Our Coast Our Future
Mornington Peninsula Coastal Strategy

MORNINGTON PENINSULA Shire

Fact sheet #4 Coastal hazard mapping

Coastal hazard maps are a valuable tool. They help us visualise areas of the Mornington Peninsula region potentially prone to coastal hazards. We can use them to inform decisions on how we plan for and adapt to coastal hazards along our coastline. This factsheet provides information to assist with interpreting the maps.

This is the fourth in a series of fact sheets available on the project website.

Our Coast Our Future | Shape Our Future (mornpen.vic.gov.au)

The coastal hazards being explored as part of the Our Coast Our Future project are:

- Erosion
- Storm tide inundation
- Permanent inundation
- Groundwater changes

Factsheet #4 provides further information on each of these coastal hazard types

Coastal hazard modelling

We use computer models to understand natural coastal processes and how these may change in the future. Modelling provides estimates of where coastal hazards impacts could occur. We call these “hazard extents”.

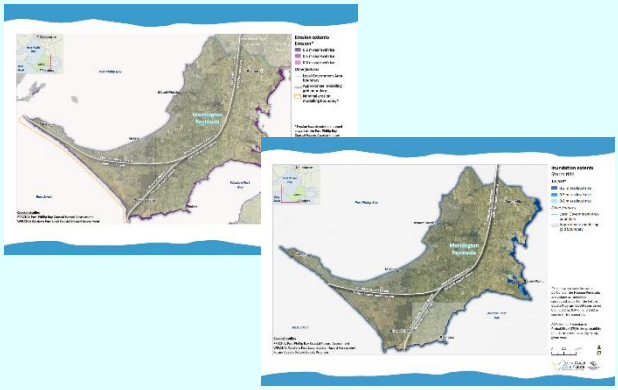
For the Our Coast Our Future project, we have estimated and mapped coastal hazard extents across the Mornington Peninsula. This has combined outputs from various coastal hazard models for the region’s marine and coastal areas.

Coastal hazard maps

Mapped hazard extents help us to determine coastal areas across the Mornington Peninsula that may be exposed to coastal inundation, erosion, sea level rise and groundwater flooding.

For each hazard type, all extents have been estimated based on “present day” ground and seabed elevations (topography and bathymetry) for the region.

Maps have been produced for the entire Mornington Peninsula and five sub-areas. Sets of maps present a range of hazard types, event likelihoods and sea level rise scenarios.



Maps have been produced for the following coastal hazard types:

- Storm tide inundation
- Erosion
- Permanent inundation
- Groundwater

Maps are available for the entire region and the study five sub-areas:

Sub area 1: Northern Port Phillip
Sub area 2: Central Port Phillip
Sub area 3: Southern Peninsula
Sub area 4: Southern Western Port
Sub area 5: Northern Western Port

Event – Where weather conditions affecting a specific place are notably different from typical, day-to-day conditions normally experienced at that location (e.g. a storm event).

Many natural processes drive coastal storm events. These include combined effects of meteorology (weather) and oceanography (sea conditions). Events vary in magnitude (size) and duration (time). They may last from hours up to several days

Annual Exceedance Probability (AEP) – on average, the probability (likelihood) of an event occurring in any given year. A higher AEP means the event is more likely to occur in any one year (higher probability of occurring in a given year). A lower AEP means there is a lower chance the event will happen in any one year (lower probability of occurring in a given year)



Mapping coastal hazards

Mapping coastal hazards allows us to visually understand how the region's coastal areas may be impacted by changing sea level rise scenarios (planning horizons) into the future. We can also examine impacts by more frequent (typical) events versus more extreme (rare) events.

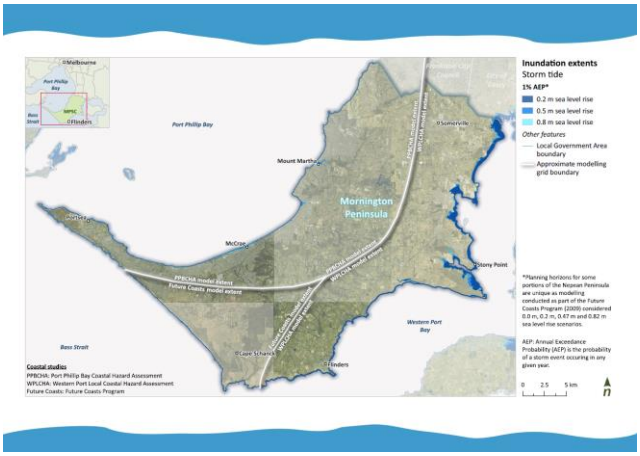
Hazard maps use coloured bands which:

- show areas potentially affected by hazards
- are in absence of any management measures
- use present day ground and seabed elevations and current shoreline positions
- highlight inundation areas arising due to certain local weather (storm) conditions.

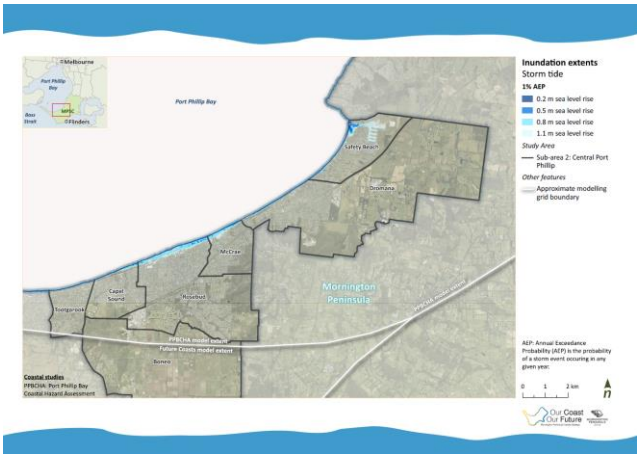
Storm-tide inundation extents by planning horizon (sea level rise scenario):

e.g. 1% AEP inundation event for all planning horizons

Inundation bands	Planning horizon (as sea level rise)	Time step
	mean sea level + 0.2 m	Short term (0 - 25 years)
	mean sea level + 0.5 m	Medium term (25 - 50 years)
	mean sea level + 0.8 m	Longer term (50 - 100 years)
	mean sea level + 1.1 m	



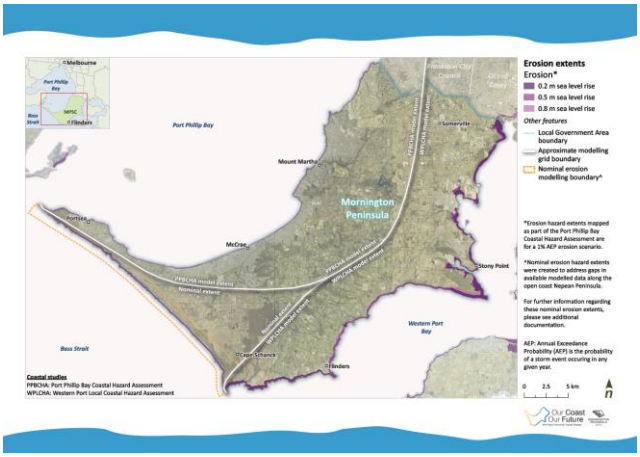
Example storm tide inundation mapping by sea level rise scenario for a 1% AEP event – Region wide



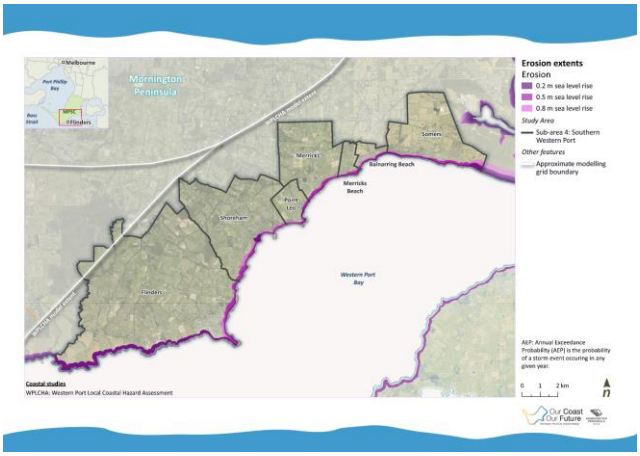
Example storm tide inundation mapping by sea level rise scenario for a 1% AEP event – Sub area 2

Erosion extents by planning horizon (sea level rise scenario):

Erosion bands	Planning horizon (as sea level rise)	Time step
	mean sea level + 0.2 m	Short term (0 - 25 years)
	mean sea level + 0.5 m	Medium term (25 - 50 years)
	mean sea level + 0.8 m	Long term (50 - 100 years)



Example erosion mapping by sea level rise scenario for a 1% AEP event – Region wide

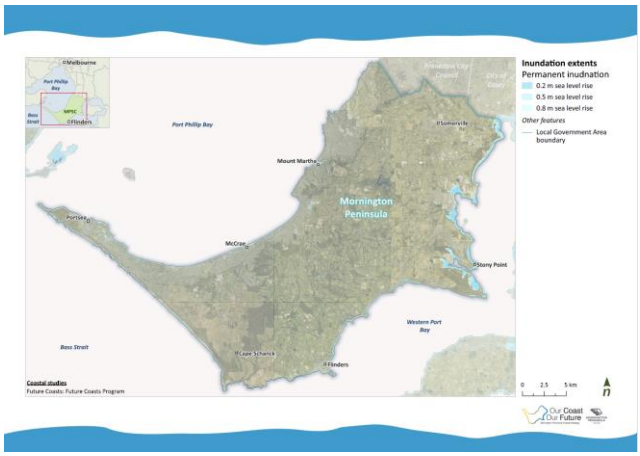


Example erosion mapping by sea level rise scenario for a 1% AEP event – Sub area 4

Permanent inundation extents by planning horizon (sea level rise scenario)

e.g. Regular inundation from tides due to sea level rise

Permanent inundation bands	Planning horizon (as sea level rise)	Time step
	mean sea level + 0.2 m	Short term (0 - 25 years)
	mean sea level + 0.5 m	Medium term (25 - 50 years)
	mean sea level + 0.8 m	Long term (50 - 100 years)



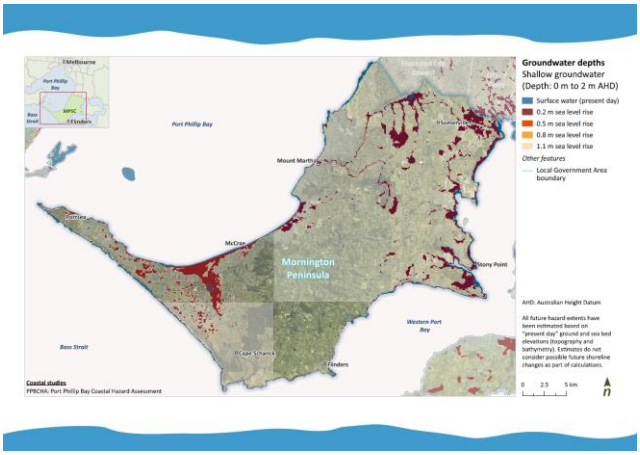
Example erosion mapping by sea level rise scenario for a 1% AEP event – Region wide



Groundwater by planning horizon (sea level rise scenario)

Maps present the extent of shallow groundwater (depth to watertable of 0 m to 0.2 m) over all planning horizons (0.0 m to 0.8 m). We think of the shallow watertables areas as “groundwater hazard extents”.

Shallow groundwater	Planning horizon (as sea level rise)	Time step
	mean sea level + 0.2 m	Short term (0 - 25 years)
	mean sea level + 0.5 m	Medium term (25 - 50 years)
	mean sea level + 0.8 m	Longer term (50 - 100 years)
	mean sea level + 1.1 m	



Example groundwater map by water depth – Region wide



What next?

Hazard maps highlight areas potentially impacted by different coastal hazard types. This is if we make no changes to how we manage these areas.

We have some time to allow us to carefully and proactively plan our response to future hazards.

Mapping allows us to think about:

- what and where the hazards are
- when hazards may occur
- how they change over time

Our work as part of the Our Coast Our Future Coastal Strategy will allow us to better plan for the future and develop an appropriate response.

Future work will use hazard extents to explore vulnerability and risk by considering the values, uses and infrastructure located in identified hazard areas.

We can use this type of risk and vulnerability assessment, to determine where adaptation (hazard mitigation) might be necessary. This work may highlight how vulnerability and risk varies for different hazard types, weather events, climate conditions and over different timeframes.

Factsheet #5 will provide further information on using this information to understand hazard vulnerability and risk

How can I get involved?

To ensure you keep up to date with the *Our Coast Our Future* Coastal Strategy and upcoming events and activities:

Visit the project website Our Coast Our Future | Shape Our Future (mornpen.vic.gov.au)

On our page you can:

- Lean more about the project, coastal hazards and our coastal communities
- Sign up so that you receive progress updates and notifications
- Read our latest project updates
- Take part in our interactive activities.

Ask us a question – email our team at coastalplanning@mornpen.vic.gov.au