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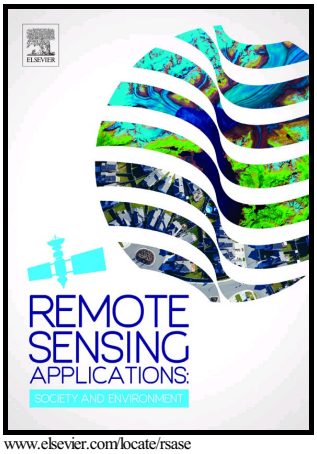

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Influence of coastal morphology on the distribution of heavy metals in the coastal waters of Tupilipalem coast, Southeast coast of India

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Abstract

To detect the shoreline changes, multitemporal satellite images of Landsat 8 OLI/TIRS dated October 27, 2014 (Monsoon) and August 27, 2015 (Premonsoon) were downloaded from USGS, Earth Explorer. Remotely sensed multi-date image analysis revealed that sandbar across the lagoon mouth is highly dynamic. Lagoon mouth closure was observed during monsoon and opened during premonsoon. To understand the influence of coastal morphology on the distribution of heavy metals from the waters of Tupilipalem coast, Southeast coast of India, a total of 13 bottom water samples were collected at a depth of < 2m near coast and analyzed with ICP-OES for the heavy metal concentrations. The heavy metals were assessed by factor analysis and hierarchical cluster analysis. The Pearson's correlation analysis yielded positive correlations among Fe, Cr and Zn during monsoon, similarly, Fe and Ni during premonsoon. The concentrations of heavy metals in the bottom water of Tupilipalem coast could be arranged in the following sequence: Fe> Pb> Zn> Ni> Cu> Cr> Cd> Mn. The significant seasonal variation among the studied heavy metals is the proxy for the influence of seasonal lagoon mouth closure.

Key words: Lagoon mouth dynamics, heavy metal pollution, statistical analysis, Dugarajapatnam port