

# Frequently Asked Questions

Answers to commonly asked questions about Victoria’s Climate Science Reports, supporting materials and Victoria’s Future Climate Tool

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## Contents

<b>1. General questions about Victoria’s Climate Science Reports.....</b>	<b>2</b>
1.1. Are there differences between Victoria’s 2024 and 2019 Climate Science Reports?....	2
1.2. Is Victoria’s Climate Science Report 2019 now out of date? .....	2
1.3. Which emissions scenario(s) or time horizon(s) should I use? .....	2
1.4. How does Victoria’s Climate Science Report 2024 align with climate science information released nationally and in other jurisdictions? .....	3
1.5. Can you provide climate projections for Victoria using Global Warming Levels? .....	4
<b>2. Using Victoria’s Climate Science Reports and Victoria’s Future Climate Tool .....</b>	<b>5</b>
2.1. How can I access Victoria’s climate projections? .....	5
2.2. Who is Victoria’s Future Climate Tool for?.....	5
2.3. Can I use Shared Socio-economic Pathways (SSPs) and Representative Concentration Pathways (RCPs) together? .....	6
2.4. Can I use Victoria’s Future Climate Tool CMIP6 data without bias correction? .....	6
<b>3. Unmodelled Climate Outcomes and Hazards.....</b>	<b>6</b>
3.1. Does the Victorian Climate Projections 2024 model all possible future changes?.....	7
3.2. Why does Victoria’s Climate Science Report 2024 not model for wind and storms?....	7
3.3. Have tipping points been considered in Victoria’s Climate Science Report 2024?.....	8

# 1. General questions about Victoria's Climate Science Reports

## 1.1. Are there differences between Victoria's 2024 and 2019 Climate Science Reports?

*The latest climate projections (CMIP6)*

Victoria's Climate Science Report 2024 (VCSR24) summarises the best available scientific evidence on climate change for Victoria, which includes the Victorian Climate Projections 2024 (VCP24). It builds on Victoria's Climate Science Report 2019 (VCSR19).

VCSR24 projections draw on the most recent Global Climate Models (CMIP6), whereas Victorian Climate Projections 2019 (VCP19) projections drew on the previous (CMIP5) generation.

*The latest emissions scenarios (SSPs)*

The climate projections in VCSR24 focus on Shared Socio-economic Pathways (SSPs), which have evolved from the Representative Concentration Pathways (RCPs) used in VCSR19.

VCSR24 primarily focuses on scenarios SSP1-2.6 (low) and SSP3-7.0 (high). These two scenarios cover the lower and higher end of the range of futures currently considered plausible.

Further information can be found in the factsheet: [How do the Victorian Climate Projections 2024 compare with previous climate projections for Victoria?](#)

*[Nov 2024, [Victoria's Climate Science Report 2024](#)]*

## 1.2. Is Victoria's Climate Science Report 2019 now out of date?

No, Victoria's Climate Science Report 2019 (VCSR19) remains a relevant component of our evidence base and is not out of date. We encourage you to use it in conjunction with Victoria's Climate Science Report 2024 (VCSR24).

*[Nov 2024, [Victoria's Climate Science Report 2024](#)]*

## 1.3. Which emissions scenario(s) or time horizon(s) should I use?

There is not a 'correct' scenario or time horizon to use. You will need to consider which emissions scenario and time horizons are the best fit for the decision you are making.

To assist, [Victoria's Future Climate Tool](#) (VFCT) allows you to adjust each of these factors, as well as climate variables and climate models. You may need to consider multiple possible futures when making your decision.

We also provide a User Guide on using VFCT on our website and are developing guidance to help you select the most appropriate emissions scenarios and time horizons for your work.

Further guidance on how to use Victoria's climate projections is included in the factsheet: [Using the Victorian Climate Projections 2024](#).

*[Nov 2024, [Victoria's Climate Science Report 2024](#)]*

*[May 2025, [Victoria's Future Climate Tool](#)]*

#### 1.4. How does Victoria's Climate Science Report 2024 align with climate science information released at a national level?

Victorian climate science information is closely aligned with resources developed by the Bureau of Meteorology and CSIRO, including:

- [State of the Climate 2024](#) report, produced biennially, which draws on the latest national and international climate research to describe changes and long-term trends in Australia's climate.
- [Climate Change in Australia](#) website and its projections tools, which provide Australia-wide summary climate projection statements, climate model data, regional summaries for National Resource Management regions and a range of other resources.

The [National Climate Risk Assessment 2025](#) (NCRA), delivered by the Australian Climate Service, presents the first detailed overview of the climate risks facing Australia and their expected impacts.

The NCRA includes projections for Victoria, which, broadly, reinforce Victoria's climate science key messages. However, note that:

- Victoria's Climate Science Reports remain the most up to date and detailed source of climate projections and analysis, as they contain higher resolution data, locally specific information and are tailored to Victoria's needs.
- NCRA's climate projections are not directly comparable to Victoria's as the reports use different methodologies and timeframes to consider how the climate may change.

We stay abreast of relevant releases of climate data and information from our jurisdictional colleagues and proactively keep each other informed via our membership and contributions to national initiatives such as the National Partnership for Climate Projections (NPCP). The NPCP is an interjurisdictional collaboration that aims to develop a coordinated approach to deliver high-quality, consistent climate information and has been operating since 2022.

## 1.5 Can you provide climate projections for Victoria using Global Warming Levels?

Global Warming Levels (GWLs) are an emerging projections framework that describes the expected change that will be experienced at a specific location (e.g. Australia) when the world reaches particular levels of global warming since the pre-industrial era.

The IPCC's Sixth Assessment Report debuted Shared Socio-economic Pathways (SSPs), which have subsequently been adopted internationally and in Victoria's Climate Science Report 2024.

### Key GWL projections for Victoria

*Under a 2 °C warmer world, Victoria's climate is projected to experience:*

- warming of about 2.0 °C (range of 1.8 to 2.3 °C) compared to the pre-industrial period (1850– 1900), or warming of about 1.3 °C (range of 1.1 to 1.6 °C) compared to the more recent 1986–2005 period (an amount similar to the global average but less than Northern Hemisphere land regions or the Arctic)
- a 2% decrease (range of -14 to +2%) in average annual rainfall compared to the 1986–2005 period
- a 7% decline (range of -17 to +4%) in average spring rainfall compared to the 1986–2005 period.

*Under a 3 °C warmer world, Victoria's climate is projected to experience:*

- warming of about 2.9 °C (range of 2.5 to 3.4 °C) compared to the pre-industrial period, or warming of about 2.2 °C (range of 1.8 to 2.7 °C) compared to the more recent 1986–2005 period
- a 6% decrease (range of -18 to +3%) in average annual rainfall compared to the 1986–2005 period
- a 11% decline (range of -27 to +1%) in average spring rainfall compared to the 1986–2005 period

[Nov 2024, Victoria's Climate Science Report 2024]

## 2. Using Victoria's Climate Science Reports and Victoria's Future Climate Tool

### 2.1. How can I access Victoria's climate projections?

Victoria's Future Climate Tool (VFCT) can be used to access and explore climate projections across Victoria. You can use VFCT to understand and plan for climate impacts at a regional and local level, and to inform risk assessments, research and planning for climate resilience for your sector and organisation.

A new dashboard, added to VFCT in May 2025, incorporates the latest climate projections data (CMIP6) customised for the Victorian context, including two new global emissions scenarios.

Victoria's Climate Science Report 2024 builds on the 2019 Report, which remains a relevant component of our scientific evidence base. VFCT retains a dashboard for Victoria's 2019 projections (CMIP5).

There is a User Guide on our website to help you use VFCT.

The previous user guide for the CMIP5 dashboard remains applicable for the CMIP6 dashboard. It was developed in collaboration with the Victorian Managed Insurance Authority (VMIA) to support the delivery of VMIA's climate change risk management service.

Further information about VFCT and how it can be used is at:

- [Victoria's Future Climate Tool – an introduction and guidance for risk management](#)
- [Victoria's Future Climate Tool – an introduction and guidance for risk management \(Accessible version\)](#).

*[May 2025, [Victoria's Future Climate Tool](#)]*

### 2.2. Who is Victoria's Future Climate Tool for?

Victoria's Future Climate Tool can be used by anyone. It provides access to the latest climate projections across Victoria and can inform risk assessments, research and planning for climate resilience.

VFCT may be particularly useful for decision-makers across government, businesses and the community; risk practitioners and project and policy staff involved in risk management; environmental and sustainability officers; geospatial information system users; and specialists managing programs, services and infrastructure.

For users with a lower climate literacy, VFCT provides 'snapshots' which allow quick access to a selection of future climate outcomes that reflect some of the key projected climate changes. For example, users may immediately access a preloaded extreme rainfall increase scenario, but may still edit any aspect of a snapshot scenario, which will convert the information presented into a 'snapshot scenario'.

*[May 2025, [Victoria's Future Climate Tool](#)]*

### **2.3. Can I compare Shared Socio-economic Pathways (SSPs) and Representative Concentration Pathways (RCPs) in my work or project?**

Yes, provided that you are transparent about which data used is from which emissions scenario and understand the risks of comparing any quantitative analysis. Using multiple sources of emissions scenarios can be complex, as each source of information will be associated with uncertainties and differences, which could lead to inconsistencies or a misrepresentation of information.

Transparency means specifying which SSP or RCP is used. Different SSP or RCP results should not be combined under a banner term (e.g. 'low emissions scenarios'). Instead, best practice is to specify which emissions scenarios you are referring to (e.g. SSP3-7.0 (high) or RCP8.5 (very high)).

Further, SSPs and RCPs are often referred to differently over time. For example, RCP8.5 was previously described as a 'high' emissions scenario but is now generally described as a 'very high' emissions scenario.

If you are undertaking quantitative analysis, it is recommended to use only a single source of climate projections at a time, as emissions scenarios are not always equivalent to one another between different pathways. For example, there is no equivalent RCP scenario to SSP3-7.0.

*[Nov 2024, Victoria's Climate Science Report 2024]*

### **2.4. Can I use Victoria's Future Climate Tool CMIP6 data without bias correction?**

Bias in a climate model refers to a systematic difference between the model's outputs and the actual observed climate. This occurs because climate models do not simulate the climate perfectly.

Bias correction is the process of adjusting these errors in climate model outputs.

The CMIP6 data in Victoria's Future Climate Tool (VFCT) is not bias corrected. However, this does not impact its applicability to the local context.

Correcting model bias is important when using absolute values from the model in isolation, for example when looking at the future temperature in a model. However, when comparing modelled historical values with modelled futures values and calculating the change between them, as is done in VFCT, any bias in a model is negated under the assumption that the model biases are consistent across the historical and future periods.

Stakeholders who require daily or monthly timeseries data should contact CSIRO for separate bias corrected model output.

*[May 2025, Victoria's Future Climate Tool]*

### 3. Unmodelled Climate Outcomes and Hazards

#### 3.1. Does the Victorian Climate Projections 2024 model all possible future changes?

The Victorian Climate Projections 2024 (VCP24) presents a range of changes in Victoria's climate under low and high emissions scenarios. However, there are possible future climate changes that are not represented in the VCP24.

VCP24 also includes some representations of changes outside the *likely* range, for example models showing a very hot, low-likelihood, high warming future.

It is important to acknowledge the possibility that there may be future changes which are not well represented in the VCP24, with three main ways we could experience them:

- through scenarios of anthropogenic emissions which are different to the two selected
- large-scale climate responses that are outside the range of the typical changes we model, and
- extreme events that remain hard to model and are not fully represented even in the latest cutting edge and high-resolution climate models (e.g. megadroughts or severe storms).

We encourage users of VFCT to communicate to those using and applying the data in a variety of contexts, that there are many different contributors to uncertainty in climate model data.

Further information can be found at: [VCP24 Fact Sheet: Unmodelled futures and the Victorian Climate Projections 2024](#).

[Nov 2024, [Victoria's Climate Science Report 2024](#)]

[May 2025, [Victoria's Future Climate Tool](#)]

#### 3.2. Why does Victoria's Climate Science Report 2024 not model for wind and storms?

Storms and the associated extreme winds and precipitation are not confidently modelled in regional projections, including in the Victorian Climate Projections 2024, due to limitations in representing the full set of relevant processes at all scales in computer models.

Modelling storms is still limited due to many challenges in representing the full range of meteorological processes at all relevant spatial scales. To understand the effect of climate change on extreme wind and precipitation (including rain and hail) from storms at an individual location, we need to understand change at a variety of scales, from large scale weather systems around the entire Southern Hemisphere through to the effect of local topography and more.

We continue to stay informed of research into wind and storms through our partnerships and stakeholders, including the ARC Centre for Excellence for 21<sup>st</sup> Century Weather, which is committed to further research into climate variability and weather systems.

So how should decision-makers account for these risks if extreme winds and storms pose a risk? Even though we can't be confident in the assessment of changes to storms or give quantitative projections, there is credible evidence that storms of various types could become more damaging with climate change. Given their damage and impact, even without the effect of

climate change, a lower risk appetite decision-maker may decide to increase the resilience of systems that are particularly vulnerable to this hazard.

Further information can be found at: [VCP24 Fact Sheet: Unmodelled futures and the Victorian Climate Projections 2024](#).

*[Nov 2024, [Victoria's Climate Science Report 2024](#)]*

### **3.3. Have tipping points been considered in Victoria's Climate Science Report 2024?**

Global tipping points are relatively abrupt and effectively irreversible changes to global climate triggered by global warming. They are not included in the climate modelling considered by the Victorian Climate Projections 2024 (VCP24) but may have important impacts on Victoria in the future.

The VCP24 projections acknowledge that abrupt climate changes and global climate tipping points changes can occur. However, the global and regional climate modelling used in VCP24 does not account for tipping points and no quantitative detail about when and how they could occur or what the effect would be is provided. This is because while we know that abrupt change can occur, considerable unknowns remain about how and when they might take place and the full dynamic effect they have.

Further information can be found at:

- [VCP24 Fact Sheet: Unmodelled futures and the Victorian Climate Projections 2024](#), and
- [Understanding the risks to Australia from global climate tipping points: Workshop report \(CSIRO, 2024\)](#) – which provides a more detailed summary of tipping points and their possible effect on Australia.

*[Nov 2024, [Victoria's Climate Science Report 2024](#)]*