



## Daintree QLD03.06.03

### Regional Setting

The dominant regional processes influencing coastal geomorphology in this region are the wet tropics to humid sub-tropical climate, south-east trade winds, mega-meso tides, strong tidal currents, low to moderate south-east seas (local wind-waves), the dominantly terrigenous sediments with interrupted northerly longshore sediment transport (low-moderate), the El Nino Southern Oscillation (driving sea-level variability, tropical cyclone frequency, beach erosion/accretion cycles); 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, river flooding, and variable longshore sand transport.

This compartment extends from Cape Kimberley to Port Douglas.

### Justification of Sensitivity

The sensitivity rating is 4. The shoreline is stable but sediment supply is limited and predicted to decline.

- A sequence of ~13 Holocene beach ridges at Wonga Beach reveal a composite beach ridges and foredune complex influenced by tropical cyclone frequency (Forsyth et al., 2012).
- Chronological and sedimentary evidence from the Daintree floodplain suggests at least four episodic cycles of catastrophic erosion and subsequent deposition or aggradation (major floodplain stripping events) occurred over the past 6000 years (Leonard and Nott, 2015).
- The Mossman River currently delivers around 50 kt/yr of suspended sediment, which is roughly 5 times what it would be under natural vegetation and runoff



conditions (see Brodie et al., 2011), although bedload is only likely to comprise ~10% of the total.

- The Daintree River currently delivers around 175 kt/yr of suspended sediment, which is roughly 3.5 times what it would be under natural vegetation and runoff conditions (see Brodie et al 2011), although bedload is only likely to comprise ~10% of the total.

### **Other comments**

The impacts of cyclonic events are likely to be more severe, with longer beach recovery times.

### **Confidence in sources**

Medium confidence in sources.

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

Brodie, J, Lucy A. McKergow, I P. Prosser, M F, Hughes, A and Hunter, H (2011) Sources of Sediment and Nutrient Exports to the Great Barrier Reef World Heritage Area, *Australian Centre for Tropical Freshwater Research report 03/11*

Forsyth A J, Nott J, Bateman M D, Beaman R J (2012) Juxtaposed beach ridges and foredunes within a ridge plain — Wonga Beach, northeast Australia, *Marine Geology* 307–310 (2012) 111–116

Leonard, S and Nott, J (2015) *Rapid cycles of episodic adjustment: understanding the Holocene fluvial archive of the Daintree River of Northeastern Australia*. *The Holocene*, 25 (8). pp. 1208-1219.



Pringle, A W (1991) Fluvial Sediment Supply to the North-East Queensland Coast, Australia, *Australian Geographical Studies*, Vol.29(1), pp.114-138

Short, A D (2000) *Beaches of the Queensland Coast: Cooktown to Coolangatta*, Australian Beach Safety and Management Program, University of Sydney Press