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The role of elevation, relative sea level history, and land cover conversions in determining carbon distributions in *Spartina alterniflora* dominated salt marshes in Galveston, Texas

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Coastal salt marshes are among the most productive ecosystems on earth and represent a substantial global carbon sink. Yet, there is little knowledge on the spatial and temporal patterns of carbon held in both above-and below-ground environments, and also on the factors that influence their carbon distribution. Such understanding is necessary to allow coastal managers to initiate and verify "Blue Carbon" projects, as well as for conservation efforts in the context of a changing climate and rising sea-level scenarios. In this study, we evaluated: 1) the temporal changes in salt marsh distributions as affected by marsh submergence, vertical accretion and land cover conversions; 2) patterns of soil carbon across different depths of the soil profile; and 3) the relationships between relative sea level, marsh distributions and the salt marsh carbon storage ability. Our results indicate that over the study period (1954 to present) a considerable portion of salt marsh extents were submerged, while at the higher terrains these salt marshes indicated a landward shift in response to the sea level rise. Soil carbon and bulk density measured in the soil profile indicated an abrupt and significant change at a depth of 15cm ($p=0.05$), which we interpreted as distinct of two different environments. As evidenced by historical aerial imagery (1954, 1969), the first (15-30 cm depth) coincided with an unvegetated salt flat at the sample locations, which were then overlain by lower bulk density and higher carbon *Spartina alterniflora* low marsh (0-15 cm depth) that migrated upslope in response to rapid relative sea level rise. Based on the findings of this study, we suggest that local and regional Blue Carbon projects or management actions, and global scale accounting of soil carbon consider both elevation and sea level history to predict carbon distribution.

Biography

Ranjani W Kulawardhana completed her PhD and Postdoctoral studies from Texas A&M University, College of Agriculture and Life Sciences.She is currently an Assistant Professor of Environmental Sciences of the Department of Biology at Jackson State University, MS. She has published more than 25 papers in reputed journals and conference proceedings, co-authored book chapters, and presented in numerous national and regional level conferences. She also serves as member of the reviewer panels in several national level proposal review committees, and reputed journals. During her academic career, she also has been secured several prestigious scholarships and awards.

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