

Sediment distribution and depositional processes along the fluvial to marine transition zone of the Mekong River delta, Vietnam

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The area of coastal rivers with a combination of fluvial, tidal and wave processes is defined as the fluvial to marine transition zone (FMTZ) and can extend up to several hundreds of kilometres. The aim of this study is to improve the understanding of sediment distribution and depositional processes along the FMTZ using a comprehensive dataset of channel bed sediment samples collected from the Mekong River delta. Six sediment types were identified and were interpreted to reflect the combined action of fluvial and marine processes. Based on sediment-type associations, the FMTZ could be subdivided in an upstream tract and a downstream tract, whose boundary is identified 80-100 km upstream of the river mouth. The upstream tract of the Mekong FMTZ, is characterised by gravelly sand and sand and occasional heterolithic rhythmites, suggesting bed-load supply and deposition mainly controlled by fluvial processes with subordinate tidal influence. The downstream tract, is characterised by heterolithic rhythmites with subordinate sand and mud, suggesting suspended-load supply and deposition mainly controlled by tidal processes with subordinate fluvial influence. Sediment distributions in wet and dry seasons suggest significant seasonal changes in sediment dynamic and depositional processes along the FMTZ. The upstream tract shows strong fluvial depositional processes with subordinate tidal influence during the wet season and no deposition with weak fluvial and tidal processes during the dry season. The downstream tract shows strong coexisting fluvial and tidal depositional processes during the wet season and strong tidal depositional processes with negligible fluvial influence during the dry season. Turbidity maxima are present along the downstream tract of the FMTZ during both wet and dry seasons and are driven by a combination of fluvial, tidal and wave processes.

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