

Seafloor Acoustic Properties Studies in Shallow Water: High-Resolution Surveys in Panama City, Florida

Matt Levey¹, Ana García-García^{2,1}, Dan Orange^{3,2}, Marianne Mulrey⁴, Geoff Shipton⁵, Isabelle Herbert¹ and RV Pelican field party

¹AOA Geophysics Inc., Moss Landing, CA 95039, USA; ²Department of Earth and Planetary Sciences, UCSC, Santa Cruz, CA 95064, USA; ³Black Gold Energy, Jakarta 12730, Indonesia; ⁴AOA Geophysics Inc., Austin, TX 78705, USA; ⁵Triton Imaging Inc., Watsonville, CA 95076, USA;

The first of two field programs designed to evaluate variations in seafloor and shallow sub-surface acoustic properties were completed during June 2007 at St. Andrews Bay, Florida, USA. This first program included the acquisition, processing, and interpretation of high-resolution geophysical data including multibeam bathymetry and backscatter, sidescan sonar imagery, and sub-bottom profiling. In addition to seasonal and spatial variations in seafloor characteristics, we are examining differences in acoustic signature of the seafloor between two multibeam echosounder frequencies.

Multibeam bathymetry and backscatter data were acquired using two Kongsberg Simrad multibeam echosounders pole-mounted side by side on a 34.4 meter survey vessel. The systems were an EM3002 operating at 300 kHz and an EM1002 operating at 95 kHz. The systems shared a single motion reference unit (MRU) and were operated concurrently. Sidescan sonar imagery was acquired with a dual frequency Benthos SIS-1000 operating at 90-110 kHz. Six survey areas (2km x 2km) were chosen because of their for potential variation in acoustic properties. Preliminary processing of the bathymetric data at 0.5 meter resolution revealed detailed seafloor features and differences between the two multibeam systems in their ability to resolve these features. At one site in a water depth of 10 meters, the lower frequency EM1002 resolved features just below the seafloor that the EM3002 did not. The sidescan sonar mosaics indicate patterns of higher/lower reflectivity that match the bathymetry observed in the multibeam images.

Processing of the multibeam backscatter is in progress and to date only qualitative analyses of these data have been performed. The next step in our research will be to conduct quantitative analysis of the vertical resolution of the two multibeam systems.