



Snapshot

New Brighton beach scraping, Byron Shire Council

Summary

The coastline of northern New South Wales (NSW) has a long history of damaging beach erosion. Recent studies predict that a large storm could affect infrastructure at New Brighton beach, which is already subject to long-term shore-line recession and climate change-induced sea-level rise impacts.

Beach scraping is designed to artificially increase dune volume. Beach scraping is unlikely to provide a long-term coastal adaptation solution. However, it is a useful tool for reducing the risk to coastal assets from coastal hazards over the short to medium-term.

Byron Shire Council has successfully completed beach scraping in 2010 and 2013 and is planning another campaign in the near future.

With coastal communities under serious threat from climate change in the near future, the management of the New South Wales (NSW) coastal zone is a high priority for councils and agencies alike. Questions being asked by managers include: How do we adapt our coastal zone to this changing climate? and What can we do to alleviate the risk of coastal hazards threatening the livelihood of our people and communities? Coastal adaptation to climate change can include three possible responses: protect through the use of hard structures and soft protection measures (e.g. beach nourishment and beach scraping); accommodate to changing conditions such as raising buildings; or retreat by abandoning the coastal location (IPCC 1995).

This snapshot describes the strategy of beach scraping used at New Brighton Beach in the Byron Shire in northern New South Wales. The coastline north of the Brunswick River in the Northern Rivers region of NSW has a long history of beach erosion. In the 1960s and 1970s several homes at the southern end of New Brighton beach had to be abandoned and further south the village of Sheltering Palms was completely lost to coastal erosion (see Figure 1).

Keywords

Coastal hazard management, beach scraping, Byron, northern New South Wales, NSW

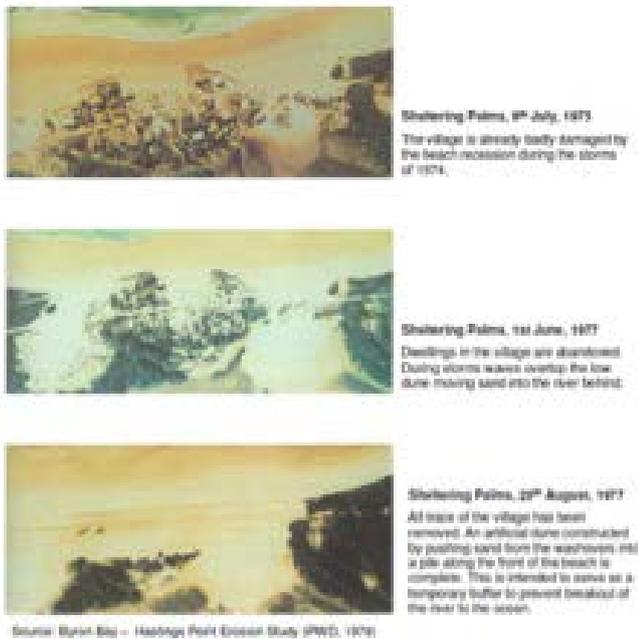


Figure 1: Village of Sheltering Palms during the late 1970s. Source: © Gordon et al. 1978.

Recent studies have predicted that a large 'design' storm (i.e. a storm with a 100 year average occurrence interval) could result in the erosion of the beach at New Brighton by 40 m to 50 m landward, or 200 m³/m (WBM 2013). As a consequence, parts of the main public road and infrastructure at New Brighton are under immediate threat from an extreme storm, or series of very large storms, which could occur at any time. New Brighton beach is also experiencing underlying long-term shoreline recession due to an imbalance in the sediment budget, with more sediment leaving the system than being returned. This long-term recession has been estimated at 8 to 15 cm/year.

The risk to New Brighton beach from projected climate change-induced sea-level rise is also very significant when looking into the future. The vulnerability of this area of the coast to beach erosion and shoreline recession increases with time, and most of the seaward properties and road infrastructure in New Brighton are projected to be at risk from, or impacted by, coastal recession by the year 2050 (see Figure 2). Wave over-topping to the hind-dune areas also presents a significant inundation hazard along the beach where the dune area is narrow and/or low.



Figure 2: Erosion hazard lines at New Brighton for the immediate (red), 2050 (beige) and 2011 (blue) timeframes. Source: © WBM 2013.

Past response to the threat of erosion at New Brighton has included the practice of beach scraping. Beach scraping is the mechanical movement of sand from the intertidal zone and placement of this sand onto the dune area. The practice is designed to speed up the rebuilding of the dune system after a storm event. It can also be used to assist in the reshaping and rebuilding of a dune system at any other time to protect coastal lands from coastal erosion, underlying shoreline recession, wave overtopping and inundation (see Figure 3).



Figure 3: Machinery at work during beach scraping. Source: © Byron Shire Council 2013.

Beach scraping was used during the late 1970s to 1990s as a strategy to combat the threat of significant erosion events (WRL 2010). Works continued into the early 1990s in combination with an active dune care campaign: these strategies were successful in enhancing the storm buffer provided by the dunes. However, beach scraping was suspended due to possible negative impacts on populations of pipis. Pipis are a type of edible clam: they are seasonal however and so beach scraping can be timed to occur when these animals are absent (Erskine and Thompson 2003; in Carley et al. 2010).

After a period of hiatus of beach scraping at New Brighton, a trial was undertaken by Byron Shire Council in 2010 to understand the effectiveness of beach scraping as a coastal hazard management strategy. The primary objectives of the project were to:

- reduce the severity of the immediate coastline hazard threat to infrastructure, by increasing foredune volume and creating a preferred dune profile
- provide data to allow determination of both positive and negative impacts
- enable council to assess the viability of beach scraping over the short to medium-term.

The 2010 trial program was considered a success from an environmental, technical and social perspective and the Council resolved to implement an on-going beach scraping program subject to funding and the prevailing coastal processes at the time. A successful trial was undertaken in 2013: before and after photos highlight the increased beach width and dune volume (see Figures 4 and 5).

Byron Shire Council expects to undertake another beach scraping program in the future. The success of the program will depend on the severity and frequency of future storm events after scraping episodes. Beach scraping will not eliminate the threat to infrastructure and private property from a major storm event but will certainly reduce the severity of this threat. Beach scraping is unlikely to provide a long-term coastal adaptation solution to address coastal erosion and shoreline recession, especially under rising sea level. However, it may provide a useful coastal adaptation tool in Australia in the short-to medium-term to reduce the risks to property and infrastructure from immediate and medium-term coastal hazards.



Figure 4: New Brighton beach before beach scraping works in 2013. Source: © Byron Shire Council 2013.



Figure 5: New Brighton beach after beach scraping works in 2013. Source: © Byron Shire Council 2013.

References

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Further information

New Brighton Beach Scraping - Byron Shire Council <http://www.byron.nsw.gov.au/new-brighton-beach-scraping>.

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