



East Bruny - South Arm TAS01.04.03

Regional Setting

This compartment extends from Cape Contrariety to Tasman Head.

It experiences micro tides, and is highly exposed to south-westerly and south-easterly swells.

The dominant regional processes influencing coastal geomorphology in this region are the humid warm to cool temperate climate, micro-tides, south-easterly Tasman Sea swells, easterly seas, dominantly quartz (terrigenous) sediments with northerly longshore transport in the northern part, and the El Nino Southern Oscillation (driving beach erosion/accretion cycles, cyclone frequency).

Regional hazards or processes driving large scale rapid coastal changes include: East Coast Lows (extra-tropical cyclones), mid-latitude cyclones (depressions), and storm surges (<1m).

Justification of sensitivity

A sensitivity rating of 4 is given to Adventure Bay Beach, a potential early to medium term responder to sea-level rise. A sensitivity rating of 3 is given to the compartment's other beaches which are likely late responders. The extensive hard rock coast is resilient.

Beach barrier sands are likely mainly glacio-fluvial sands, supplied to Storm Bay continental shelf by the Derwent and Huon Rivers from glaciated highlands during glacial low sea stands, and reworked onshore during post-glacial marine transgressions. There is negligible present-day sand supplied by rivers, and modelling suggests only minor potential for present-day continuing onshore sand supply from the shelf to Hope, Calverts and Neck Beaches ([Harris & Heap 2014](#)).



The main beaches (Neck, Hope and Calverts Beaches) are embayed between prominent rocky headlands, are probably not losing sand alongshore, and are all continuing to show strong foredune recovery after erosion events (an air photo time series for Hope Beach since the 1940s shows no significant change in long-term behaviour as yet). These beaches will probably be late responders to sea-level rise.

Adventure Bay Beach (at the southern end of Adventure Bay) receives sand drifted southwards alongshore from shallow subtidal sand supplies in Adventure Bay. However, subtidal sand distribution visible on air photos implies that it is also losing sand into deep water off Fluted Cape ([Sharples & Donaldson 2014](#)). Although this beach's sand supply appears to be currently in equilibrium, with no evidence of shoreline recession as yet, there is a potential for increasingly frequent erosion events, resulting from rising sea-levels, to tip this beach into a losing sand budget earlier than other beaches in the compartment. Hence, Adventure Bay Beach may be an early-to-medium term responder to sea-level rise.

Other comments

Inundation susceptibility is low in most of this compartment, owing to steep rocky backshores and relatively high barrier beach dunes. However, only a low foredune and beach ridges back Adventure Bay Beach; the extensive low backshore areas are susceptible to inundation, particularly via several creek outlets creating gaps in the foredune.

The sandy Bruny Island Neck isthmus is potentially at risk of being breached by shoreline recession related to sea-level rise. However, if Neck Beach is a late responder to sea-level rise as indicated, the main risk of breaching will probably come from the swell-sheltered D'Entrecasteaux Channel side where progressive shoreline recession driven by local wind-waves is already evident ([Sharples & Donaldson 2014](#)). A similar situation holds for South Arm neck isthmus (behind Hope Beach), which is similarly showing more evidence of erosional recession on the north (swell-sheltered Ralphs Bay) side, than Hope Beach itself.



The main areas of infrastructure at risk from shoreline recession and inundation in this compartment are the Bruny Island neck and South Arm roads, and both roads and residences at Adventure Bay township, behind Adventure Bay Beach.

Confidence in sources

Moderate – high confidence: Based on repeated field inspections and air photo time series evidence, but no detailed published studies as yet.

Additional information

Beach profile monitoring for several beaches within compartment: 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.

Sharples, C & Donaldson, P 2014, A First Pass Coastal Hazard Assessment for Kingborough Local Government Area, Tasmania, By: Blue Wren Group, School of Land & Food (Geography), University of Tasmania, DOI 10.13140/2.1.4677.9680.

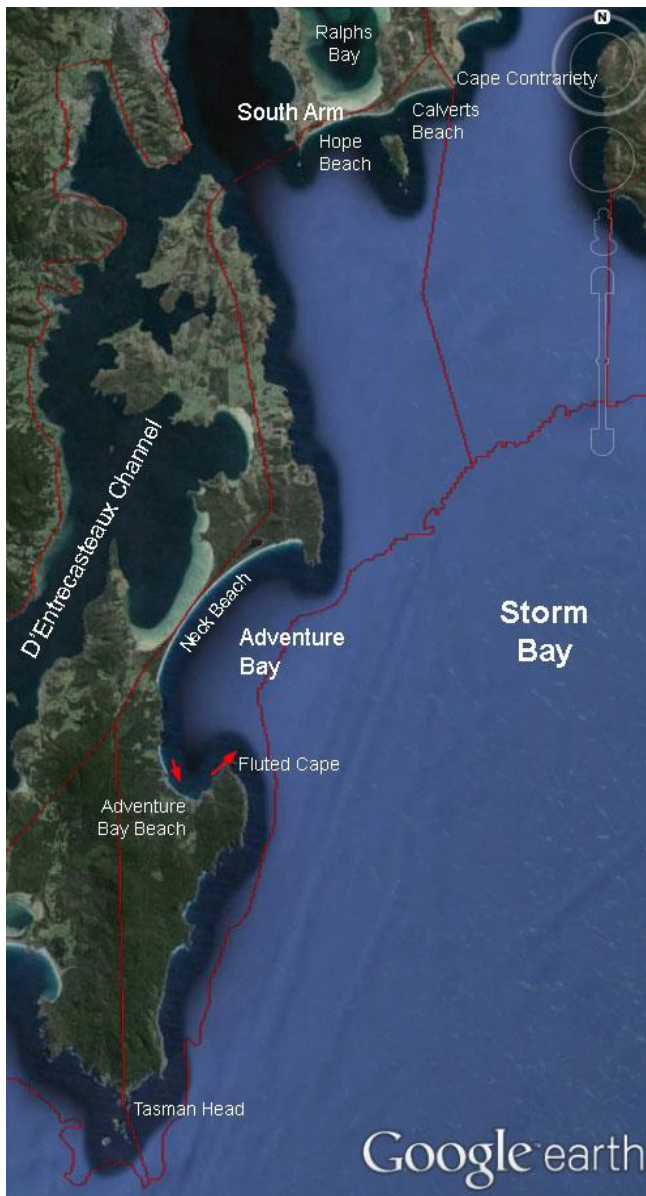


Figure 1: Compartment TAS01.04.03 South Arm – East Bruny. Small red arrows indicate interpreted longshore sand transport in and out of Adventure Bay beach (driven by refracted swell waves).