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Late Quaternary Paleoenvironmental Reconstruction of a Drowned Drainage System - Sunda Shelf, South China Sea: Foraminiferal Evidence

The Sunda Shelf, the largest shelf area outside of the polar shelves, was subaerially exposed during the Last Glacial Period, with a low sea level of as much as -116 m below present mean sea level. Large river systems were active on the exposed shelf, forming a coastal plain (Sunda Land) which supported marginal marine environments. Sea-level rise due to post-glacial melting of ice inundated the area, drowning and reorganizing the drainage systems. The wide aerial extent of the Shelf, its semi-enclosed location in a marginal sea (South China Sea), and tectonic stability make it ideal for studying Late Quaternary sea-level changes. Marginal marine benthic foraminifera are effectively used for paleoenvironmental reconstruction due to their sensitivity to changes of exposure time in inter tidal environments. Such a method has been employed for the Sunda Shelf to reconstruct its paleoenvironment, from the time of subaerial exposure to complete flooding.

Foraminiferal assemblages defining a mangrove-marsh, deltaic, estuarine, bay/lagoon, and an inner shelf (inner neritic) environment have been recognized. An arenaceous assemblage characterizes a subaerial mangrove-marsh environment formed during low sea level , while rotaliids dominate in deposits that characterize the transgressive phase of sea level. An open ocean type assemblage predominates the Holocene unit. Evidence exists for rapid post-glacial sea-level rise, resulting in flooding of the central shelf area. A synthesis of the faunal assemblages, tied in with the ^{14}C chronology, gives an overview of the paleogeographic evolution of the Shelf.