



## Cleveland Bay QLD03.07.10

### Regional Setting

The regional processes dominating this region include the wet tropics to humid sub-tropical climate, south-east trade winds, meso tides (2.5m), strong tidal currents, low to moderate south-east seas (local wind-waves), 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.

### Justification of Sensitivity

Sensitivity rating is a 4 as the shoreline is highly susceptible to inundation from storm surge and sea level rise in the south, with Rowes Bay beach likely to erode.

### Other comments

Cleveland Bay is a 25 km wide north-facing bay with 50 km of shoreline consisting of four sections. The eastern 12 km long Cape Cleveland shore has several small embayed beaches backed by the steeply rising cape. These low energy beaches are stable but will erode with rising sea level. The 20 km long southern tidal creeks (Alligator, Crocodile and Coca), tidal flats and mangrove-lined shore are extremely low gradient, with supratidal flats extending up to 10 km inland. This shore is highly susceptible to inundation from storm surges and future sea level rise, with Ross River also a source of flooding. Townsville port and CBD have variable elevations and susceptibility to inundation. Rowes Bay is presently stable, but will be increasingly susceptible to erosion, inundation and possibly increased northerly longshore sand transport around Cape Palleranda to Shelly Beach. By 2100, Rowes Bay is predicted to erode by up to 140 m, the Strand by 25 m, and the southern tidal flats, south of Ross River, by up to 400 m.



Magnetic Island will have susceptibility ratings ranging from 3 on the predominately bedrock shore, to 4 in the sandy bays, including Horseshoe, Geoffrey, Shelly and Picnic; all of which are predicted to erode by up to 150 m. There is also a sensitivity rating of 4 along the western Bolger Bay tidal flats-mangrove shore, which may erode by up to 400 m.



*Cleveland Bay – Cape Pallerandra to Cape Cleveland. (Red arrows indicate shoreline progradation, Ross River source and longshore sand transport.)*





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

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<https://www.ehp.qld.gov.au/coastalplan/coastalhazards.html>