EFFECTS OF VARIABLE INUNDATION PATTERNS ON WETLAND PLANT COMMUNITIES AND NITROGEN UPTAKE IN THE SALT RIVER WETLANDS

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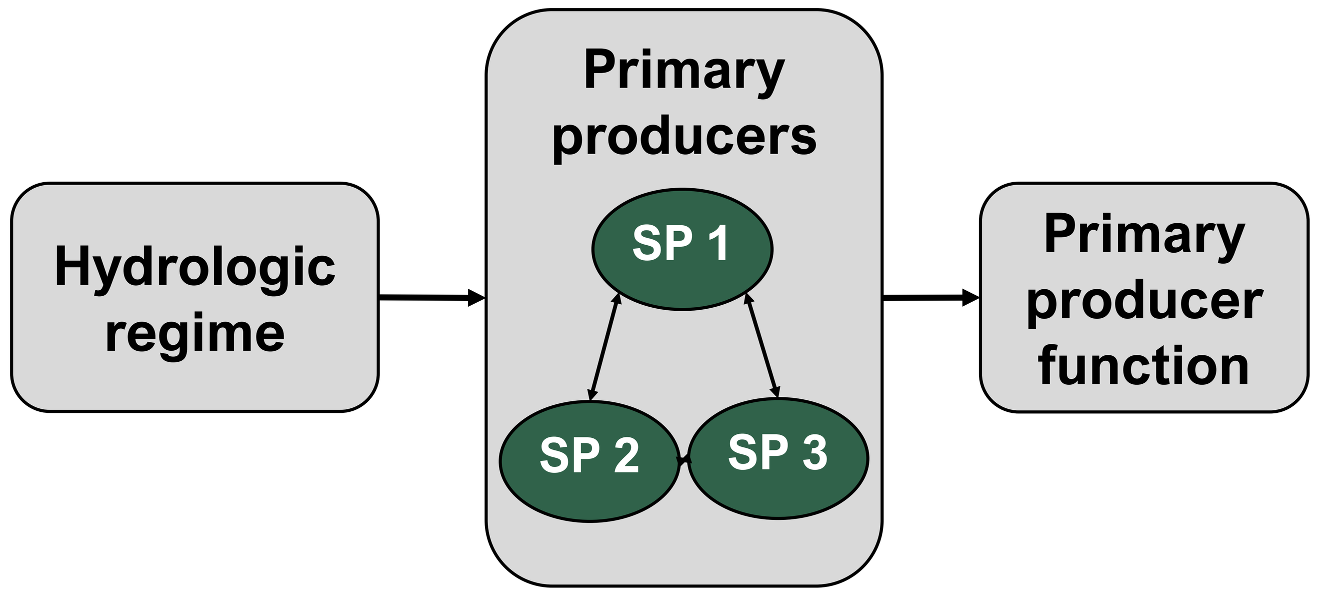
Background



How do plant communities vary as a function of inundation in accidental urban wetlands, and how does this variation affect nitrogen uptake?

Plant communities along the Salt River vary in time, in terms of cover type and water permanence. (Bateman et al 2015).

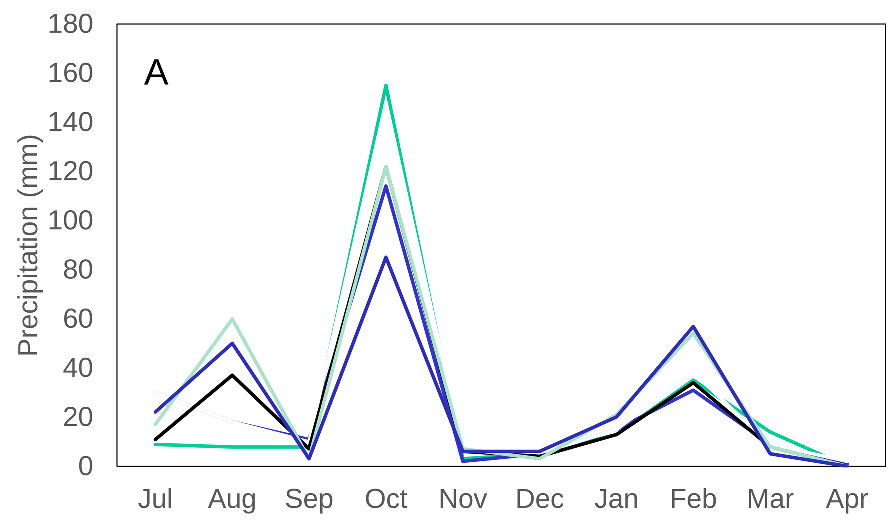
The presence of certain wetland plant species may positively or negatively influence overall nitrate removal (Suchy 2016). This demonstrates the importance of community context.

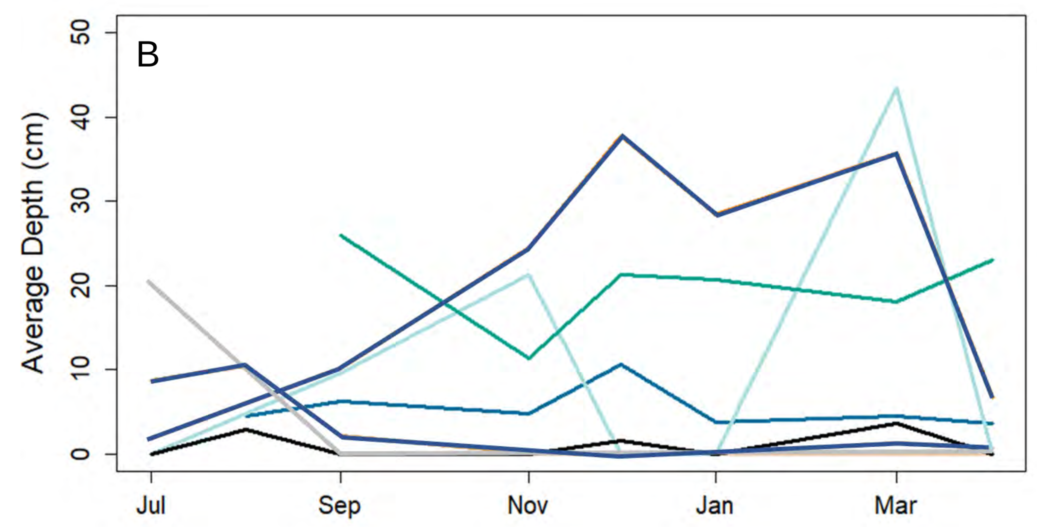
Examples of accidental wetlands.

Nitrogen uptake and processing may be dependent on complex interactions between community composition and environmental conditions, which vary over time and space within a site.

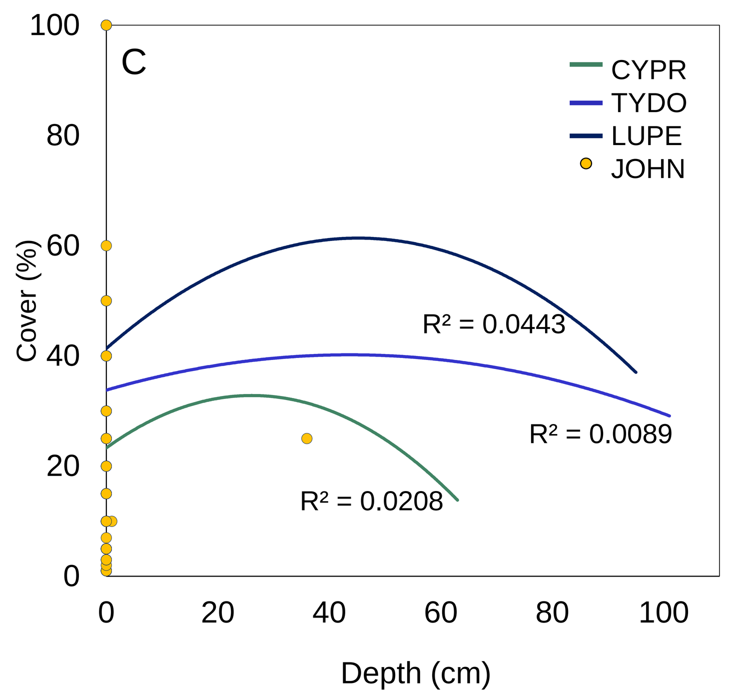
References
Bateman, H. L., Stromberg, J. C., Banville, M. J., Makings, E., Scott, B. D., Suchy, A., & Wolkis, D. (2015). Novel water sources restore plant and animal communities along an urban river. *Ecohydrology*, 8(5), 792-811.
Suchy, A (2016). Denitrification in Accidental Urban Wetlands : Exploring the Roles of Water Flows and Plant Patches (dissertation).

Results

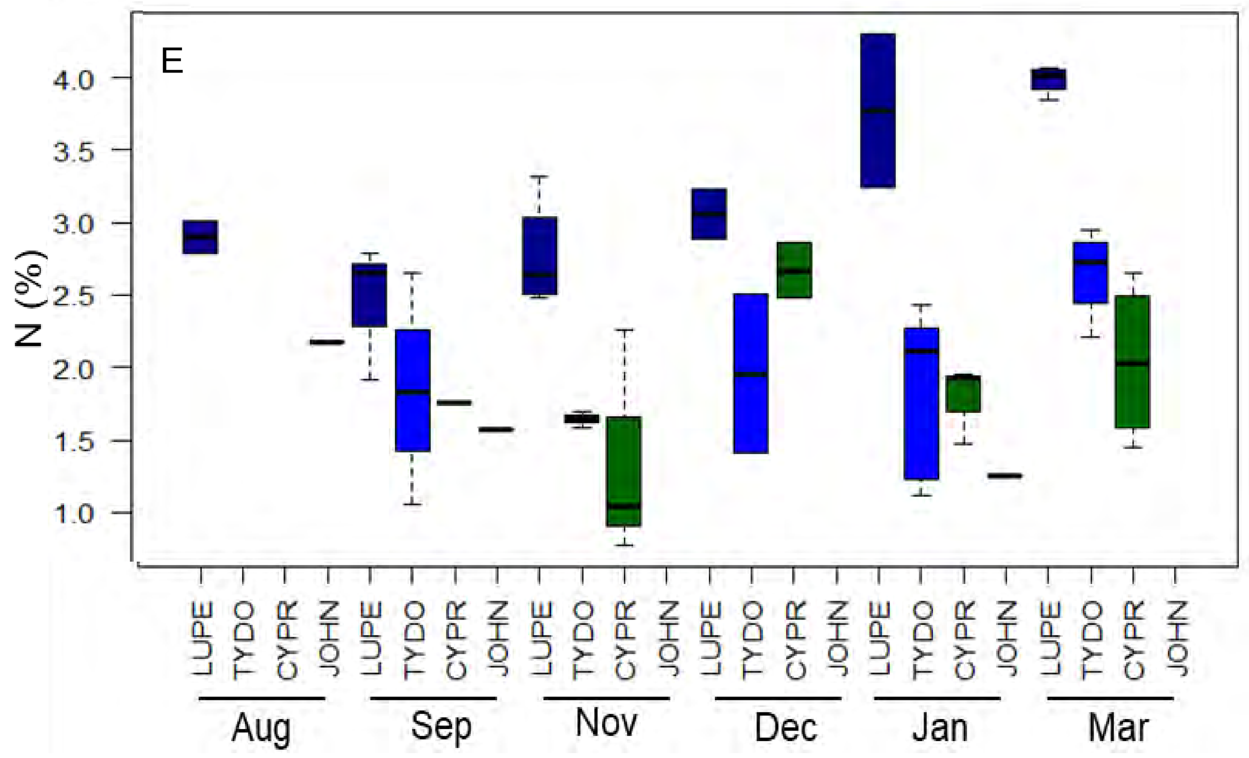


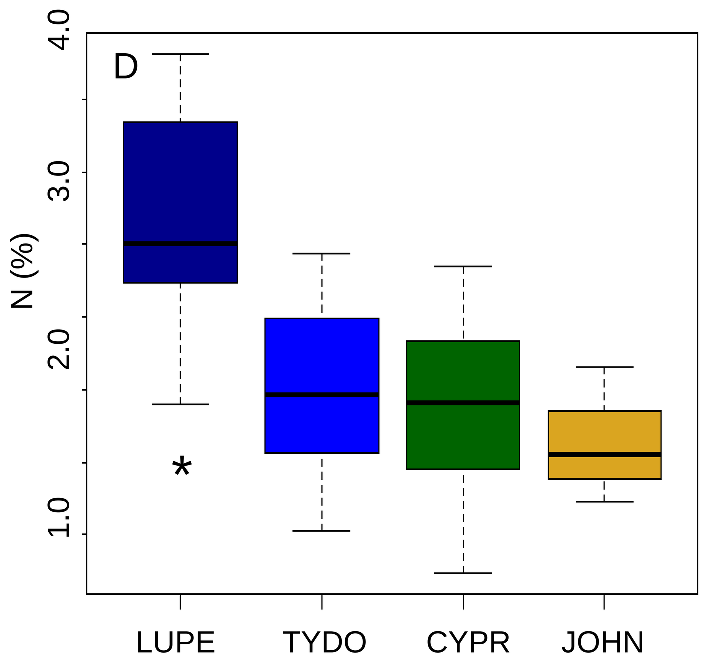


Precipitation (A) did not correspond to observed hydrology, including wetland depth (B) or wetted width (not shown), suggesting urban inputs, as well as geomorphology, drive site-specific patterns.

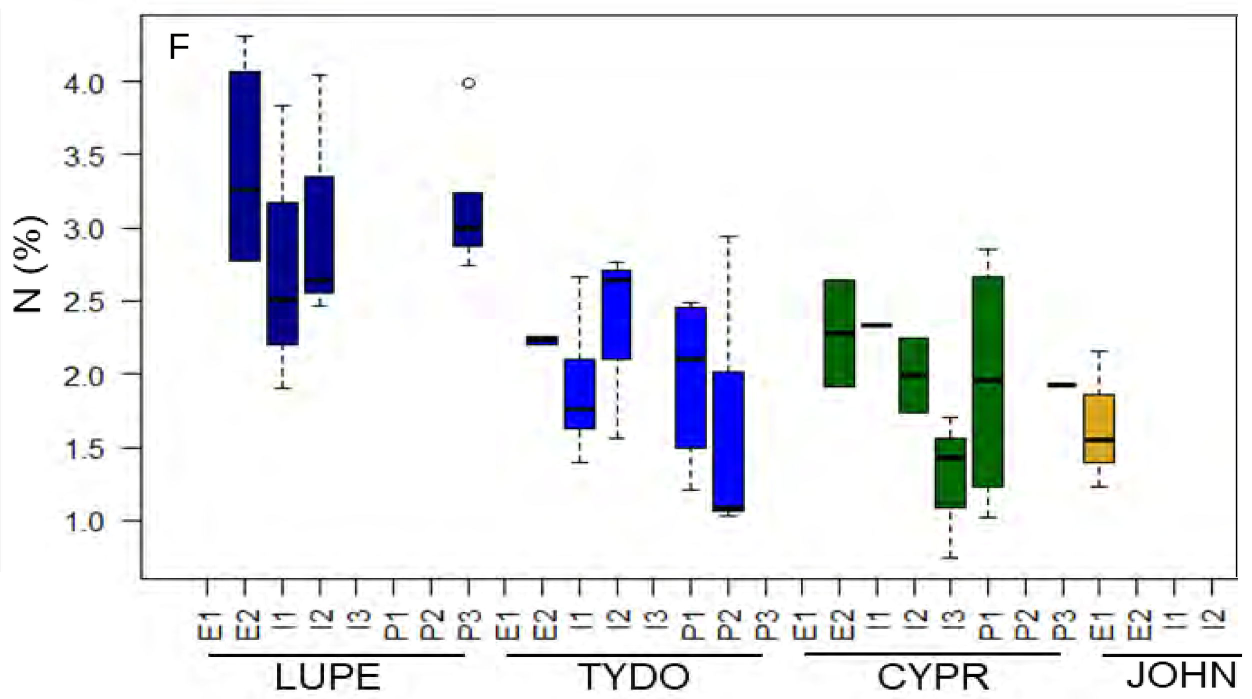


Dominant plant species vary in inundation preferences (C).

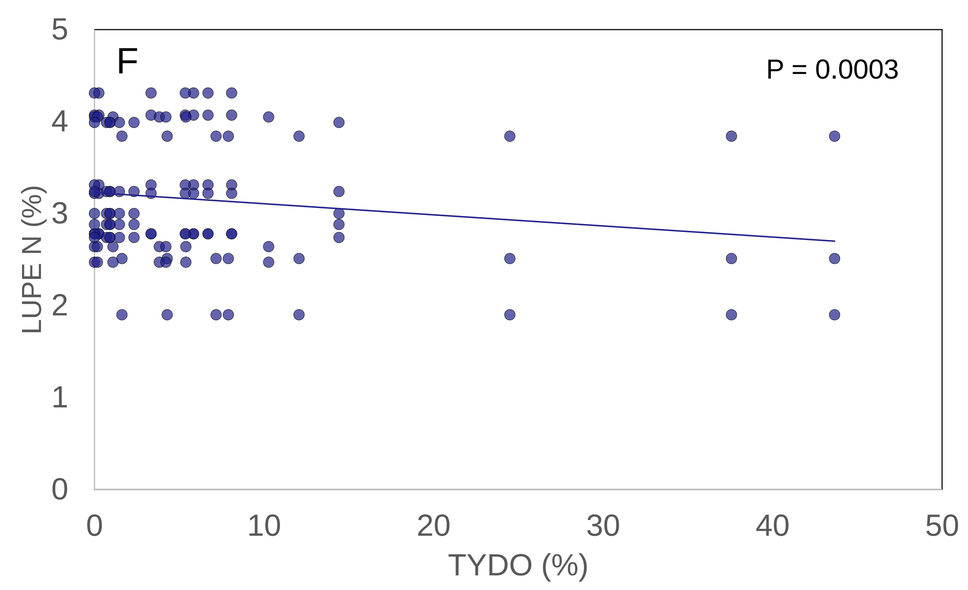




Dominant plant species vary nitrogen content (%) across sampling period (D).



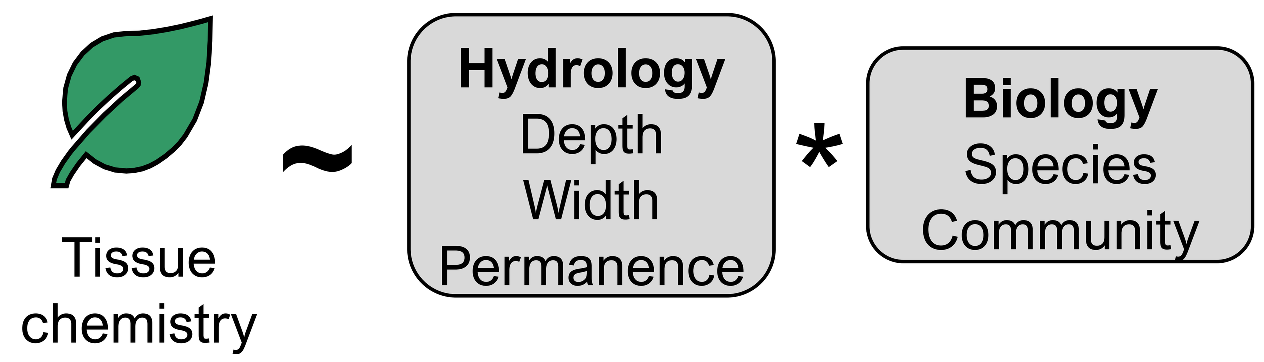
Dominant plant species nitrogen content varied through time (E), as a function of water, and across sites (F).



Abundance of *Typha spp* had a significant negative relationship with *Ludwigia spp* nitrogen content, potentially due to *Typha*'s relatively larger root structures and competitive growth rate.

Methods

Accidental wetland sites along the Salt River. Wetland sites were designated ephemeral, intermittent, or perennial given water permanence of less than 40%, 75%, or 95%, respectively.



Monthly field observations of plants, water, and tissue chemistry. Monthly transect and tissue sample data between July 2018 – April 2019.

Conclusions

Accidental wetland hydrology driven by more than precipitation alone and varies between sites.

Plant species differ in their hydrologic preferences and tissue chemistry.

Species-specific tissue chemistry varies over time and across sites.

Some species may influence the nitrogen uptake of others.

Acknowledgements

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