

# SEAWALLS

This fact sheet provides information on one of a set of adaptation options that were considered in detail as part of the Coastal Hazards Adaptation Plan (CHAP) for responding to coastal hazard risks.

## What are they?

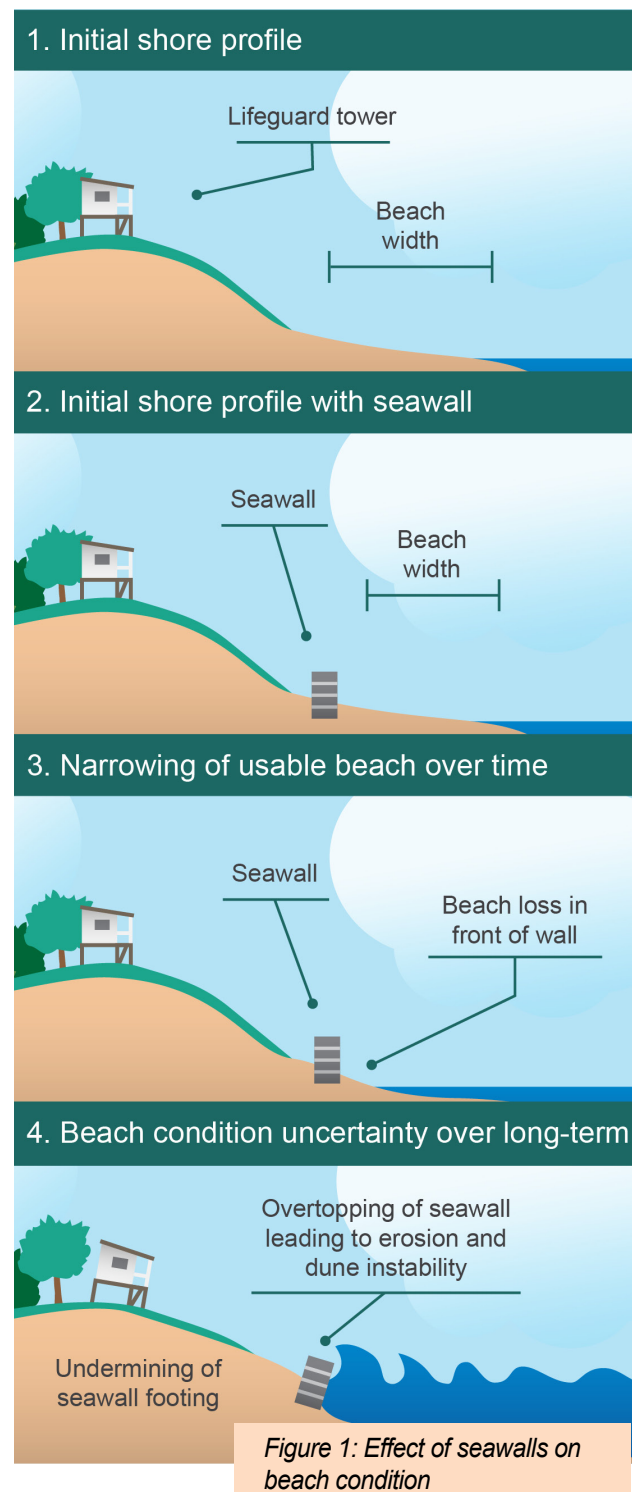
Seawalls are structures separating land and water, designed to prevent coastal erosion and other damage from wave action and storm tide inundation. Seawalls are normally very large structures as they are designed to resist the full force of waves and storm surges. They are linear, hard, engineered structures constructed along the coastline, most often at the foot of cliffs or sand dunes and are put in place to protect the land and structures situated behind them.

## Why have they been considered?

Seawalls are often viewed as a method for permanently preventing damage to developed areas adjacent to the coastline. However, they can, and often do, lead to adverse impacts on the surrounding area and, particularly if they are unprotected. Figure 1 illustrates the typical effects of a buried seawall on an open coast beach. It was important to explore the full range of positive and negative consequences of seawalls on the Noosa coastline.

## Things to consider:

- › Seawalls do not prevent the causes of erosion – wave energy – they just transfer it elsewhere. Therefore in many cases can accelerate erosion on their seaward side or make erosion worse for unprotected areas nearby.
- › Under certain conditions seawalls can be overtopped by water leading to erosion behind the structure as the water seeks to drain away. Because of sea level rise, seawalls constructed today may be overtopped more frequently and therefore require repeated “topping-up” to minimise this occurrence.
- › Seawalls can be aesthetically unappealing, particularly if they are regularly exposed.
- › May hinder (temporary or near-permanent) access and safe use of the beach due to the loss of sand surrounding the seawall.
- › Works may eventually be required to strengthen the foot of the seawall as the footings become at risk of destabilisation due to the loss of sand on the seaward side of the wall.
- › Cost and supply uncertainty with regard to access to feasible rock supplies.
- › Appropriateness of placing seawalls on publicly-owned land where the benefits are primarily privatised.



*Figure 1: Effect of seawalls on beach condition*

## What did our analysis conclude?

The analysis performed by economists specialised in adaptation considered the costs and benefits associated with constructing and maintaining rock seawalls for all beach localities identified as High or Very High erosion risk by 2100. This included sections of Peregrine Beach (425m), Castaways Beach (410m), Teewah Beach (560m), and approximately 3.4km from Sunrise Beach to Sunshine Beach.

The benefits of this response is that it provides protection to a small number (relative to the whole LGA) of properties and public assets for the foreseeable future. However, the seawall would almost certainly cause erosion of the beach seaward of the structure thereby negatively affecting recreation, tourism and environmental values (including ecological and natural coastal processes) on a significant scale.

The analysis performed by economists commissioned by Council found this option performed the worst of all measures analysed, with a Net Present Value<sup>1</sup> of -\$2.773 billion for the Eastern Beaches locations and -\$67 million at Teewah.

This option was not considered feasible as the analysis found there is a 60 per cent loss in recreational benefits, a 14 per cent loss in tourism expenditure and a 44 per cent loss in non-use benefits over the study period (2020–2100). These costs significantly outweigh the value of the private properties and public assets being protected.

The financial cost to provide the level of protection required for a major coastal erosion event are prohibitive given the required height and length of the seawall, significant technical investigations to design the structure, land tenure arrangements and construction and maintenance. The analysis did not include any assumptions regarding inevitable interruptions to beach use and adverse effects for adjacent properties during construction which may increase the costs of this option.

Based on the extent of urban development existing and planned for these areas, the analysis demonstrated seawalls are not a viable option for Noosa as it is unable to demonstrate sufficient public benefit to justify the economic, social and environmental costs involved.



Seawall construction. Source: City of Gold Coast

1 – Put simply, Net Present Value is a method of calculating the total return on investment for a project or expenditure by comparing the total costs with the total benefits you expect to result from the investment and translating those returns into today's dollars, so that you can decide whether the project is worthwhile.