THE MORPHOLOGY AND LONG TERM SHORELINE CHANGES

OF LONG BEACH, SANDY BAY

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Declaration

This thesis contains no material that has been submitted for credit in any other degree or graduate diploma in any tertiary institution. To the best of the author's knowledge, this thesis contains no material previously published or written by other persons, except when due reference is made in the text of the thesis.

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Abstract

This project has analysed the long term changes in shoreline position and morphology of Long Beach, located 3 kilometres south of the Hobart CBD in southern Tasmania. Also of interest was the effect of the seawall on shoreline recession rates on Long Beach, offshore bathymetry and the sediment cycling in the area.

Aerial photography and Geographic Information Systems (GIS) is used to create graphical change maps of the study area from 1947 to 1998, in order to interpret regions of change. This information was interpreted to obtain numerical values for the rates of recession or accretion. The changes in offshore bathymetry were also investigated through the production of a digital elevation model. Spot height data was analysed and interpolated in order to effectively locate offshore sand stores.

Results have shown extensive shoreline retreat from 1947, with sand loss being most severe on the mid-regions of Long Beach and on Long Point to the north. In comparison, accretion is prevalent on Nutgrove Beach indicated by a developed dune system. Rates of recession have averaged 2 metres/year during periods of maximum erosion. This figure is comparable to other shoreline studies completed in the region. The variations in sediment supply were analysed in relation to the effect of coastal processes and various coastal engineering structures.

It was found that the erosion on Long Beach has been a direct result of a combination of natural and human-induced changes.

- A shift in the balance of northerly and southerly winds has altered the sediment equilibrium that existed prior to the 1950s, as a result sediment is no longer able to reach Long Beach from the northern beach.
- The extension of a sewage outfall pipe on Blinking Billy Point has possibly restricted sediment movement from the south.
- The presence of the seawall on Long Beach combined with a narrow beach has resulted in waves impacting on the beach during storm events resulting in increased erosion due to wave reflection and scouring.
- Foreshore development, the presence of bridges to the north and damming of the Derwent River may all have influenced wind patterns and sediment supply to Long Beach which has resulted in the poor condition of the beach.
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