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GSA Connects 2022 meeting in Denver, Colorado

Paper No. 174-1

Presentation Time: 9:00 AM-1:00 PM

USING DETRITAL ZIRCON (U-TH)/HE THERMOCHRONOLOGY TO DETERMINE CHANGE IN PROVENANCE, SEDIMENT ROUTING AND DEPOSITIONAL HISTORY OF THE MIOCENE-PLEISTOCENE BENGAL FAN, INDIAN OCEAN

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The Bengal Fan is the world's largest submarine fan deposit by area, and fan sediments preserve a faithful record of Tibetan-Himalayan orogenesis since Early Miocene time. This study uses detrital zircon (U-Th)/He (ZHe) thermochronology, U-Pb and ZHe double-dating, and sediment mixing models to characterize shifts in provenance and erosional history of the Himalaya and Tibet recorded by Bengal Fan sediments from Late Miocene to Late Pleistocene time, with emphasis on the Pliocene-Pleistocene interglacial transition. Zircon grains are collected from sediment cores acquired during IODP Expedition 354 (2015). A total of 157 single zircon grains from 25 samples of sandy and silty turbidites will be analyzed for single ZHe analyses (an average of 8 grains per sample), and ~50 zircon grains will be chosen for double-dating with U-Pb geochronology. In turn, all ZHe results will be compared with large-n (n=300-600) U-Pb age distributions from the same samples. Sediment mixing models will determine potential source regions for individual samples by "unmixing" crystallization and cooling age populations present in each sample. Preliminary results (n=84) show shifts in the range of cooling ages from ~5.9-45 Ma in the Late Miocene, with a single grain at ~233 Ma, to ~2.5-410 Ma in the Late Pliocene, and finally ~0.5-20 Ma in the Early-Middle Pleistocene, with a single grain at ~492 Ma. These results indicate shifts in source contributions from central-East Himalaya in the Late Miocene, to a Lesser and Tethyan Himalaya source in the Late Pliocene, to a predominantly Eastern Tibet and Lhasa terrane source in the Late Pleistocene in tandem with a broad increase in exhumation rates. We attribute these variations in cooling age ranges to change in sediment source terrains for the Ganges and Brahmaputra River system. Ongoing work seeks to further refine sediment mixing models for the Ganges-Brahmaputra-Bengal Fan system in tandem with large-n U-Pb geochronologic efforts.

Session No. 174--Booth# 165

[T36. Future Directions in Tectonics and Lithospheric Processes: A Session for Early Career Researchers \(Posters\)](#)
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