1pAOa4. Use of a 600-kHz ADCP to characterize submerged aquatic vegetation in a very shallow estuary. Joseph D. Warren and Bradley J. Peterson (Southampton College of Long Island Univ., 239 Montauk Hwy., Southampton, NY 11968, joe.warren@liu.edu)

Submerged aquatic vegetation (SAV) serves as a key habitat for the larval forms of many commercially important marine organisms. In coastal waters, anthropogenic factors can cause severe damage and loss to this habitat. In order to measure changes in the spatial coverage of SAV, aerial photography or diver surveys are required. We investigated an alternative approach using a high-frequency (600 kHz) acoustic Doppler current profiler to make high-resolution (in the vertical) measurements of the scattering in several very shallow bays in Long Island, NY. These data were used to determine the presence and amount of SAV in an area. Diver surveys provided ground-truthing of these data. Field measurements are also compared with an acoustic scattering model for eel grass (a common SAV type in the northeast United States). The purpose of this project was to determine whether acoustic sampling of benthic vegetation could accurately determine species type and coverage. If this is possible, then acoustic sampling could provide maps of spatial and temporal changes in SAV distribution and abundance. [Work was supported by an award from UNH CICEET.]

1pAOa5. Acoustic scattering by benthic shells: Dominant scattering mechanisms and applications. Timothy K. Stanton and Dezhang Chu (Woods Hole Oceanograph. Inst., Dept. of Appl. Ocean Phys. and Eng., Woods Hole, MA 02543, tstanton@whoi.edu)

When benthic shells occur in sufficiently large numbers, they can dominate acoustic backscattering by the seafloor, especially at angles of incidence away from normal. In order to use sound as a tool to remotely detect and quantify the shells, the scattering properties of the shells need to be understood, both in free-space as well as when placed on the seafloor. Through laboratory experimentation, it has been determined that the edges of certain types of shells (such as bivalves and sand dollars) can dominate the scattering over an important range of grazing angles. The surfaces of these shells and others dominate under other conditions. The dominant scattering effects are discussed in the context of interpreting acoustic backscatter data in terms of meaningful parameters such as numerical density of the shells.

1pAOa6. Acoustic mapping of squid egg clusters and their bottom habitat in Monterey Bay, California. Kenneth G. Foote (Woods Hole Oceanogr. Inst., Woods Hole, MA 02543), Roger T. Hanlon (Marine Biological Lab., Woods Hole, MA 02543), Pat J. Iampietro, and Rikk G. Kvitek (California State Univ., Seaside, CA 93955)

Clusters of gelatinous egg capsules, known as mops or beds, of the market squid (*Loligo opalescens*) were mapped in a shallow-water, sandy habitat of Monterey Bay, California. The benthic egg clusters were imaged using an EdgeTech 272-TD dual-frequency sidescan sonar towed from R/V MACGINITIE, an 8-m-long survey vessel, with data recorded on a Triton Elics International Isis digital data acquisition system. Verification of target identity was accomplished independently by video photography from a remotely operated vehicle. The survey area included a 4-km stretch of sandy seafloor between Lover's Point and Cannery Row in Monterey at depths of 15–30 m. The study area had previously been mapped using the RESON SeaBat 8101 240-kHz multibeam sonar. Resulting high-resolution bathymetric data, with 1-m resolution, were used during the survey planning and execution. Squid egg clusters were clearly visible in the very-high-resolution, 400-kHz backscatter imagery, with pixel size 10–20 cm, recorded from the towed sidescan sonar. The concentration of egg clusters was greatest along a sloping feature believed to be a submarine fault. Egg mops with diameter as small as 0.5 m were distinguishable. [Support by Sea Grant is acknowledged.]

1pAOa7. How useful is bathymetric information in the classification of high frequency sonar surveys? Louis Atallah (Inst. of Informatics, The Br. Univ. in Dubai/ The Univ. of Edinburgh, P.O. Box 502216 Dubai, UAE) and Penny Probert Smith (Univ. of Oxford, Oxford, OX1 3PJ, UK)

In several sonar studies, bathymetric information; is used for the correction of amplitude data and the calculation of backscattering strength, which is plotted versus grazing angle and used for seabed classification. Bathymetric data is also used as an easily viewed backdrop to visualize backscattered sonar data in surveys. This work proposes an automatic method that combines amplitude features (describing backscattering strength and sonar texture) with bathymetric features (indicating seafloor variability) for sonar classification. Features are selected per window (of user defined size) and areas around grab samples in a survey are used for training. The importance of bathymetric features is investigated in this study, and highlighted by feature selection algorithms as well as by scatter plots exploring the training areas. Classification rates are significantly improved when both amplitude and bathymetry features are used. The final results show the classified windows plotted versus their exact position in the survey. The method described in this work is applied to a sidescan bathymetric sonar dataset taken in Hopvagen Bay Norway. The methods are also applicable to other sonars which provide bathymetric information; a multibeam sonar is such an example.