



## Myall Lakes Coast NSW02.01.02

### 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 Seal Rocks to Yacaaba Head.

### Justification of sensitivity

Sensitivity rating is a 4. Erosion has been inferred on both geological and historic time scales. Much of the area is in a National Park.

### Other comments

This secondary compartment consists of two tertiary compartments, Eurunderee and the smaller Fens Embayment. The Quaternary geomorphological history has been comprehensively summarised by Thom et al. (1992). These southeast facing transgressive dune barriers have accumulated large volumes of sand during the Holocene, developing seaward and over from extensive Pleistocene inner barrier deposits. In the Fens embayment, the transgressive dunes top a broad sequence of prograded beach-ridge/relict foredune ridges. The beach is reflective and highly protected at the southern end where it joins Yaccaba Head (the 'tombolo' has been overwashed in historic times); transgressive dunes are progressively larger to the



north but overlie a Holocene prograded strandplain. The Eurunderee section consists of sets of parabolic and long-walled transgressive dunes overlying Pleistocene deposits. A narrow foredune separates Broadwater Lake from the sea; it is little more than 300 m wide, much of it comprising a dune blowout. This narrow foredune was established a permanent ridge blocking Broadwater Lake around 4000 years ago (Thom, et al., 1992), but potentially could be breached in future under rising sea levels and storm wave inundation.

Despite the large volumes of sand, phases of erosion have been demonstrated at Holocene and historic time scales. Sand transported alongshore could continue to feed these dunes as well as move north around Seal Rocks, as inferred by Roy et al. (1997).

Topographic surveys of beach and foredune ridge at Dark Point over the past 34 years indicate extensive erosion in 1974, with phases of recovery (averaging ~3m/yr until 1998) and lesser cut since then (Hesp, 2013).

### **Confidence in sources**

Medium confidence: Detailed geological mapping has unravelled the Quaternary history of this area, but likely future behaviour is less certain.

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

Hesp, P.A., 2013. A 34 year record of foredune morphodynamics, Dark Point, NSW, Australia. *Journal of Coastal Research*, Special Issue 65, 1295-1300.

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.

Roy, P.S., Zhuang, W.-Y., Birch, G.F., Cowell, P.J., Li, C., 1997. Quaternary geology of the Forster-Tuncurry coast and shelf, southeast Australia, NSW Geological Survey Report p. 405.