

# CASE STUDY - WYE RIVER, VIC GEOCONTAINER SHORT TERM PROTECTION WORKS

Oliver Nickson, Great Ocean Road Coast and Parks Authority, [oliver.nickson@greatoceanroadauthority.vic.gov.au](mailto:oliver.nickson@greatoceanroadauthority.vic.gov.au)

## SUMMARY

Between winter 2019 and 2021 riverine and coastal erosion collectively caused 14.8m of landward recession of the Wye River foreshore in Victoria. The resulting reduction in sand dune buffer from 25m to 10m in front of the Wye River Surf Life Saving Club (WRSLSC) significantly increased the buildings vulnerability to erosion. Sand nourishment was used as a 'low impact and nature based' first attempt management option however this proved ineffective due to the significance of the riverine erosion component. A shift in management approach to the emergency installation of a 0.75m<sup>3</sup> geo-container seawall and three groynes had an immediate influence by diverting the river away from the WRSLSC and halting further erosion. A significant quantity of sand has been deposited within the groyne compartments in the 9 months following their installation.

## EROSION MECHANISM

A significant change in the river mouth's channel alignment from west to east, which began in 2017, was identified as the key factor driving localised erosion (see Figure 1). However, coastal erosion also contributed with a significant acceleration of landward recession observed during periods of elevated tidal levels and high energy wave events.

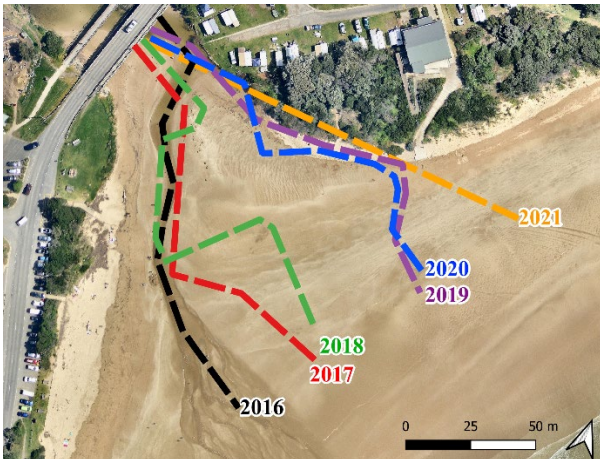


Figure 1 - Channel migration 2016-21 (2016, nearmap).

## EROSION OBSERVATIONS

Drone monitoring was used to capture the evolution of the erosion, with a 14.8m maximum landward recession observed since 2019, see Table 1. The maximum average erosion rate was 0.11m/day which occurred between the 24/05/21 and 11/06/21.

Table 1 - Maximum recession distances.

Period	June 2019 Aug 2021	April 2021 Aug 2021	May 2021 June 2021
Recession(m)	14.8	10.5	2

## POLICY ENVIRONMENT

Short-term erosion management actions were undertaken following the Victorian Marine and Coastal (MAC) Policy 2020 adaptation action hierarchy which preferences nature-based solutions and soft engineering options over hard engineering solutions. This project has highlighted that the policy is centered around a long-term management approach and to facilitate future time sensitive erosion management a rapid response decision making framework is now being developed.

## SAND NOURISHMENT

The sand nourishment program implemented as a low impact first attempt involved four discrete nourishment events; the first deposited 400m<sup>3</sup> and the remaining three 800m<sup>3</sup> each. Following the failure of the fourth attempt, a management approach transition was required as nourishment was proving unsuccessful in halting the riverine influence.

## GEOCONTAINER GROYNES AND SEAWALL

To immediately halt the shorelines landward recession a 100m long seawall at a height of 0.8-1.2m was installed using 0.75m<sup>3</sup> geo-containers (see Figure 2). Though the seawall provided substantial protection, additional erosion management measures in the form of three geotextile groynes were installed to force the migration of the river away from the eastern foreshore to prevent riverine erosion from impacting the dune (see Figure 2). Significant nourishment was also completed in tandem with the installation of the groynes to augment their value.



Figure 2 - Installed geo-container structures.

## PROJECT SUCCESS

Immediately the seawall functioned as desired by stopping further river migration westward and mitigating the persistent incidental erosion that was occurring during higher tidal levels. The installation of the groynes (Aug 2021) shift the river's trajectory westward and away from the WRSLSC which has persisted until present (May 2022). This has led to a substantial increase in beach volume in front of the WRSLSC considerably reducing its vulnerability to erosion.