

REEs and ϵ_{Nd} in the north-eastern Indian Ocean

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North-eastern Indian Ocean is important in terms of global ocean circulation as it acts as conduit between the Indian and the Pacific Ocean. The Indonesian Throughflow (ITF) connects the Pacific and the Indian oceans and transports ~ 10 million m^3/s less saline and warmer water from Pacific to Indian Ocean and hence impact climate phenomena such as ENSO and the Indian Monsoon. REEs and ϵ_{Nd} are routinely being used to track the oceanic water masses, however these data are very sparse in the north-eastern Indian Ocean constraining the knowledge of transport of water from Pacific to Indian Ocean and about the water masses present in the Andaman Sea, a back arc basin. In this study an effort is being made to understand the water masses present in the north-eastern Indian Ocean, their movement and process influencing the biogeochemistry of trace elements in this region by measuring dissolved REEs and ϵ_{Nd} in profiles from Arabian Sea to eastern Indian Ocean upto $13.82^\circ S$ and $101.49^\circ E$ and then to the Andaman Sea. ϵ_{Nd} varies from -13.64 in Bay of Bengal to -2.94 in far east station ($13.82^\circ S$ and $101.49^\circ E$). Non-radiogenic values observed in the Bay of Bengal has been reported due to release of Nd from particles of the Ganga-Brahmaputra origin. In the far eastern Indian ocean ϵ_{Nd} varies from -2.94 near surface to -7.97 near bottom at ~ 4000 m. Radiogenic Nd near surface in the eastern Indian Ocean indicates supply of Indonesian Throughflow to the Indian Ocean. $\epsilon_{Nd} \sim -7$ in deeper water seems to be sourced from southern origin water. More radiogenic ϵ_{Nd} of the intermediate waters of the eastern Indian Ocean compared to the NIIW in the Arabian Sea indicates acquisition of radiogenic Nd from shelf sediments of volcanic origin through exchange process. The Andaman Sea is characterise by ϵ_{Nd} values ~ -11 near surface to -9 at bottom, similar to those observed in nearby Bay of Bengal. In addition to water masses, particles of different sources such as those from the Ganga-Brahmaputra-Irrawady and volcanic origin seem to control the dissolved ϵ_{Nd} of the north-eastern Indian Ocean.