

Grain Size, Backscatter and Metal Concentration in Eastern Long Island Sound

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Infrastructure development in Long Island Sound (LIS) is expected to increase in the near future. However, insufficient information on the ecology and environment of the region has proven to be a barrier in legislative decision making. As a result, Lamont Doherty Earth Observatory (LDEO), University of Connecticut, Queens College and NOAA have begun a survey of grain size, sedimentary environment and metal concentration in three LIS infrastructure “hotspots.” Sampling of the “Pilot” (Central LIS) region was completed in 2014, and Phase II (Eastern LIS) is scheduled to begin in late August 2017. To prepare for Phase II, grain size and metal concentration data from past studies in the Eastern LIS (ELIS) region, as well as data collected in the Pilot study, were combined to create a map predicting target sampling locations. Target locations were based on multiple analyses: Grain size, backscatter and metal concentration. Grain size analysis consisted of overlaying grain size backscatter raster data and grain size sample locations in ArcGIS within the pilot region. The means of these two data sets were graphed, and the resulting linear regression was used to reclassify backscatter raster data into eight grain size categories (phi values). This linear regression model was applied to the Phase II region, reclassifying backscatter into phi values and providing a map of expected grain size distribution in the Phase II region. Grain size results indicated that most of the Eastern Long Island Sound is composed of coarse grained materials like sand. Metal Concentration analysis consisted of mapping metal concentrations in the ELIS, and comparing those metal concentrations to grain size. Metal analysis results showed a positive correlation between 6 out of 16 metals in the ELIS and fine grained sediment. Taking this information into account, 300 target sampling locations were determined in the Phase II region. High levels of coarse grain sediment and low metal concentrations are expected throughout the ELIS.