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Preface

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PREFACE



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Shelf sediments in Asian Seas play a crucial role for understanding the interplay of tectonically, climatically, and anthropogenically induced continent-ocean fluxes and coastal long-shore particle transport. Due to high accumulation rates, sequences of river mouth systems and depositional centres on the shelf display in high resolution changes in climatic conditions as the Southern Oscillation and the monsoon dynamics during the Late Quaternary, but also anthropogenic activities in the drainage areas of the rivers delivering their sediment load to the continental shelf. For understanding the interrelation between basin formation, paleo-environment, and sediment facies, two depositional systems have been studied at the northern shelf of the South China Sea during the last years within the frame of joint Chinese and German - research projects: The Pearl River Estuary (PRE) and the Beibu Gulf (Gulf of Tonkin). Selected results from these studies are presented in this Special Issue of *Journal of Coastal Research* (JCR).

The Pearl River - the third longest river in China - delivers almost 90 million tons per year of sediment load to the South China Sea, which is deposited in the PRE and receiving basins offshore the estuary's mouth. Fine grained suspended matter reaching the South China Sea is transported by a permanent East-West directed long-shore current to the Beibu Gulf and further south to the northern South China Sea. Therefore, the Beibu Gulf sediments contain not only particles descending from rivers merging the basin in the West, the North, and at Hainan Island in the East, but also from the continent East of the Qiongzhou Strait. Hence, the Beibu Gulf is an ideal area to study naturally and anthropogenically induced matter fluxes from river drainage basins southeast of the Tibetan Plateau and along the South China Sea's northern coastal areas. By multi-proxy concepts the facies of the sediments serve as a textbook for the reconstruction of the change in climate – in particular the monsoon dynamics and corresponding oceanographic conditions – together with the Post-Pleistocene sea level dynamics. One of the outcomes of the studies refers to the role of local tectonics in the relative sea level change. Zhan *et al*. show that neotectonics in the area of the Pearl River Delta is characterized by fault activity and differentiated movement of fault-blocks, which has played one of the most important roles in the Pleistocene development of the Pearl River mouth system, whereby vertical displacement of tectonic blocks has created the accommodation space for Quaternary sediments. In Holocene, however, neotectonic influence on channel development turned to be less important as the activities became weaker. Based on seismic data and surface sediments samples and sediment cores Xia *et al*. have investigated the Late Pleistocene and Holocene basin fill of the Pearl River Mouth System. The history of marine transgressions due to different phases of sea level rise can be reconstructed. The authors distinguished two strata groups: The older (Pleistocene) Strata B consists of terrestrial clastic sequences separated by a discontinuity from the Holocene transgressive marine sediments (Strata A) on top of it. These Holocene sediments have been mapped by surface samples according to their different sedimentological, geochemical and geotechnical facies by Shi *et al*., and Heise *et al*. Gradients in grain size and sedimento-physical parameter can be clearly spatially distinguished according to the hydrodynamics within the estuary. The anthropogenically induced heavy metal concentration decreases towards the more marine influenced southeastern parts of the estuary and shows higher values in the central part

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and at the western shoals of the estuary. Compared to the PRE, the Beibu Gulf is a more complex system which has been studied by Bauer *et al*. combining hydrographical, sedimentological, and bio-chemical measurements. Four ecological zones were separated in the study area, all being differently or jointly influenced by riverine input, the Qiongzhou Strait, and the South China Sea waters. The correlation between the environmental parameters and the sedimentary facies form a base for multi-proxy approaches to interpret ancient sediment sequences. Interestingly, despite the fact that suspended matter descending from the PRE is deposited also in the Beibu Gulf (due to the east-west directed long-shore transport) in the receiving basin no pollution effect in the center of the gulf is measurable according to Xia, Waniek and Leipe, most likely indicating the strong dilution effect due to the gulf's wide opening to South China Sea.

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