

## **Persistent South Asian Monsoon induced erosion over the past 26 million years**

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On geological timescales, CO<sub>2</sub> is removed from the ocean-atmosphere system by silicate weathering and the burial of organic carbon. Increases of both have been attributed to Himalaya-Tibetan Plateau uplift and changes in the monsoon's erosive power [1,2] with some studies suggesting that uplift initiated the monsoon [3] while others linking tectonics with monsoon controlled exhumation [4]. The timing of Asian monsoon development is, however, still poorly constrained and recent estimates range from the early Miocene (~22 million years (Myrs) ago) [5] to the Eocene (~39 Myrs ago) [6]. Detailed long-term records of South Asian monsoon induced erosion (reflecting its strength) and potential changes related to past warmer climates are lacking. Here we use the Sr, Nd, and Pb isotope compositions of clay minerals transported to the central Bay of Bengal (ODP Site 758) to show that the general spatial pattern of regional erosion, which today is strongest at the location of most intense monsoon rains, persisted throughout the last 26 Myrs. Two periods of stronger monsoon erosion and physical weathering occurred around 20 and 10 Myrs ago. This led to enhanced sediment deposition on the Bengal fan and potentially reduced atmospheric CO<sub>2</sub> thus contributing to global cooling.

[1] Raymo & Ruddiman (1992) *Nature* 359, 117-122; [2] France-Lanord & Derry (1997) *Nature* 390, 65-67; [3] Molnar et al. (1993) *J. Rev. Geophys.* 31, 357-396; [4] Iaffaldano et al. (2011) *Earth Planet. Sci. Lett.* 304, 503-510; [5] Clift et al. (2008) *Nature Geosci.* 1, 875-880; [6] Licht et al. (2014) *Nature* 513, 501-506.