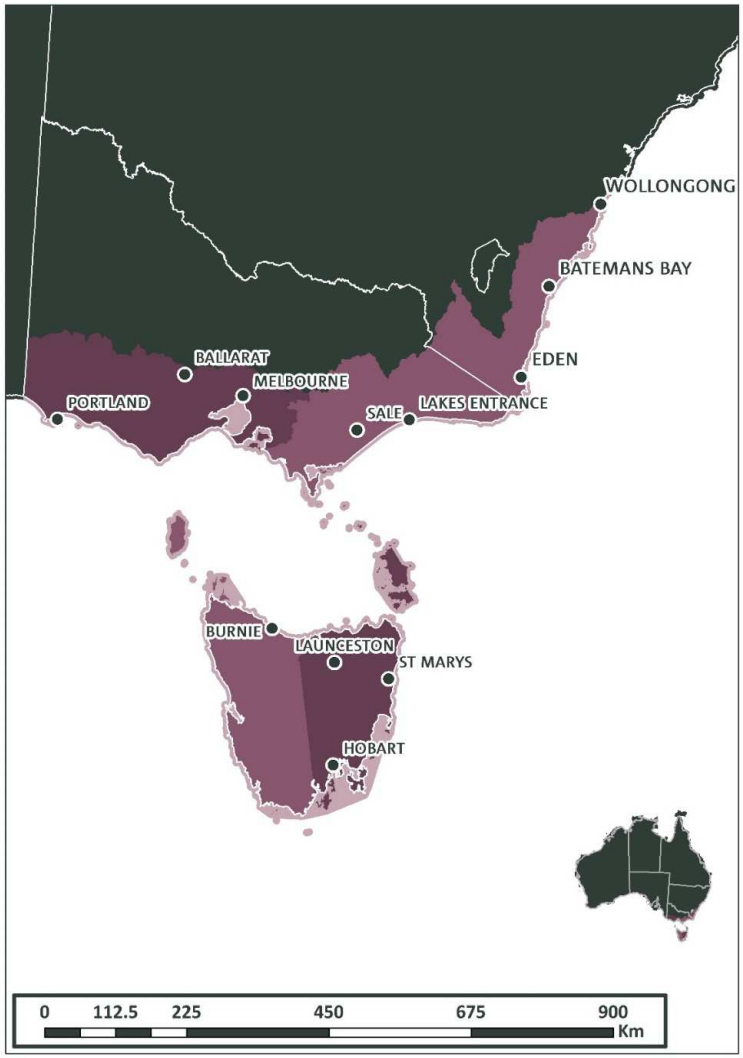
Climate projections for Southern Slopes



The following projections are for the Southern Slopes cluster, comprising regions in Tasmania, southern Victoria and south-east New South Wales (shaded purple and lighter purple on the map).

This cluster has an extensive coastal zone and a diversity of local climates across its relatively small area.

The Southern Slopes is within the ‘mid-latitudes’ of the global climate system, falling between the subtropical ridge of high pressure (at about 30 °S) and the so called ‘Roaring Forties’ (at 40-50 °S).

The dominant rain-bearing weather systems are cold fronts and troughs coming from the west.

Some of the content for this Pamphlet drawn from Gerbing, C. Webb, L. and Grose, M. 2015 Southern Slopes Cluster brochure, CSIRO and BoM.

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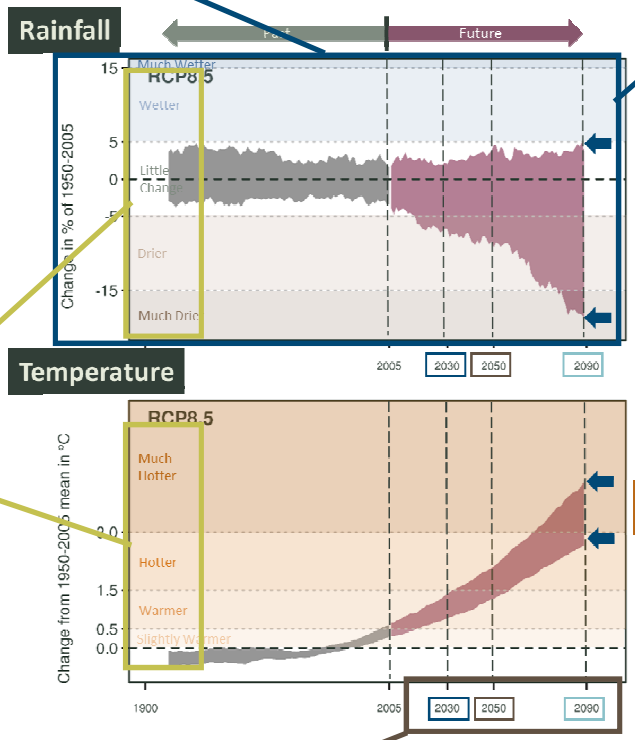
KEY TO THE PROJECTIONS SLIDES

Time series of rainfall (top) and temperature (below) for the historical period (1900 to 2005; grey) and projected period (2005 to 2099; purple) showing the 10th to 90th percentile of the 20-year running mean from 40 CMIP5 models.

Projected period colour code:
Purple: high emissions (RCP8.5)
Blue: intermediate emissions (RCP4.5)
Green: low emissions (RCP2.6)

Categories of warming and rainfall changes are indicated by colour shading on the graph as described in the table:

Rainfall (% change relative to 1950 - 2005)	Temperature (degrees Celsius change from 1950-2005)
Much Wetter (> 15 %)	Much Hotter (> 3.0)
Wetter (5 to 15 %)	Hotter (1.5 to 3.0)
Little change (-5 to +5 %)	Warmer (0.5 to 1.5)
Drier (-5 to -10 %)	Slightly Warmer (0 – 0.5)
Much Drier (> -15%)	



Outlook periods explored are 20 year periods centred on 2030, 2050, 2090.

For adaptation planning, consider top and bottom of the range of plausible change, indicated by the blue arrows.

Descriptions of what could be expected given model representation (40 CMIP5 models) in the various future periods:

2030: Warmer with most models indicating little change in rainfall, and some models indicating drier.

2050: Warmer to hotter with most models indicating little change in rainfall, and some indicating drier.

2090: Hotter to much hotter with most models indicating little change in rainfall or drier climate, and also a chance of a much drier climate.

*Seasonal projections may differ from annual. Seasonal detail shown later.
Maximum model consensus by 2090, if it exists, is indicated by orange bar.
For adaptation planning, consider top and bottom of the range of plausible change. The 2090 range is indicated by the blue arrows.

Maximum consensus (at least 33% of models) indicated by orange box. In this example, the maximum consensus future by 2090 could be described as 'much hotter with no rainfall consensus'.

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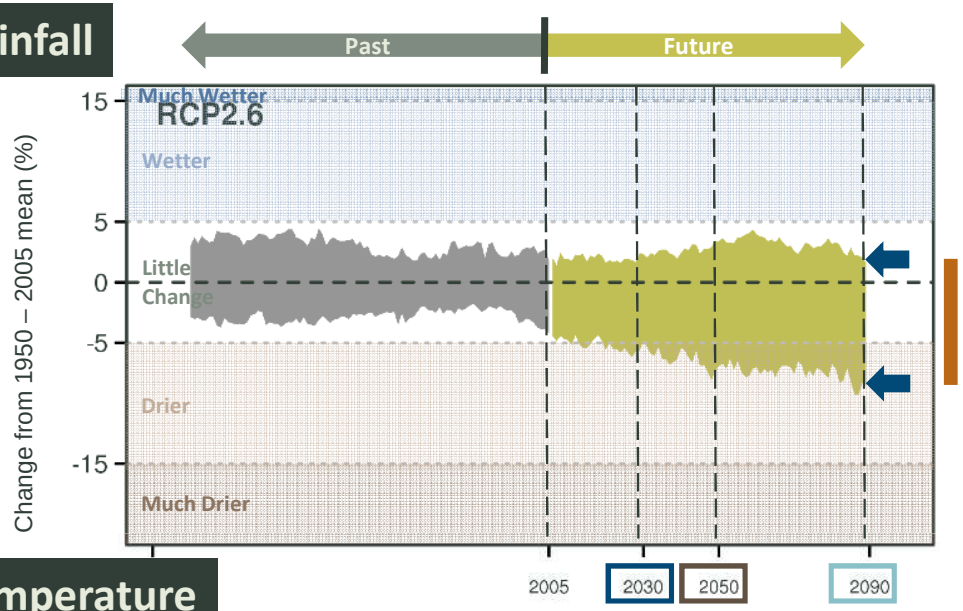
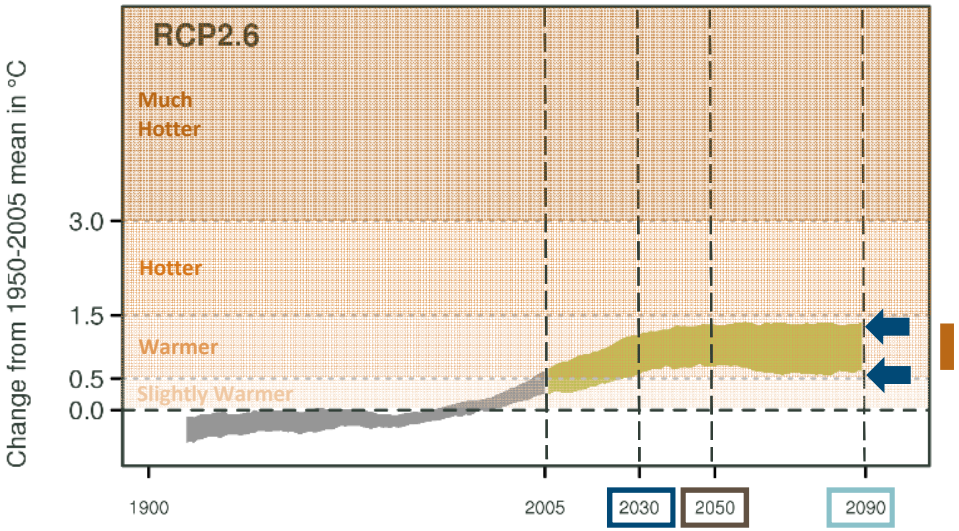
Climate projections for Southern Slopes (annual*) : Low emissions

Rainfall



Temperature



2030: Slightly warmer to warmer with most models indicating little change in rainfall, but a chance of drier climate.

2050: Warmer with most models indicating little change in rainfall, but also a chance of drier climate.

2090: Warmer with most models indicting little change in rainfall, though a chance of a drier climate exists.

***Seasonal projections may differ from annual. Seasonal detail shown later.**

Maximum model consensus by 2090, if it exists, is indicated by orange bar.

For adaptation planning, consider top and bottom of the range of plausible change. The 2090 range is indicated by the blue arrows.

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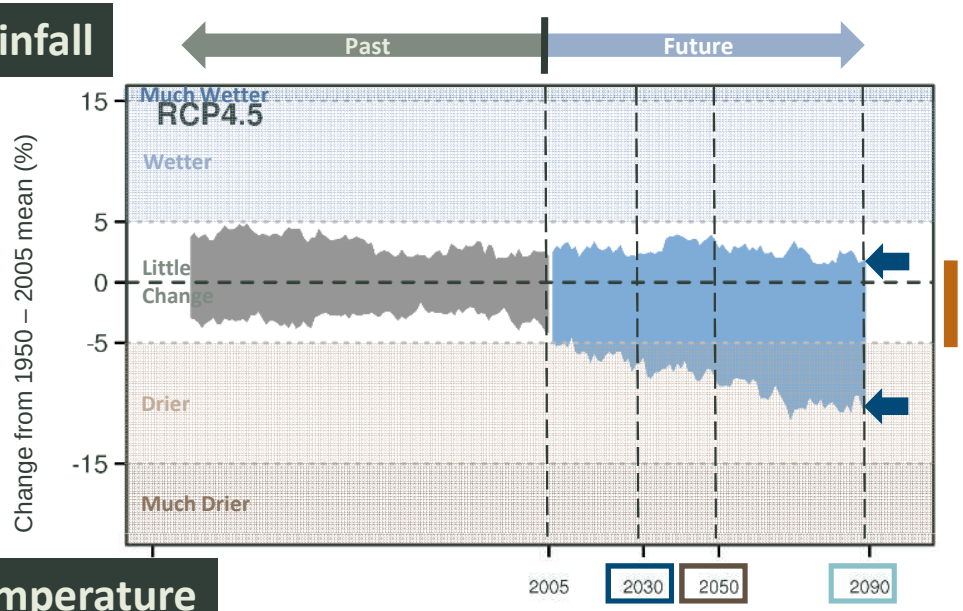
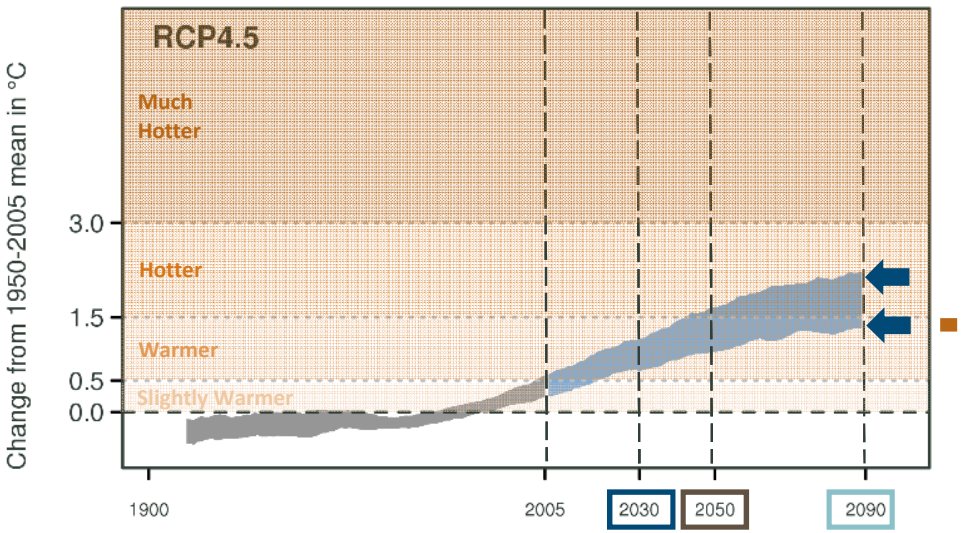
Climate projections for Southern Slopes (annual*) : Intermediate emissions

Rainfall



Temperature



2030: Slightly warmer to warmer with most models indicating little change in rainfall, though some models indicate a drier climate

2050: Warmer with most models indicating little change in rainfall, with a chance of drier climate.

2090: Warmer to hotter with most models indicating little change in rainfall and many models indicating drier climate.

***Seasonal projections may differ from annual. Seasonal detail shown later.**

Maximum model consensus by 2090, if it exists, is indicated by orange bar.

For adaptation planning, consider top and bottom of the range of plausible change. The 2090 range is indicated by the blue arrows.

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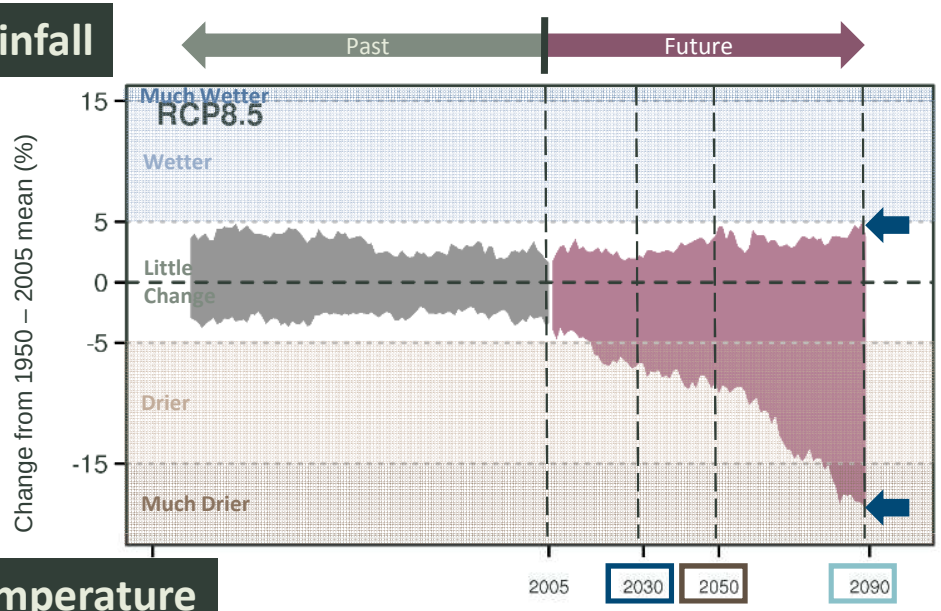
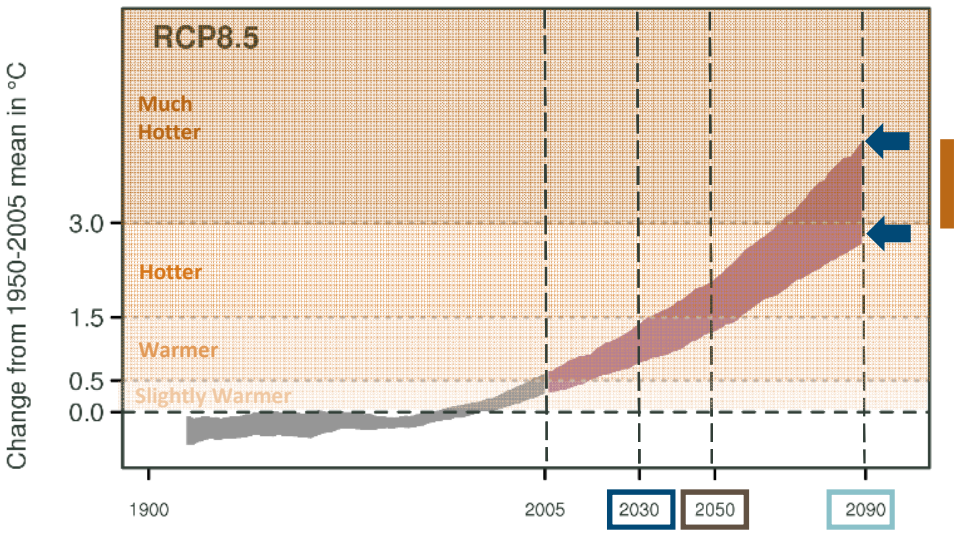
Climate projections for Southern Slopes (annual*) : High emissions

Rainfall



Temperature



2030: Warmer with most models indicating little change in rainfall, and some models indicating drier.

2050: Warmer to hotter with most models indicating little change in rainfall, and some indicating drier.

2090: Hotter to much hotter with most models indicating little change in rainfall or drier climate, and also a chance of a much drier climate.

***Seasonal projections may differ from annual. Seasonal detail shown later.**

Maximum model consensus by 2090, if it exists, is indicated by orange bar.

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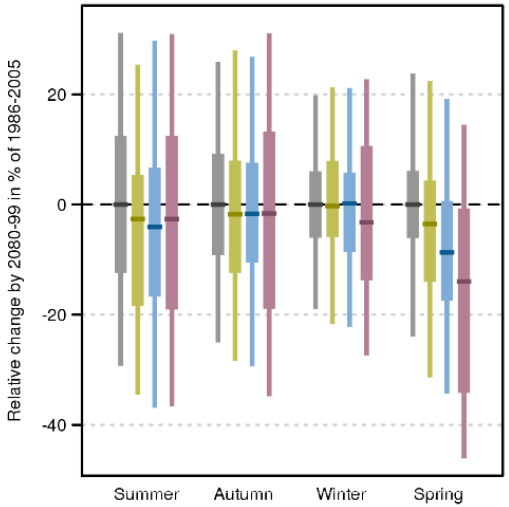
Seasonal Rainfall

Graph shows projected change in seasonal precipitation for 2090 (2080-99) in (from left) summer, autumn, winter and spring. Anomalies are given in % relative to 1995(1986-2005) under RCP2.6 (Green), RCP4.5 (blue) and RCP8.5 (purple). Natural climate variability is represented by the grey bar.

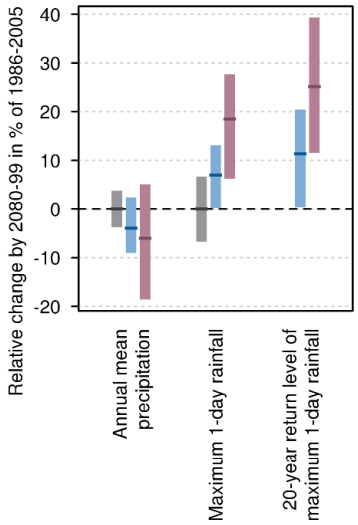


Understanding of physical rainfall processes (southward shift of winter storm systems), supported by climate model results, indicate rainfall decreases for winter and spring (high confidence), except for Tasmania in winter, where increases are projected (medium confidence).

Changes to summer and autumn rainfall are possible but not clear, although there is a tendency for decrease in Tasmania, particularly western Tasmania in summer and decrease in western Victoria in autumn.

Extreme Rainfall

Modelled differences (per cent) in annual average rainfall, rainfall on the wettest day of the year, and rainfall on the wettest day in 20 years for 2080-2099 compared to 1986 to 2005 under RCP4.5 (blue) and RCP8.5 (purple). Natural climate variability is represented by the grey bar.



Even though annual mean rainfall is projected to decrease in the region, understanding of the physical processes that cause extreme rainfall, coupled with modelled projections indicate with high confidence a future increase in the intensity of extreme rainfall events. However, the magnitude of the increases cannot be confidently projected.

Time spent in drought is projected, with medium confidence, to increase over the course of the century.

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