Nitrogen removal in constructed wetlands in Connecticut

Zulimar Lucena
zulimar.lucena@yale.edu

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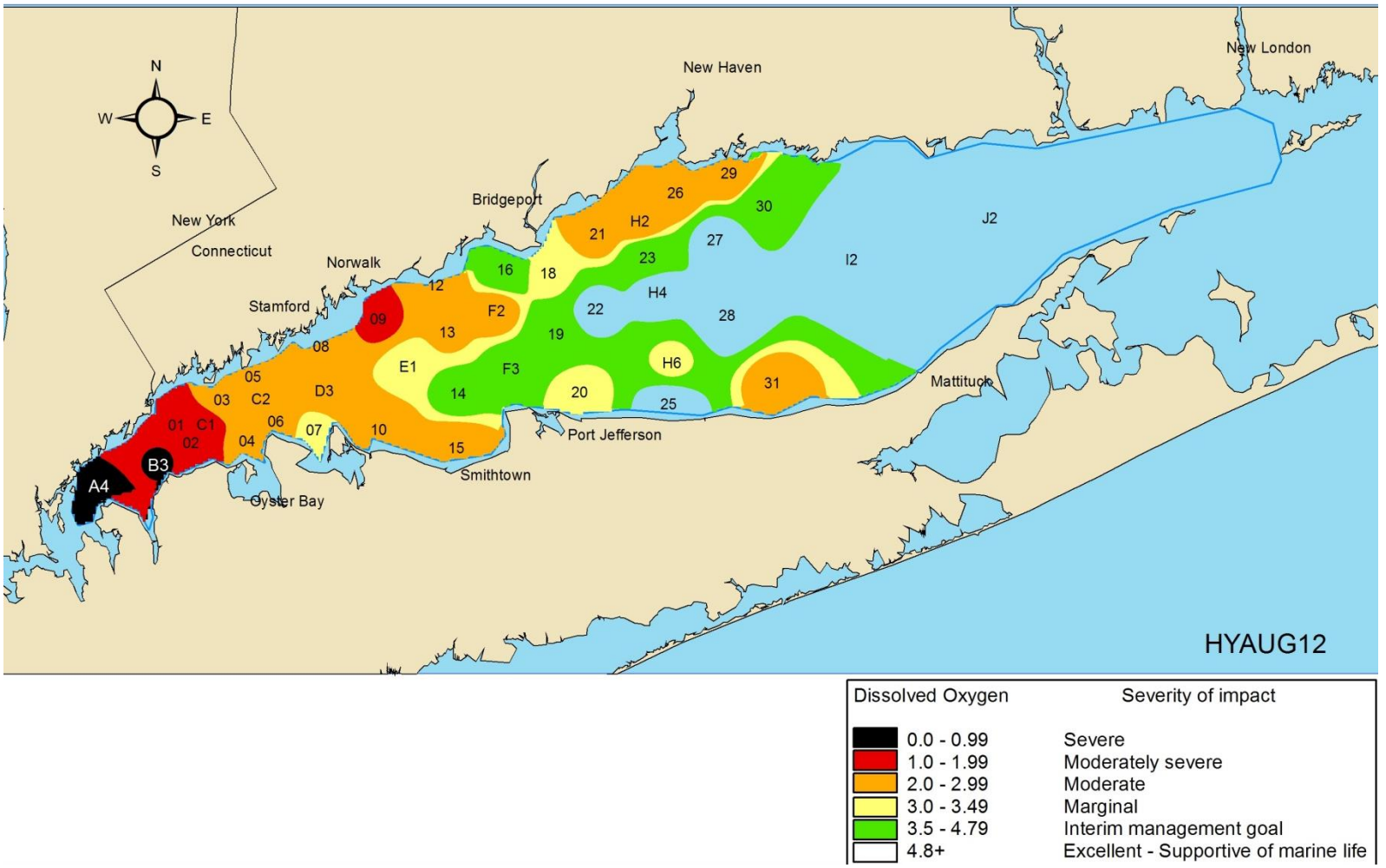
Long Island Sound

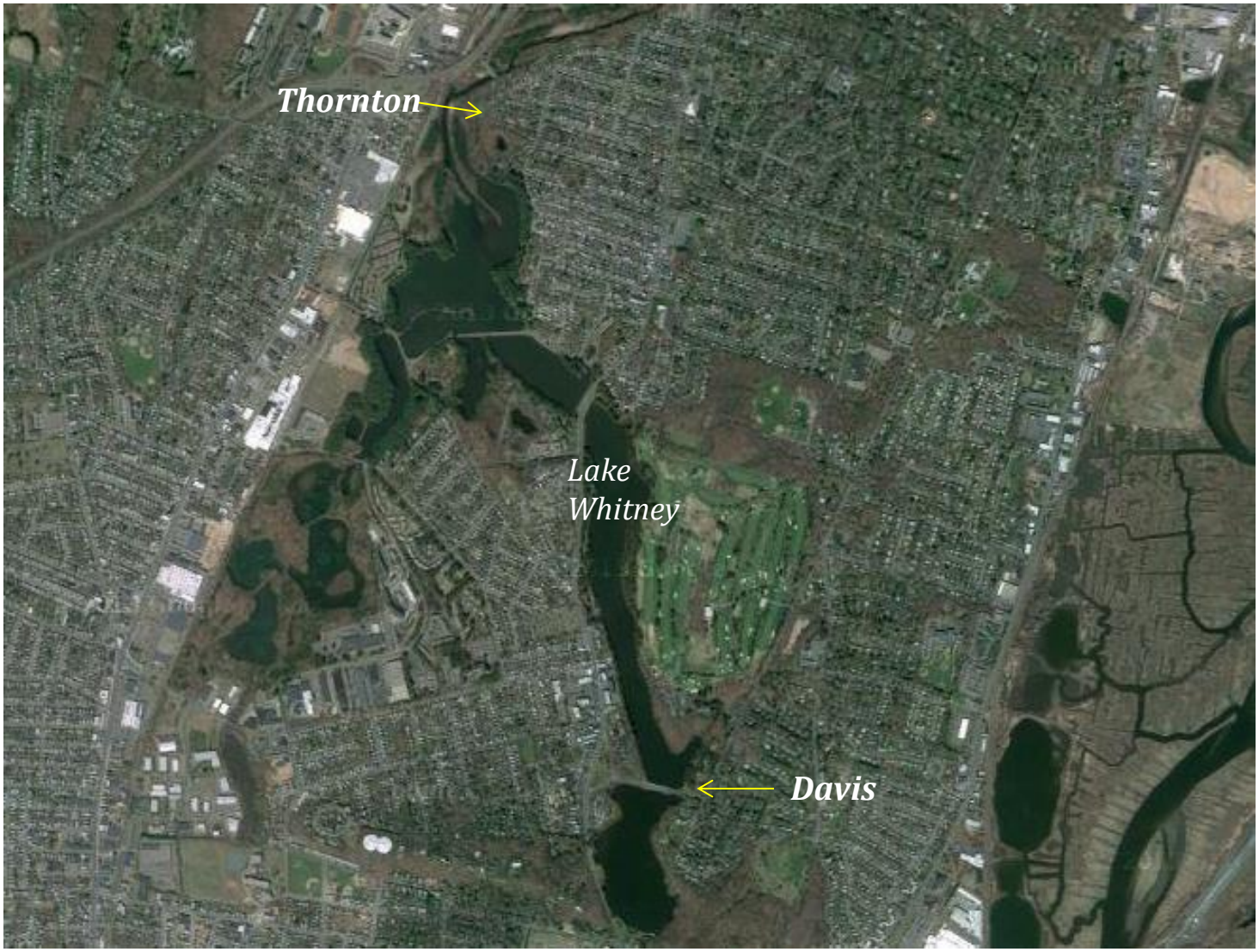


Source: CT DEEP

Objectives

- Evaluate the effectiveness of constructed wetlands in removing nitrogen from stormwater in the Long Island Sound Watershed.
- Identify the key factors that contribute to stormwater nitrogen removal efficiency in constructed wetlands.

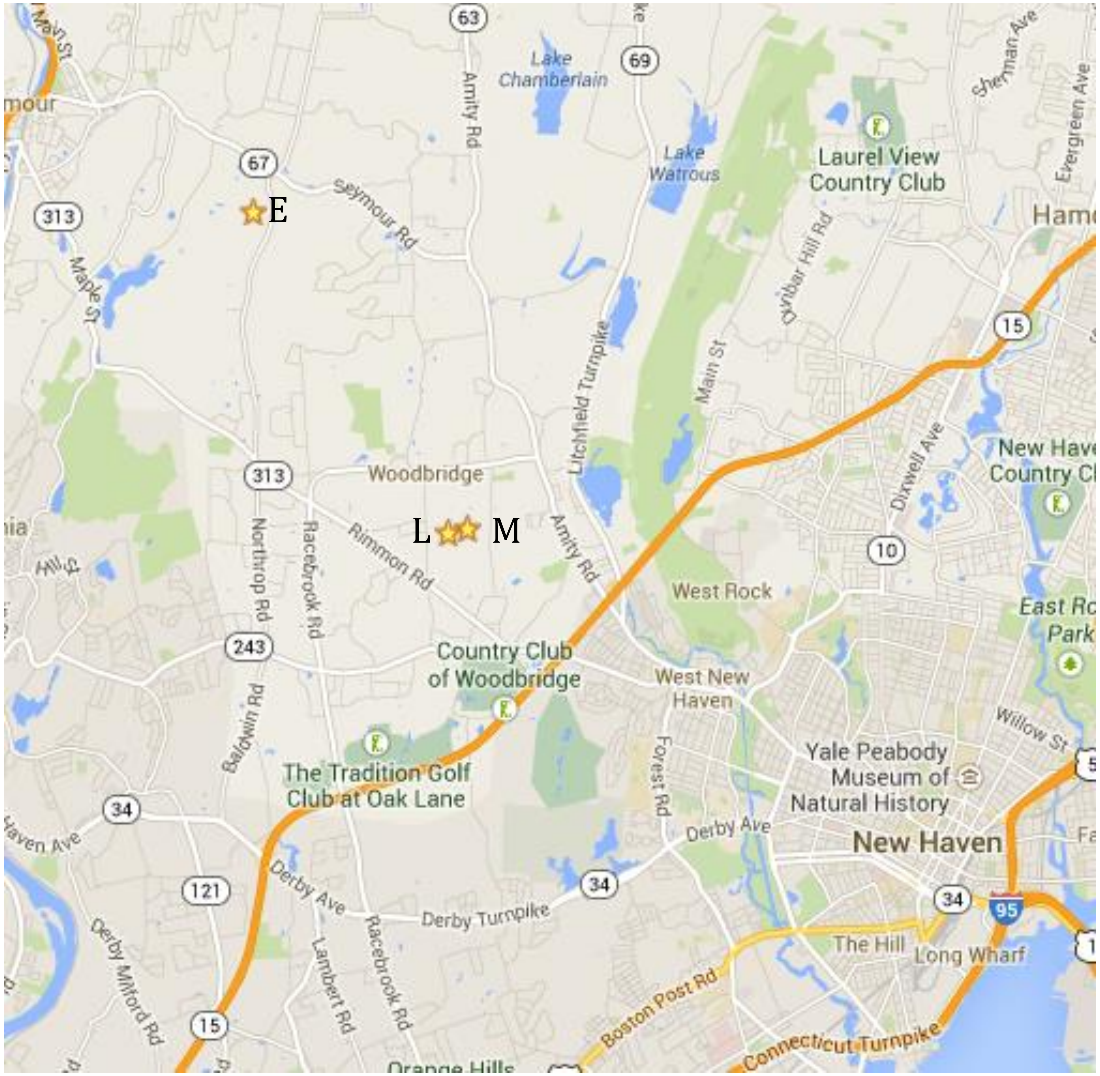
Study Sites



Study Sites


Elderslie


Woodside Dr
Race Brook
Marion Dr
Marion
Lois Dr
Lois
Dales Dr


E
L
M
Lake Chamberlain
Amity Rd
Lake Watrous
Laurel View Country Club
Seymour Rd
Maple St
Dunbar Hill Rd
Litchfield Turnpike
Main St
Woodbridge
Northrop Rd
Racebrook Rd
Rimmon Rd
Amity Rd
West Rock
Dixwell Ave
Country Club of Woodbridge
West New Haven
The Tradition Golf Club at Oak Lane
Yale Peabody Museum of Natural History
New Haven
Forest Rd
Derby Ave
Derby Turnpike
Baldwin Rd
Derby Milford Rd
Lambert Rd
Boston Post Rd
Connecticut Turnpike
The Hill
Long Wharf
Willow St
Sherman Ave
Evergreen Ave

Methods

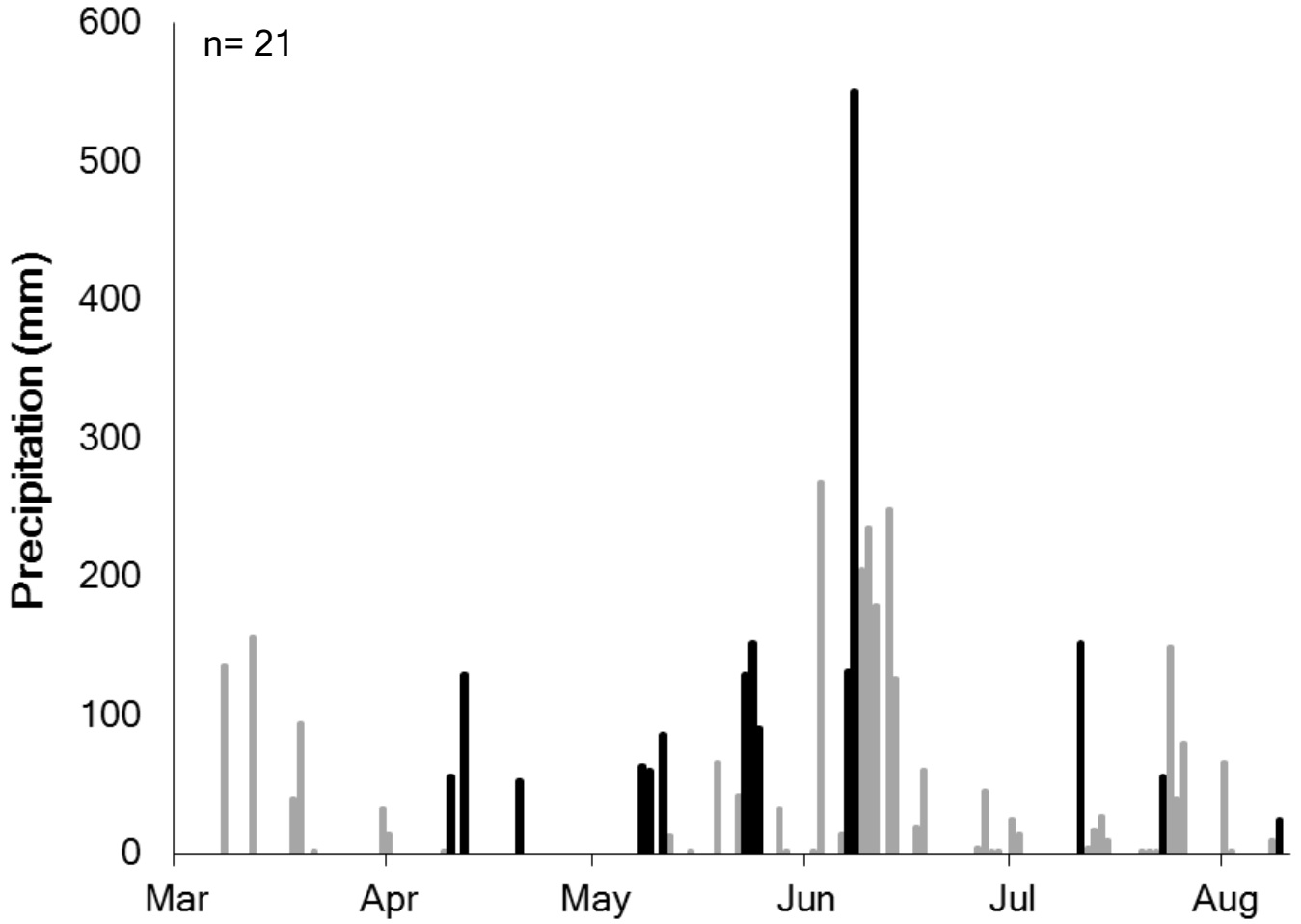
- Water flow was determined using stage-discharge relationships:
  - Weirs
  - Pressure transducers for water level

Methods: Water Quality

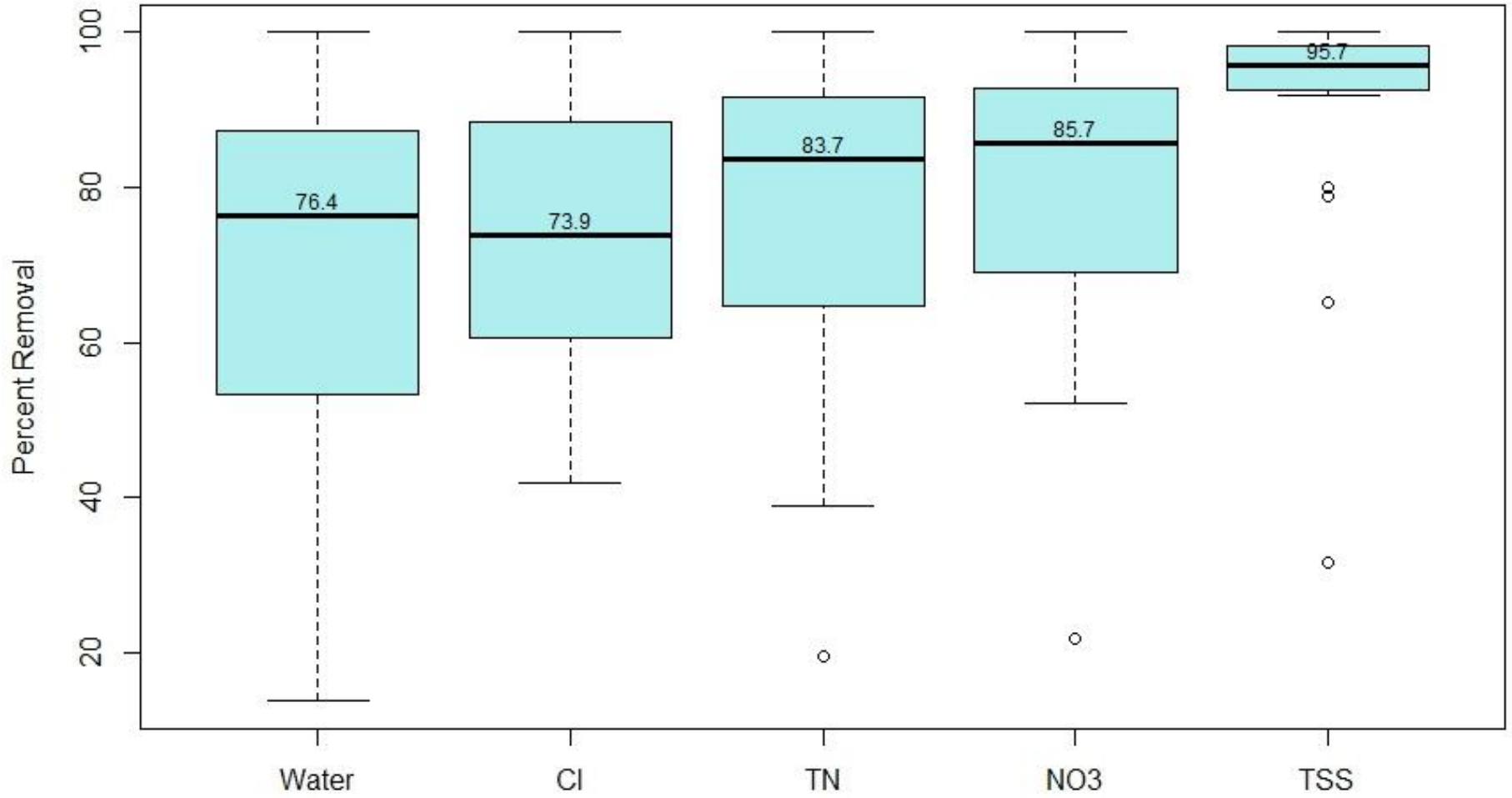
- ISCO Autosampler 3700 at wetland inlet & outlet
- Manual composites
  - One flow-weighted sample per storm for influent & effluent
- Samples were analyzed to determine Event Mean Concentration (EMC) and N loads.

Sample Collection Period

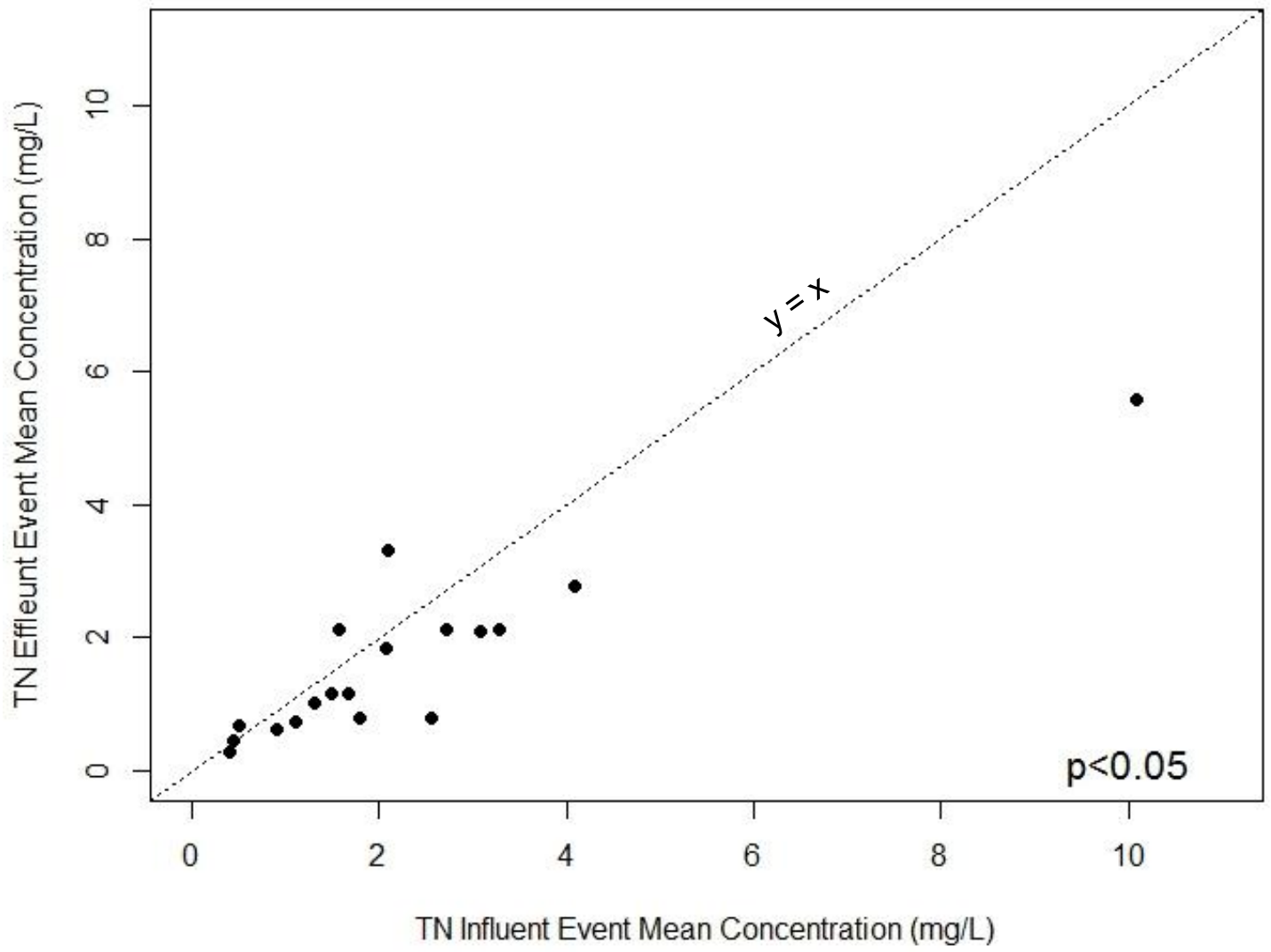
Thornton



Thornton: Removal Rates

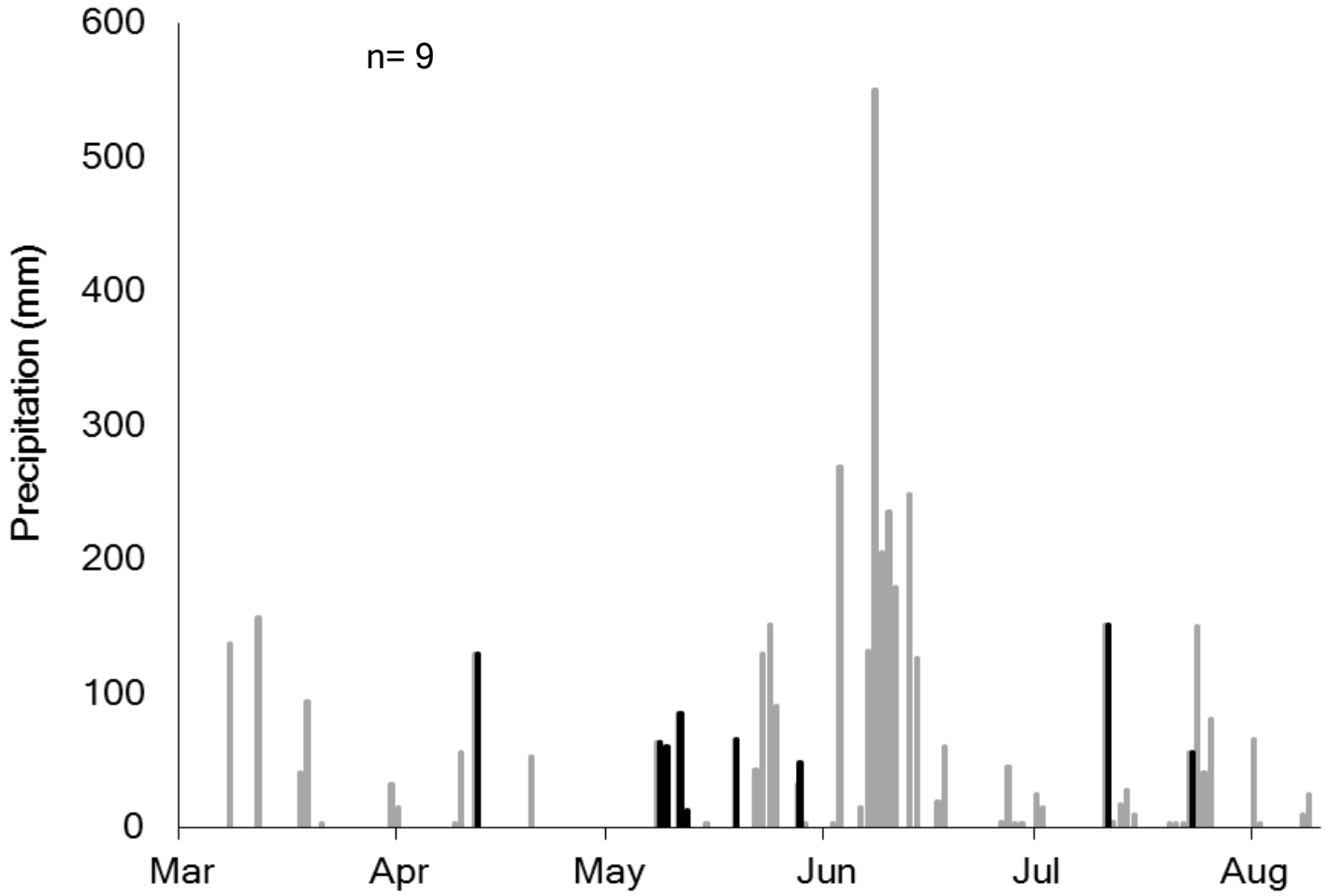


Thornton: Effluent vs. Influent

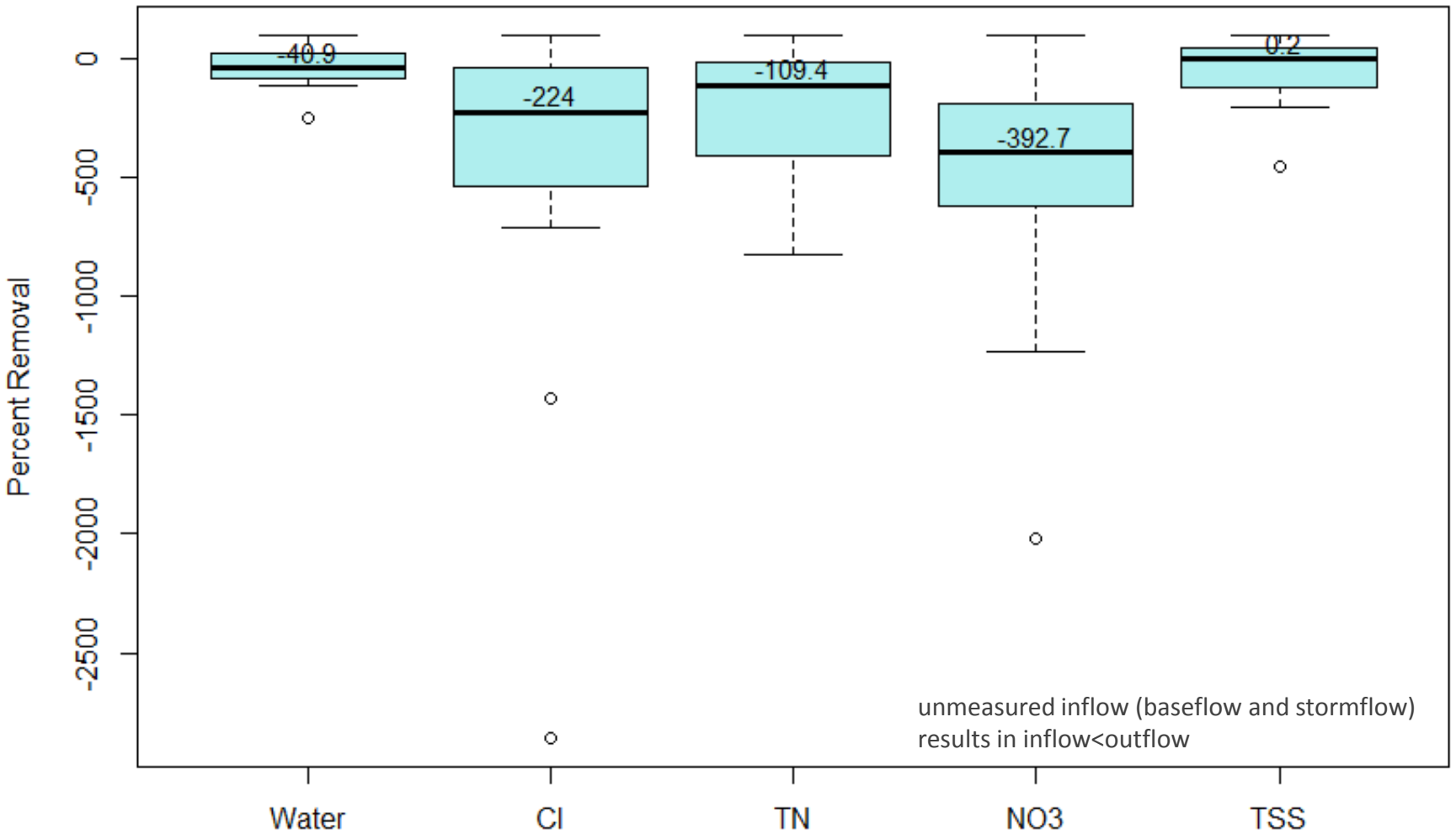


Sample Collection Period

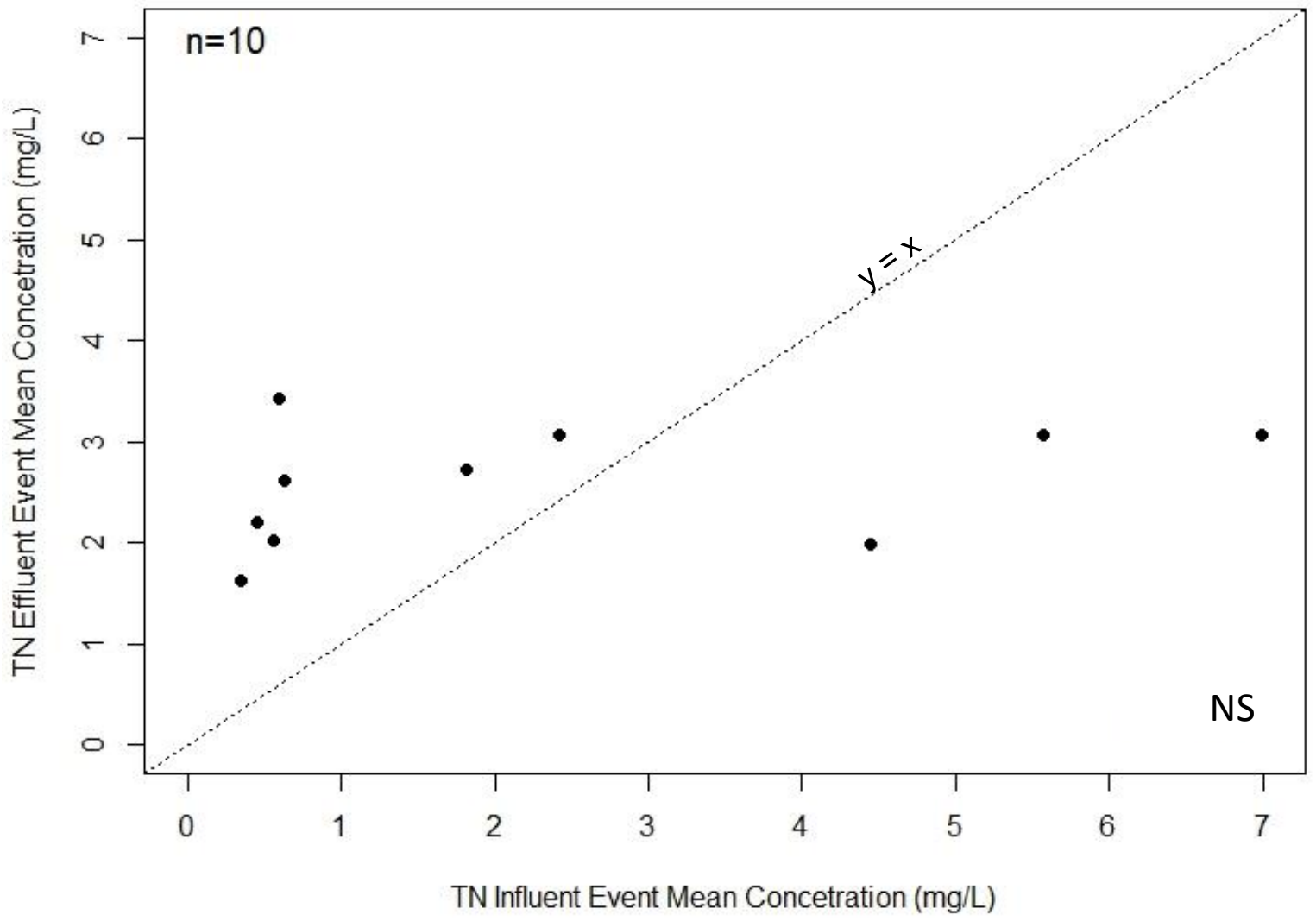
Davis



Davis: Removal Rates



Davis: Effluent vs. Influent



Conclusions

- Thornton:
  - Significant biogeochemical N removal
  - Main mechanism for N removal is hydrologic
- Davis:
  - Hydrology issues
  - Biogeochemical removal not significant

Other sites

- Lois & Marion
  - Data from 9 to11 storms
  - Hydrology issues
- Elderslie
  - Few storms, only one with outflow
  - Additional data collection

Future Work

- Assess explanatory variables
  - Residence times
  - Input N concentrations
  - Wetland-watershed area ratios
  - Soil organic matter content
  - Vegetation

Acknowledgements

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