



Early Holocene Sediment Discharge from Taiwanese Rivers: Intensified Asian Monsoon and Climate Change

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Temporal variations of fluvial sediment discharge can reflect the significant climatic variation. In this study, high-resolution sedimentary records - on the millennial scale - from onshore wells, offshore cores and seismic profiles are used to quantify sediment discharge from small mountainous rivers around Taiwan since the last glacial maximum. While significantly high sediment accumulation rates have been observed in the modern flood plain, shelf and deep-sea basins during the late Pleistocene and Holocene, early Holocene rates are unusually high. In northeast Taiwan, for example, sediment flux from the Lanyang River between 10-12 ka BP appears to have been 10 mt/yr, about 4 fold greater than measured annual discharge prior to 1960. In the southwest Taiwan, the highest sedimentation rate happened during 10-12 ka BP. Long-term average discharge since 8 ka BP has been ~ 12 mt/yr, less than half the 29 mt/yr that was deposited on the Kaohsiung-Pingtung Plain. These and other sedimentation histories around Taiwan as well as in the South China Sea and the Bay of Bengal indicate that the occurrence of high sediment load cannot be explained solely by general circulation model of sea-level change; climate and climatic change also should be taken into account. We suggest that the intensification of the Asian monsoon, particularly in the case of Taiwan, typhoons, which occurred during the early Holocene may have been the root cause of the increased rainfall and thus increased erosion and sediment delivery. This study reconstructs the long-term sedimentary history of the region since the late Quaternary, especially focuses on the increased sediment discharges during the particularly warm and humid paleo-climatic period in NE and SW Taiwan. Moreover, it could help to better understand and predict fluvial sediment fluxes and their geological and societal impacts in response to future global warming.