

Carbon Burial in Mangrove Forest Soils of the Coastal Everglades

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Mangrove forests bury carbon in their soils at rates much greater than other types of forests on a per-area basis. As a result, large stocks of carbon are concentrated in a relatively small area along the coastal margin where dramatic climate-driven impacts are expected. Hence this small yet highly vulnerable area will have a disproportionately large impact on global carbon cycling. To investigate vulnerability and carbon cycling of these systems, we measured mangrove forest soil accretion rates, as well as organic carbon, CaCO_3 , and nutrient accumulation rates over the last 100 years (via ^{210}Pb dating of soil cores) from the mangrove forest within Everglades National Park. We found that accretion rates match (within error) the relatively modest average sea-level rise over the most recent 50 and 100-year periods for most of the system, but have not kept pace with the substantially higher sea level rise in the last decade. The few locations that are not keeping pace with sea level over any of the three time scales also have substantially lower organic carbon burial rates than the rest of the system and are located in the oligohaline region most susceptible to enhanced organic carbon mineralization. Burial rates of both CaCO_3 and total phosphorous decreased significantly with distance from the Gulf of Mexico. In addition soil profiles of CaCO_3 indicate dissolution with depth.