

Climate and Climate Change Impacts

Factsheet for State of the Marine and Coastal Environment 2021 Report

The Commissioner for Environmental Sustainability's *State of the Marine and Coastal Environment 2021 Report* for Victoria is prepared according to the *Marine and Coastal Act 2018*.

Victoria's climate has changed in recent decades, becoming warmer and drier. These changes are expected to continue. The Commissioner's report explores the impacts of these changes in a marine and coastal context, from catchment to reef. The report is available at www.ces.vic.gov.au

Key facts

This report assesses changes to Victoria's climate, and the consequences of those changes. None of the Climate and Climate Change Impacts indicators in the State of the Marine and Coastal Environment 2021 Report were assessed as having a good status. Indeed, deteriorating trends were observed for 21 of the 22 regional indicators where the trend was assessed.

- Tidal gauge measurements show that **sea levels at Williamstown have been rising** by approximately 1.8 cm per decade since 1981, and at Stony Point by 3.5 cm per decade since 1981.
- Research published in 2020 found **significant change in shoreline position along 13% of the Victorian coast between 1986 and 2017**. Erosion hotspots extend along 76.6 km of the coastline, equivalent to approximately 6.2% of the Victorian coast. 100 km of the **Gippsland coastline is highly vulnerable** to coastal erosion.
- It is likely that **Victoria's coasts have already warmed by more than 1°C**, with areas of the Port Phillip Bay coastline with temperatures approximately 1.5°C warmer than an indicative pre-industrial era baseline.
- The **increasing frequency of marine heatwaves** around Australia in recent years has irreversibly changed marine ecosystem health, habitats and species. Effects include depleted kelp forests and seagrasses, a poleward shift in some marine species, and increased occurrence of disease.
- A reduction in annual rainfall of 7–12% has been observed along the Port Phillip Bay coastline during the 21st century, and a 13–20% reduction in cool-season rainfall. Notably, the biggest percentage rainfall reductions have occurred on the western side of Port Phillip Bay, which is also projected to have faster population growth in coming decades, placing **increasing pressure on water resources**.



Commissioner
for Environmental
Sustainability
Victoria

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Rainfall (PPB)

7-12% annual rainfall reduction along PPB coast this century and a 13-20% reduction in cool-season rainfall. Largest rainfall reductions in west PPB where fastest population growth is projected, placing pressure on water resources.

Air temperature (SW)

Victoria's coast is likely 1°C warmer, with PPB coast regularly experiencing years ~1.5°C warmer, than pre-industrial baseline. Under a high emissions scenario, Victorian coastal locations are projected to experience days with maximum temperatures of approximately 55°C by 2080-2099.

Impact on infrastructure (PPB)

Under 2100 inundation scenario of 82cm sea level rise and 1-in-100 year storm tide: Kingston LGA has highest projected risk of 11,115 inundated buildings. Patterson Lakes and Chelsea Heights are most at risk. ~45% of buildings in Queenscliff LGA inundated under scenario.

Impact of fire on ecosystems (GL)

2019-20 bushfires impacted water quality at some East Gippsland sites, although GL maintained very good water quality. Algal blooms were detected in GL after 2003 and 2006-07 fires.

Sea level and coastal inundation (SW)

Since 1981, sea levels have risen ~1.8cm/decade at Williamstown and ~3.5cm/decade at Stony Point. Sea levels are expected to rise by ~12 cm at sites along Victoria's coast by 2030; and ~40 cm projected by 2070. Modelling predicts that CIN will be extensively impacted by climate change.

Ocean acidification (SW)

Ocean surface waters around Australia have increased in acidity more than 30% from 1980s to the 2010s. The increase has accelerated in recent decades. Impacts include loss of plankton base for food webs and damage to reef-building communities such as molluscs.

Water temperature (SW)

Increasing frequency of marine heatwaves around Australia has caused permanent impacts on ecosystem health, habitats and species: depleting kelp forests and sea grasses, a poleward shift in some species, and increased disease.

