

# Adaptive coastal management

## Frameworks for decision makers

### Coastal Management Fact Sheet 2.1

***The open coast of southern Victoria is a dynamic environment that constantly changes in response to wind, wave and tidal processes***

To effectively manage the open coastline and adapt to coastal changes, land managers must understand physical coastal processes and adopt management responses that are consistent with best practice and Government policy. All decisions must be evidence-based and appropriate to the dynamics and character of a particular stretch of coastline.

Ongoing monitoring and management of the dynamic open coast is required to ensure that our beaches, dunes and offshore ecosystems are maintained in a healthy and resilient condition.

#### **Considerations for decision makers**

Coastal land managers must carefully investigate the range of adaptation options available and weigh up the costs and benefits of each before making a decision. Any decision must consider the cost of installation, ongoing maintenance, the durability of the intervention, and any likely residual financial and environmental impacts.

Managers must also ensure that the intervention is appropriate to the degree and type of public use at the site, and consider any likely future changes to the site's physical nature.

#### **State Government Policy**

Effective and sustainable management of the open coast must take into account its storm/recovery cycles. The chosen response needs to be sustainable to the environment, communities and the government.

The Victorian Coastal Strategy (VCS) 2008 is the State Government's policy commitment for coastal, estuarine and marine environments in Victoria. It provides a comprehensive management framework for Victoria's coast. The VCS outlines three broad adaptation options for infrastructure protection:

- 1. Protect:** construction of defensive structures
- 2. Accommodate:** alter existing structures to minimise risk of damage, or undertake 'soft' coastal adaptation measures
- 3. Retreat:** relocate infrastructure away from potential coastal hazards and allow natural processes to occur

In addition, The Victorian Coastal Hazard Guide provides a risk-based methodology for coastal hazard assessment within the VCS framework. Best practice management ensures that coastal adaptation options are considered in terms of the risks and effects on the coast as a whole.



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## Choosing adaptation options

Solid protective structures, such as seawalls and groynes, may be attractive options for direct protection of infrastructure. However, they can have unintended consequences on the wider coastal system. 'Reflection scour' can occur when waves hit a hard structure and then carry sand back offshore.

Risk of erosion may also be transferred along a defensive structure as wave energy is concentrated at unprotected locations. Solid structures incur large installation and maintenance costs and may be unsustainable.

In cases where coastal infrastructure cannot be relocated and solid structures are not viable options, 'soft' adaptation measures may be more suitable to reduce the risk of further erosion. This includes sand trapping, laying geotextiles, or beach renourishment.

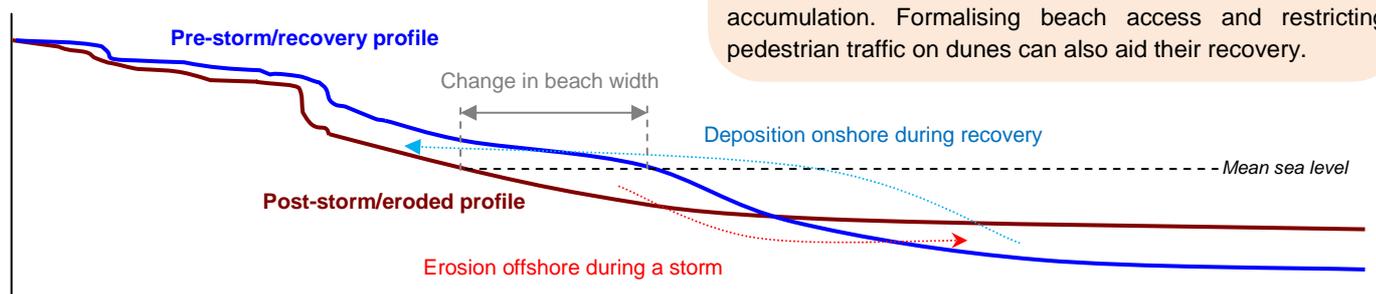


Figure 1: Sand movement offshore during storms (red) and subsequent recovery during calm conditions (blue)

Published by the Victorian Government Department of Environment and Primary Industries Melbourne, September 2013

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## Planning and consultation

Coastal management plans are prepared and implemented by Committees of Management. They provide opportunities for adaptive planning in response to the changing coastal environment. Public consultation and review of these plans enables stakeholders and the community to contribute, ensuring that our coastlines continue to support healthy ecosystems which can be enjoyed by future generations.

### Understanding coastal processes:

The dynamic open coast can experience significant erosion during storm events, with potentially large volumes of sand moving offshore.

Following large storms, beaches may gradually recover to their pre-storm position (Figure 1). This requires a period of calmer conditions that promotes a landward movement of sand to increase beach width. This process may take several years and is dependent on many factors, including the availability of sand, duration of calm conditions, storm events and land management practices.

### Coastal Dunes

Coastal dunes are highly significant for beach stability and coastal and inland protection. They provide a sediment store and act as a buffer between land and sea. A resilient dune system has a gentle slope and is stabilised by native vegetation. Unstable dunes are prone to erosion and duneface collapse.

Dunes are often eroded during storms. Their recovery and further growth requires an area of dry beach seaward of the dune, favourable winds that direct dry sand towards the dune, and vegetation to trap wind-blown sand and promote accumulation. Formalising beach access and restricting pedestrian traffic on dunes can also aid their recovery.

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