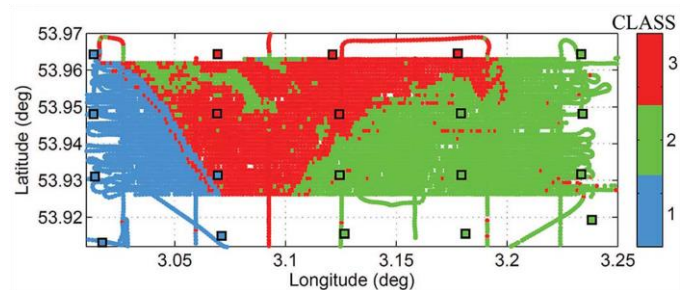
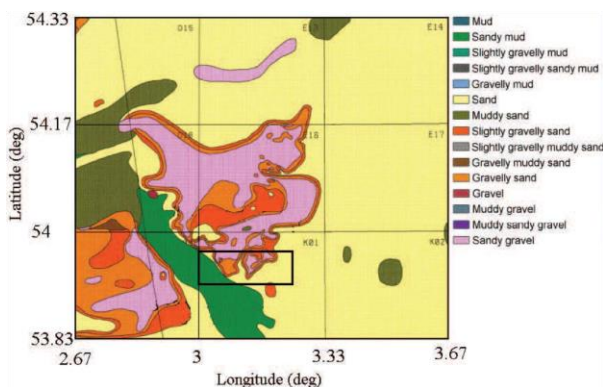


Theme: Acoustic Remote Sensing

# Use of low-cost single beam echo sounders for seafloor monitoring

Seafloor/riverbed bathymetry and sediment classification is of great importance for many off-shore applications. There are currently several remote sensing techniques available to reach this goal. The methods range from high-precision high-coverage multi-beam echosounders to cost-effective lower-precision non-acoustic methods like LIDAR techniques. In this project, two low-cost echologgers EA400 and AA400 will be tested as a potential tool for seafloor monitoring. The performance of these equipment will be investigated under real-world circumstances. A reference area in which the depth and sediment composition are known is selected to investigate the performance of the echologgers.

The goal of this project is twofold. 1) It is required to investigate the performance of these newly available altimeters at depth determination at coastal areas. Different depths ranging from a few meters to a few tens of meters will be investigated. 2) We also investigate the potential of these instrument for seafloor sediment classification. In general, the backscatter values and in particular the echo shape (the shape of the received signal) are tools for sediment classification. Echo shapes of received signal will be used to extract a few statistical features. The principal component analysis (PCA) is used to reduce the number of features and the k-means clustering method is used to obtain a number of sediment classes. For further information you may refer to Amiri-Simkooei AR, M Snellen, DG Simons (2011), Principal component analysis of single-beam echo-sounder signal features for seafloor classification, IEEE Journal of Oceanic Engineering 36 (2), 259-272.

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