



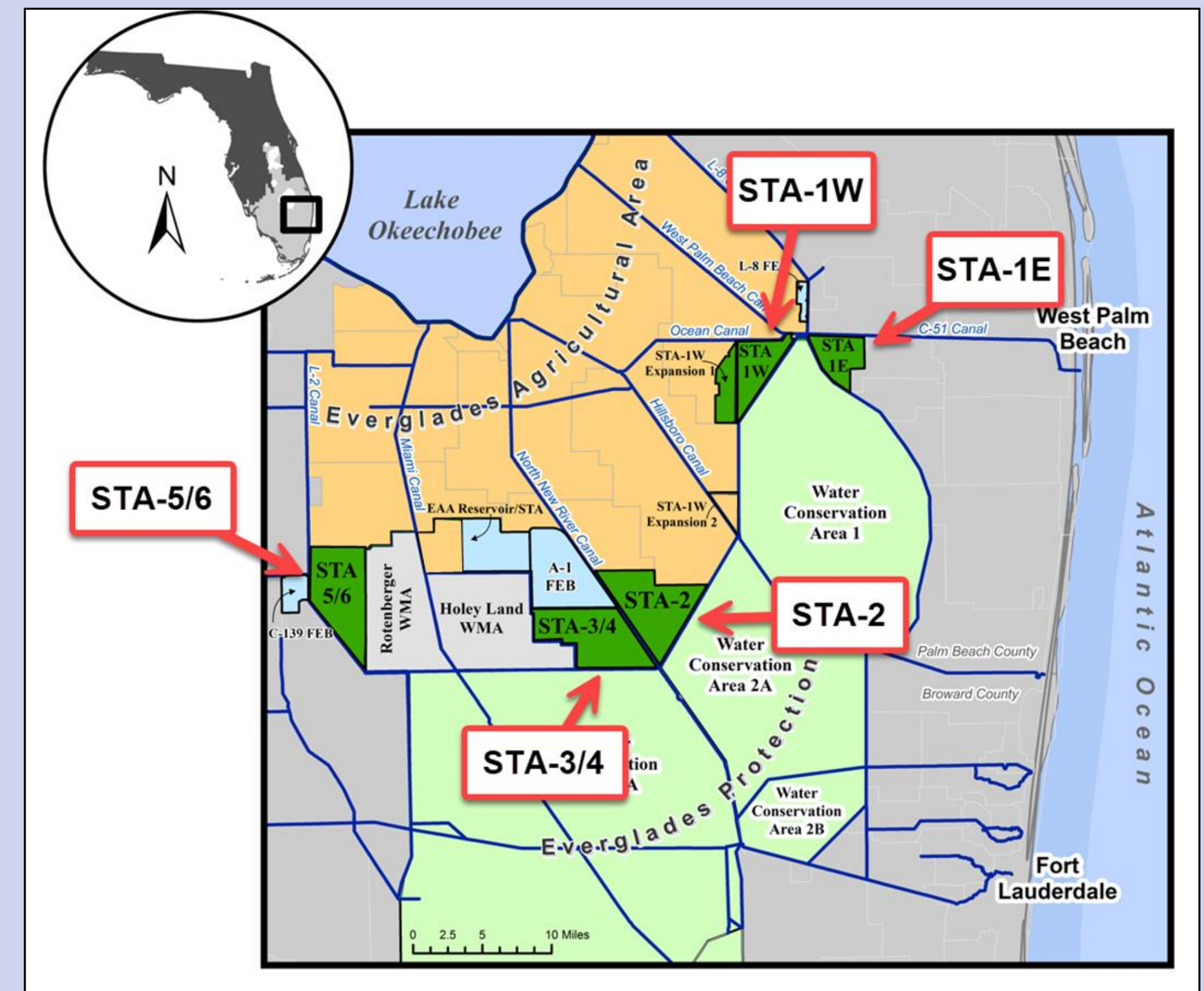
Treatment Performance Relationships in the Everglades Stormwater Treatment Area Complex

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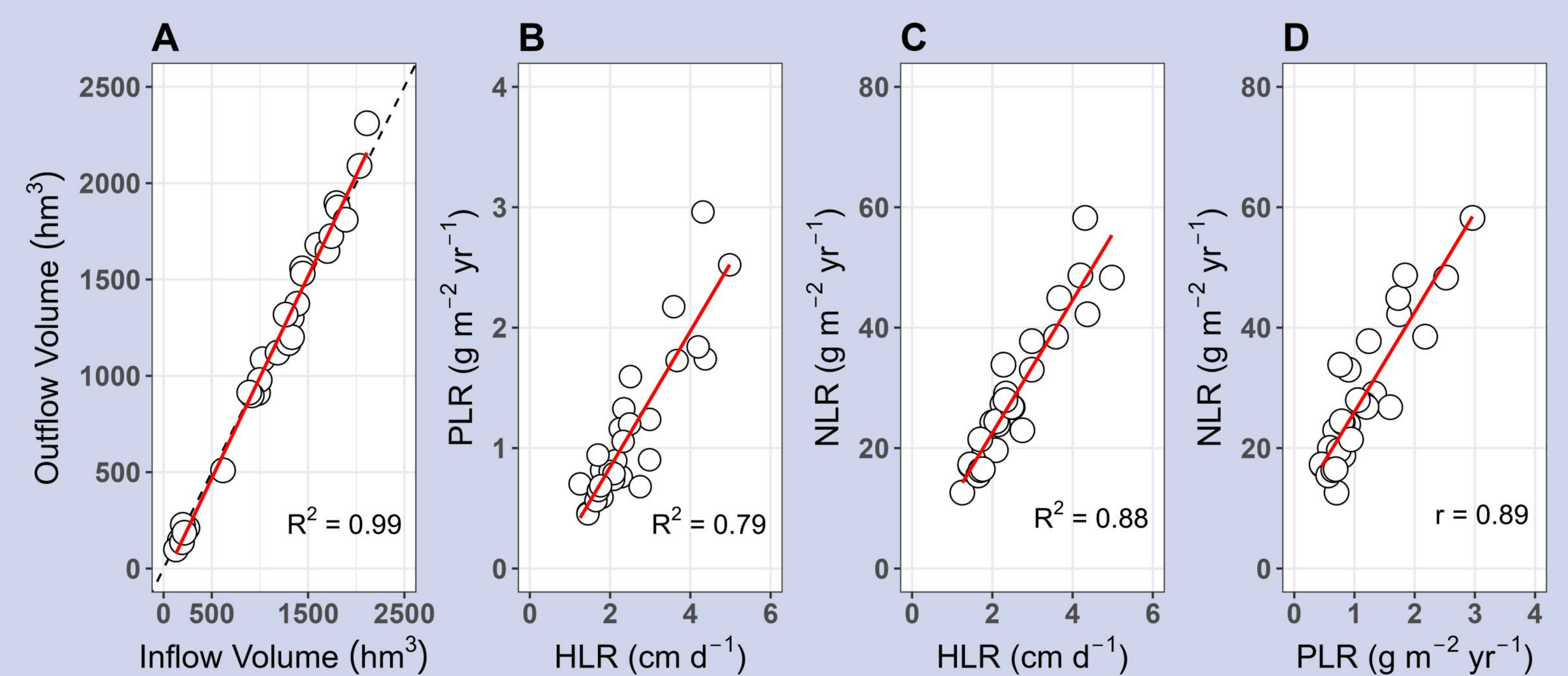
INTRODUCTION

- The Everglades STA Complex comprises five freshwater wetlands (~ 25K ha) constructed for Everglades restoration and operated by the South Florida Water Management District.
- The STAs' primary role is to reduce total phosphorus (TP) concentration in agricultural/urban runoff before it enters the Everglades ecosystem.
- This poster documents treatment performance of the STA Complex over a 28-year period-of-record and focuses on relationships often not evaluated by other investigators.
- Measurements of TP, total nitrogen (TN), and dissolved calcium (Ca) in weekly/biweekly grab samples from STA inlets and outlets were pooled over all STAs by District water year (May 1 to April 30) and evaluated for trends with scatterplots and regression analyses.



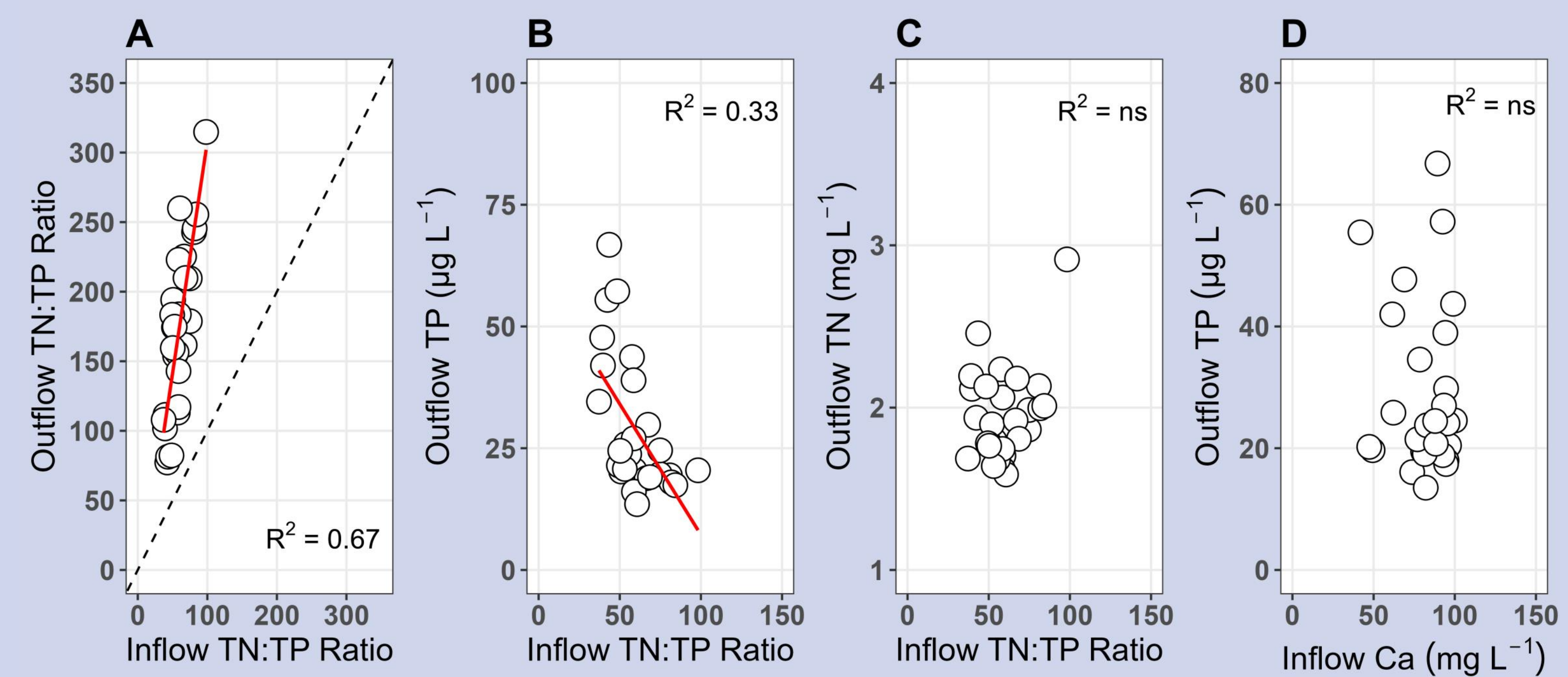
WATER & NUTRIENT LOADS

- STA Complex annual water budgets were dominated by surface-water flows (>90%) with minor influence from seepage and evapotranspiration. Treated water volumes increased 5-fold over the POR, which reflected STA expansion and weather events. (A).
- Hydraulic loading rate (HLR) was an adequate predictor of TP and TN loading rates (PLR, NLR) (B, C).
- PLR and NLR were highly intercorrelated (D).



TN:TP MOLAR RATIOS & CALCIUM

- TN:TP molar ratios indicate that STA Complex inflow and outflow were P limited and that the magnitude of P limitation increased markedly from inlet to outlet (A).
- Flow-weighted mean outflow TP and TN concentrations had poor or no significant relationship with inflow TN:TP molar ratio (B, C).
- Outflow TP concentration was not statistically related to inflow Ca level despite the documented role that Ca has in precipitating water-column P (D).



TP & TN REMOVAL

- The STA Complex was approximately twice as efficient at sequestering TP mass (i.e., % load reduction) than TN mass (A, B).
- Outflow TP concentration was strongly correlated with PLR compared to a relatively poor relationship for outflow TN concentration with NLR (C, D).
- Areal TP and TN mass retained exhibited nonlinear relationships with the corresponding PLR and NLR. The TN data suggested that the STA Complex had reached a retention asymptote. Conversely, TP retention was not at an asymptote (E, F).
- There was a strong relationship between % TP mass retained and outflow TP concentration, while there was no statistically significant relationship for TN (G, H).

