

Earth Systems and Climate Change
Hub



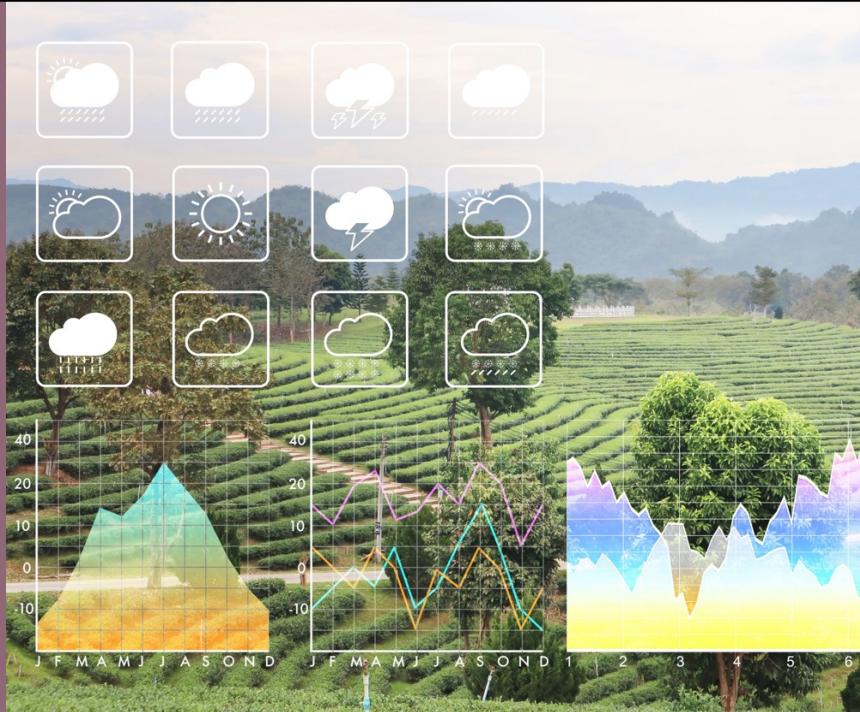
science
webinar
series

Tuesday 21 July 2020
11:30am–12:30pm (AEST)

Building partnerships for robust climate risk assessments: why, what, how, when?

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www.nespclimate.com.au

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Why climate risk assessments?

Need to manage risks associated with:

- physical risks due to climate variations and climate change, and

- transition to a zero carbon economy

- How: building partnerships
- What: improving climate literacy; understanding acute risks – climate extremes, and chronic risks – long-term climate changes
- A short example: the electricity sector
- When: now

Why do we need to use climate change science?

When we know how climate change may impact us, we can:

- Raise awareness and encourage change
- Identify risks (and opportunities)
- Understand and manage vulnerabilities
- Make sound (climate-smart) decisions
- Ensure policies and regulations account for the changing climate
- Encourage mitigation of greenhouse gas emissions to curb climate change
- Identify ways to adapt to the change that is inevitable.

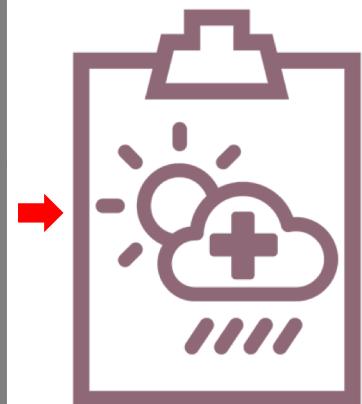
How do we go about it?

What we know about the system or sector and how it is affected by climate

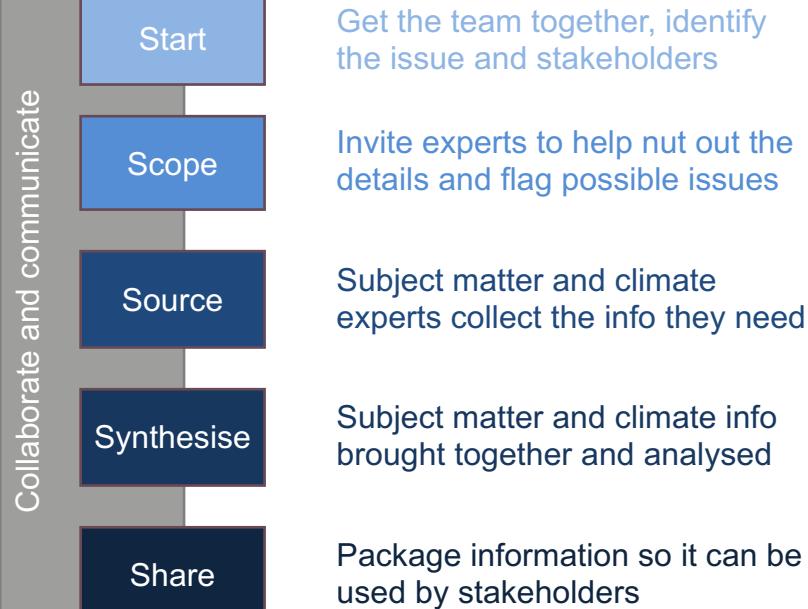


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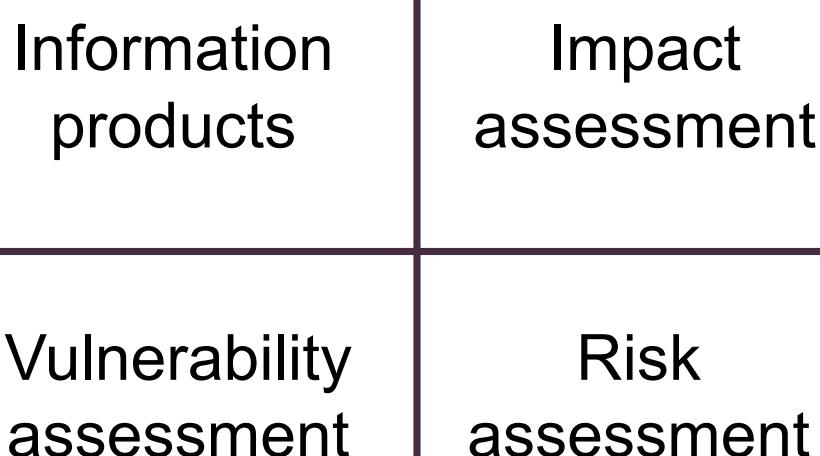
What we know about our climate and how it is changing



Climate change health check: five steps



Climate change health check: then what?



AS 5334—2013: Climate change adaptation for settlements and infrastructure – a risk-based approach

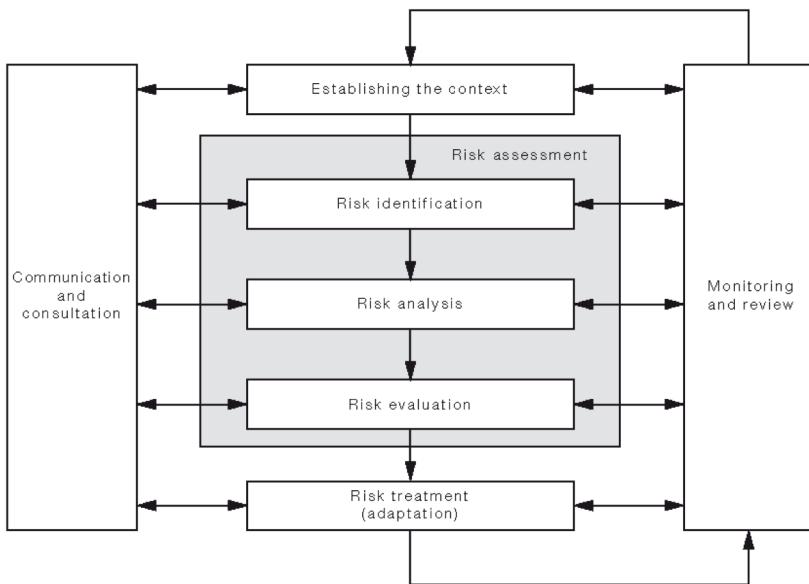


FIGURE 3 RISK MANAGEMENT PROCESS
(adapted from AS/NZS ISO 31000)

What do successful partnerships look like?

Northern
Territory mango
industry

<http://nespclimate.com.au/climate-change-impacts-in-the-northern-territory-mango-industry/>



What do successful partnerships look like?

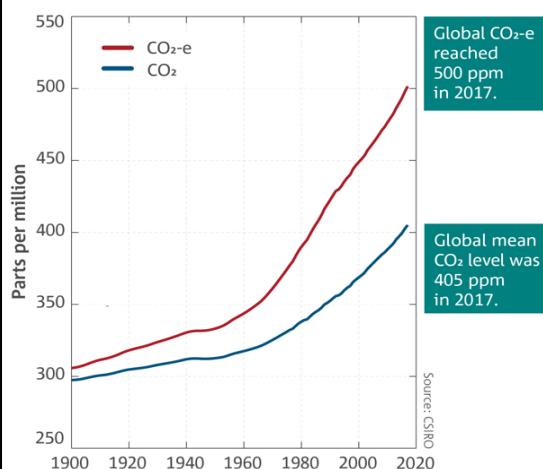
Gondwana rainforests
World Heritage Area

<http://nespclimate.com.au/identifying-climate-change-information-needs-for-gondwana-rainforests/>

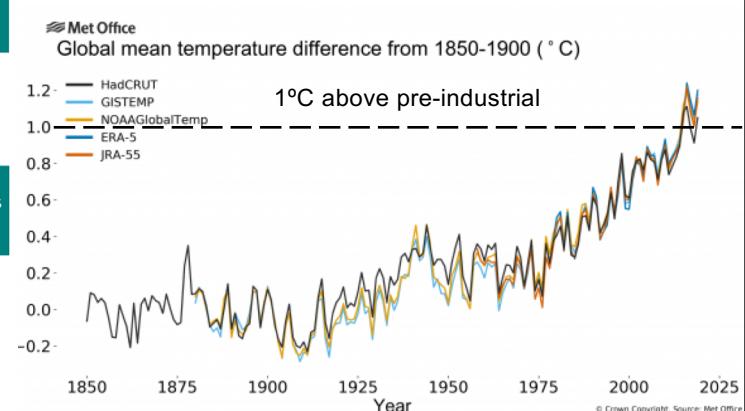


Climate literacy: Observed global climate change

Greenhouse gases



Global mean temperature change



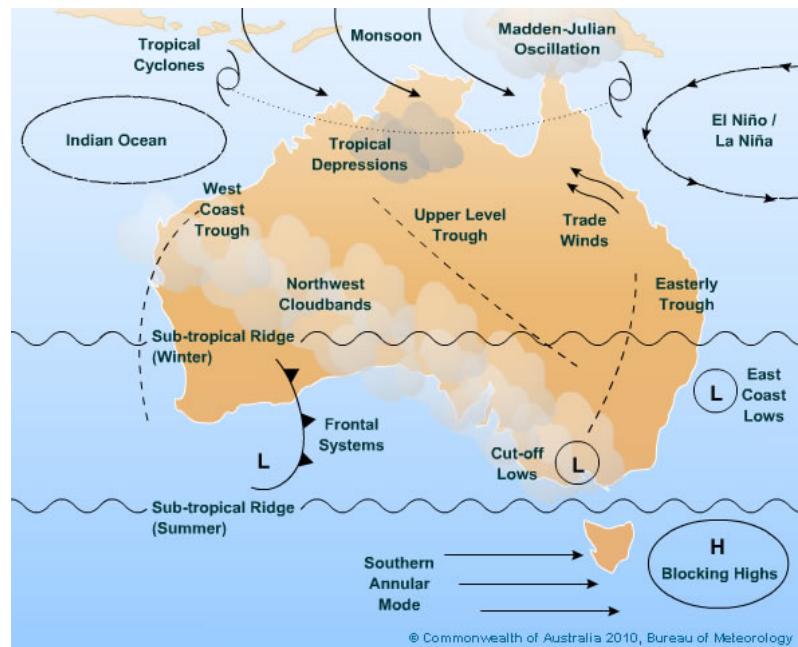
SotC 2018

WMO 2020

Australia's climate influences

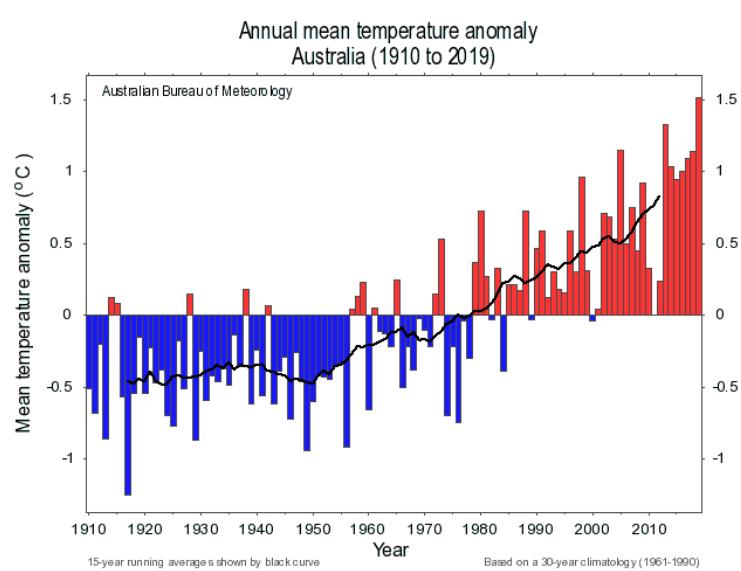
Climate influences, or "drivers", modulate the occurrence of particular weather patterns.

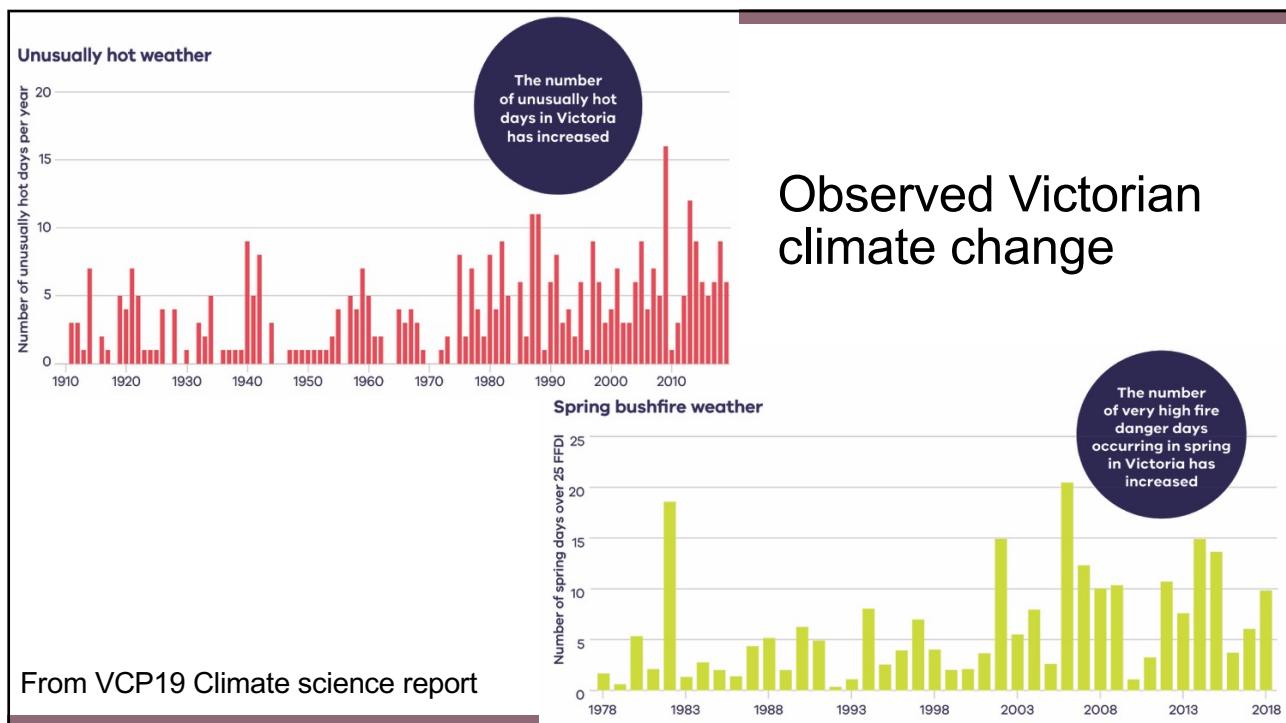
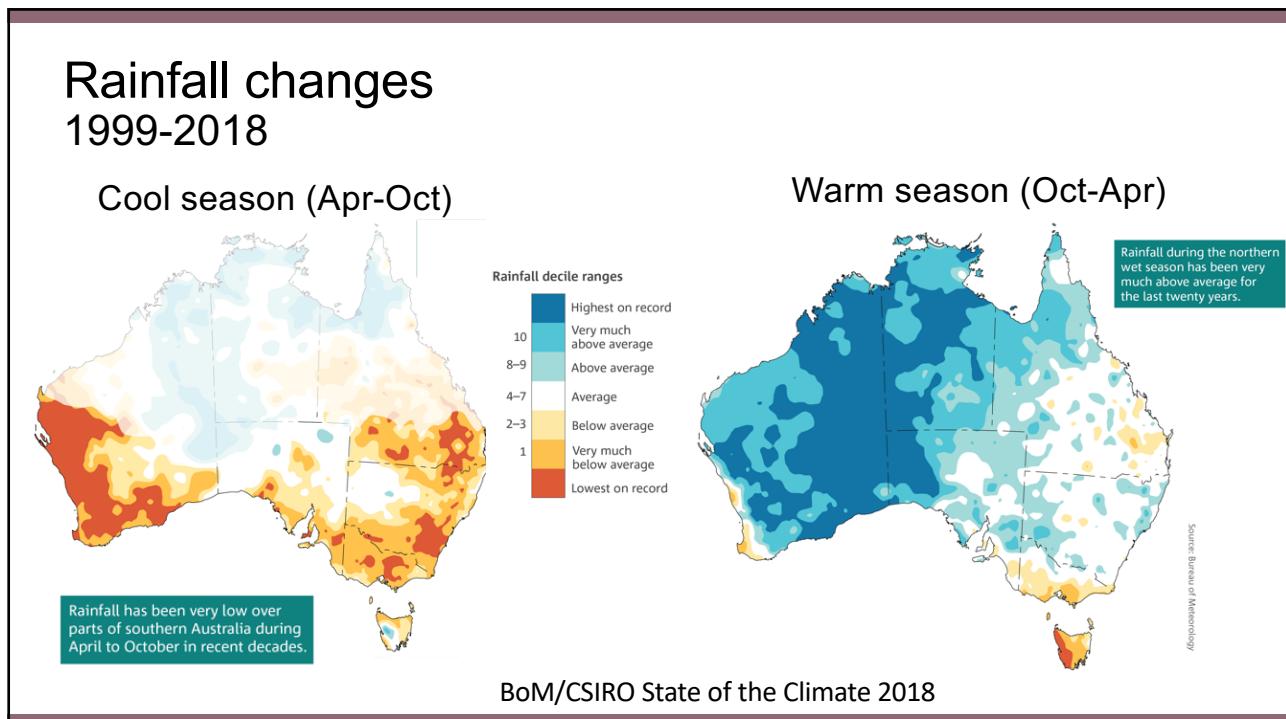
Note: these change with season as well!

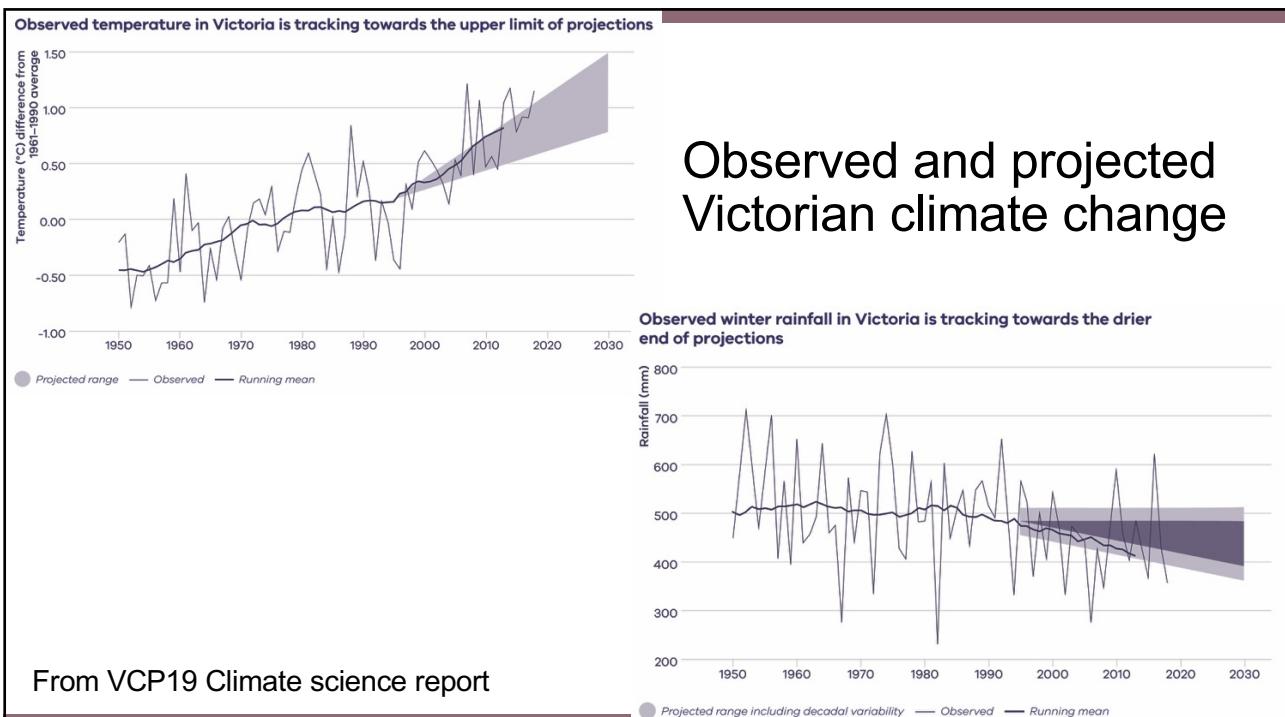


Climate variability vs climate change

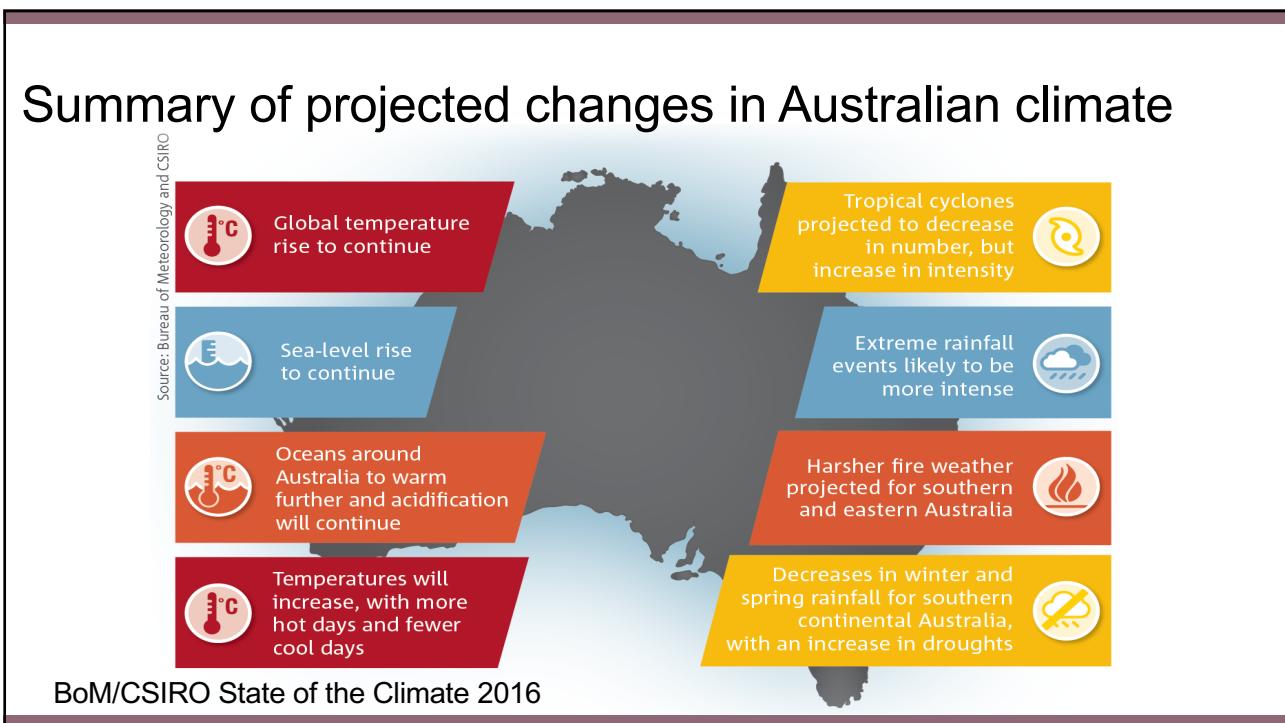
- The observed climate varies partly due to those types of modes
- However, these modes are not sufficient to describe observed trends





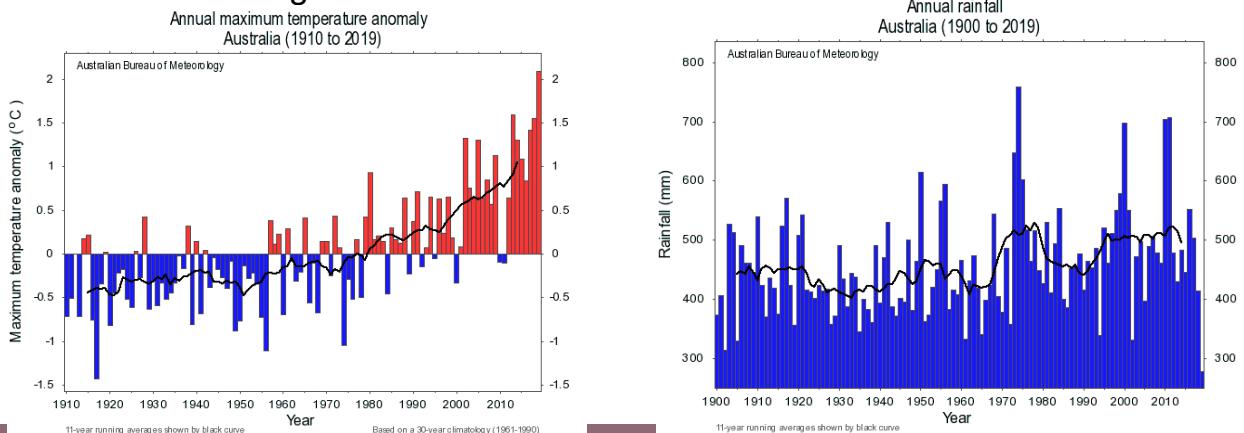


Observed and projected Victorian climate change



Australian climate in 2019

- Record high annual maximum temperature across Australia due to climate change. Virtually impossible due to natural climate variations alone.
- Record low annual rainfall across Australia, mainly due to natural variations, not climate change.



Climate change and the 2019 bushfires

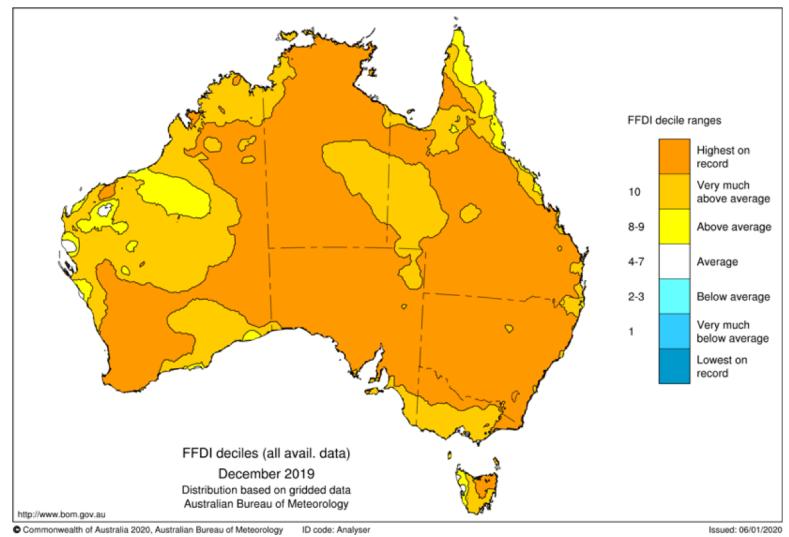
- Eastern Australia experienced unprecedented bushfires in spring and summer 2019 due to extended drought, heat waves and periods of strong winds
- Natural weather and climate variations (Indian Ocean Dipole, Antarctic vortex breakdown and stronger westerly winds over NSW) were the main cause of the extreme low rainfall and the extreme fire danger
- Climate change contributed to the extreme conditions through long-term increases in temperature and heat waves across Australia, and reduced rainfall in winter across southern Australia

Extreme fire weather 2019

FFDI deciles for Dec 2019

Unprecedented fire danger in 2019 across much of Australia

- Many recent events are worse than conditions experienced previously.



An example: The electricity sector

- The electricity sector is transitioning to low emission technologies
- The generation and distribution networks are vulnerable to extreme weather and climate events, as demonstrated in the 2016 SA blackout and the 2019 bushfires
- The Australian Government is providing \$6.1 million over three years to improve climate and extreme weather information for the electricity sector, through the Electricity Sector Climate Information (ESCI) project



Electricity Sector Climate Information (ESCI) project

- Designed to improve the reliability and resilience of the National Electricity Market to the risks from climate change and extreme weather
- Partnership between CSIRO, BoM and AEMO, with DISER funding
- The most important climate hazards are (in order of priority): increasing temperature, bushfires, wind, precipitation/dam inflows, and coastal inundation

<https://www.climatechangeaustralia.gov.au/en/climate-projections/future-climate/esci/>



Summary

- Climate change has already led to significant changes in climate risks and will continue to do so.
- The most confident projected changes are: increases in heat waves, sea level extremes, severe fire weather, reductions in winter rain in southern Australia, and increases in heavy 1-day rain; less certainty in other extremes.
- Climate risk assessments need to synthesise sector expertise and climate information.



References

Australian Academy of Science, *The science of climate change: Questions and answers 2015*,
<https://www.science.org.au/climatechange>

CSIRO & Bureau of Meteorology, *State of the Climate 2018*,
<https://www.csiro.au/en>Showcase/state-of-the-climate>

Victoria's Climate Science Report 2019,
<https://www.climatechange.vic.gov.au/climate-science-report-2019>

Climate change in Australia: regional projections of climate change
<https://www.climatechangeaustralia.gov.au/en/>

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Keep in touch

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