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Reconstructing erosion in Cenozoic Asia from the marine stratigraphic record

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South and SE Asia are the sources for the largest sediment bodies on the planet, reflecting their altitude, fast rock uplift rates and erosive monsoonal climate, all of which are tied to the India-Asia collision. Debate continues concerning when rapid erosion commenced and what processes are dominant in controlling this. Resolution of this issue requires generation of independent climatic, erosional and tectonic histories for the region that can be correlated or not to establish links. A robust reconstruction of erosion requires that the bulk of the sediment, stored offshore on the passive margins of Asia, be accounted for. A recent compilation of seismic data from the marginal seas of East Asia now shows that sedimentation rates sharply increased across the region, and especially in the Red River catchment after around 33 Ma and continued to increase until around 11 Ma. Sedimentation rates were sharply lower at 11-4 Ma due to drier conditions across Asia at that time. Since 4 Ma sedimentation regained high values, but because these are no more than seen in the middle Miocene northern hemispheric glaciation does not seem to have greatly influenced net continental erosion since 4 Ma. Modern river sediment fluxes are much higher than average for the Pleistocene, suggesting that pulses of sedimentation caused by periods of faster erosion do not appear to be strongly dampened by sequestering in continental sedimentary basins, but mostly reach the continental margins. Evidence for surface and rock uplift onshore during times of faster erosion is scarce, although potassic magmatism and strike-slip faulting on the eastern flanks of the Tibetan Plateau starting at 35-30 Ma correlates with faster offshore sedimentation and possibly surface uplift. At present few climate records exist for the Cenozoic, though the monsoon likely strengthened in stages since that time. New data from ODP Site 1148 in the northern South China Sea show periods of wetter conditions at 21-24 Ma, 15-17 Ma and progressive since 10 Ma. Fast

sedimentation and an illite dominated mineralogy since 4 Ma accompanies a series of proxies that indicate a strong summer monsoon after that time. The evidence shows a broad positive correlation between monsoon strength and erosion over long periods of geological time.