



## Halifax Bay (south) QLD03.07.09

### 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 Eleanor Creek to Cape Pallarenda.

### Justification of Sensitivity

Sensitivity rating is a 4 as the sediment supply is limited and predicted to decline:

- There is sediment leakage from Cleveland Bay around Cape Pallarenda, where Shelley Beach is growing to the west.
- Black River Delta extends offshore post-flooding and northerly drift (170,000 m<sup>3</sup>/yr) nourishes beaches to north (Dalla Pozza 2007)
- The Black and Bohle Rivers are located at the southern, more protected end of the sediment compartment, but beach ridges are sensitive to erosion (e.g. Bushland Beach) along with the mangrove coast at mouth of Bohle River.
- Localised wet season sediment supply from Cassoway, Leichhardt and Christmas Creeks has resulted in several hundred meters of beach building (Short 2000).



### **Other comments**

- Sea-level rise is likely to exacerbate existing coastal erosion
- The impact of cyclonic events is likely to be more severe, with longer beach recovery times.
- Black River currently delivers around 160 kt/yr of suspended sediment, which is roughly four 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

### **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*

Coventry, R J, Hopley, D, Campbell, J, Douglas, I, Harvey, N, Kershaw, A P, Oliver, J, Phipps, CVG. and Pye, K (1980) The Quaternary of Northeastern Australia, *Chapter in Henderson, R.A. and Stephenson, P.J. (eds.), The Geology and Geophysics of Northeastern Australia*, Geological Society of Australia, Queensland Division, Brisbane (pp 375-419), ISBN 0 909714 67 3

Dalla Pozza, R I (2007) A Holocene Sand Budget for the Seasonally Wet Tropics Region of North Queensland, unpublished PhD thesis, JCU

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