Ocean Beach TAS02.03.02

Regional Setting

This compartment extends from Braddon Point to Trial Harbour.

Ocean Beach is one of the highest wave-energy beaches in Australia. The dominantly south-westerly swell wave environment exhibits frequent storms and also strong westerly seas.

The dominant regional processes influencing coastal geomorphology in this region are the Mediterranean to humid cool-temperate climate, micro-tides, high energy south-westerly swells, westerly seas, carbonate sediments, interrupted swell-driven longshore transport, and the Southern Annular Mode (driving dominant south-westerly swells and storms).

Regional hazards or processes driving large scale rapid coastal changes include: mid-latitude cyclones (depressions), storm surges and shelf waves.

Justification of sensitivity

Sensitivity rating is 5. The compartment has a declining sand budget and its shoreline has been progressively receding since about 1980. It is probably an 'early responder' to sea-level rise.

Most sand in this compartment was supplied by outwash from glaciation of the adjacent quartzite-dominated West Coast Range to continental shelf during glacial low sea stands, and reworked onshore by glacial-phase aeolian transport (extensive vegetated Pleistocene to Holocene transgressive dunes back the beach) and by wave transport during post-glacial marine transgressions.

There is a very limited present-day sand supply (none from rivers, but probably some continuing onshore wave-induced sand supply from the shelf (Harris & Heap 2014). However, volumes are unknown and clearly insufficient to prevent shoreline

recession which has been occurring for last 35 years. Sand is being lost by ongoing landwards aeolian transport (active transgressive dunes) and by southwards longshore drift of eroded beach sands into flood-tide deltas within Macquarie Harbour (Figure 1).

After episodic erosion and accretion phases between the 1940s and 1979, shoreline (beach and dune-front) recession has been dominant since the 1980s, with several tens of metres of progressive recession since then (based on air photo time series measurements – Walford (2011) and further in-progress work by C. Sharples). In addition to eustatic sea-level rise that has occurred over this period, mean annual wind speeds at the adjacent Cape Sorell Bureau of Meteorology station have been consistently higher during the period 1990 – 2015 than during the 1970s.

Sea-level rise and potentially stronger wind-generated seas associated with the changing climate are likely to exacerbate the rates of erosion in this compartment. These effects are probably, already significantly responsible for increased shoreline erosion observed since 1980.

Other comments

Very little infrastructure is at risk, apart from a Parks & Wildlife Service lookout and shacks near the southern end of the beach.

There is minimal susceptibility to backshore flooding in most ocean-facing areas due to high dunes backing the beach (typically 30m high). Some low areas at the southern tip of the beach (mainly inside Macquarie Harbour entrance) are likely susceptible to storm surge inundation.

Confidence in sources

Moderate to high confidence: Sensitivity assessment is mainly based on Walford (2011) and in-progress studies by C. Sharples.

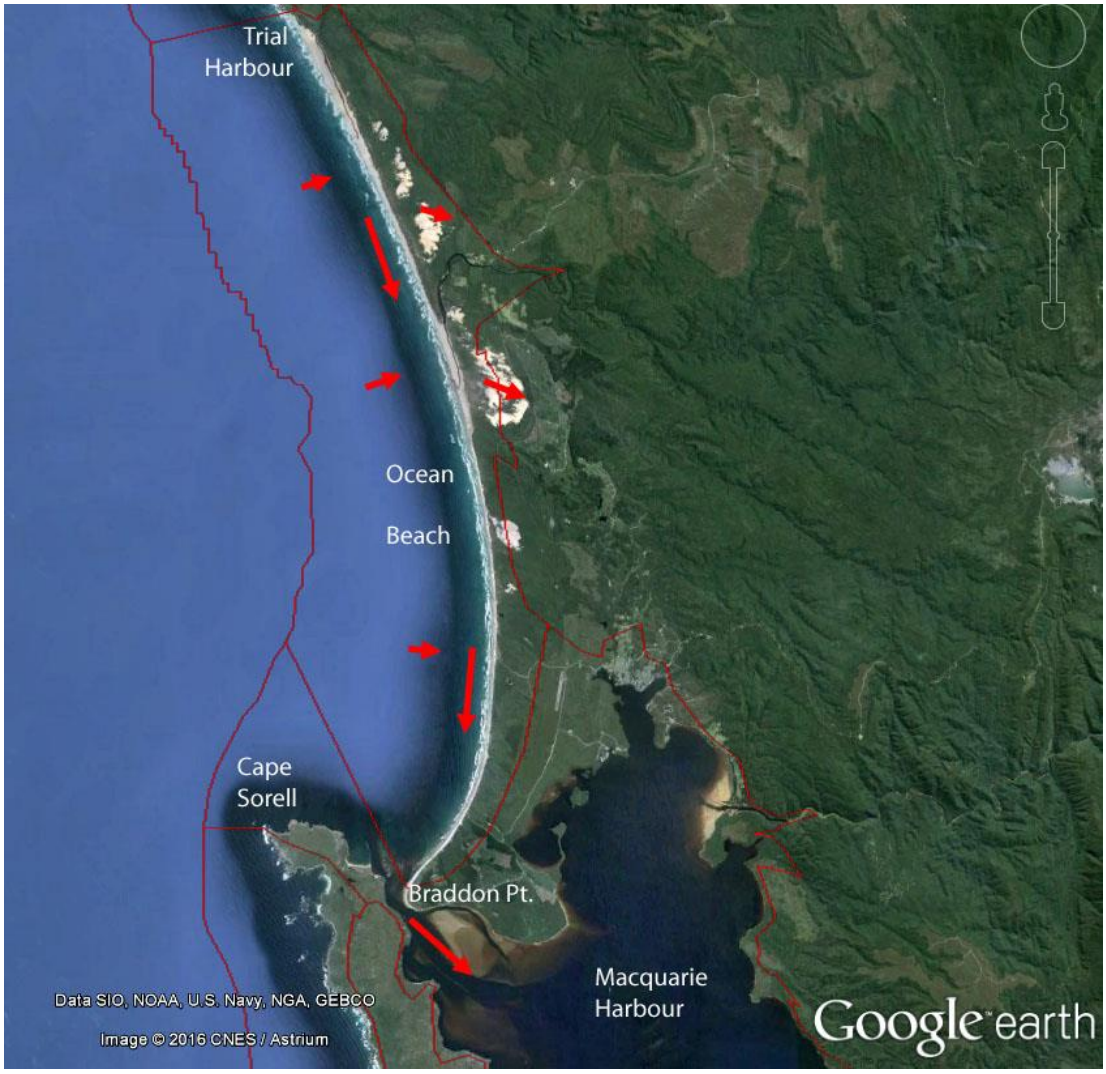

Figure 1: *Compartment TAS02.03.02 Ocean Beach. Red lines indicate the Secondary Compartment boundaries. Red arrows indicate sand transport directions with relative arrow sizes roughly indicative of relative sand transport volumes. The large flood-tide deltas visible inside the tidal channel entrance of Ocean Beach are sinks for much of the sediment eroded from the beach face and dune front since the early 1980s.*

Figure 2: *Actively receding erosion scarp at Ocean Beach, showing peat horizons which are interpreted as former swamp deposits laid down in back-dune swales. This illustrates the lack of significant dune-front recovery and progressive recession into older back-dune deposits, which has been a feature of the beach for several decades. Photo by C. Sharples.*

Additional information (links and references)

Surveyed beach profiles 2011 onwards: www.tasmarc.info

Harris, PT & Heap, A 2014, 'Geomorphology and Holocene Sedimentology of the Tasmanian Continental Margin', in KD Corbett, PG Quilty & CR Calver (eds), Geological Evolution of Tasmania, Geological Society of Australia (Tasmania Division), pp. 530-539.

Walford, H 2011, 'Assessment of coastal erosion at Ocean Beach, Western Tasmania', Bachelor of Science (Honours) thesis, University of Tasmania.