Marrawah TAS02.03.06

Regional Setting

This compartment extends from Bluff Hill Point to Woolnorth Point.

High to medium energy coast, exposed to south-westerly swells and frequent storms, and to seas driven by strong, generally westerly winds. Micro-tides occur here.

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

The beach sands and extensive coastal and terrestrial dune sands and sand sheets, on and inland of this coast, were probably mainly derived from sands blown landwards from the exposed shelf during glacial low sea stands, and reworked shore-wards by waves during post-glacial marine transgressions. Some of the shelf sands likely originated as glacial outwash, transported down the Pieman River to the shelf from extensively glaciated highlands, and down the Arthur and other rivers from other active, mass wasting processes in catchments under glacial climatic conditions. However, there is little or no supply of sand to the coast from rivers at the present time.

Sediment mobility modelling (Harris & Heap 2014) indicates there may be ongoing, wave driven supply of sand from the shelf to the coast at the present. The sandy beaches on this coast are all well embayed between protruding rocky headlands, so

there is probably only minor alongshore leakage of sand in and out of each beach embayment, although there may be minor leakage of sand into the compartment around Bluff Hill Point (Davies 1973). Although there may be some active loss of sand inland behind Studland Bay and Mt Cameron Beach, via unvegetated transgressive dunes, it is likely most beach embayments in this compartment have stable or possibly slightly gaining (from offshore) sand budgets.

At present, beaches within this compartment appear to be continuing to recover from episodic erosion events (see ***Figure 2***) and are not yet showing clear evidence of progressive recession in response to sea-level rise. However, despite likely stable or gaining sand budgets, most or all beaches in this compartment exhibit protruding bedrock outcrops and are closely backed by rising bedrock slopes (albeit mainly dune-mantled). With ongoing sea-level rise and high wave energies, the beaches in this compartment are likely to be gradually squeezed out against their rising bedrock back-slopes. These beaches are likely to be medium–term rather than late responders to sea-level rise (sensitivity rating 4).

Elsewhere, the sloping to cliffed, hard rocky shorelines that comprise a large proportion of this compartment can be expected to be resilient and show little shoreline change by 2100.

Other comments

Aeolian calcarenites backing parts of beaches near Mt Cameron West are the southernmost aeolian calcarenites in Australia, and exhibit Aboriginal petroglyphs, which have been artificially buried for their protection from vandalism.

Owing to mostly sloping, bedrock and dune backshores, the parts of this compartment susceptible to coastal inundation are mainly limited to areas on and very close to the shore face, and to estuarine reaches of the rivers and creeks reaching the coast along this shoreline.

Much of this coast is immediately backed by agricultural land used mainly for grazing. However, there is little built infrastructure on this coast that is likely to be directly threatened by coastal flooding or recession before 2100.

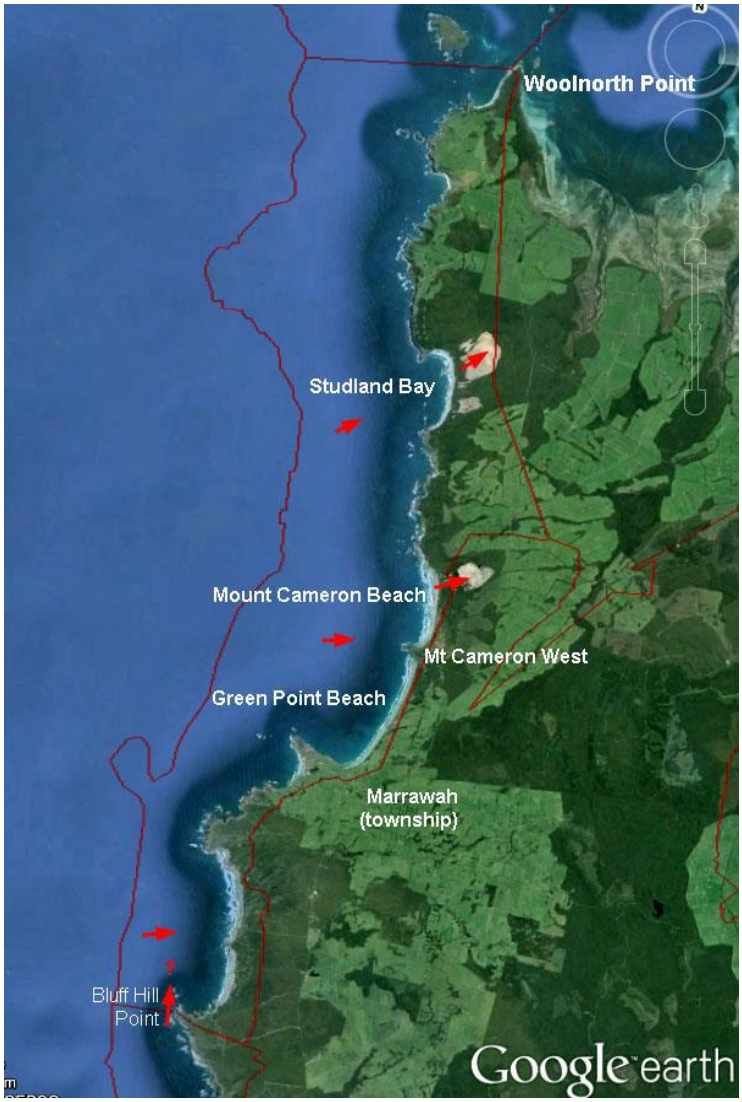

Figure 1: *Compartment TAS02.03.06 Marrawah. Red arrows indicate the main inferred sediment transport pathways within this compartment. It is likely that most beach embayments in this compartment have a mostly stable or slightly gaining sand budget.*

Figure 2: *Well-advanced foredune recovery, following an episodic erosion event at Green Point Beach, suggests that this beach is not yet responding to sea-level rise with progressive recession, but rather is likely to be a medium-term or late responder to sea-level rise. Photo by C. Sharples (2010).*

Confidence in sources

Medium confidence: Sensitivity assessment is based on existing geological and topographic mapping with some field inspections. There have been no detailed studies of coastal processes in this compartment, and data on shoreline behaviour history over the twentieth century is not yet available.

Additional information (links and references)

In addition to geological and topographic mapping which is available at several scales, the following references are pertinent to coastal processes and sea-level rise responses in this coastal compartment:

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.

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.