Earth Systems and Climate Change Hub

National Environmental Science Programme

Understanding shoreline change on the Victorian coast: Anglesea, Great Ocean Road

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 at Anglesea on the Great Ocean Road. This and other regional summaries are available at www.nespclimate.com.au.

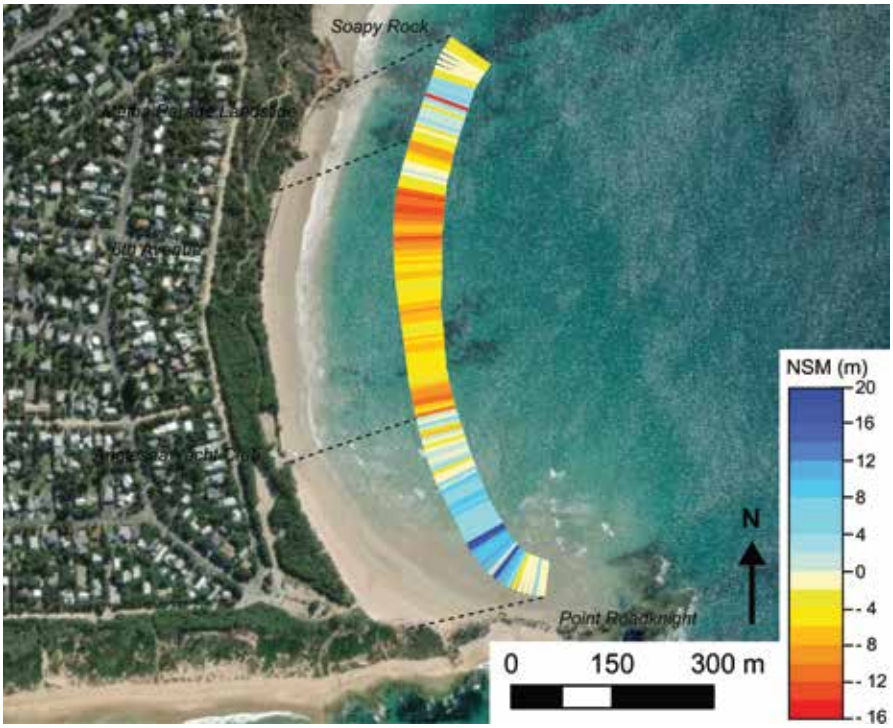
Historic shoreline change on the Anglesea coast

Anglesea is a coastal town located 120 km south-west of Melbourne. This study focuses on a 900 m section of coast from Point Roadknight to Soapy Rock. This is a cliffed coast that is easily eroded by waves due to the softness of the rock. Rockfalls and landslides threaten people and infrastructure, and any continued landward retreat of the cliffs will increasingly put built and recreational assets at risk.

Erosion has occurred along the 500 m stretch of shoreline extending northwards from the Anglesea Yacht Club, with occasional sections showing no major net change in shoreline position. Since 1962 the shoreline here has retreated by an average of ~6 m, although localised erosion of up to 13 m has occurred near the 6th Avenue intersection. Most erosion occurred between 1983 and 2005. Since then the shoreline has been stable or experienced slow retreat.

The pattern of shoreline retreat through time is complex with periods of rapid erosion affecting different sections of coast at different times due to localised cliff collapse or landslides. Even when landslides do not result in shifts shoreline position, they remain hazardous.

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



Shoreline change on the Anglesea coast showing net shoreline movement (NSM), calculated as the distance between the earliest (1962) and most recent (2019) shorelines. Negative values (yellow/orange/red) indicate landward retreat (erosion) and positive values (green/blue) indicate seaward advance.

The largest landslide occurred in December 1973 over 200 m at the northern end of the study area. While there was no shoreline retreat, the top of the cliffs shifted about 20 m inland, leaving the coast vulnerable to further erosion. The slip was stabilised by construction of drains to control surface run-off, topographic reprofiling and installation of a retaining wall on the beach. This event demonstrates the threat that cliff collapse poses to this coast.

Shoreline growth has only occurred over a small section of coast at the southern end of the study area near Point Roadknight. Since 1988 dune plants have established on the beach moving the shoreline up to 20 m seaward. A dune – 4 m in height and 3 m wide has formed – providing some protection against erosion. However, dunes did not form elsewhere on this coast at any time.

How was shoreline change determined?

Researchers compared the shoreline in aerial photos dating from 1962–1990 to photos taken during 2005–2019 and were able to detect changes of 6 m or more. The shoreline was defined as the seaward edge of vegetation or the base of the cliff, whichever was applicable.

Implications for the future

The soft rock cliffs and limited dune development on this coast mean it is vulnerable to future erosion. It will only take moderate increases in waves or sea level to increase the frequency of erosion of the current narrow beach, contributing to further coastline retreat. Some of the sediment eroded from the cliffs will nourish the beaches, but history suggests that this is not enough to prevent future erosion. This could occur slowly or suddenly by large cliff collapse, either way posing threats to people and infrastructure.

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.

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

DEAKIN UNIVERSITY

VICTORIA State Government | Environment, Land, Water and Planning