



Waterhouse TAS03.02.03

Regional Setting

This compartment extends from East Sandy Point to Cape Portland.

Waterhouse and Boobyalla Beaches are high energy beaches, directly exposed to both refracted south-westerly swells moving eastward through Bass Strait and large seas driven by the dominantly westerly winds. Smaller beaches on the more sheltered western sides of Anderson & Ringarooma Bays receive less energetic refracted swells and are less exposed to westerly winds.

Meso-tidal at Waterhouse Beach to micro-tidal at Boobyalla Beach ([Short 2006](#)).

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 3. Despite some losses, sand budget is probably stable or gaining overall, and these swell-exposed beaches are likely to be late responders to sea-level rise. Hard rocky shore sections are resilient.

The extensive sandy barriers in this compartment are mostly derived from sands previously transported to Bass Strait by rivers eroding granites in the catchments during glacial low sea-stands, which were then reworked onshore from the Bass Strait shelf during post-glacial marine transgressions ([Davies, J.L. & Hudson 1987](#)), and also from shoreline reworking of extensive Pleistocene longitudinal terrestrial



dunes (which still cover large onshore areas of north-eastern Tasmania) during the present Holocene interglacial high sea stand ([Bowden 1983](#)). The Ringarooma River is cutting through dune systems and recycling their sand back to the shore in Ringarooma Bay ([Davies, J.L. & Hudson 1987](#)), as well as continuing to supply additional sand to Boobyalla Beach, as it has been since 1875, from extensive tin-sluicing of weathered granites in its catchment ([Knighton 1991](#)). Sediment mobility modelling ([Harris & Heap 2014](#)) suggests there is also likely to be ongoing swell-driven movement of sand onshore in this compartment, but more so to the east in Ringarooma Bay.

A generally eastwards, swell-driven alongshore drift of sand into and through this compartment is evident, with likely minor, eastwards littoral drift of sand around East Sandy Point and Waterhouse Point. However, the promontory of Cape Portland is probably a barrier to alongshore drift of sand out of the compartment ([Davies, J.L. 1973](#)). Windblown sand is also supplied into the compartment via active headland bypass dunes at East Sandy Point, and moves across Waterhouse Point via another active headland bypass dune. Large active transgressive dunes behind both Waterhouse and Boobyalla Beaches are also removing sand inland (south-eastwards) from the coastal system (see **Figure 3**).

Given there are both gains of sand to and losses of sand from the beaches in this compartment, it is unclear whether there is a net gain or loss of sand overall. However, with beaches and incipient foredunes continuing to be observed to recover from erosion events in recent years (see **Figure 2**), it is likely that the sand budget is gaining overall, which suggests these beaches are likely to be late responders to sea-level rise. In most areas, they are not likely to show evidence of progressive recession in response to sea-level rise for some decades at least.

Other comments

Some low-lying coastal areas within this compartment will be increasingly subject to inundation with ongoing sea-level rise. However, the most exposed coastal areas in this compartment – behind Waterhouse and Boobyalla Beaches – are almost entirely unsettled and lacking in infrastructure, although they are in some parts backed by

grazing farmland, which has been perceived to be threatened by the actively transgressive dunes backing these beaches (see **Figure 3**).

Most settlements and infrastructure are on the more sheltered western shores of Anderson and Ringarooma Bays, for example at Tomahawk and Bridport.

Artificial diversion of the outlet of the Great Forester River near Bridport has created problems for Bridport Harbour (in the former estuary of the diverted river), with the artificially-caused reduction in river discharge allowing sand bars to accumulate in the harbour mouth from alongshore sand drift.

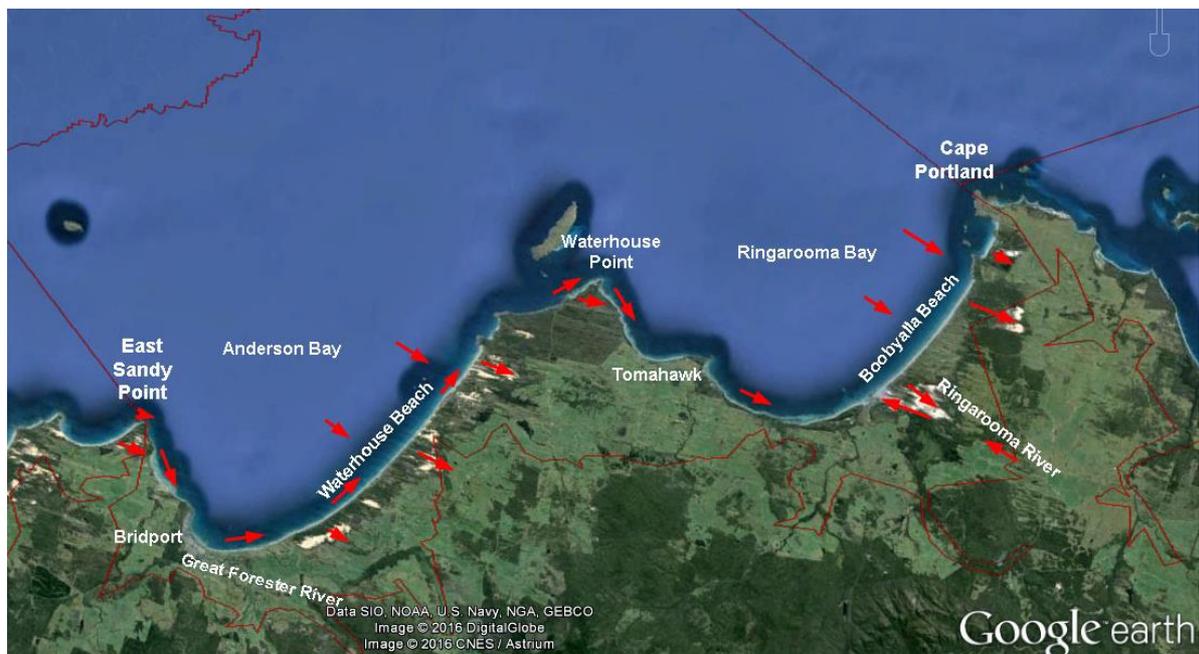


Figure 1: *Compartment TAS03.02.03 Waterhouse (north-east Tasmania). Red arrows indicate inferred sand transport pathways which, as described in the text, include a complex mix of onshore and alongshore drift, headland bypass and transgressive dune transport, and ongoing fluvial sand supply from artificial disturbance in the Ringarooma River catchment.*



Figure 2: View southwards down Waterhouse Beach from South Croppies Point, showing some of the transgressive dunes that are actively removing sand landwards from the coastal beach barrier system. The beach also shows evidence of recovery from beach and foredune erosion events (incipient dune vegetation evident at the back of the beach in the middle-ground), which suggests this beach remains in a dynamic equilibrium (sensitivity rating 3) with a stable or gaining sand budget overall. Photo by Chris Sharples (2002).

Confidence in sources

Medium confidence, based on interpretation of likely coastal behaviour from available general geological and geomorphic information (see list below). However no detailed studies pertinent to overall compartment sand budgets or shoreline behaviour are available.



Figure 3: *These large, active, transgressive dunes behind Boobyalla Beach (south of Cape Portland) are removing sand landwards from the coastal sandy barrier system. Photo by C. Sharples (2002).*



Additional information

Geological mapping of this compartment (including Quaternary sand distribution) is available at several scales. A number of consultant reports exist for various local coastal areas and issues such as sand bar issues at Bridport Harbour, however the references cited below are the main ones relevant to overall compartment sand budget and behaviour:

Bowden, A 1983, 'Relict Terrestrial Dunes: Legacies of a Former Climate in Coastal Northeastern Tasmania', *Zeitschrift fur Geomorphologie N.F.*, vol. 45, pp. 153-174.

Davies, JL 1973, 'Sediment Movement on the Tasmanian Coast', in *1st Australian Conference on Coastal Engineering*, vol. Australia National Conference Publication No. 73/1, pp. 43-46.

Davies, JL & Hudson, JP 1987, 'Sources of shore sediment on the north coast of Tasmania', *Papers and Proceedings of the Royal Society of Tasmania*, vol. 121, pp. 137-151.

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.

Knighton, AD 1991, 'Channel Bed Adjustment along Mine-Affected Rivers of Northeast Tasmania', *Geomorphology*, vol. 4, pp. 205-219.

Short, AD 2006, *Beaches of the Tasmanian Coast & Islands*, Sydney University Press, Sydney.