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Title: Long Island Tidal Marsh Blue Carbon Storage – North and South Shore Site Accounting

Tidal salt marshes provide critical ecosystem services such as habitat, water filtration, coastal protection and blue carbon sequestration. However, the full stock of carbon storage in tidal salt marshes is underestimated, as most calculations rely on estimates from the top meter of salt marshes. We conducted several transects of depth probes in order to establish average marsh depth and determine the total carbon storage of three Long Island marshes. Marsh coastal sediment cores, sampled from the Long Island North Shore (Sunken Meadows - 2.66 m depth) and the South Shore (Cow Meadows - 1.98 m depth and Baldwin Park - 2.46 m depth), were analyzed for loss-on-ignition (LOI), bulk density, and x-ray fluorescence (XRF).

Results indicate that while Baldwin Park had the highest mean carbon density (33.36 kg/m³) compared to Cow Meadow (29.00 kg/m³) and Sunken Meadows (24.70 kg/m³), Cow Meadow had the highest total carbon storage (42,441,073 kg) compared to Sunken Meadows (20,288,962 kg) and Baldwin Park (6,619,993 kg) - due to the greater average depth and total area of the marsh. We compare the carbon density of these sites to the existing available data for the geographic area of NYC and Long Island, utilizing the Coastal Carbon Atlas and our previous core results. Greater uncertainty in carbon storage stems from the depth of the marsh, as compared to the mean carbon density (which varies along a normal distribution, with a mean of 27 kg/m³) or the total acreage (available through accessible government wetland maps and remote sensing products). Additional effort in probing for depth, as well as exploring alternative geophysical techniques may enhance total carbon storage accounting in tidal marshes.