



Sydney Southern Beaches NSW02.03.05

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 Cape Banks to Port Hacking Point.

Justification of sensitivity

Overall rating is a 3, although sand extraction from Kurnell may exacerbate sensitivity of this area to a 4 or 5. There will be continued loss of sand at Towra Point.

Other comments

The beaches in Botany Bay are relatively low energy, although Lady Robinson Beach on the western side has formed as a sequence of beach ridges, but has experienced episodes of severe erosion in the past (Andrews, 1916). The potential inundation in this area has been studied in a COVERMAR project by Sydney Coastal Councils Group and by CSIRO (see McInnis et al. 2012; and Dall'Osso et al., 2014).

Bate Bay contains Cronulla Beach, Sydney's longest beach. Much of the back barrier area of transgressive dunes has been mined for sand extraction, making this



area potentially sensitive (Gordon, 1992). Considered to be eroding with high confidence at geomorphologic and historic scales by Chapman et al. (1982). Roy and Crawford (1980) have studied the geologic history of Kurnell Peninsular and Foster, and others have undertaken several investigations of erosion issues at Bate Bay/Cronulla area (for instance Foster, 1974). There are shelf sand bodies in this region (Field and Roy, 1984).

While Jibbon Beach is relatively sheltered behind Port Hacking Point, Deeban Spit is more exposed to swell coming into Port Hacking. The large flood tidal delta extends into the deep water of Port Hacking and has been studied by Roy (1984). It continues to build landwards from inshore sands and has been used as a source to nourish Cronulla beaches.

Confidence in sources

Medium confidence.

Additional information (links and references)

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Gordon, A.D., 1992. The restoration of Bate Bay, Australia – plugging the sink. *Proceedings of the 23rd International Conference on Coastal Engineering, ASCE, Venice*, pp. 3319-3310.

Gordon, A.D., Hoffman, J.G., 1989. Seabed Information, 1:25,000 Sheets: Bate Bay, Sydney Heads, Broken Bay, Gosford, Public Works Department New South Wales Coast and Rivers Branch.



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McInnes, K.L., Lipkin, F., O'Grady, J., Inman, .M, 2012. Mapping and responding to coastal inundation. Sydney Coastal Councils & CSIRO.

Roy, P.S., 1984. New South Wales estuaries: their origin and evolution, In: Thom, B.G. (Ed.), Coastal geomorphology in Australia. Academic Press, Sydney, pp. 99-121.

Roy, P.S., Crawford, E.A., 1981. Holocene geological evolution of the southern Botany Bay-Kurnell region, central New South Wales coast. Records of the Geological Survey of New South Wales 20, 159-250.

Beach Sand Nourishment Scoping Study (2010)

[http://www.sydneycoastalcouncils.com.au/Project/Sand Nourishment Scoping Study](http://www.sydneycoastalcouncils.com.au/Project/Sand_Nourishment_Scoping_Study)

Mapping and Responding to Coastal Inundation (2012)

[http://www.sydneycoastalcouncils.com.au/Project/Mapping and Responding to Coastal Inundation](http://www.sydneycoastalcouncils.com.au/Project/Mapping_and_Responding_to_Coastal_Inundation)