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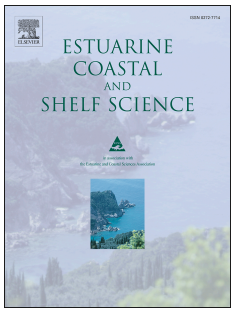

Hydro-sedimentary processes of a shallow tropical estuary under Amazon influence. The Mahury Estuary, French Guiana

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Hydro-sedimentary processes of a shallow tropical estuary under Amazon influence. The Mahury Estuary, French Guiana.

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Abstract

Along the Guianas coast, coastal dynamic is characterized by the migration of mud banks originating from the Amazon. This singular feature affects the dynamic and the morphology of local estuaries and can induce rapid bathymetric evolution in lower estuaries. Since 2012, the navigation channel of the Mahury Estuary (French Guiana) is enduring a severe siltation whose origin comes from a mud bank crossing the estuary mouth. This study aims to determine how the migration of a mud bank through an estuary mouth could influence the transport and fluxes in the estuary. Field measurements were performed over a year with the monitoring of the salt intrusion length, mooring surveys during spring-neap cycles and shipboard profiling surveys during semi-diurnal cycles. Salt intrusion lengths underline a significant seasonal variation characterized by the transition from a steady-state length during high river discharge and a wide range of lengths with the tidal range during low to moderate river discharge. During the rainy season, measurements indicate a fluvial-dominated condition with low suspended-sediment concentrations most of the semi-diurnal cycle.

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