

FACT SHEET

Coastal processes and hazards



**Bellarine
Bayside**
Coastal Management



Bellarine Bayside uses best-practice planning approaches to coastal hazard risk management and adaptation responses in collaboration with Traditional Owners, government agencies and the community.

THE COASTAL LANDSCAPE

Located on Wadawurrung Country, the northern Bellarine coastal reserve holds important value to many. It contains sites of cultural significance, natural areas that sustain coastal and marine vegetation and wildlife, and it is utilised and loved by many for recreational pursuits, playing an important part of the social and economic fabric of the local communities.

Across the northern Bellarine Peninsula, the coastal landscape includes:

- Predominant landform: Sandy beaches
- Intertidal zones, dunes, cliffs, and rock platforms.
- Saltmarsh low bluffs, wetlands and inland groundwater connections.

Coastal environments are dynamic by nature, continually changing as natural coastal processes such as tides, winds and waves shape the shoreline. Coastal environments are also impacted by the pressures of climate change, growing populations, increased visitation, changing use and historic planning issues.

Actions we take to manage coastal processes can also have implications for the cultural, environmental, social and economic values of coastal areas.

DRIVERS OF CHANGE

Understanding the key drivers of landscape change is the first step to developing a plan to balance values and land use.

Tides

Daily tides move sand offshore, onshore and along the coast, continually shaping the coastal environment and impacting groundwater levels and coastal wetlands.

Waves and wind

Wind, combined with the morphology (shape) of the sea floor, drives the size, frequency, duration and energy of waves.

Wave energy can move sand offshore, onshore and along the coastline, with wind and wave direction affecting the direction of sand movement.

Climate patterns

Local climate conditions (e.g. dominant wind patterns) and extreme weather events influence changes in the coastal landscape.

Extreme weather events such as storms can cause major changes in a short time due to coastal erosion.

Sediment supply

Sediment (sand) is delivered to coastlines from catchments, rivers, dunes and offshore environments.

When sediment supplies reduce or cease, affected coastlines will be prone to erosion. When sediment supply is abundant, coastlines tend to remain stable or build towards the sea.

COASTAL HAZARDS

Natural coastal processes such as erosion and inundation (flooding) continually shape our diverse and dynamic coastline.

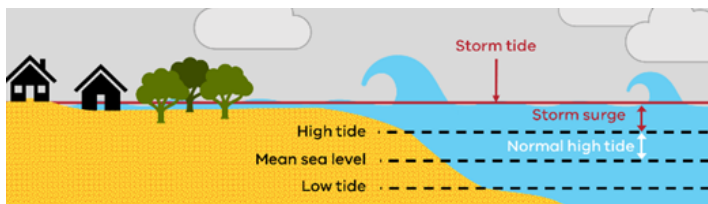
These processes are called coastal hazards when they threaten coastal values (cultural, environmental, social or economic) and uses, including infrastructure.

Some coastal hazards for our coast are described below.

Storm tide inundation

Storm tide inundation is the temporary flooding of low-lying coastal land such as wetlands, marshes, inlets and estuaries.

Storm tide inundation can also combine with catchment flooding from severe rainfall events, increasing the extent or depth of inundation.



Permanent inundation

Permanent inundation occurs when low-lying areas become regularly inundated as part of the local tidal cycle due to sea level rise.

Saline groundwater intrusion

Saline groundwater can move into fresh aquifers, affecting water used for drinking and irrigation.

Saline intrusion can occur in many ways, including vertical movement of the water table and lateral movement of coastal waters. Changes in land use, coastal processes, and average sea level over time can influence the extent of saline groundwater intrusion.

Coastal erosion

Sandy beaches and natural dune systems go through periods of erosion and accretion (growth). In calm conditions, wind and waves transport sand onshore, building up the dune, assisted by coastal vegetation trapping sand.

Erosion can occur when winds, waves, coastal currents or extreme weather events shift sediment away or along the shoreline, sometimes just offshore.

On a stable beach, the sand moved offshore in a storm event will gradually move back onto the beach, and overall shoreline position stays the same over time. In some cases, changes in sediment supply or climate conditions (such as bigger or more frequent storms) mean beaches may not rebuild fully between extreme events. With less sand retained on the beach over time, shoreline recession may occur where the shore position moves gradually landward.



Low-earthened cliffs, such as those along our coast, are subject to surface processes (rain, surface runoff) and marine influences at the base of the cliff (e.g. undercutting due to waves driving shoreline recession). This can result in cliff falls or slumping and the rebuilding (recovery) of a cliff is limited by the amount of sand available nearby or along the coast.

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