

Sedimentary record and degree of heavy metals contamination in near shore area of southwestern Black Sea, Turkey

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The study of coastal sediments provides useful information on marine environmental conditions and pollution history. This work aims to reconstruct the temporal distribution of metals and investigate the anthropogenic enrichment for Al, As, Cd, Co, Cr, Cu, Pb, Mn, Ni, V and Zn during the Twentieth and early Twenty First centuries. Three sediment cores were collected from the seabed in the southwestern Black Sea in 2013 were investigated through the variability in grain-size and selected elementations to characterize the historical development of trace metal contamination. Selected element contamination of the sediments was assessed on the basis of the enrichment factor (EF), contamination factor (CF) and pollution load Index (PLI). The core sediments consist mainly of clay (49-74%) and silt (23-41%) with small amounts of sand (0.5-14%). The average concentrations of metals measured in mg kg⁻¹ are; 55710 for Al, 30 for As, 1,1 for Cd, 14 for Co, 79 for Cr, 32 for Cu, 1472 for Mn, 60 for Ni, 41 for Pb, 122 for V and 120 for Zn. Generally, all heavy metals (Co, Cr, Cu, Pb, Mn, Ni, V and Zn) and arsenic show an overall increasing trend from 50 cm to top of the sediment cores. Based on the vertical distribution of trace metals and their EF and CF values, the Southwestern Black Sea shelf sediments are moderately polluted with As, Co, Cr, Cu, Pb, Mn, Ni, V and Zn, and unpolluted to moderately polluted with Cd. The EF, CF and PLI values indicated anthropogenic influence caused by the input of untreated industrial wastewater, agricultural activities and domestic sewage from the large European and Asian rivers. The results of the present study were obtained with the support of the TUBITAK project 114Y240.