

Comparison of Soil Total Nitrogen Stocks in Natural and Restored Mangrove Forests of Southwest Florida

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Human activities have more than doubled the amount of N applied to terrestrial soils in the past century, and 20-60% of this N is exported to the aquatic environment. These rates are expected to double or triple by 2050. Excess N can lead to eutrophication of coastal systems, causing algal blooms, fish kills, coastal acidification and decreases in biological diversity. Coastal wetlands are globally important for N cycling and storage, with temperate mangrove soil total N (TN) stocks estimated between 2.73 – 20.73 Mg Ha⁻¹. However, much remains unknown about local drivers of soil TN accumulation. The objective of this study is to quantify and compare TN stocks in natural and restored mangrove sites in Southwest Florida. Soil cores have been collected from 24 plots at 4 sites in our study regions. In each plot a single core was collected for Pb-210 dating so that stocks of natural and restored sites can be compared for equivalent timeframes. Measurement of dry bulk density and loss-on-ignition were made from four cores within each plot for quantifying spatial uncertainty. For preliminary results, TN will be estimated using LOI data because measurement of TN concentrations from an elemental analyzer are ongoing. Understanding the TN stocks in natural and restored mangrove forests will help inform better understanding of how factors like surface elevation, vegetation biomass, and time since restoration influence the amount of TN mangrove soils can store.