



Broulee NSW02.06.03

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 Mosquito Bay Head to Bingie Bingie Point.

Justification of sensitivity

Sensitivity rating is a 4. Despite evidence of past gradual progradation, several beaches appear to have stopped prograding and are known to be susceptible to erosion.

Other comments

The northern section of this compartment is rocky with deeply embayed pocket beaches, such as Mosquito Bay and Malua Bay, continuing south to Burrewarra Point. Between Burrewarra Point and Broulee Island is a broad embayment with several small crescentic beaches. Barlings Beach, the easternmost beach, is dominated by locally sourced carbonate sand (and may therefore be a relatively sensitive, fast responder), whereas beaches to the south are dominated by quartz sand.

Broulee Island is often connected to the adjacent beach by a tombolo, but this can be breached (see Ballard, 1982). Bengello Beach fronts a broad progradational plain that has built out at ~0.25 m/yr for the past 7,000 years (Thom et al., 1981; Oliver et al., 2015). The modern beach has been surveyed on a regular basis for >40 years,



recording the rapid erosion during a sequence of storms in 1974 to 1978, and the recovery over the ensuing decade, with fluctuations thereafter (Thom and Bowman, 1980; Thom and Hall, 1991; McLean and Shen, 2006; Mclean et al., 2010, 2014, Figure 1). This shoreline will be a slow responder, and appears stable or perhaps slowly accreting, except that the frontal dune is atypically high, implying that the system may have changed from a sensitivity of 1 to one of 4.

Moruya Heads Beach and Pedro Beach contain smaller beach-ridge plains and both beaches show rotation in response to ENSO, with up to 100 m change in position of either end of each beach (Short et al., 2014). Beaches at the southern end of this compartment are more bedrock controlled and will be slow responders.

Confidence in sources

Medium confidence: Despite an unparalleled understanding of the dynamics of Bengello Beach at geological and historic time scales, it is difficult to translate this into confident analyses of how these sections of coast will behave in the future.

Additional information (links and references)

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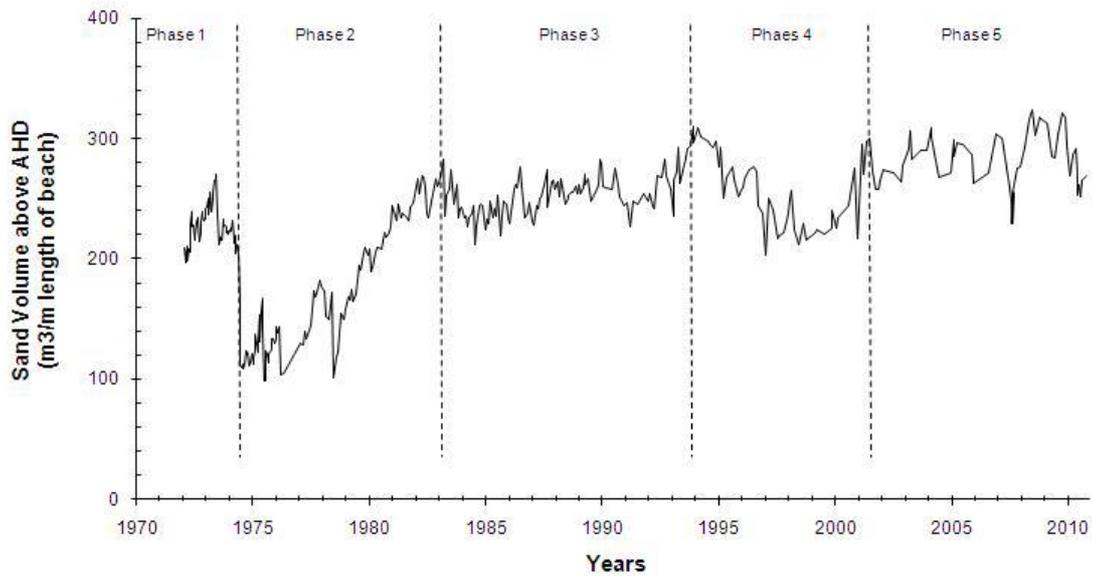


Figure 1. Time series of beach profile change 1972-2010, Bengello/Moruya Beach (from McLean et al., 2010).