



Deep-sea weathering and erosion records of monsoon variations in the northern South China Sea

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In this study we have examined the changes in a number of commonly used proxies for chemical weathering intensity in the northern South China Sea at ODP Site 1144 and in the delta of the Pearl River. Sediment at ODP Site 1144 is dominantly eroded from Taiwan and shows a sharp increase in the state of weathering of sediment deposited after 12 ka, reaching a peak at 10 ka and then decreasing to a lower background level after ~7 ka. The higher hematite/goethite values suggest more arid weathering despite the monsoon intensification at this time. Mass accumulation rates, Sr isotopes, Rb/K, kaolinite/(illite + chlorite) and Ti/Ca all show increases in this time period, although the frequently used CIA does not show a clear response. We suggest that the pulse of sediment represents enhanced erosion of the exposed continental shelf during a period of strong monsoon. This erosion was brought to an end by the flooding of the Taiwan Strait during sealevel rise after 8 ka. Although the sediment was originally from Taiwan the strong weathering is not an immediate response to climate change but represents the accumulated weathering of the shelf during sealevel low stands. As a result deep-water sedimentary weathering records provide us with a history that cannot be directly matched to the climatic history at the time of sedimentation. In contrast, sediment buffering appears to be less important in the Pearl River delta. In this setting provenance is clear and the deposits show sediment with intensity weathering in the Early Holocene, decreasing in strength during the Holocene as the summer rains weakened.