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# Cenozoic Climate-Tectonic Interactions in the Western Himalaya Recorded in the Indus Submarine Fan: Initial Results from IODP Expedition 355

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The Indus Submarine Fan is the largest repository of clastic sediment eroded from the Western Himalayas since the start of India-Eurasia collision, likely around 50 Ma. Interpreting this sedimentary archive is central to understanding how the Asian monsoon and Himalaya have evolved together. Models indicate linkages between surface processes, controlled by climatic influences, and the tectonics of the solid Earth. The development of large-scale duplexes within the Lesser Himalaya starting in the Late Miocene may be linked to changes in erosion intensity and location, especially spanning the 7–8 Ma climatic transition previously identified in the foreland basin and offshore Oman. Although some of these issues can be addressed by studies onshore, erosion has removed much of the older record from the crystalline basement itself and the Siwalik Group foreland sediment tend to image limited stretches of the Himalayan front rather than supplying a basin-wide record. The sediment record of the Arabian Sea must be used to understand how the Indus catchment responds to changes in monsoon strength. Drilling by International Ocean Discovery Program Expedition 355 in the Eastern Arabian Sea has recovered two submarine fan sections spanning the last ca. 11 Ma, predated by a mass transport deposit. These should allow us to reconstruct how the Western Himalaya have responded to climate change since the late Miocene. Autocyclic processes within the fan and a major mass transport deposit mean that the record is not continuous, but is largely complete. Initial results indicate that the Indus Submarine Fan was receiving materials from Himalayan high-grade metamorphic rocks since at least ca. 14-17 Ma and that there was a direct connection with the suture, likely close to the western syntaxis, dating from the late Miocene. However, initial postcruise results now indicate that there has been significant flux directly from the Indian Peninsular, especially since 3 Ma that disrupts the Indus-supplied erosional record.