



## Pioneer River Delta (South) QLD04.01.04

### 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 Pioneer River mouth to Dudgeon Point.

### Justification of sensitivity

The overall sensitivity rating is a 4, owing to the low-lying nature of the coast (TD beaches, tidal flats and mangroves), including two large estuaries - all of which will experience shoreline erosion and be inundated by storm surge and sea level rise.

### Other comments

The southern side of the Pioneer River mouth and delta consists of the 9 km long, tide-dominated Far Beach, then the large Bakers Creek and Sandringham Bay tide-dominated, funnel-shaped estuaries. There is a total of 27 km of predominately low energy shoreline, consisting of mangrove-lined tidal flats extending 3-4 km offshore; all contained in an 11 km wide bay between the river mouth and Dudgeon Point. This entire shore is low-lying and highly susceptible to storm surge, sea level rise, decreased sediment supply owing to river damming, and the aggradation of the



deltaic plain following sea level rise, which will lead to general shoreline erosion. Sediments are predominately medium and quartz-rich, suggesting a Pioneer River source.

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

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

Gourlay – Pioneer R study

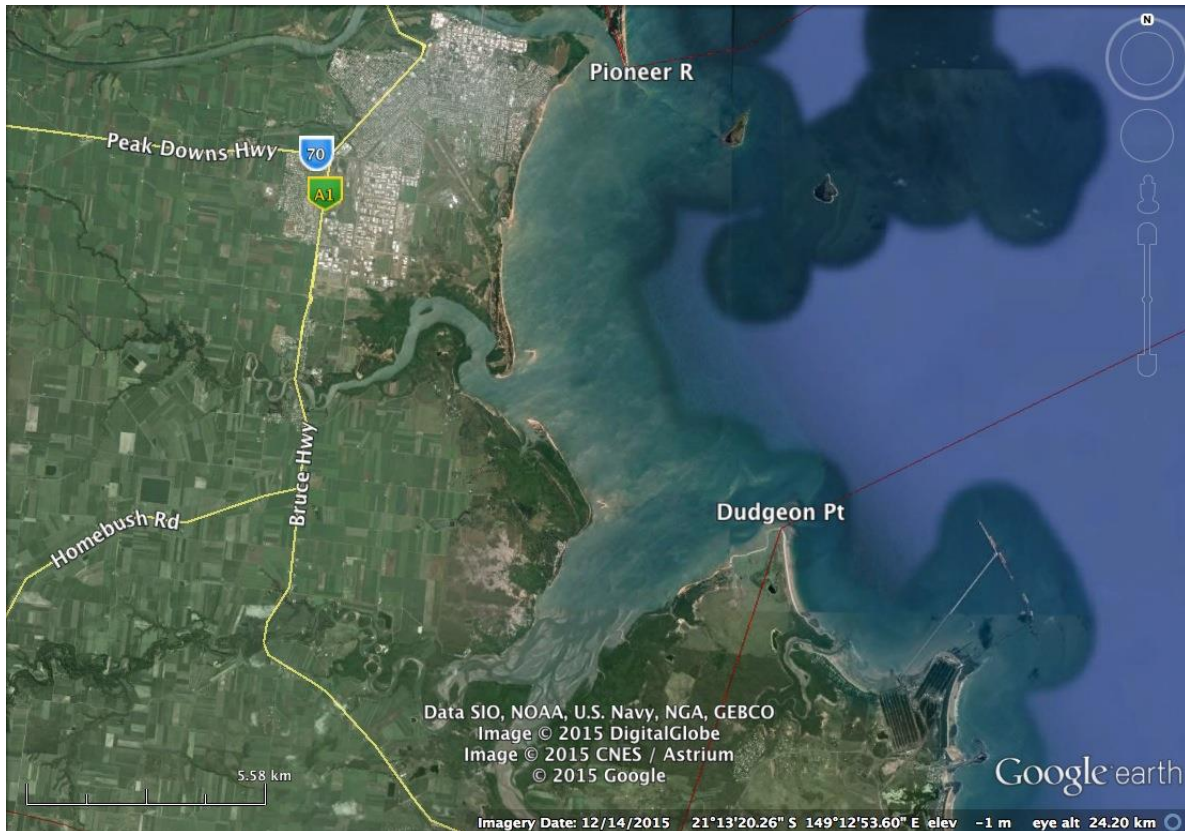
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EPA, 2004, *Mackay Coast Study*. State of Queensland Environmental Protection Agency 2004

[http://mackay.qld.gov.au/\\_data/assets/pdf\\_file/0009/134892/Pioneer\\_River\\_Flood\\_Study\\_WRM\\_Oct\\_2011.pdf](http://mackay.qld.gov.au/_data/assets/pdf_file/0009/134892/Pioneer_River_Flood_Study_WRM_Oct_2011.pdf)

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



*Pioneer River Delta (South) – Pioneer River mouth to Dudgeon Point*