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Effects of seasonal anoxia on the distribution of phosphorus fractions in the surface sediments of southeastern Arabian Sea shelf

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Abstract

The seasonal upwelling along the southeastern Arabian Sea (SEAS) brings cold, nutrient-rich low oxygen subsurface water to the continental shelf. The subsurface oxygen deficiency due to upwelling is severe in some years, the intensity of which could profoundly influence the nutrient cycling along the SEAS. Herein, we studied the effect of seasonal anoxia on fractionation of phosphorus during the peak upwelling period of August 2013. Abundance of five fractions of phosphorus (P), namely exchangeable or loosely sorbed P (P_{ads}), iron-bound P (P_{Fe}), authigenic P (P_{aut}), detrital apatite plus other inorganic P (P_{det}) and organic P (P_{org}), in surface sediments of SEAS shelf has been studied using a sequential extraction procedure (SEDEX) to examine their distributions and sources. Total P (TP) concentrations ranged from 209 to 1081 $\mu\text{g g}^{-1}$ with an average of $508 \pm 256 \mu\text{g g}^{-1}$. Among the five P fractions, the authigenic P

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