## Seagrass Sediment Carbon in the Indian River Lagoon, Florida

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Seagrass meadows are vital to estuarine ecosystems, serving as efficient natural carbon sinks by sequestering $CO_2$ through photosynthesis and storing organic carbon in their sediments. Despite the important benefits and services provided, seagrass ecosystems are declining globally due to a myriad of climatic and anthropogenic factors. Historically, extensive seagrass meadows were common throughout the Indian River Lagoon (IRL), Florida, however, eutrophication and subsequent declines in water quality and light attenuation has led to significant losses over the last decade. The loss of habitat structure reduces carbon storage capacity, which can weaken both ecosystem stability and resilience. Seagrass carbon stock data are currently lacking in the IRL and baseline information on spatial variability is required to forecast changes in stocks over time and to derive regional and global estimates. In 2023, we quantified seagrass biomass and sediment carbon stocks at 27 sites spanning the IRL's latitudinal gradient. We found significant differences in carbon storage across IRL basins, which are related to seagrass diversity and persistence. This study offers the first comprehensive carbon stock assessment of seagrass habitats across the IRL, establishing crucial baseline data for these vital ecosystems. By strengthening the science, supporting the storage potential of coastal ecosystems, carbon sinks, and our understanding of associated biogeochemical processes, the ability to identify and manage priority areas for conservation and restoration will greatly improve.