



## Recherche TAS01.04.06

### Regional Setting

This compartment extends from Rossel Point to South East Cape.

It is exposed to refracted south-westerly swell and south-easterly Tasman Sea swells, as well as being micro-tidal.

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

Beach and barrier sands are likely to be mainly glacio-fluvial sands, supplied to Storm Bay continental shelf by the Derwent, Huon and Lune 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 sediment mobility modelling suggests little potential for present-day continuing onshore sand supply from the shelf ([Harris & Heap 2014](#)).

A number of sandy beaches embayed between rocky headlands in Recherche Bay and Southport (including Roaring Beach, Southport Beach and Planter Beach: see [Sharples \(2015\)](#)) are probably neither gaining nor losing sand significantly, and although these are episodically eroded by storm waves, they are not yet showing clear evidence of progressive shoreline recession and will probably be late responders to sea-level rise.



In contrast, large sand sinks in the form of flood-tide deltas are present in the permanently open tidal coastal lagoons of the Lune Estuary, Southport Lagoon (**Figure 2**), Blackswan Lagoon and the Cockle Creek estuary lagoon (as well as a prominent ebb-tide delta just outside the Lune estuary mouth: see **Figure 3**). Given the likelihood that ongoing sea-level rise will create additional sand accommodation space in these sinks, it is likely that beaches adjacent to each sink will begin to lose increasing amounts of sand into them, and will thus likely be medium-term responders to sea-level rise. These beaches include Kingfish and Elliott Beaches, adjacent to the Lune estuary mouth; Big Lagoon Beach, adjacent to Southport Lagoon; Little Lagoon Beach, adjacent to Blackswan Lagoon; and Cockle Creek Beach, adjacent to Cockle Creek estuary lagoon. Big Lagoon Beach is a narrow sandy barrier (actually a tombolo connecting to a bedrock island on the south side of the tidal lagoon entrance) that bars most of Southport Lagoon and is highly exposed to swell waves; it is likely that as sea-level rises, this barrier will transition from simple recession of the seawards shoreface to a landwards translation (or 'roll-over') of the entire barrier.

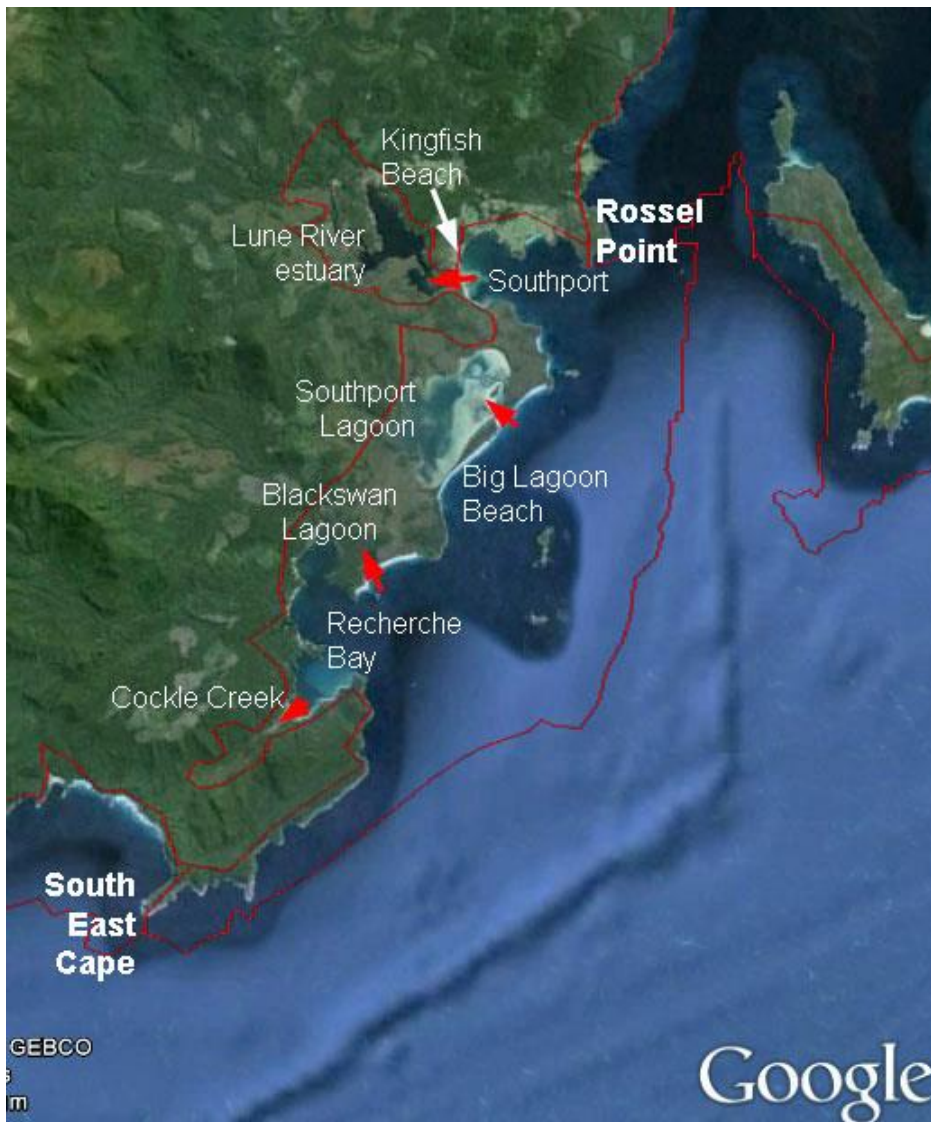
No historical beach behaviour data is available for most of these beaches at present, except for Kingfish Beach which has exhibited some progressive shoreline recession during the Twentieth Century, particularly in its southern parts close to the flood- and ebb-tide deltas at Lune estuary mouth ([Sharples 2015](#)). As a result, attempts have been made to place boulders to protect shacks situated very close behind the beach (see **Figure 4**). Kingfish Beach is possibly an early responder to sea-level rise.

#### **Other comments**

Some shoreline areas have significant susceptibility to coastal flooding, as summarised by [Sharples \(2015\)](#).

Roads, residences and other infrastructure are susceptible to both present-day and increased future coastal flooding and shoreline recession along parts of the north shore of Southport, and the western and southern shores of Recherche Bay.

Other shores in this compartment are mainly uninhabited, with little susceptible infrastructure. However, saltmarsh communities at Southport Lagoon and elsewhere may in parts be affected by coastal squeeze as sea-level rises against steep backshore slopes.



**Figure 1:** Compartment TAS01.04.06 Recherche. Red arrows indicate tidal lagoon or estuary sand sinks which are likely to gain increased accommodation space and capacity to sequester sand in response to sea-level rise.





**Figure 2:** Southport Lagoon showing the permanently open tidal channel and extensive flood-tide delta within the lagoon, which will have capacity to sequester large amounts of sand from adjacent beaches as sea-level rise creates additional accommodation space within the lagoon. The sandy barrier of Big Lagoon Beach extends southwards from the rocky headland on the LHS of the tidal channel. The narrow mouth of the Lune estuary is visible in the background and also has large ebb- and flood-tide sand deltas which are not visible in this photo. Photo by C. Sharples (2014).



**Figure 3:** Flood- and ebb-tide deltas at the mouth of the Lune River estuary have likely been sequestering sand from the southern part of Kingfish Beach on the northern side of the estuary, and accommodation space for sand in these sinks will increase as sea-level continues to rise. This is a 1946 air photo from Adamson 93 project, run 11, negative 27851 (© Department of Primary Industries, Water and Environment, Hobart).





**Figure 4:** A view down Kingfish Beach, showing boulders placed to protect shacks from erosion. Some progressive recession of the southern part of this beach has occurred during the twentieth century, with sand probably being lost into ebb- and flood-tide deltas at the adjacent Lune River estuary mouth. Photo by C. Sharples (2001).



**Figure 5:** *Although Southport Beach at Southport township is an embayed beach, with little likely loss of sand and so likely to be a late responder to sea-level rise in respect of shoreline recession, the main road is located at very low elevation immediately behind the beach, where it is prone to storm surge flooding and will be increasingly so in future. Photo by Nepelle Crane (2011).*

### **Confidence in sources**

Moderate confidence: Only limited previous studies (e.g., at Kingfish Beach) are available. This assessment is mainly based on reconnaissance field observations and inferences by Chris Sharples.



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

Useful geological and topographic mapping at several scales is available for coastal areas in this compartment. [Sharples \(2015\)](#) summarises available information on coastal erosion and inundation hazards for this compartment, and references some of the limited earlier studies that are available. The following sources have been cited above:

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 2015, *A First Pass Identification of Coastal Hazards for the Huon Valley Council LGA*, Huon Valley Council & NRM South, Hobart.