## Growth History of a Ferromanganese Crust from the Afanasiy-nikitin Seamounts, Equatorial Indian Ocean

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A 60 mm thick <sup>10</sup>Be dated Fe-Mn crust from the Afanasiy-Nikitin Seamount (ANS) was studied for the past long-term variations in the oceanographic conditions recorded by its chemical composition. The ANS is located at ~3°S and 83°E, in the vicinity of the distal Bengal Fan, in the Eastern Equatorial Indian Ocean. The accumulation rate was high during the early periods of crust accretion (up to 8 mm/my), where as, in the section between 25 and 5 mm the accretion rate ranged between 4.3 and 2.6 mm/my. A very slow rate of accretion (0.84 mm/my) is recorded in the topmost 5 mm. The specimen records two events of high silicate detritus input with corresponding dilution of oxide-bound elements. During the early stages of the Fe-Mn crust growth (~ 17 Ma to 14 Ma), the oxide precipitation was associated with significant deposition of silicate detritus that apparently resulted in dilution of oxide-bound elements. The silicate detritus content decreased and the oxide-bound element contents increased until 7.5 Ma. The second event of high silicate detritus input occurs at ~ 7 Ma with expected dilution of oxide-elements. The mineralogy of the silicate material is dominated by quartz and feldspar, which at the outset suggests that the source of silicate detritus must have been continental crust. The Nd-Sr isotopic composition of silicate matter extracted from five bulk crusts collected at different water depths from the ANS-flank have Nd between -7.41 and -9.8 and <sup>87</sup>Sr/<sup>86</sup>Sr between 0.7081378 and 0.7096762. These values at the outset suggest that the main source provenance of silicate matter may have been the Himalayas, but with minor contributions from Indonesian Arc. This interpretation is supported by the earlier observations of Derry and France-Lanord (1996) that the Himalayas were the main source of sediments to the distal Bengal Fan in particular and Indian ocean in general since >17 Ma. The high radiogenic-Nd and low radiogenic-Sr in our samples than the Himalayan average represented by Ganges-Brahmaputra or distal Bengal Fan sediments ( Nd: ~ -13 and  ${}^{87}$ Sr/ ${}^{86}$ Sr: ~0.74) require another source with very high Nd and low  ${}^{87}$ Sr/ ${}^{86}$ Sr. The Indonesian Arc Nd of ~ -3 and  ${}^{87}$ Sr/ ${}^{86}$ Sr of ~0.708 appears to be the most probable candidate with diluting the isotopic signals of the Himalayan material in the ANS Fe-Mn crusts. Considering the above two indicators of continental source for silicate matter in the crust as valid, the period from 17 Ma to 14 Ma and ~7 Ma may be the times of intensified erosion. The silicate event at ~7 Ma is consistent with the major uplift of Himalayas in the Late Miocene (9-6 Ma) as evident in the ODP Leg 116 sediment accumulation record (Rea, 1992). But the precise source of high silicate detritus in 17 to 14 Ma section is not identified. A possibility is that the input of Indonesian Arc erosion product to the ANS region may have been increased significantly at the time of reduced erosion in the Himalayan region. The detailed accumulation history of the studied specimen is under investigation.

**References:** 

Derry, L.A. & France-Lanord, C., 1996, Earth Planet. Sci. Lett., 142, 59-74. Rea, D. K., 1992, ODP Synthesis of Results, AGU Geophys. Monogr., 70, 387-422.