

Environmental Geochemistry of Heavy Metals in Coastal Sediments of Gawatr Bay, Southeast Extreme of Iran

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Abstract

In this investigation, coastal sediments of Gawatr bay were studied to assess the degree of heavy metal pollution as a consequence of natural and anthropogenic sources. Samples were collected from 14 stations in summer 2009, and analyzed by Inductively Coupled Plasma Mass Spectrometry for Fe, Mg, Mn, Pb, Zn, Cu, Cr, Cd and Ni. These concentrations were compared with environmental investigation limits. In addition, sediment samples were exposed to wet sieving and Laser Particle Sizing and organic matter determination. Geochemical normalization maps confirmed that most of heavy metal concentrations were related to coastal sediments of Pasabandar harbor in which, concentrations of Fe, Mn, Pb, Zn and Cr were 3.15, 2.53, 1.35, 4.24 and 100 times background concentrations in study area respectively. The reason for these contaminations is reparation and maintenance of fishing vessels as well as wastewater discharge into semi-closed Pasabandar harbor. Due to sedimentological characteristics of bottom, and high organic matter content, mangrove ecosystems growth in Gawatr estuary provide an aggregation area for some heavy metals in Gawatr bay. Correlation coefficients confirm that organic and inorganic colloids such as Fe, Mn hydroxides as well as clay minerals have a significant role in bioavailability of heavy metals in study area. High correlations among Cr, Mg, Ni and Fe showed that dissolution of ophiolitic formations by Bahu-kalat river is an important factor for heavy metal accumulation in Gawatr bay. In this research, it was also delineated that shrimp farm has no obvious effect on heavy metal pollution in the area.

Keywords: *Gawatr bay, Heavy metals, Pollution, Geochemical maps.*
