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Geo-environmental assessments of heavy metals in surface sediments from coastal plain deposits, Arabian Gulf, Kuwait

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The present study focused on the investigation distribution of seven heavy metals (Pb, Zn, Cu, Ni, Cr, Cd, As) collected from surface sediments at two locations Mina Shuwaikh and Mina Abdulla beach sediment area, which lie between the Shuwaikh area in north to Mina Abdulla area in south. The study reveals that the order of the mean concentrations of tested heavy metals in sediments of Mina Shuwaikh beach sediment area and Mina Abdulla beach sediment area is respectively Zn>Cr>Ni>Cu>Pb>As>Cd and Zn>Cr>Ni>Pb>Cu>As>Cd. Indication from both the contamination factor and degree of contamination is that all the measured heavy metals, excluding Pb and Cd, exhibits low contamination status in the sediment. Based on geo-accumulation index, the sediments are generally classified as unpolluted with regards to the measured heavy metals. The computed Enrichment Factors (EF) showed that some heavy metals (Pb, Zn, Cr and Cd) have values of up to 1, which indicated the enrichment through lithogenic and anthropogenic sources. Further screening revealed that more than 50% of calculated EF values for the Pb, Zn, Cr and Cd are from lithogenic sources, thereby suggesting that the main sources of pollution are geogenic materials. Results of pollution load index conclude that sediments from both Mina Shuwaikh beach sediment area and Mina Abdulla beach sediment area are generally unpolluted.

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