



Contribution of Sediment Compaction/Loading to the Ganges-Bangladesh Delta Subsidence

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A pronounced spatial variability characterizes the subsidence/uplift rates in the Ganges-Bangladesh delta estimated from both sediment cores and modern geodetic techniques. The large variability of the subsidence rates suggests an interplay of different natural and anthropogenic processes including tectonics, sediment loading and sediment compaction, groundwater extraction among many others drivers of the delta vertical land movements. In this study, we focus on estimating the subsidence rates due to the sediments transported by the Ganges-Brahmaputra since the last 18 000 years. The delta subsidence induced by the sediment loading and the resulting sea level changes are modelled by the TABOO and SELEN software (Spada, 2003; Stocchi and Spada, 2007) in the framework of a gravitationally self-consistent Earth model. The loading history was obtained from available sediment cores and from the isopach map of Goodbread and Kuehl (2000). The results demonstrate that the delta loading enhanced by the Holocene sedimentation can be responsible for a regular subsidence across the Ganges-Brahmaputra delta with an amplitude of 1-5 mm/yr along the Bengal coast. These estimates demonstrate that the contribution of the Holocene as well as modern sediment loading should be taken into account in climate change mitigation policy for Bangladesh.