

Monsoon control over the Trace Metal fluxes in the Arabian Sea

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Settling fluxes of Al, Fe, Mg, Mn, Co, V, Pb, Ni, Cd and Cu were measured in the Eastern, Central and Western Arabian Sea using nine sediment traps deployed at different depths. Results indicated that annual fluxes of the lithogenically associated trace metals such as Al, Fe can be accounted by the atmospheric aerosol fluxes. Annual flux of Mg is almost double in the western Arabian Sea when compared to the eastern Arabian Sea and ~50% of appears to be carbonates. Redox sensitive elements such as Mn and Co show high fluxes at the western side where the denitrification layer is absent. More than 70% settling fluxes of Pb, Ni and Cu appears to be anthropogenically enriched and atmospherically transported to the deep Arabian Sea. Enrichment factor of these elements are comparable to the aerosols particles reported.

During the North East monsoon period and the Spring Inter monsoon period, the enrichment factor of trace elements in the settling particles increase remarkably. Relating the EF with SSMI winds and the aerosol index from Nimbus/TOMS satellite reveals that the enrichment is controlled by the wind direction and the provenance of aerosols. The enrichment factor in the settling particles decrease drastically, during the South West monsoon due to the absence of non-polluted aerosols in the Southern Hemisphere winds.

However, increased flux of most of the trace elements is observed during the beginning of the South West monsoon period. It indicates that the trace elements deposited during the Pre-SW monsoon period accumulate in the surface water and transported to Deep Ocean along with the biogenic particles.