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Developing methodology for efficient eelgrass habitat mapping across lidar systems

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Developing Methodology for Efficient Eelgrass Habitat Mapping Across Lidar Systems.

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Super Storm Sandy, the second costliest hurricane in U.S. history, made landfall on the east coast of the U.S. in October 2012. In an attempt to assess the impacts of the storm on coastal ecosystems, several U.S. mapping agencies such as the National Oceanic and Atmospheric Administration (NOAA), the U.S. Geological Survey (USGS), and the U.S. Army Corps of Engineers (USACE) commenced data collection efforts using a variety of remotely-sensed data types including aerial imagery and topobathymetric lidar. The objective of this study was to investigate the applicability of object-based image analysis techniques for benthic habitat mapping. Bathymetry and reflectance data collected by a Riegl VQ-820-G system and the AHAB Chiroptera system along with aerial imagery (Applanix DSS) were compared using an objectbased image analysis (OBIA) technique to classify dense eelgrass beds, mixed sand and macroalgae, and sand habitats. In order to determine the efficacy of this method for benthic habitat classification it was also compared to a manual method of classification from aerial imagery. The resulting habitat maps were compared between systems to determine the feasibility of using one OBIA classification rule set across lidar systems and aerial imagery. Our preliminary results using the Riegl system suggest our methodology correctly classified 85% of benthic habitats. Preliminary results using the Chiroptera also suggests similar accuracy of classification. This methodology will allow streamlined creation of habitat maps for coastal managers and researchers using large sets of data collected by multiple sensors. Testing of this OBIA methodology is ongoing as new data from various sensors becomes available.