

“Going Local”: Addressing Heterogeneity in Biogeochemical Cycling in Mangrove Systems Through Sedimentary Setting and Geomorphology

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Highly productive mangrove forests are valued as ‘blue carbon’ systems for their ability to sequester organic carbon within their soils. Due to this utility, multiple global assessments have been carried out to identify global central tendencies of mangrove organic carbons stocks and flux rates. Mangrove forests, however, exhibit high ecological heterogeneity that is obscured in accounting of global central tendencies. In these studies, a macroscale mangrove typology based on hierarchical classification of sedimentary and geomorphic setting was used to identify global variability in mangrove soil organic carbon burial rates and elemental stoichiometry of mangrove soil stocks. Mangroves occupying terrigenous sedimentary settings bury organic carbon at a faster rate than carbonate settings, though terrigenous setting mangrove soils exhibited lower ratios of OC:SOM. Differences in sedimentary setting and geomorphology provide insights concerning ecosystem properties, can be used for prioritizing mangrove restoration, and underscore the importance of ‘going local’ to improve fundamental understanding of carbon cycling in mangrove ecosystems.