Chemical Analysis on Local Source Vegetation and Soils in the Apalachicola Region

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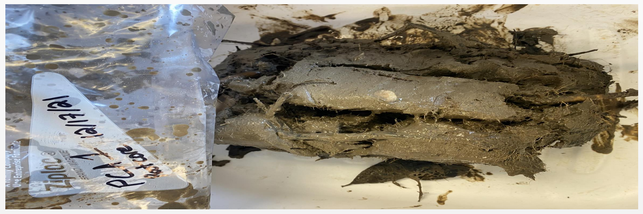
Introduction

The goal of this project is to quantify differences in carbon, nitrogen, and organic matter content of coastal wetland vegetation and soils to quantify changes that occur during the process of soil formation.



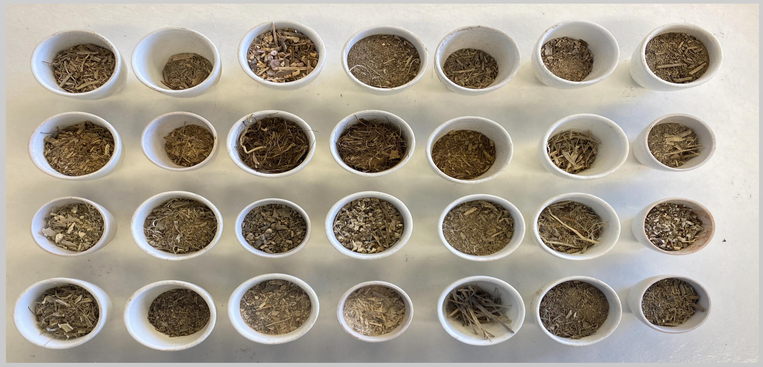
**Depicts the sorting process, before and after. In total one core takes around an hour to two to complete

Methodology

We sampled the four most abundant vegetation types in coastal wetlands of Apalachicola Bay: Spartina alterniflora, Juncus roemerianus, Rhizophora mangle, and Avicennia germinans.

We collected leaves and roots from each vegetation type. For roots, we collected 16 soil cores, 4 of each vegetation type. Cores are 30 cm deep PVC pipes that are used to obtain a cross-section of living/dead materials in and around the plant of interest. When processing cores, roots were washed with water and sorted by size & living condition(dead or alive). I used a ruler to measure diameter and suspended the roots in water. Sinkers are usually dead while floaters are usually alive. Small roots were less than 2 mm, medium were considered 2mm-5mm and large were considered over 5mm.

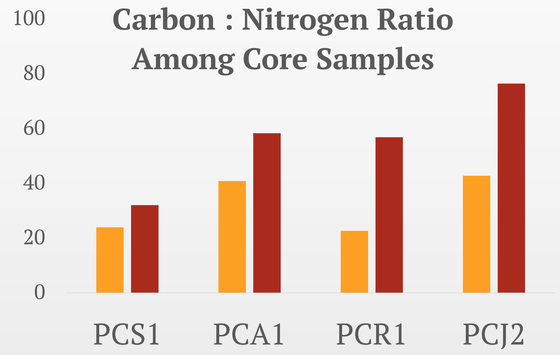
Loss on Ignition is performed to calculate the mass of organic matter present in vegetation after it is burned at 550 degrees Celsius. Secondly, Elemental Analysis was used to measure C and N content.

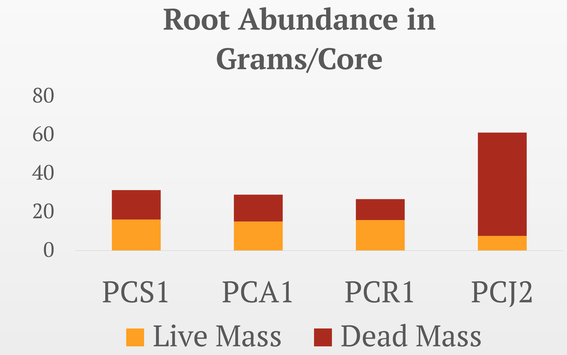


**Filled crucibles with around 1-2 grams of our homogenized samples to put in a furnace at 550 degrees Celsius for LOI

Results

These are preliminary results. Our preliminary data yields information about Carbon : Nitrogen composition and relative root abundance.





Mass Composition %:	PCS1	PCA1	PCR1	PCJ2
Dead(%)	48.63%	47.92%	40.6%	87.45%
Live(%)	51.37%	52.08%	59.4%	12.55%

Conclusion

- Dead vegetation had higher C:N ratios. This indicates preferential loss of N after root death.
- Higher C:N= more decomposition PCJ2(Juncus) had the highest total root abundance, dead mass and highest C:N ratio out of all samples.
- Influx of dead mass in PCJ2 causes the C:N ratio to become larger

** Depicts the devicewe used in lab in order to extrude the core to start sorting and analyzing roots

References

. Chmura, G. L., and P. Aharon. “Stable Carbon Isotope Signatures of Sedimentary Carbon in Coastal Wetlands as Indicators of Salinity Regime.” Journal of Coastal Research, vol. 11, no. 1, Coastal Education & Research Foundation, Inc., 1995, pp. 124–35, http://www.jstor.org/stable/4298316.

Heiri, O., Lotter, A.F. & Lemcke, G. “Loss on ignition as a method for estimating organic and carbonate content in sediments: reproducibility and comparability of results.” Journal of Paleolimnology 25, 101–110 (2001). https://doi-org.proxy.lib.fsu.edu/10.1023/A:1008119611481