



Pellew NT04.01.02

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 Rosie Creek Delta to Calvert River.

Justification of sensitivity

Sensitivity rating is 2 or 3. The coast has prograded over millennia and appears to continue to have plenty of sediment, primarily mud.

Other comments

The coastal plain continues from Rosie Creek to the Calvert River. Rosie Creek has a second channel that winds behind an extensive mudflat and exits 15 km east of the laterite outcrop that marks the compartment boundary. There appears to be an abundance of sediment in the nearshore, and there are several detached sand shoals or spits. The plain has built out for at least 2 km at beach NT1458.

Mangroves are extensive within a swampy, chenier ridge plain at the mouth of Bing Bong Creek. Detached sand shoals, or perhaps chenier ridges, occur on either side



of the Bing Bong loading facility which includes a channel dredged through the nearshore sediments.

The prograded muddy coastal plain is widest where the McArthur River reaches the coast in the lee of the rugged Sir Edward Pellew group of islands (which are predominantly rocky and not sensitive). The McArthur Delta is protected from wave action by these offshore islands, and the restricted width of the delta is a function of bedrock outcrops near the delta mouth. The McArthur River and Batten Creek have delivered sediment to build the delta plain, which contains the active modern course of both main channels, and former channels now shaped by tidal processes. The main river channel has changed its course several times in the past 4000 years, and there are complex sediment dynamics in this sequence of distributaries. This compartment appears to have a good sediment supply and may still be accreting.

Confidence in sources

Medium confidence: There is little evidence on which to base assessment of sediment source and availability.



Additional information (links and references)

- *An inventory of all the beaches in northern Australia has been compiled by Short (2006). This provides details of the geomorphology of each beach and other information that will be useful in determining the functioning of tertiary compartments:*
Short, A.D., 2006. Beaches of the northern Australian coast: the Kimberley, Northern Territory & Cape York. Sydney University Press.
- *There has been little comprehensive study of the coast of the Northern Territory. There is little information on the offshore characteristics of NT. A workshop was held in 2007 that summarised the nature of the offshore environment, recognising Joseph Bonaparte Gulf in the west, Arafura in the north, and the Gulf of Carpentaria in the east. The report is available at www.environment.gov.au/system/.../characterisation-workshop-report.rtf*
- 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.
- Woodroffe, C.D., Chappell, J., 1993. Holocene emergence and evolution of the McArthur River Delta, southwestern Gulf of Carpentaria, Australia. Sedimentary Geology 83, 303-317.
- http://www.lrm.nt.gov.au/_data/assets/pdf_file/0003/13908/33_siredwardpellew.pdf