



## **Tidal Inlet Behaviour on Zambezi Delta Barrier Islands: A Multi-Decadal Perspective**

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The Zambezi River has the biggest delta in east Africa. It discharges into the Indian Ocean on the Mozambique coastal plain at 18°55' S. It is characterized by a 350 kilometre-long barrier island chain including 25 tidal inlets with associated ebb- and flood-tide deltas. The tidal range varies from 1.4 to 3.8 m from neap to spring tides. A forty year annual record of tidal inlet morphology from satellite imagery was utilised to examine the patterns and rates of change at the tidal inlets. A major longshore drift divide occurs mid-delta with sediment being transported in both directions away from the delta apex. Inlets migrated in the direction of longshore drift by between 7 and 60 m per year over the 32 year study period (1984-2016). Several modes of inlet sediment bypassing were identified at various inlets (spit breaching, ebb-delta breaching, outer channel shifting). Almost all inlets exhibited significant widening and all barrier islands migrated landwards by between 2 and 60 m/year. The delta is experiencing very high rates of longshore transport and landward retreat. This is accompanied by an increase in tidal prism at most inlets and points to large-scale delta recession in response to sea-level rise and sediment supply reduction. There is a clear increase in the extent of flood tide deltas. The major dams in the catchment: Kariba (1959), Cahora Bassa (1974), and Itzhi-Tezhi (1977), all contribute to reduced sediment load over the time period of the study.