



## Port Stephens NSW02.01.03

### Regional Setting

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).

This compartment extends from Yacaaba Head to Tomaree Head.

### Justification of sensitivity

Sensitivity rating is a 4 overall. However, the local erosion hotspot at Jimmys Beach and its vicinity are ranked at 5. The shores around the entrance of Port Stephens are highly vulnerable to change, based on observations

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### Other comments

Port Stephens is a large embayment, exposed to oceanic wave processes and tidal sediment movements at the entrance of an extensive estuary (Thom, et al., 1992). Waves refract into Shoal Bay on its southern side, at times undercutting an established foredune on a steep reflective beachface. Erosion studies have been undertaken at Nelson Bay (Nielsen, 1979). An erosion hotspot occurs at Jimmys Beach on the northern side, linked to Winda Woppa spit, associated with periodic bi-directional sand transport along a steep beachface. The sand pulses along the crenulated shore as sand waves at about 70m/yr (Short 2007). Historic maps reveal



dynamic shifts in shoreline position, highlighting the vulnerable nature of landforms adjacent to an extensive flood tide delta (see historic maps of growth and destruction of Myall Point/Winda Woppa spit, in Fig. 5.10 in Thom et al., 1992; see Figure 1). The area has been the subject of detailed studies as part of council's management program with recent storms cutting a local road. Council continues to nourish the beach from local sources. The tombolo linking Hawks Nest to the headland has been washed over by waves in historic time but recovers into a foredune complex.

### **Confidence in sources**

High confidence: Jimmys Beach has been the subject of extensive investigations by state and local authorities, most recently in the development of the CZMP

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

Nielsen, A.F., 1979. Nelson Bay erosion study. NSW Department of Public Works, Coastal Engineering Branch, Report No PWD 79003.

Short, A.D., 2007. Beaches of the New South Wales Coast. Australian Beach Safety and Management Program, Sydney.

Thom, B.G., Shepherd, M., Ly, C.K., Roy, P.S., Bowman, G.M., Hesp, P.A., 1992. Coastal Geomorphology and Quaternary Geology of the Port Stephens-Myall Lakes Area. Australian National University, Canberra.

Vila-Concejo, A., Austin, T., Harris, D., Hughes, M., Short, A., Ranasinghe, R., 2011. Estuarine beach evolution in relation to a flood-tide delta. Journal of Coastal Research, SI 64, 190-194.

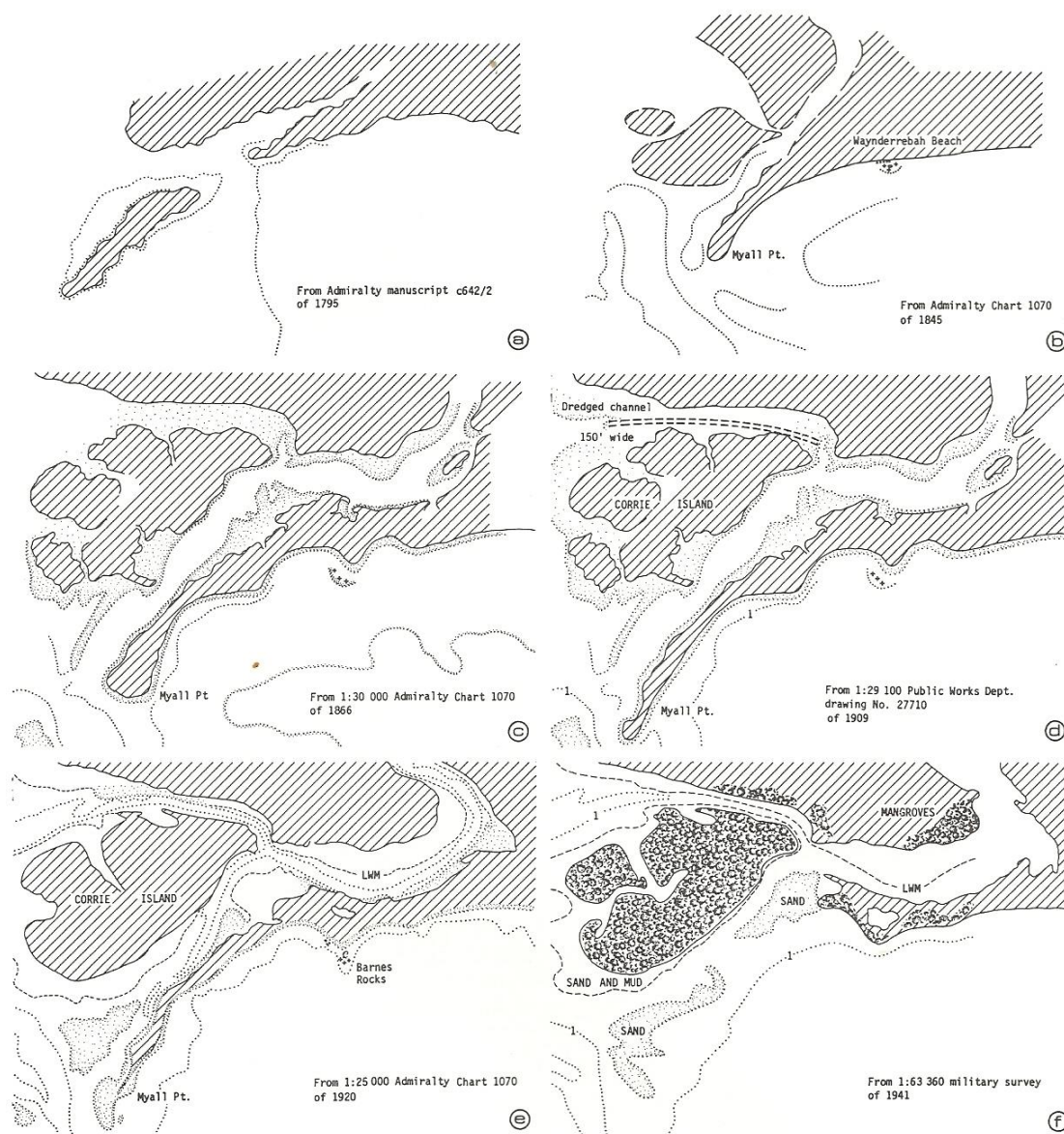


Figure 1. Historic maps of Myall Point/Winda Woppa spit from Thom et al. (1992, Fig 5-10, p.183).