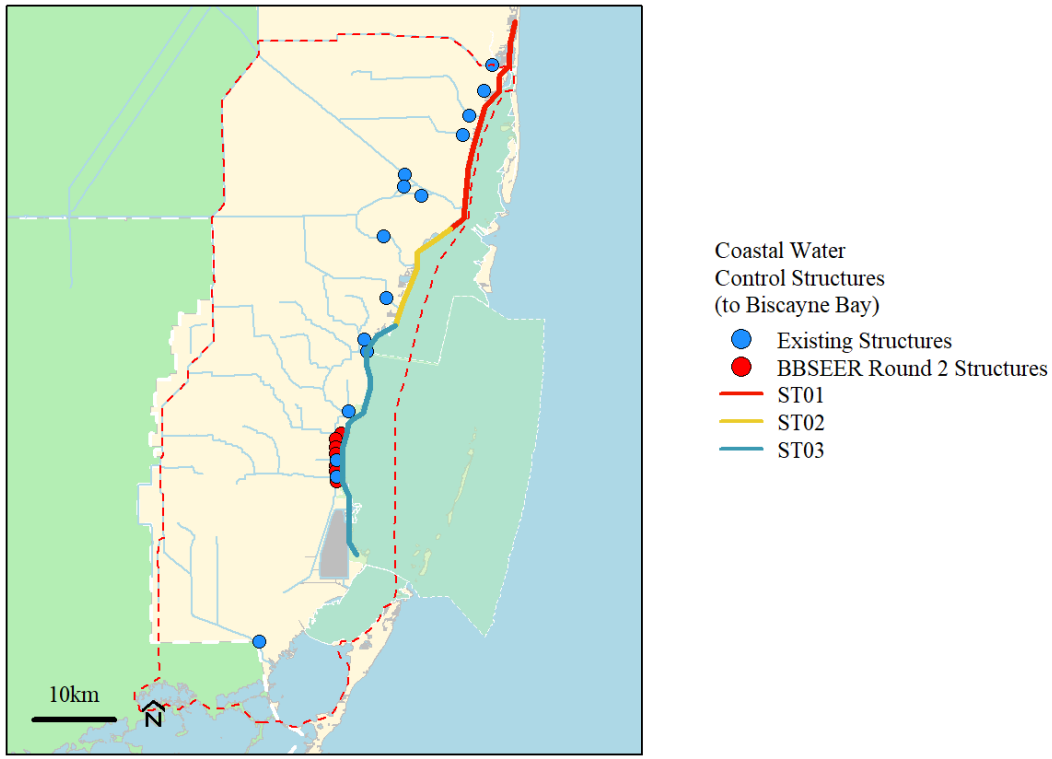
Average annual total discharge, TP load and TN load by aggregated by NNC region

By NNC Region



Average percent difference relative to FWOi TP (top) and TN (bottom) loads

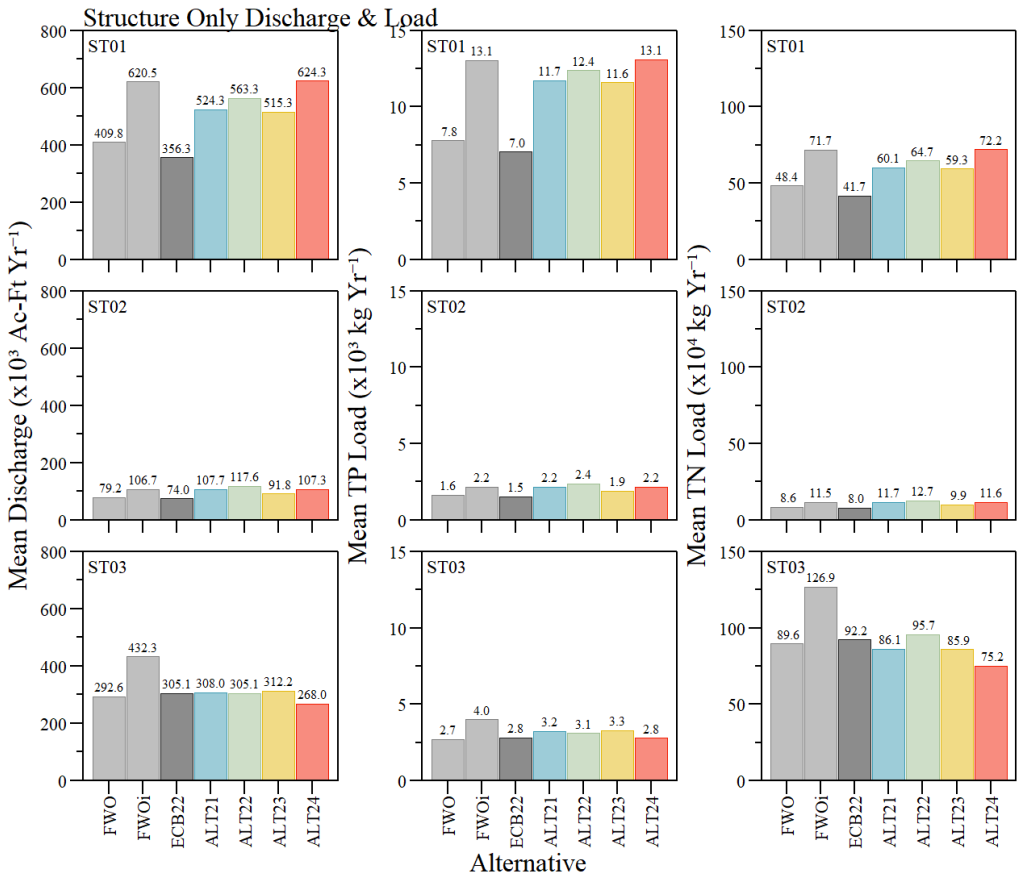
Coastal Structures - "ST" transects



Coastal structures relative to "ST" Transects. This analysis focuses on ST01, ST02 and ST03.

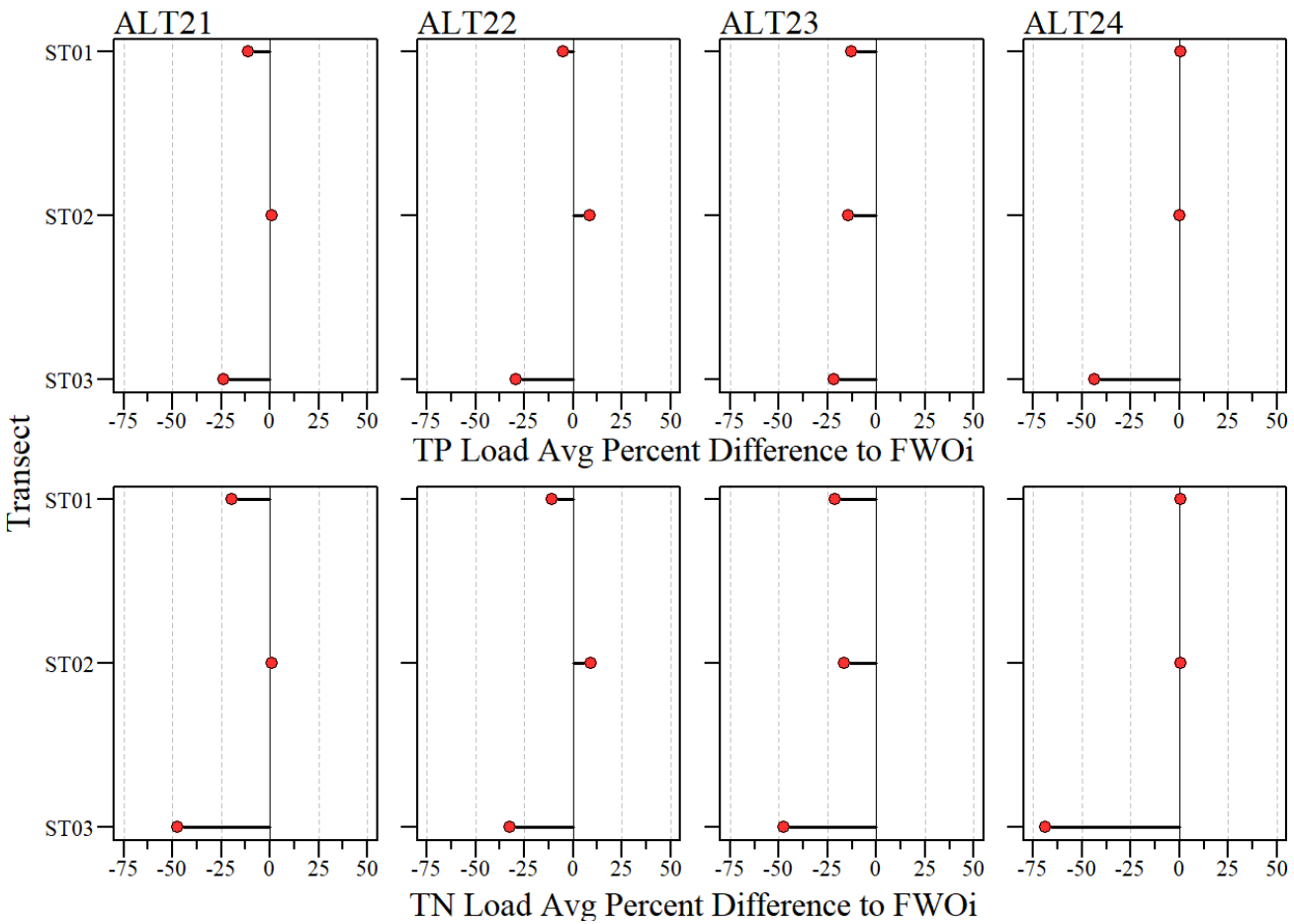
Back to the start of adventure

By Transect



Average annual total discharge, TP load and TN load by aggregated by "ST" transects

By Transect



Average percent difference relative to FWOi TP (top) and TN (bottom) loads

Summary

- Simple approach to estimating loads to compare relative changes across alternatives
    - This analysis is specific to modeled structure flow across alternatives
    - Does not assume any changes to WQ due to basin transfers/treatment
        - For changes in basin transfer of water, a proportional flow/load approach could be taken to estimate potential changes in loads
- Limited TN data for some location during the selected 10-year period.
- While the average TP concentration was used high within monthly variability at some locations was observed.
    - A sensitivity analysis could be conducted similar to approached taken in LOSOM combined with bootstrapping/monte carlo to assess sensitivity to changes in TP concentrations.
- Similar approach could be taken for groundwater flow at transect level if sufficient WQ data is available to represent groundwater quality
- Develop performance metric?

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