Initiating long-term monitoring in Northeast Florida to quantify state change from sea-level rise and saltwater intrusion

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Why long-term monitoring?

Sea-level rise and saltwater intrusion are increasing stress and causing state changes in coastal ecosystems. Wetlands are converting to mudflats, uplands to wetlands, and lowsalinity to more salt-tolerant communities. In Northeast Florida, mangroves are also increasing in abundance at their range limit.

Concurrently with these chronic stresses, stochastic events (e.g., tropical storms) are impacting coastal ecosystem structure and process, leading to state change when resilience is low.

Without holistic, long-term monitoring that effectively captures variability across the landscape, researchers and managers cannot quantify change over time or accurately predict potential future changes.

Pablo Creek

We have initiated a long-term monitoring program at UNF's William C. Webb Coastal Research Station in NE Florida, in the Pablo Creek watershed.



Water Quality

In collaboration with NPS, tidal channel water quality using **EnviroDIY** Monitoring Stations, or Mayflys. These units record parameters like conductivity every 15 minutes, with data available in near rea time online.



Soil Properties

Soil carbon depth profiles along the elevation gradient using augers and corers.



We are measuring ecosystem components and functions across the coastal landscape, from mudflat to upland states along the inundation stress gradient at several tidal saline wetlands.

In the future, we plan to expand monitoring activities upstream to better understand coastal resilience at the watershed scale. At the upper end of the watershed, UNF's Sawmill Slough Preserve holds non-tidal forested wetlands that drain into Pablo Creek.

Remote Sensing



Repeated site-wide collection of true-color, multispectral, and LiDAR remotely sensed imagery.

Surface Elevation

In collaboration with NPS, surface elevation tables and feldspar markers across the elevation gradient.

Plant Diversity

Repeated plant

community composition

plots along the elevation

gradient, using quadrat

methods and visual

cover.

surveys at permanent

Gas Fluxes

Repeated greenhouse gas flux surveys along the elevation gradient using chamber approaches, to measure methane emissions and carbon dioxide exchange.

Adaptive and collaborative

The Pablo Creek monitoring effort is just beginning, with initial installation and data collection in summer 2023. We want to ensure this effort supports broader initiatives and allows comparison across the Southeast USA and beyond.

> Please reach out to discuss the planned monitoring; we are happy to collaborate on additional parameters, leveraging data to compare across regions, and trying new techniques to keep adapting long-term.

> > UNF Pablo Creek

NPS TIMU

GTM NERR

10 km

We are excited that Pablo Creek is situated between existing monitoring efforts at NPS Timucuan E&HP to the north, and GTMNERR to the south. Together, we can bolster the NE FL network for a robust understanding of coastal resilience.

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Porewater Quality

Porewater quality sampled from permanent wells in the root zone and shallow groundwater, using YSI ProDSS for spot sampling and Solinst LTCs for continuous conductivity and level monitoring.

