

Understanding shoreline change on the Victorian coast: Port Fairy



Victoria has more than 2,500 km of coastline. In addition to its important and varied natural values, the coast provides critical social, cultural and economic benefits to communities. Coastal erosion already affects these values in many parts of Victoria. Climate change is likely to increase the frequency, intensity and extent of existing coastal hazards, further increasing the impact of erosion on the Victorian coast.

The Earth Systems and Climate Change Hub is investigating shoreline change in Victoria through the National Centre for Coasts and Climate.



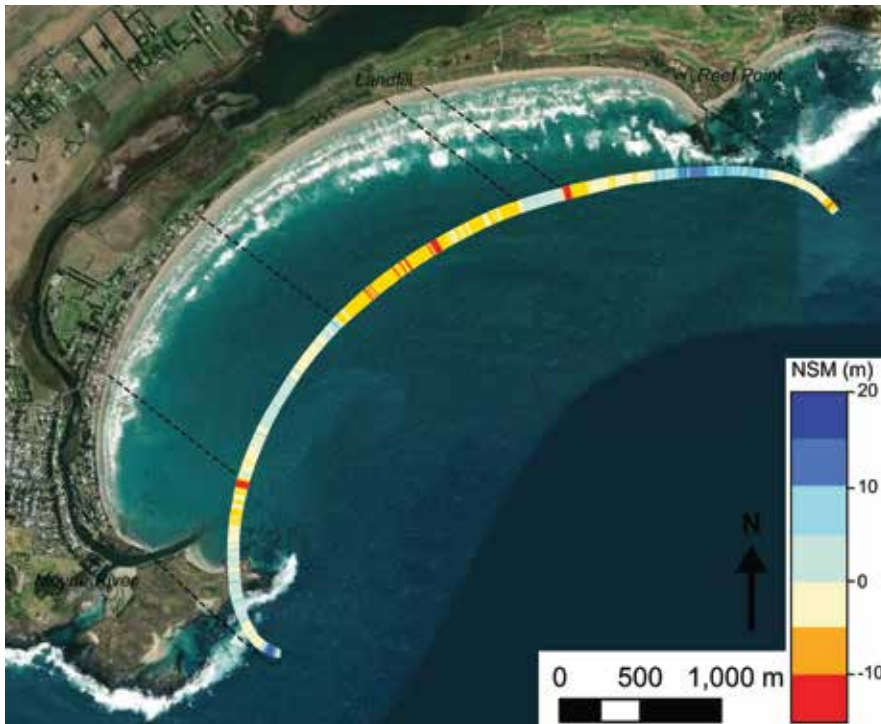
Understanding trends and changes in erosion rates is important for informing coastal management and planning activities. Researchers at the National Centre for Coasts and Climate (NCCC) in the Earth Systems and Climate Change Hub worked with the Department of Environment, Land, Water and Planning and Deakin University on the Victorian Coastal Monitoring Program to investigate changes in the frequency and intensity of historic erosion, and to shed light on the drivers of shoreline change, now and into the future. The program investigated historic shoreline change for 15 coastal areas in Victoria.

This fact sheet summarises the patterns of historic change for East Beach, Port Fairy. This and other regional summaries are available at www.nesplclimate.com.au.

Historic shoreline change on the Port Fairy coast

East Beach is located on Victoria's far south-west coast, approximately 300 km west from Melbourne. It extends in a broad arc eastward from the Moyne River to Reef Point. Erosion has been a concern here since the 1870s when construction of the Moyne River training walls altered sediment transport processes and shoreline movement. The town of Port Fairy, in the west of the bay, is protected by rock revetments that have been constructed progressively since the 1950s, but remains vulnerable to erosion and inundation when sea level is elevated. Away from these structures, ongoing shoreline retreat and erosion during storms has exposed old landfill resulting in the construction of new revetments.

Through the western half of the study area – from the Moyne River extending eastwards for ~2.4 km to the end of the rock revetment – the shoreline has been relatively stable, showing little to no net shift (<7.4 m) in shoreline position since 1968. This stability is due to the revetments which prevent shoreline retreat. Shoreline shifts within this 'stable' section of coast are largely linked to modifications to the existing revetments.



How was shoreline change determined?

Researchers compared the shoreline in aerial photos dating from 1968–1986 to photos taken during 2011–2019 and were able to detect changes of 5 m or more. The shoreline was defined as the seaward edge of vegetation or the top of any rock walls, whichever was applicable.

The remaining far-eastern section of East Beach has shown an overall stable to slightly seaward shift in shoreline position since 1968.

Implications for the future

The construction of revetments has minimised erosion but increased maintenance costs and recreational and visual impacts. The frequency of erosion events means that the potential for dune recovery is limited, so unprotected sections of East Beach are vulnerable to further erosion.

Living shorelines can reduce the threats of coastal erosion and flooding. NCCC researchers are developing national guidelines for coastal habitat restoration and eco-engineering to provide coastal managers and councils with more information to help manage threats to assets and mitigate future erosion risk.

Shoreline change on the Port Fairy coast showing net shoreline movement (NSM), calculated as the distance between the earliest (1968) and most recent (2019) shorelines. Negative values (yellow/orange/red) indicate landward retreat (erosion) and positive values (green/blue) indicate seaward advance.

However, there was some erosion between 1968 and 1989 in areas where shoreline protection structures were inadequate. Since 2011 the total range of shoreline movement has been less than 7 m.

From the revetment extending eastwards for ~2.1 km, the shoreline has retreated by an average of 5 m since 1968, although this extends up to 14 m adjacent to the new landfill revetment. From 1969 to 1986 the

shoreline moved up to 18 m seawards with the establishment of plants on the beach and foredune development. While shoreline movement between 1986 and 2011 is unknown, since 2011 the coast has shown progressive erosion. The dunes now consist of a steeply scaped foredune measuring ~ 8 m in height, with only occasional short-lived early dune growth. There has only been substantial dune recovery in the lee of the new landfill revetment.

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