Tracing the Source of Nutrients Entering North Central Florida Bay: A Stable Isotope Approach

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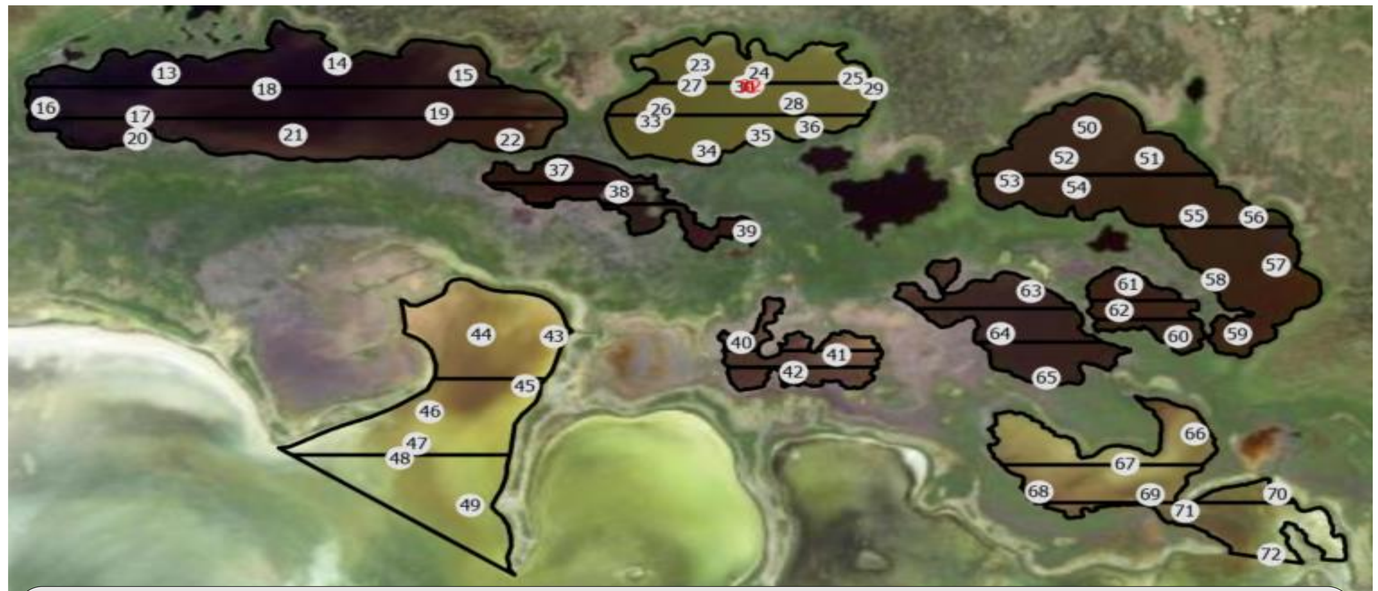
Problem Statement

Florida Bay has shown declining health from:

1. **Increased nutrient concentrations**
2. Recurring seagrass die-offs
3. Persistent seasonal algal blooms.

The origin of nutrients entering this region must be identified to inform restoration management



Question: What is the source of Nitrogen entering Florida Bay?

Allochthonous

Surface/groundwater flow

Atmospheric Deposition

Autochthonous

Legacy Bird Rookery

Internal Recycling

Methods

$\delta^{15}N$ and $\delta^{13}C$ isotopic analysis were run on microalgae providing evidence of nutrient source dynamics across the 2021/2022 hydroseasons.

Results

- Sample results (n = 148) fell within the isotopic range consistent with allochthonous input of nitrogen (~ 2-3‰)

Dual stable isotope analysis has revealed **external loading** **rather than internal cycling** as the main driver of nutrient influx in **North Central Florida Bay**

Conclusions

- Allochthonous hydrologic inputs act as the primary input of N to the lake systems.
- Mixing model analysis shows a trend of Taylor Slough marsh and Florida Bay surface water influencing the nutrient regime of the northern and southern portion of the systems, respectively.