



Multi-frequency acoustic seabed characterization in shallow gas bearing sediments in Dunmanus Bay, SW Ireland

Xavier Monteys (1), Stephen Bloomer (2), and Ross Chapman (2)

(1) Geological Survey of Ireland, Marine Section, Dublin, Ireland (xavier.monteys@gsi.ie), (2) Canadian Marine Acoustic Remote Sensing Facility, University of Victoria, Victoria, BC V8W3V6

Multi-frequency multibeam and single-beam acoustic datasets have been analyzed in an attempt to characterize the near-seabed physical environment in Dunmanus Bay. This is an embayment located in the SW of Ireland characterized by a diverse seabed geology including rock outcrops, fine soft sediments, pockmark occurrences and shallow gas. Multiple concurrent acoustic datasets were acquired from two high frequency systems (EM1002 - 95 kHz & EM3002D - 300 kHz) onboard the R.V Celtic Voyager, as part of INFOMAR, the Irish national mapping program (www.infomar.ie). Multibeam backscatter data were examined by extracting a set of statistical parameters, at selected incidence angular ranges, and performing multivariate analysis. Resulting classification was correlated to sediment's physical descriptors and described using additional groundtruthing collected during the survey. Dual frequency single-beam echosounder datasets (EA400 operating at 38 kHz & 200 kHz) were analyzed by extracting a number of echo shape and amplitude features from the wave envelope data and these features were compared with the multibeam results. In general, it was found that there was a good correlation between the single-beam features and the multibeam seabed surface classification. On the other hand, increased penetration of the 38 kHz acoustic signal into the subsurface, particularly in soft sediments, enabled the gas related echo-facies to be better constrained.