



Sediment Characteristics and Trace Element Geochemistry over a Sand Ridge at the Exit of Bosphorus Strait, Turkey

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The sediment input, transport and deposition at the junction of the Strait of Istanbul (Bosphorus) and the Sea of Marmara have been an ongoing debate for several years. The region reflects the presence of a rather intricate submarine topography controlled by the deep channel exit of the Bosphorus strait and a sand ridge evolved on the relict deposits during the Late Pleistocene-Holocene. The main scope of this study is to assess the textural characteristics of sediment, associated with its organic matter and heavy metal content. The granulometric data reflected a multimodal character in sediment distribution. The surficial sediment over the sand ridge and on the depression channel behind this ridge, where the calculated net sediment transport vectors present elliptical closures, are bimodal and trimodal in character. The concentrations of major and trace metals in surface sediments displayed significant spatial diversity. The shallow sediments close the coast are enriched in Pb, Cr, Cu, Zn and Cd and to a lesser degree in As, reflecting anthropogenic inputs from the Istanbul Metropolitan area and to some extent from the Black Sea via the Bosphorus strait. The distribution of EF values for these metals presents evidently the importance of anthropogenic influence. On the basis of statistical analyses the anthropogenic impacts on the study area have been classified into three distinct regions, the most severe condition along the coast. The strong currents, driven by the Bosphorus-jet, control deep sediments and re-build them up as coarse-grained sediments on the submerged shelf, usually on suitable places where the current speed decreased or deviated.