Marsh Loss on Long Island:
Does Biogeochemistry Trump Climate Change?

A. Kolker, S.L. Goodbred, J.K. Cochran, R. Aller
Marine Sciences Research Centerr
Stony Brook University

There is concern that slow accretion rates coupled with an acceleration in the rate of eustatic sea level rise (SLR) will lead to salt marsh loss. In salt marshes from a variety of physical settings around Long Island, New York, USA sediment accretion and salt marsh loss occurred independently of each other. Rates of wetland loss were determined by analyzing historic aerial photographs using GIS. Accretion rates were determined by applying two models to profiles of excess ^{210}Pb, which provided accretion rates on an historic 100 year time scale, and a 25-30 year time scale that closely matched the time scale of the aerial photographs. Almost all accretion rates ranged between 0.2 ~ 0.6 cm/yr, near or above the local rate of relative seal level rate (SLR) of 0.28 cm/yr. An inverse relationship between marsh loss and accretion rate was not found, implying that SLR does not drive marsh loss in most of these settings. Instead, marsh loss rates are positively correlated with population in the adjacent upland. Marsh degradation is linked to sedimentary sulfide buildup and eutrophication. These findings suggest that anthropogenic alterations to coastal processes is a greater threat to urban and suburban salt marshes than present day rates of relative SLR.