



Signal Loss and Sediment Recycling in the Quaternary Indus Fan and Delta System

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ABSTRACT

Sediment supply from the Indus River to the deep-ater Arabian Sea is strongly modulated by the intensity of the Asian summer monsoon, as well as by sea level variations. Strong changes in sediment provenance since the Last Glacial Maximum allow the transport of sediment to be traced from source to sink. Bulk sediment Nd and Sr isotope data indicates a relatively unbroken and direct supply of fine-grained sediment from the river mouth into the submarine canyon during the Holocene, although the volumes involved are less than 1% of the total flux and around 50% of the total flux is derived from reworking of stored sediment largely from floodplains. In contrast, coarser sediment is stored close to the river mouth and must be reworked into the canyon during times of falling or low sea level. Detrital zircon U-Pb ages show that the sand entering the Holocene Canyon is not closely correlated with that discharging from the river mouth. However, the system is not entirely buffered because rapid short-term variations in the source of sediment can be detected, spanning decades or less. Some of these fluctuations may be related to large-scale mass wasting or storm events on shore. The deepwater turbidite record in the fan itself shows that most sediment is eroded during wet, warm, interglacial times, but is only reworked and transported to the submarine fan during times of low sea level resulting in homogenization of the original record over time periods equivalent to a glacial cycle.