

Late Quaternary chronology of the Lower Bengal Fan (IODP Expedition 354) – paleoclimate implications

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IODP Expedition 354 drilled seven sites along an east west oriented core transect of 320 km length at 8°N in the lower Bengal Fan (France-Lanord et al., 2015). The sites were recovered to reconstruct the Himalayan uplift, the monsoonal development, and the turbiditic depositional mechanisms.

Here, we concentrate on the hemipelagic sequences that represent a several meter thick top layer of Late Quaternary age. We studied a number of physical, optical, geochemical, stable isotopic, and grain-size properties of the top layer in order to estimate sedimentary properties, and to assess the climate and monsoonal development of the region during the last glacial cycle.

Records of wet-bulk density as well as color reflectance b* and L* show a dominant precession cyclicity. Hence, we are able to provide an insolation-tuned chronology for the last 200 ka (MIS1–7). The records agree well with $\delta^{18}\text{O}$ records from Chinese caves. An independent age model is derived from records of relative paleointensity. We compare both chronologies and evaluate their chronological and paleoclimatic implications. Grain-size measurements show in-phase variability with monsoonal strength. In addition, color endmember modeling reveals strong correlation of three color endmembers to monsoonal variability. We will also discuss elemental geochemistry, stable carbon and nitrogen isotopes, and potential sources of organic matter.