

Particulate metal geochemistry of Nethravati estuary, southwest coast of India

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Seasonal suspended particulate matter (SPM) and bed sediments were collected for one year from the Nethravati estuary. Nethravati is a small tropical mountainous river draining predominantly granite-gneisses, charnockites and metasediments belonging to Archean, and alluvium and laterites of quaternary-tertiary period. The heavy metals in the Nethravati estuary and their geochemical behaviour are studied. The suspended particulate matter and its metal chemistry show strong seasonal and spatial variation in the estuary. The Fe and Mn oxyhydroxides are important carriers of metals in the estuary; however, the abundance of oxyhydroxides in the estuary is highly seasonal. The Fe oxyhydroxides are abundant in the estuary compared to Mn oxyhydroxides. Maximum concentration of heavy metals in the estuary was observed at low Fe/Mn ratio, suggesting role of Mn oxyhydroxides in the metal partitioning. The metal geochemistry in the estuary is driven by the redox cycling of metals in the estuary coupled with adsorption-desorption of metals on to the metal oxyhydroxides. The heavy metal concentrations in the estuarine bed sediments are higher than the suspended particulate matter (SPM). However, from the pollution point of view, the concentrations of heavy metals are not enriched and are within the limits.