

A comparative study of the flux and fate of the Mississippi and Yangtze river sediments

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Abstract Large rivers play a key role in delivering water and sediment into the global oceans. Large-river deltas and associated coastlines are important interfaces for material fluxes that have a global impact on marine processes. In this study, we compare water and sediment discharge from Mississippi and Yangtze rivers by assessing: (1) temporal variation under varying climatic and anthropogenic impacts, (2) delta response of the declining sediment discharge, and (3) deltaic lobe switching and Holocene sediment dispersal patterns on the adjacent continental shelves. Dam constructions have decreased both rivers' sediment discharge significantly, leading to shoreline retreat along the coast. The sediment dispersal of the river-dominated Mississippi Delta is localized but for the tide-dominated Yangtze Delta is more diffuse and influenced by longshore currents. Sediment declines and relative sea level rises have led to coastal erosion, endangering the coasts of both rivers.

Key words Mississippi River; Yangtze River; water discharge; sediment transport; dam construction