ANNUAL REPORT ON GEOTRACES ACTIVITIES IN INDIA

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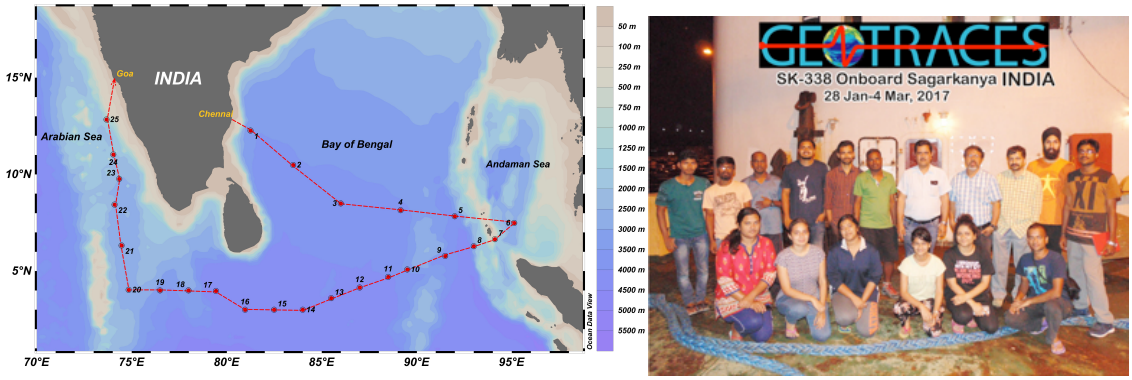
The GEOTRACES-India cruise in the Indian Ocean

The GEOTRACES-India cruise onboard Sagar Kanya (SK 338, GI10; Fig. 13) was started on January 28, 2017 from Chennai and ended on March 3, at Goa with about 20 participants (Fig. 14). During 35 days of cruise time samples for trace elements and isotopes in seawater, sediments and aerosol have been collected in the Bay of Bengal, the Andaman Ocean, the Indian Ocean and the Arabian Sea in 25 sampling stations. The cruise was successful and most of the objectives of the cruise were met. For the first time, McLANE pumps were operated successfully to collect the particulate matter.



Figures 13 and 14. *Cruise track for SK 338 and the participants.*

Dissolved Zinc (DZn) distributions from the Northeastern and Indian Oceans

Total dissolved Zinc (DZn) were analyzed in 12 full vertical profiles to understand their distributions in the northeastern Indian Ocean including Andaman Sea and Indian Ocean. DZn was measured using flow injection system by fluorometric detection. Overall, the DZn concentrations range from 0.24 nM to 11.53 nM with surface low and increased with depth, indicating a typical nutrient type distribution. Relatively high surface (≤ 25m) concentrations was observed in the northern stations closer to the river prone Ganga-Brahmaputra, Irrawady and Salween rivers compared to the southern stations. A strong Zn-Si relationship was observed in all stations sampled in the northeastern Indian Ocean with a slope consistent to a global average value. Decoupling of Zn and Si in some of the stations where dissolved oxygen is less than 50 µM has been observed in the transect.

Dissolved eHf in the Indian Ocean

As a part of GEOTRACES-India programme, Hf isotopic compositions were measured, for the first time, in the Arabian Sea and North-East (N-E) Indian Ocean water columns. Surface waters in the northen AS are unradiogenic in ε_{Hf} compared to southern AS, indicating the continental input from the Himalaya and aeloian inputs. ε_{Hf} varies within a narrow range of -2.16 to 2.14 in the intermediate to bottom waters of the Arabian Sea. In the N-E Indian Ocean waters, ε_{Hf} varies from -10.35 to +7 .78.Surface waters of the Indian Ocean are quite less radiogenic Hf, which is possibly resulting from the dissolution of unradiogenic Hf from the sediments delivered from the G-B system in the north and dust deposition from Australian deserts in the southern Indian Ocean. Deep and bottom waters of Andaman Sea having high

radiogenic ε_{Hf}, which could be due to local input from volcanics. Deep and bottom waters in the BoB also moderately less radiogenic, could be due to leaching of sediment discharged from the G-B system. The intermediate waters of the BoB are radiogenic in Hf, similar to those of the Andaman Sea which indicates the supply of the intermediate water from the Andaman to the Eastern BoB. However, the deep and bottom waters from the Indian Ocean display a ranges of 0.32 to 4.96 and -0.56 to +3.95respectively.

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