

The Mekong River Delta – variation of sedimentation and morphology in a mega-delta

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The Mekong Delta

Various sediment- and hydrodynamic factors including tides (meso-tidal system), waves, coastal currents and seasonal-driven river discharge influence the coastal zone. Mega-deltas, especially like the Mekong River Delta (MRD), represent these land–ocean interactions. Subaerial and subaqueous coastal morphology are both regulated by the local energetic environment and supply of sediment. In reverse, delta morphology and sedimentary pattern reflect these impacts.

In the MRD that belongs to the Asian mega-deltas, the influence of different factors can be seen. Tidal processes influence the delta shaping permanently due to their persistent occurrence (Unverricht *et al.*, 2012). Wave processes have a more long-term impact due to beach-ridge-shaping in the delta morphology (Tamura *et al.*, 2012a,b). Outside the river mouth region, other factors have recently not been sufficiently investigated.

However, after the classification of Orton & Reading (1993) the MRD is a tide- and wave dominated delta. Investigations on the delta plain support this classification. The transition from tide-dominated to tide and wave dominated regime appears around 3500 years BP (Ta *et al.*, 2002). Its tidal regime changes from semi-diurnal tides over mixed tides to diurnal tides along a more than 500 km-long coastline (Nguyen, 2012). The eastward exposed coastline is more strongly influenced by waves than its western part in the Gulf of Thailand. The monsoon seasons dominate the flow regime and sediment transport along the river, in the delta plain and also in the subaqueous delta. Both coastal erosion and accretional progradation occur along the deltaic coast. However, only sparse data exist on delta dynamics and their footprints in the subaqueous delta.

The present study aims to contribute information about seafloor relief and sedimentation of the MRD to interpret modern sediment dynamics.

Applied methods

Three cruises in 2006, 2007 and 2008 were conducted in the subaqueous Mekong Delta Region between the Bassac River, the main distributary of the MRD, and the Gulf of Thailand. All cruises took place during the inter-monsoon season between March and May where wave and wind influences are not dominant in comparison to the summer monsoon (May to early October) and winter monsoon season (November to early March). Investigations present data of suspended matter (turbidity meter, water samples, LISST-instrument), seismic profiles (Boomer and C-Boom-system), grab and sediment core sampling and point and transect current-measurements (using ADCP) which provide data on current directions and velocities. Data of different tidal gauge stations in the MRD were also integrated, compared to the mixed semidiurnal–diurnal tidal cycle and related to our own relevant measurements