



## Karumba QLD02.01.01

### Regional Setting

The dominant regional processes influencing coastal geomorphology in this region are the wet-dry tropical climate, trade winds, monsoons, irregular meso-tides, large seasonal mean sea-level range, low to moderate seas, seasonally high river sediment discharges, terrigenous sediments, the El Nino Southern Oscillation (driving sea-level variability & tropical cyclone frequency), and the Madden-Julian Oscillation (driving weather patterns including monsoons and tropical cyclones).

Regional hazards or processes driving large scale rapid coastal changes include: tropical cyclones, storm surges and river flooding.

This compartment extends from Karumba to Mitchell River.

### Justification of sensitivity

Sensitivity rating is a 3. The coast appears stable and may even be a 2 as there has been considerable progradation over the Holocene

### Other comments

This compartment runs north from Karumba to the mouth of the Mitchell River. This section of Cape York Peninsula is drained by the Mitchell and Gilbert Rivers, which have built fan deltas into the Gulf. The Mitchell River Delta has prograded over 17 km in the past 6ka, and has changed from wave domination in the oldest unit to tide domination at the modern shoreline. Asymmetrical patterns of ridges imply variation in the relative effectiveness of longshore transport in both directions (Nanson et al., 2013). Morphology of beach ridge and cheniers indicate reduced average rates of shoreline progradation, from about 3km/ka to less over the past 2ka, until 0.2 ka BP when progradation rates increased; this is possibly in response to increased fluvial



sediment supply from the anthropogenically disturbed catchment. The Gilbert River delta has prograded 15–20 km during the past 6.5 ka, and the subsurface facies show prodelta mud overlain successively by delta-front and subtidal sands, strandline beach and chenier ridges, and intertidal to supratidal mudflats (Jones et al., 1993, 2001).

#### **Confidence in sources**

Medium confidence: There is little evidence on which to extrapolate Holocene history to contemporary processes.

#### **Additional information (links and references)**

Jones, B.G., Martin, G.R., Senapati, N., 1993. Riverine-tidal interactions in the monsoonal Gilbert River fandelta, northern Australia. *Sedimentary Geology* 83, 319-337.

Jones, B.G., Woodroffe, C.D., Martin, G.R., 2003. Deltas in the Gulf of Carpentaria, Australia: forms, processes and products, In: Sidi, F.H., Nummedal, D., Imbert, P., Darman, H., Posamentier,

H.W. (Eds.), *Tropical deltas of southeast Asia: sedimentology, stratigraphy, and petroleum geology*. SEPM Special Publication, Tulsa, OK, pp. 21-43.

Nanson, R.A., Valcarelov, B.K., Ainsworth, R.B., Williams, F., Price, D., 2013. Evolution of a Holocene, mixed-process, forced regressive shoreline: the Mitchell River delta, Queensland, Australia. *Marine Geology*.