

Project title:

Quantifying Carbon Accumulation and Stocks in Delaware Estuarine Wetlands

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Abstract:

Carbon sequestration is considered an important means to mitigate the impacts of greenhouse gas emissions on climate change. Increasing the amount of carbon stored in wetlands may become an important policy goal with economic benefits relevant to carbon offset programs. Coastal and estuarine marshes are an important sink for atmospheric carbon dioxide, but it is unclear how much biomass carbon accumulates in marsh soils. This study addresses the question of carbon sequestration in marshes of the Delaware River and Bay estuary. Rates of sediment accumulation and marsh accretion in the estuary have been established through past research, but carbon accumulation rates are unknown. Carbon accumulation rates will be quantified for a range of saline, brackish, and tidal freshwater marshes to establish the spatial variability and time-dependence of carbon sequestration. Nested radionuclide chronometry (^{137}Cs , ^{210}Pb , ^{14}C) of soil cores will be used to compute carbon accumulation averaged over decadal to millennial timescales. These rates will be extrapolated over the extent of Delaware wetlands as mapped by the National Wetlands Inventory to estimate carbon storage (stocks). Knowledge of carbon stocks will inform scientists, coastal managers, and policymakers involved in regional evaluations of blue carbon sequestration, and provide context for wetland restoration in the region.