



## Chambers Bay NT01.02.02

### Regional Setting

The dominant regional processes influencing coastal geomorphology in this region are the wet-dry tropical climate, trade winds, monsoons, mega to meso (limited) tides, semi-diurnal, waves dominantly seas, episodic high river sediment discharges, mixed carbonate – terrigenous sediments, tidal sediment transport, limited longshore transport, the El Nino Southern Oscillation (driving high sea-level variability), 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, king tides and river flooding.

This compartment extends from Cape Hotham to Point Stuart.

### Justification of sensitivity

Sensitivity rating is a 3 overall, with a local rating of 5 in certain places due to saline intrusion. There is no evidence on which to indicate patterns of shoreline change.

### Other comments

South of Cape Hotham, the cliffs quickly transition into a broad, progradational, muddy coastal plain. Occasional sandy chenier ridges have been deposited along this coast, with the successive ridges joining at Point Stuart. Although a regular accretion trend is indicated by radiocarbon dating (Clarke et al., 1979), the cheniers are not spaced regularly and have formed intermittently along much of this muddy coast (Lees. 1987). A former mouth of the Adelaide River can be seen to the west of this muddy coast; the Mary River to its east has experienced a succession of changes, during which it has been a large estuarine system comparable to the



adjacent Adelaide River (apparent from the sequences of tapering paleochannels), and at other times a much smaller, apparently fluvially dominated river (Woodroffe et al., 1993). The Mary River has undergone spectacular change in the most recent 6 decades with the two tidal systems, Tommycut and Sampan Creeks extending dendritic tidal channels back into the freshwater paperbark wetlands (Mulennan and Woodroffe, 1998). Then, expansion of the tidal creek systems has been accompanied by rapid extension of mangroves, reoccupying plains which they apparently also dominated in the past. There is susceptibility to further saline intrusion into low-lying coastal plains, particularly as a consequence of sea-level rise.

### **Confidence in sources**

Medium confidence: A historic pattern of tidal creek expansion has been documented, but vulnerability of adjacent low-lying plains is poorly constrained.

### **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](http://www.environment.gov.au/system/.../characterisation-workshop-report.rtf)*



- Clarke, M.F., Wasson, R.J., Williams, M.A.J., 1979. Point Stuart chenier and Holocene sea levels in northern Australia. *Search* 10, 90-92.
- Lees, B.G., 1987. Age structure of the Point Stuart chenier plain: a reassessment. *Search* 18, 257-259
- Miloshis, M., Valentine, E.M., 2013. Sea Level Rise and Saltwater Intrusion Modelling on the Lower Mary River, Report to the NT Government Department of Land Resource Management. Charles Darwin University, Darwin, Australia.
- Mulrennan, M.E., Woodroffe, C.D., 1998. Saltwater intrusion into coastal plains of the Lower Mary River, Northern Territory, Australia. *Journal of Environmental Management* 54, 169-188.
- Woodroffe, C.D., Mulrennan, M.E., Chappell, J., 1993. Estuarine infill and coastal progradation, southern van Diemen Gulf, northern Australia. *Sedimentary Geology* 83, 257-275
- Woodroffe, C.D., Mulrennan, M.E., 1993. Geomorphology of the lower Mary River plains, Northern Territory. North Australia Research Unit and Conservation Commission of the Northern Territory, Darwin.
- [http://www.lrm.nt.gov.au/\\_data/assets/pdf\\_file/0003/13926/14\\_chambers.pdf](http://www.lrm.nt.gov.au/_data/assets/pdf_file/0003/13926/14_chambers.pdf)
- [http://www.lrm.nt.gov.au/\\_data/assets/pdf\\_file/0004/13927/13\\_mary.pdf](http://www.lrm.nt.gov.au/_data/assets/pdf_file/0004/13927/13_mary.pdf)