Pioneer River Delta (North) QLD04.01.03

Regional setting

The regional processes dominating this region include the wet tropics to humid sub-tropical climate, south-east trade winds, meso tides (4.55m), 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.

This compartment extends from Cape Hillsborough to Pioneer River mouth.

Justification of sensitivity

Overall sensitivity rating of 4. Sensitivity ratings range from 3 on the bedrock headlands, to 4 on beaches which will erode, and tidal flats which will be inundated. There will also be a decrease in fluvial sediment supply owing to river damming, and the aggradation of the deltaic plain following sea level rise, which will lead to general shoreline erosion.

Other comments

This compartment contains the Pioneer River and its sandy sediments that have been deposited as beach and tidal flats, and shoals for 60 km downdrift. It extends from the southern Pioneer River mouth to its northern boundary at Cape Hillsborough, and consists of a series of three bedrock headlands (Shoal, Emieo and Slade) each backed by mangrove-filled, tidal creeks and the larger northern Sand

Bay. The Pioneer River enters the coast through a trained mouth at Mackay; its medium to coarse, quartz-rich, sandy sediments are then transported northward, assisted via pumping past Mackay Port and around Slade Point, Emieo and Shoal Point, along Williamsons beach and are ultimately deposited in the 5 km wide aptly named Sand Bay. Sand bay is a shallow sandy bay ringed by extensive tidal flats and mangroves. Longshore sand transport has been estimated at between 30,000 to 40,000 m^3yr^{-1}. However, it is now being decreased by damming on the Pioneer, and interrupted by the Port breakwaters.

The tidal flats will be inundated by storm surge and sea level rise, while the beaches will erode in response to sea level rise and possible decreased longshore sand transport. Mackay City is at risk to storm surge and flooding, and the upper deltaic plain to saline intrusion, all of which will both increase as sea level rises.

Additional information (links and references)

EPA, 2004, *Mackay Coast Study*. State of Queensland Environmental Protection Agency 2004

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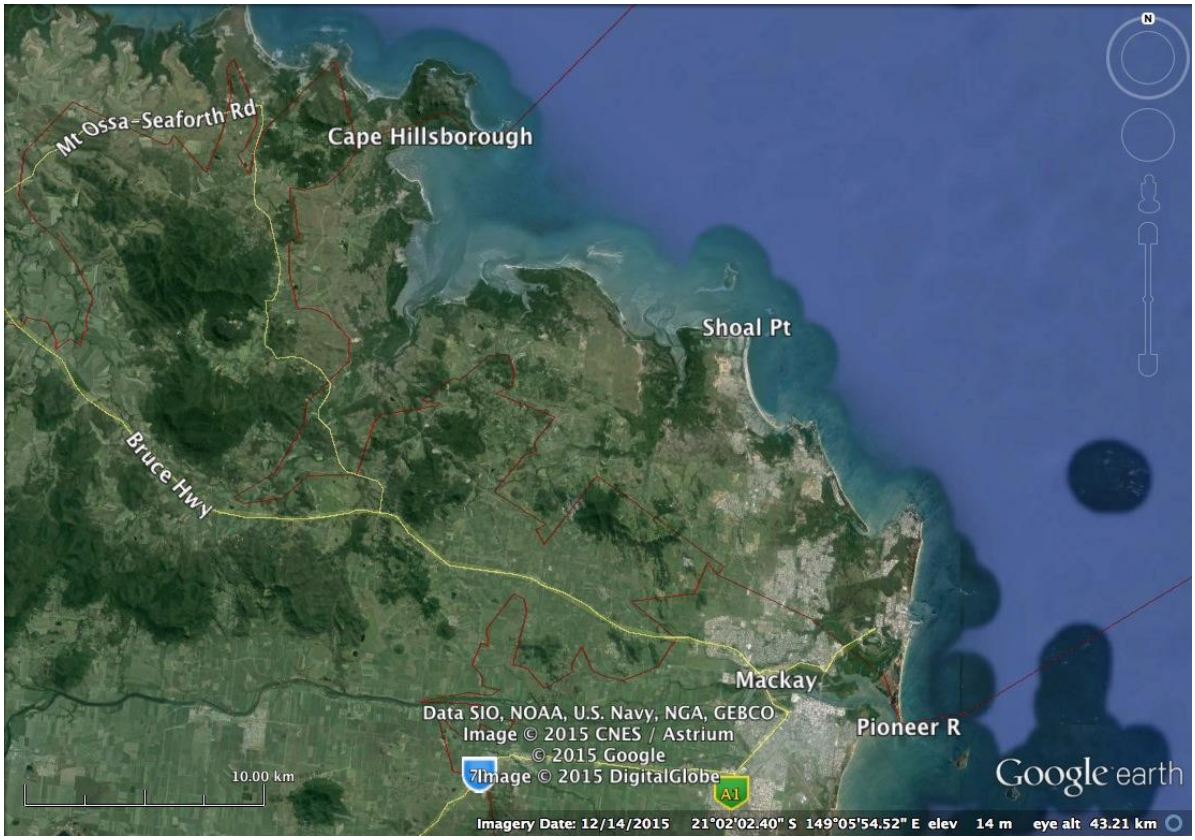
http://www.bom.gov.au/hydro/wr/unesco/friend/pioneer/pioneer.shtml



Pioneer River Delta (North) – Cape Hillsborough to Pioneer River mouth