

Trace Metal Characterisation of the Atmospheric Particles Transported to the South-Eastern Arabian Sea

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The south-eastern Arabian Sea is one of the high productive regions of the Arabian Sea due to high river runoff as well as upwelling. This region is unique because of heavy rainfall and prevalence of humid climate over the south-western India. An attempt has been made here to distinguish the sources of trace metals in the suspended particulate matter of rain water (SPM) around Mangalore to the south-eastern Arabian Sea.

Alkali and alkaline earth elements (Na, K, Ca and Mg) in the SPM are enriched by factors of 2 to 10, but depleted in Al, Fe, Mn and Co by similar factors compared soils around the region, suggesting the dominance of long-range transport of SPM rather than that from the local soils. The SPM collected during the pre-monsoon (spring inter-monsoon) is particularly enriched former group of elements due to the influence of deserts surrounding the Arabian Sea. The hazardous trace metals (Ag, As, Cd, Cu, Zn, Ni, and Pb) are enriched by factors of 2 to 50 as compared to soils near the study area, reflecting the influence of anthropogenic processes like biomass burning, fossil fuel combustion, as well as emission particles from ferrous and non-ferrous industries. The contamination of trace metals appears to be maximum during the winter monsoon perhaps be due to the major reversal of wind direction from south-west to north-east over the large Indian sub-continent. This study indicates that the atmospheric transport of trace metals to the marine environment is significant even in the humid regions.