Earth Systems and Climate Change Hub

National Environmental Science Programme

Understanding shoreline change on the Victorian coast: Inverloch, South Gippsland

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.

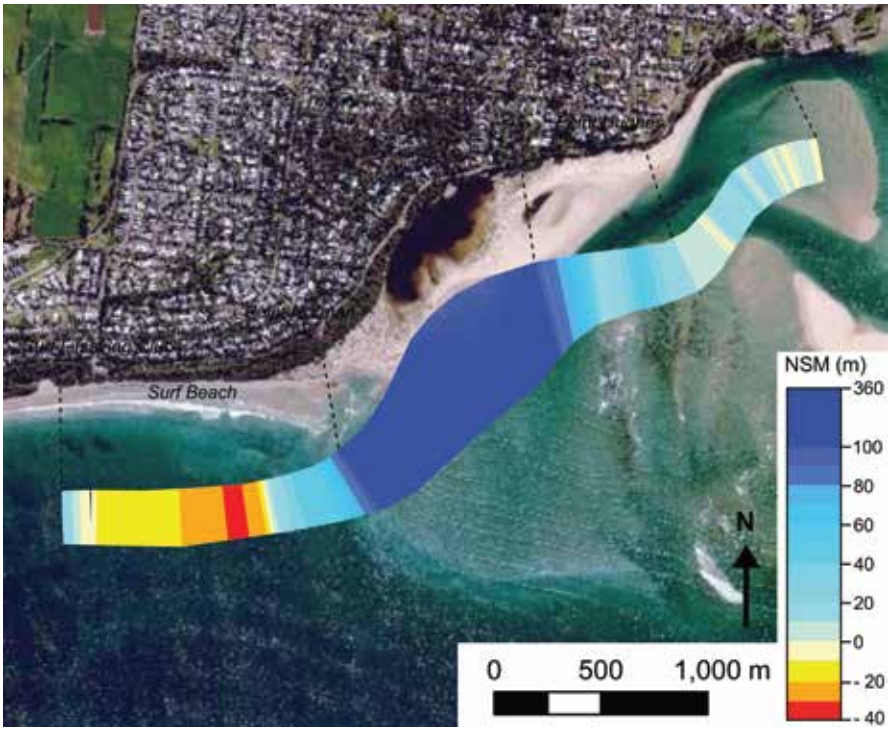
This fact sheet summarises the patterns of historic change for Inverloch, South Gippsland. This and other regional summaries are available at www.nespclimate.com.au.

Historic shoreline change on the Inverloch coast

Inverloch is situated at the mouth of Anderson Inlet, approximately 143 km south-east of Melbourne. This coast is vulnerable to erosion due to the movement of sand bars and channels in the estuary, and from waves when sea level is elevated. Much of the shoreline inside the estuary mouth is protected from erosion by rock walls; however, erosion of the Inverloch Surf Beach threatens key assets including the Surf Life Saving Club.

Accumulation of sand and shoreline advance between Point Norman and Point Hughes since 2010 has resulted in the biggest change in shoreline position: in 2018 it was, on average, 105 m seawards of its 1962 position. This advance is unusual for the Inverloch coast. Before 2010, the coastline here consisted of a narrow sand beach with small dunes. Movement of the estuarine channels and shifts in sand bars resulted in fluctuations in shoreline position, both advance and retreat, over this time, but most of this change was relatively minor. The shoreline now consists of a large sand spit, up to 480 m wide. This landform is low and sparsely vegetated; however, exotic plants have formed a series of dunes up to ~4 m in height at Point Norman.

The **Earth Systems and Climate Change Hub** is funded by the Australian Government's National Environmental Science Program



Shoreline change on the Inverloch coast showing net shoreline movement (NSM), calculated as the distance between the earliest (1962) and most recent (2018) shorelines. Negative values (yellow/orange/red) indicate landward retreat (erosion) and positive values (green/blue) indicate seaward advance.

The Inverloch Surf Beach – from the Surf Life Saving Club extending eastwards for 600 m to Point Norman – has retreated by an average of 19 m since 1962. This erosion has largely occurred since 2010. The overall pattern here was one of net shoreline advance between 1962 and 1981 resulting in the seaward growth of the shoreline by ~35 m. Shoreline retreat (~13 m) occurred between 1981 and 1985 followed by a period of relative shoreline stability until 2010. Since 2010 the shoreline has retreated at an unprecedented rate, and it now occupies its most landward position over the 56-year study period.

Implications for the future

The timing of the recent erosion and alongshore accretion suggest that these shifts in shoreline position are linked. Sand eroded from the Surf Beach may have been transported alongshore to accumulate at Point Norman; alternatively, spit development here may have altered the impact of waves at the Surf Beach increasing the likelihood of erosion. The sand spit may have been a transient feature, but the rapid growth of non-native dune plants has increased the stability of this landform. It is therefore unlikely that this sand will be redistributed to the Surf Beach in the near future, and the coast here remains 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.

How was shoreline change determined?

Researchers compared the shoreline in aerial photos dating from 1962–1991 to photos taken during 2009–2018 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.

This research was led by ESCC Hub Project 5.9 *Natural habitats for coastal protection and carbon sequestration (NCCC Phase 2)* and supported by the Victorian Coastal Monitoring Program funded through the Victoria Sustainability Fund. For more information contact: Dr Teresa Konlechner t.konlechner@unimelb.edu.au.

NCCC National Centre for Coasts and Climate

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