Tracking Climate Change, Human Impact, and the Overall Oceanic and Terrestrial Health of Estuaries Along the Hudson River and Long Island Sound to Influence Policy

Cruz, Emily (School: Manhasset High School)

According to the National Oceanic and Atmospheric Administration, approximately 39% of Americans live in coastal areas. In the wake of Hurricane Harvey and Maria, attention has been drawn to the countries vulnerability to major storms and has prompted more attention to surge protection afforded by natural barriers, such as marshes. Estuaries were studied to ensure that the optimal level of health in these wetlands is reached to ensure that protection from storm surges is optimized. Through analyzing sediment cores obtained from the following marshes: Piermont, Alley Creek, Iona and Pelham Bay, the paleoclimatic data can be used to understand the climactic and anthropogenic influences on the marsh, and asses health of the estuary and the overall New York region. These sediment cores were subject to Loss-On-Ignition (the percent of organic matter) analysis and macrofossil analysis. All of the sediment cores show evidence of human influence based on the fluctuations in Loss-On-Ignition (LOI). The cores from Iona and Piermont show evidence of European arrival due to a similar decrease in the Loss-on-Ignition percentage at similar levels. The increasing levels of Loss-On-Ignition after European arrival may be due to phragmites (seen at every location) or due to the waste water present at both Piermont and Alley Creek. Through analyzing the changes in Loss-On-Ignition, and the exact biota in macrofossil analysis, the optimal level of biodiversity and health can be correlated to the highest loss-on-ignition percentage. This research shows the potential implications of restoring marsh health.

Awards Won:
Geological Society of America &amp
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