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ABSTRACTS

WOLANSKI, Eric (Australian Institute of Marine Science, PMB No. 3, Townsville MC, Qld. 4810, Australia) 2002. Journal of Coastal Research, SI 36 (Proceedings, ICS 2002)

Damming the Mekong and Ord river estuaries

Cambridge Gulf, tropical Western Australia, is a macro-tidal estuary with 8 m tides. The West arm is largely untouched by human activities. The East arm is the estuary of the Ord River affected by two river dams constructed 30 years ago. The West arm appears to be at equilibrium since there has been no net loss or gain of sediment for the last 111 years. Tidal dynamics and occasional river floods appear responsible for self-scouring this channel. The East arm has measurably silted the last 30 years, the stream cross-sectional area being halved. Field and numerical studies suggest that this is due to the dam-induced suppression of large river floods, this has increased tidal pumping of sediment. The Ord River estuary is now geomorphologically unstable.

Can this also occur in the Mekong delta? The estuary is shallow with a mean maximum tidal range of 3.2 m. The freshwater discharge varies seasonally between 40,000 and 1,700 m³s⁻¹. The delta is heavily populated with about 32 million people, mostly rice farmers and fishermen. The estuary is their main transport route, which is hindered by siltation at the mouth. Irrigation for rice is hindered by salinity intrusion and acid sulfate soils in the low flow season. A water-sediment dynamics model was applied to the Mekong River, calibrated against the (sparse) oceanographic data and used to predict qualitatively the effects of the 100 proposed dams and the water diversion schemes in the Mekong River catchment. The model predicts that the salinity intrusion in the estuary may increase for several months a year, coastal erosion may increase, siltation in the estuary may increase by up to 7 x 10⁵ tonnes per year, and the wet-season flushing of acid sulfates will decrease. Detailed investigations are warranted.