OBSERVATIONS OF ACOUSTIC BACKSCATTER AND CURRENT VELOCITY ABOVE AN EELGRASS CANOPY OVER MULTIPLE TIDAL CYCLES

Norton, A.R. (1) and Dijkstra, S.J. (1)

(1) Center for Coastal and Ocean Mapping, University of New Hampshire, Durham, NH

Acoustic mapping of eelgrass beds has the potential to document, in three dimensions, the structure of an eelgrass canopy. However, the acoustically-measured height of a submerged canopy can vary by more than 50% due to plant pronation in response to hydrodynamic forcing. In May of 2016, a multi-beam echosounder, high-resolution current profiler and high-definition video camera were deployed on a custom-built stationary frame above an eelgrass canopy in New Castle, NH. The objectives of the study were (1) to observe how the varying posture of the eelgrass canopy due to currents affects the acoustic backscatter signature and (2) to verify, in the field, a laboratory-tested model by Luhar and Nepf (2011) for deflected canopy height under varying hydrodynamic forcing. Acoustic, current velocity, and video data were collected continuously over several tidal cycles, and plant morphological characteristics (blade length, thickness, width) were sampled periodically during the deployment. Preliminary results indicate that the acoustic signature of a fully-pronated canopy differs significantly from an upright canopy, and that changes in the acoustically-measured canopy heights are correlated to changes in horizontal current velocity. Continuing work will also try to examine the changes in acoustic backscatter intensity from the canopy with changing light levels and time of day. These data offer an interesting snapshot of the daily and weekly variability of parameters that may affect the acoustic signature of an eelgrass canopy.