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Assessment of Heavy Metals Pollution in the Sediments of Euphrates River, Iraq

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ABSTRACT

Fourteen bed sediments samples were collected from the Euphrates River in order to determine concentrations, seasonal, spatial and contamination assessment of heavy metals such as Pb, Cd, Zn, Cu, Ni, Co, Fe, Mn and Cr. The mean concentrations are as follows: 2249.47 mg/kg for Fe, 228.18 mg/kg for Mn, 67.08 mg/kg for Ni, 58.4 mg/kg for Cr, 48.00 mg/kg for Zn, 28.16 mg/kg for Co, 22.56 mg/kg for Pb, 18.91 mg/kg for Cu and 1.87 mg/kg for Cd. To assess metal contamination in sediments, sediment quality guidelines were applied. The mean concentration of Cd, Cu, Ni, Fe, Mn, and Cr exceeded the USEPA guideline. The metal contamination in the sediments was also evaluated by applying enrichment factor (EF), contamination factor (CF), geo-accumulation index (Igeo) and pollution load index (PLI). Based on enrichment factor (EF), the Euphrates River sediments have very high enrichment for Pb, extremely high for Cd, moderate for Zn, significant to very high for Ni, very high to extremely high for Co, moderate to significant for Mn and significant to very high for Cr. According to contamination factor (CF), Cd and Cr are responsible for very high contamination. According to Igeo, the Euphrates River sediments are moderately to strongly polluted by Cd. Based on PLI, all sampling sites suggest no overall pollution of site quality.

KEYWORDS

Heavy Metals; Euphrates; River Sediments; Pollution; Iraq

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