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Benthic Habitat Mapping in New York Coastal and Estuarine Waters

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High-resolution bathymetric and backscatter studies are being undertaken in the nearshore, coastal and estuarine waters of New York to understand the nature and distribution of benthic habitats, sediment types and processes and cultural artifacts. We are particularly interested in benthic community structure and the relationships between benthic communities and sea-floor acoustic properties, especially backscatter. Information on the character and distribution of benthic communities in coastal environments is necessary for understanding the importance of different terrains, an essential component of ecosystems-based management. We are characterizing the sediment surface using high-resolution EM 3000 multibeam bathymetry and backscatter along with side-scan sonar. Sediments with a range of backscatter characteristics are sampled for sediment properties and benthic fauna, and benthic organisms are identified and counted. There are complex but resolvable patterns in bottom sediment characteristics, and geophysical and sediment data are being used to create maps of sediment type and bottom morphology. In particular, regions of low backscatter generally are areas of recent fine-grained sediment accumulation. The primary morphological elements of these areas include current-created bed forms such as sand waves and occasional furrows, mounds with biological origins, and rock outcrops. We also observe features created by sand mining, navigation dredging, clamming (both mechanical and by hand), moorings, anchor drags, dredge-spoil disposal, cargo sweeping deposits, aquaculture structures, and shipwrecks. Statistical analysis of the backscatter, faunal and sediment data set indicates that benthic communities are highly correlated with acoustical backscatter characteristics. However, our results to date suggest that there are likely to be more morphological zonations in an area than distinct benthic communities.