



Acoustic remote characterization of grain-size on the seabed of the inlet channel of the Tagus River estuary (Portugal)

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The use of acoustic remote characterization allows mapping the seafloor, including discrimination of different seafloor types. In this study, we used the Angular Range Analysis (ARA) technique to analyze the backscatter data from four distinct surveys acquired by different multibeam echo sounders systems to estimate the mean grain-size of sediments at the seabed of the inlet channel of the Tagus River estuary. The correlation between the ARA and laboratory results (mean grain size) presents in most cases a moderate to a strong linear relationship and the standard deviation of the residuals of the mean grain size between the ARA and the laboratory results varied between 0.52 and 1.01 [U+F066]. Therefore, we show in this study that it is possible to apply acoustic remote characterization to highly hydrodynamic areas such as the Tagus River channel. There are however, regions where the higher residuals of the standard deviation of the mean grain size between the ARA and the laboratory results do not allow mapping with accuracy the sediments grain-size. These difficulties can be explained by the existence of certain singularities: regions with poor sediment sorting; changes in the seabed that occurred during the time interval between the hydrographic and sediment sampling surveys; solid input from tributary rivers; dumping of dredged material; positional inaccuracy of the samples; insufficient signal penetration of the multibeam echo sounders system to represent the vertical variation of the samples; and sediment mixing of vertical sedimentary structures during sampling.