



Sediment dynamics in the floodplains of the Mekong Delta

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During the last decades, the floodplains of the Mekong Delta have been channelized and transformed from a natural inundation area to a hydraulic system which is in large parts man-controlled. It is assumed that this transformation leads to a change of the sediment dynamics in the Delta. However, a quantification of the sediment dynamics on the floodplains and channels in the Delta has never been accomplished. The sediment input in the floodplains plays a central role in the agricultural development as well as the agro-ecosystem of the Delta. The sediment dynamics including floodplain deposition and suspended sediment transport in secondary channels are examined in this study. The study is comprised of an extensive instrumentation scheme, aiming at the monitoring of floodplain and channel hydraulics and sediment dynamics, which was installed in an investigation area in the Plain of Reeds of the Mekong Delta. Two succeeding flood seasons were monitored and a comprehensive dataset from 21 water level and 7 water quality stations was collected.

The thorough processing and analysis of these data revealed a complex hydraulic regime governing even more complicated sediment processes in the floodplain. In particular, the paddy compartments surrounded by dikes function as sedimentation basins, i.e. a sink of suspended sediment, while the secondary channel system works as suspended sediment carrier. The processes of sedimentation in the floodplain have been studied based on the data from both monitored suspended concentrations and sedimentation traps. The paradigms of mutually exclusive or simultaneous erosion and deposition of fine sediment are discussed and key parameters for calculating deposition and erosion were defined respectively. An exponential decrease of suspended concentration along the secondary channel with distance from the main river was identified. This significant change strongly influences the sediment dynamics in the floodplain. The outcome of this study will directly support flood management practices in the Mekong Delta aiming at a balance between flood protection and sediment, resp. nutrient input into the floodplains.