



## Cairns Coast QLD03.06.04

### 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 Port Douglas to Cape Grafton.

### Justification of Sensitivity

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

- Cairns Beach is artificially reclaimed from mangroves and tidal flats. Cairns is low-lying, subject to storm flooding and is backed by relict sediment in beach ridges.
- The main distributary of the Barron River cut a new route seaward in 1939 to the north, cutting off fluvial sediment supply to delta. Beaches north of the mouth lost main sand supply and suffered erosion until the new sub-tidal delta built enough sand for beaches to be replenished (Pringle 1991)"
- Barron River currently delivers around 80 kt/yr of suspended sediment, which is roughly 2.7 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.

- Mission Bay has a few embayed beaches south of Trinity Inlet. These mostly face north, are protected and have a localized source of sediment.

### **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*

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