

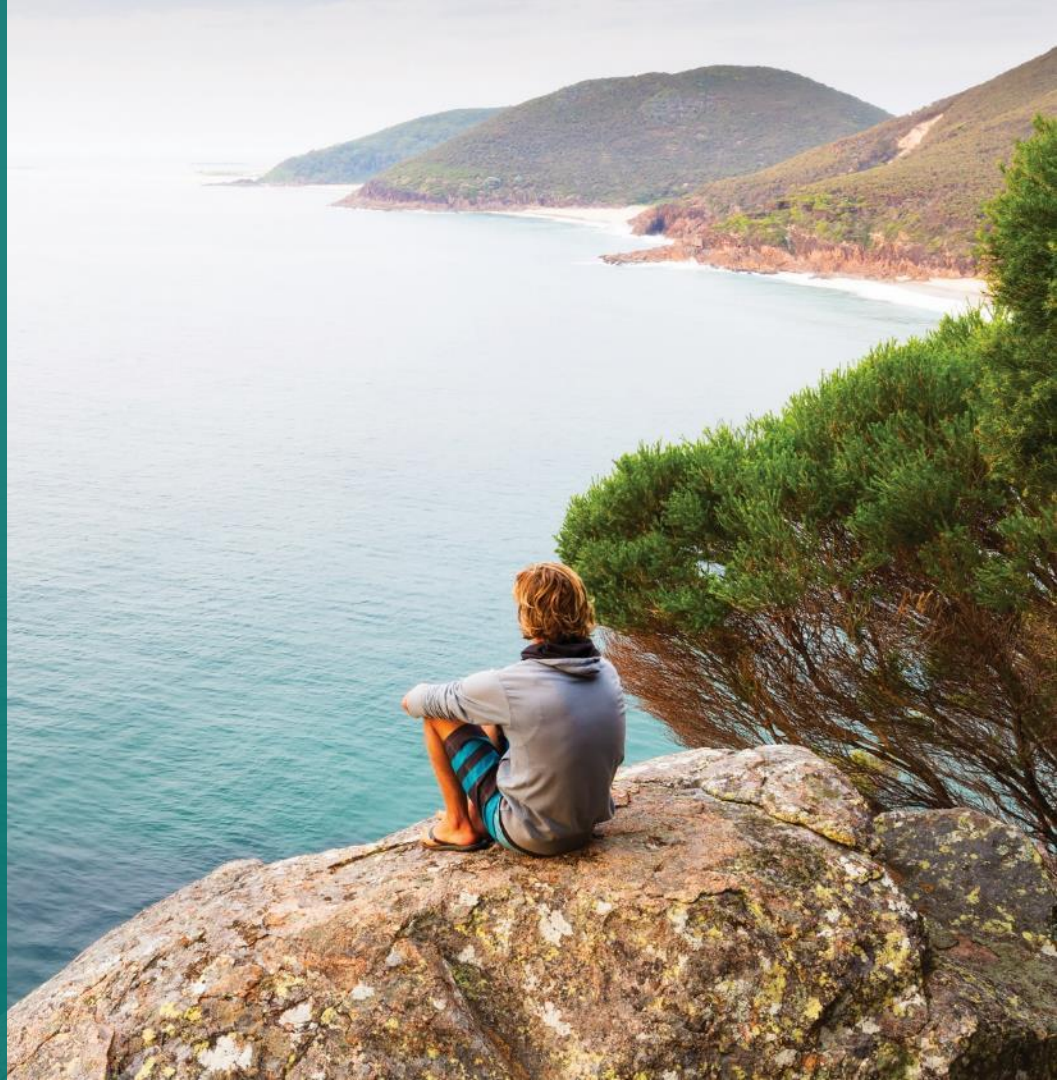
State of the Climate 2018

**Why plan for climate
change?**

Dr Lynette Bettio
Bureau of Meteorology



Australian Government
Bureau of Meteorology



Managing
climate
risk:

A rapidly
changing
landscape



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World Economic Forum — Global Risks Report 2018

Top 10 risks in terms of Likelihood

- 1 Extreme weather events
- 2 Natural disasters
- 3 Cyberattacks
- 4 Data fraud or theft
- 5 Failure of climate-change mitigation and adaptation
- 6 Large-scale involuntary migration
- 7 Man-made environmental disasters
- 8 Terrorist attacks
- 9 Illicit trade
- 10 Asset bubbles in a major economy

Top 10 risks in terms of Impact

- 1 Weapons of mass destruction
- 2 Extreme weather events
- 3 Natural disasters
- 4 Failure of climate-change mitigation and adaptation
- 5 Water crises
- 6 Cyberattacks
- 7 Food crises
- 8 Biodiversity loss and ecosystem collapse
- 9 Large-scale involuntary migration
- 10 Spread of infectious diseases

Categories

-  Economic
-  Environmental
-  Geopolitical
-  Societal
-  Technological

Source: World Economic Forum Global Risks Perception Survey of Almost 750 experts and decision-makers in the World Economic Forum's multistakeholder communities

Note: Survey respondents were asked to assess the likelihood of the individual global risk on a scale of 1 to 5, 1 representing a risk that is very unlikely to happen and 5 a risk that is very likely to occur. They also assess the impact on each global risk on a scale of 1 to 5 (1: minimal impact, 2: minor impact, 3: moderate impact, 4: severe impact and 5: catastrophic impact). See Appendix B for more details. To ensure legibility, the names of the global risks are abbreviated; see Appendix A for the full name and description.

Clear impacts are already apparent



Increased frequency, intensity, duration and extent of heatwaves



Longer fire season with more extreme fire danger days



More time spent in drought and hotter droughts



Greater proportion of rainfall from heavy rainfall events



Increased frequency of coastal storm surge inundation and recession

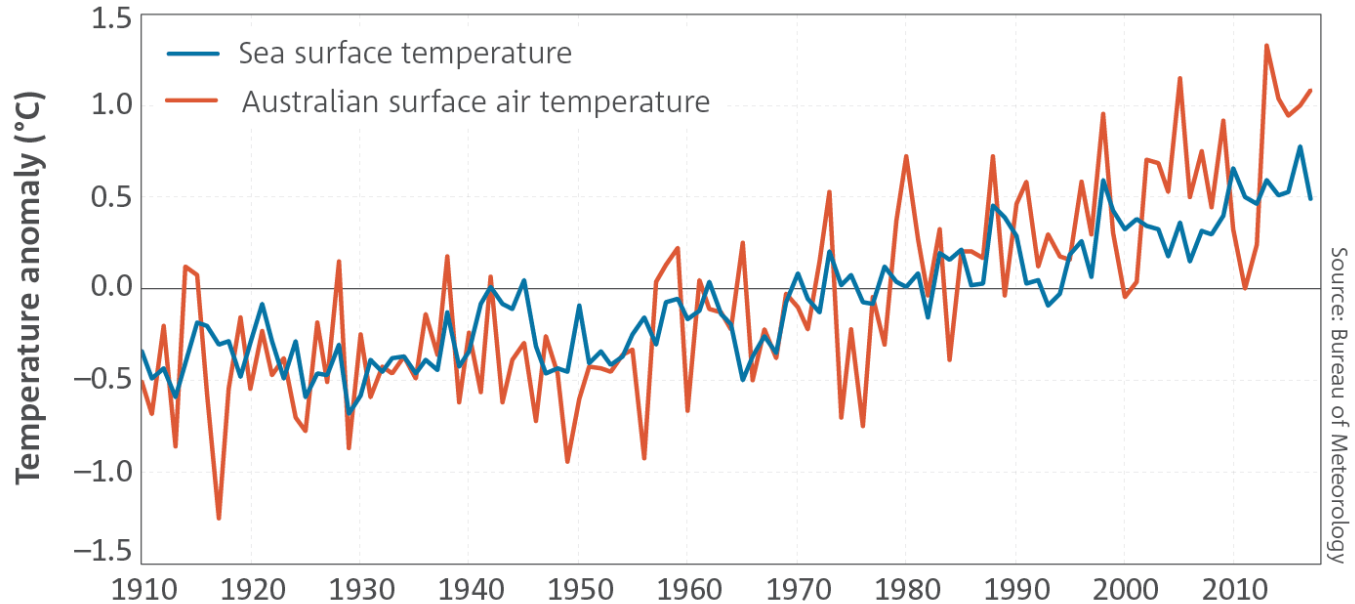


Prolonged high ocean temperatures

Australia's changing climate



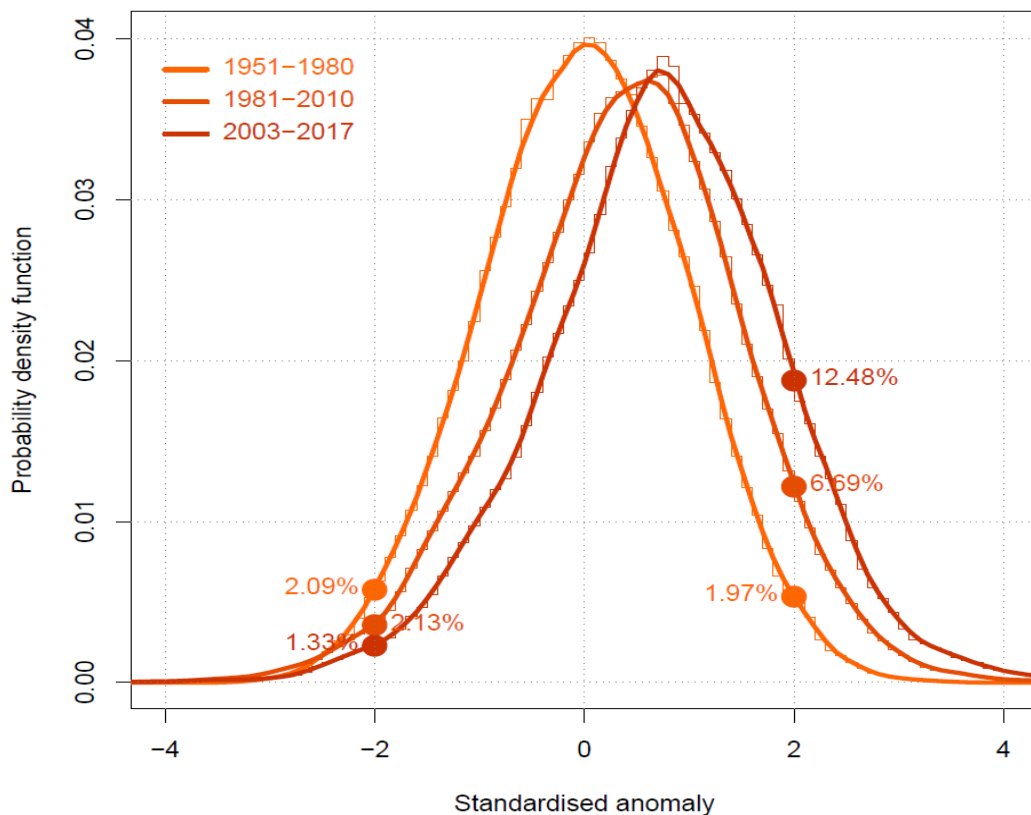
Temperature



Rise of 1.4°C in Australian land surface temperatures

Why does 1°C matter?

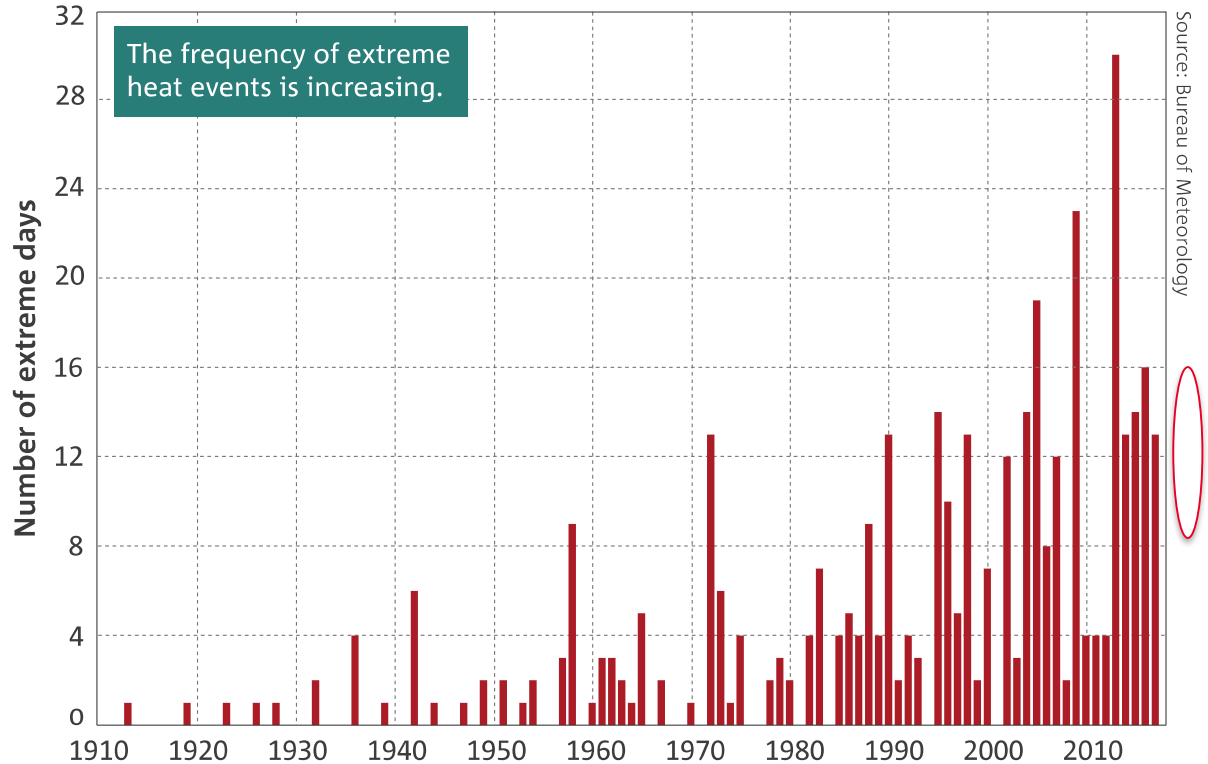
Increase in temperature has increased the occurrence of very warm monthly daytime temperatures



Australia's changing climate

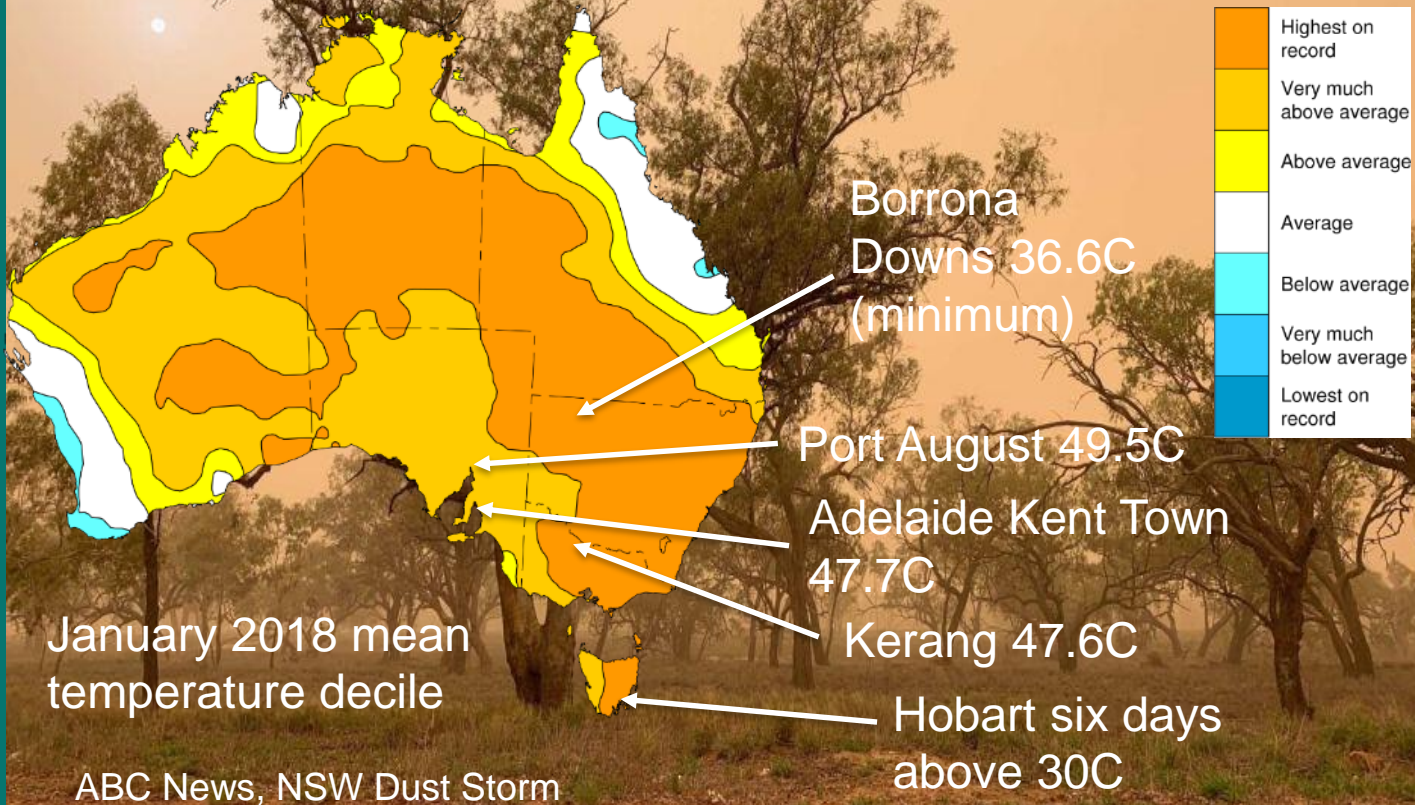


Temperature



January 2019: Australia's hottest month on record

Averaged across the country, 8 of the 10 warmest days
occurred during January 2019



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Impacts?

Human health

Agriculture

EM sector

Need for cooling

Cost of power

Tourism



Queensland flying fox species decimated by record heatwave

'As far as we know, [the spectacled flying fox] has never suffered heat deaths before,' ecologist says



▲ Conservationists estimate more than 4,000 spectacled flying foxes have died this week in the heatwave. Photograph: Marc McCormack/EPA

Mass fish die-off in Darling River could impact fish numbers in other states

ABC Riverland, By Sowabeh Haniffa and Nadia Iqbal
Updated 15 Jan 2019, 4:13pm



PHOTO: Experts believe the mass die-off of Murray cod in NSW will impact fish numbers in other states. (Facebook: Rod Mackenzie)

Climate change costs will have knock-on effect on interest rates, Reserve Bank warns

7.30 By Laura Tingle
Updated Tue at 10:50pm

The Reserve Bank has warned it will have to take the impact of climate change into account when setting interest rates.

"The economy is changing all the time in response to a large number of forces," Guy Debelle said in a keynote address to the Centre for Policy Development.

"Monetary policy is always having to analyse and assess these forces and their impact on the economy.

"But few of these forces have the



PHOTO: Reserve Bank Deputy Governor Guy Debelle delivering his speech to the Centre for Policy Development. (ABC News)

What caused the blackouts in Melbourne, and do Victorians need to get used to power cuts?

By Dan Harrison
Updated Mon at 9:23am



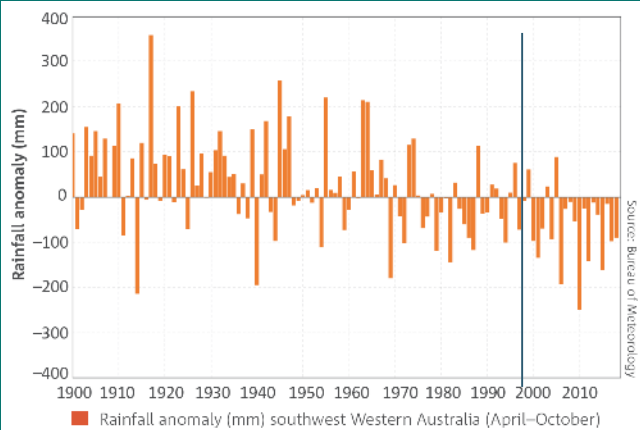
PHOTO: More than 200,000 Victorians had their power interrupted on Friday. (ABC News: Zalka Rizmal)

The current drought has had a dramatic effect on economic output, reducing farm output by 6 per cent..

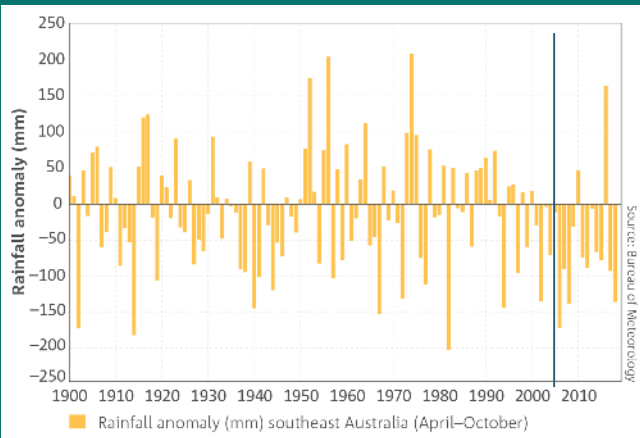
IOCI



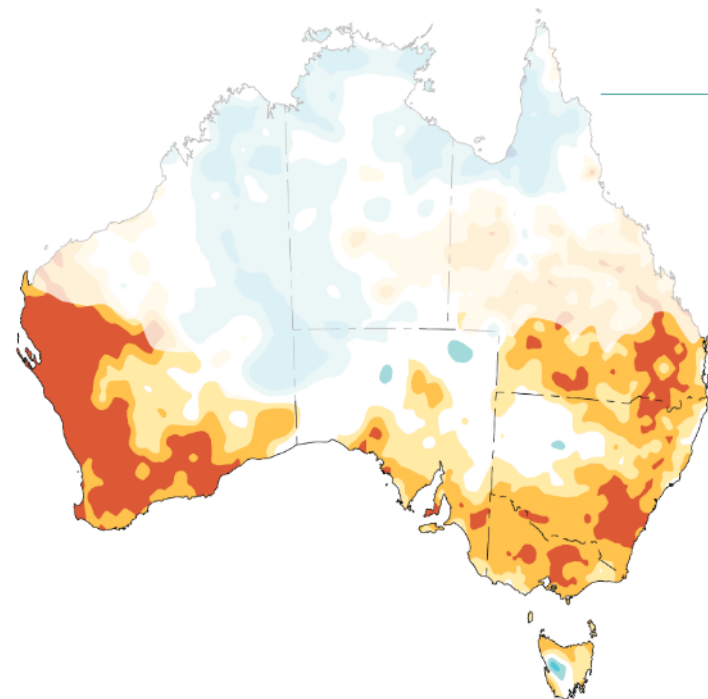
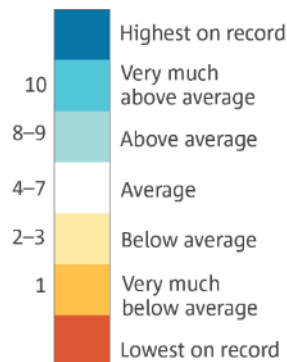
Rainfall



SEACI



Rainfall decile ranges



20 year April–October rainfall
deciles: declines in south

Southern Australia's decline an example of good adaptation in cities?

The Indian Ocean Climate Initiative (IOCI) research partnership established in 1998.

The South Eastern Australian Climate Initiative (SEACI) research partnership established in 2005.

Cost of desalination plants



Melbourne	\$3.5bn
Sydney	\$2.4bn
Adelaide	\$1.83bn
Gold Coast	\$1.2bn
Perth	\$955m



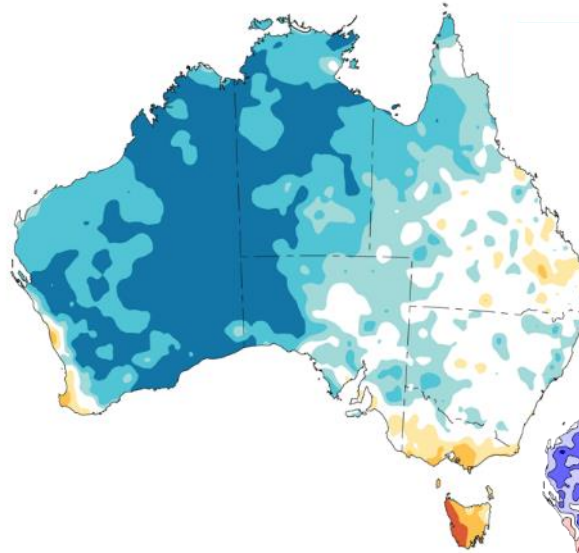
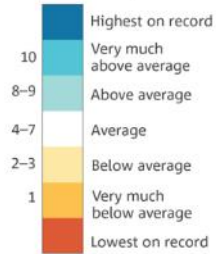
Lake Hume 2007 Source Image: Wikipedia

Wetting over northern Australia and increasing heavy rain events

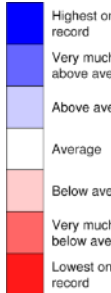
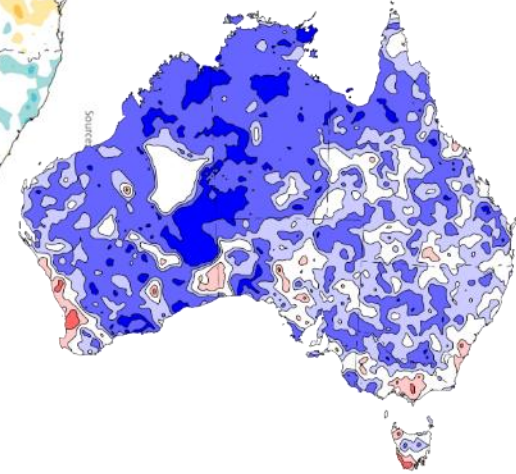


Rainfall

Rainfall decile ranges



20 year October-April rainfall
deciles: Increases in north



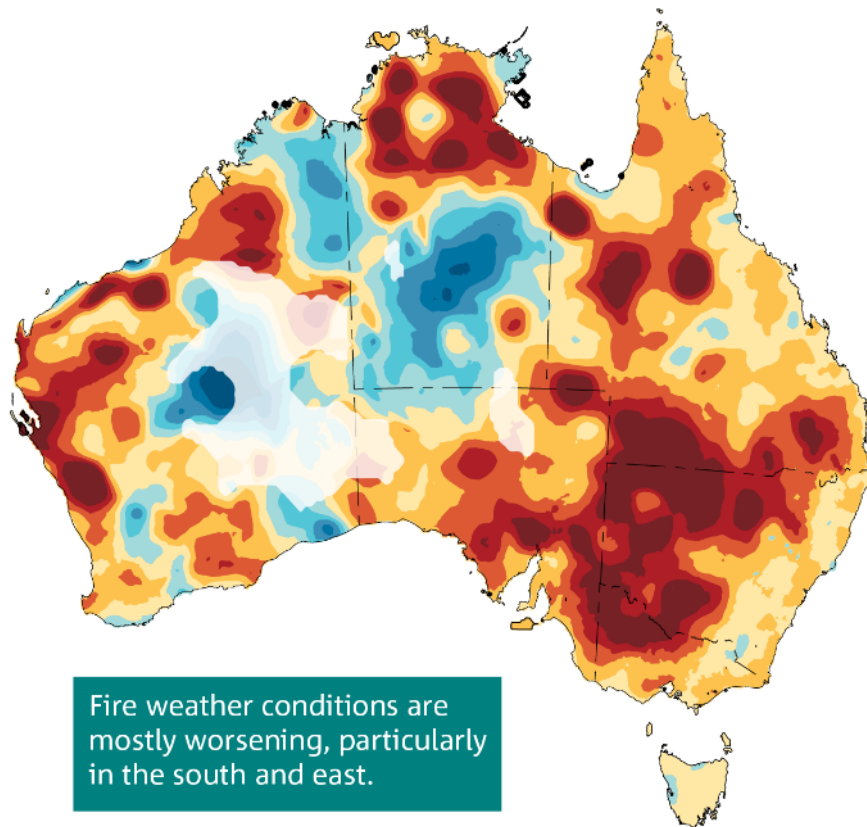
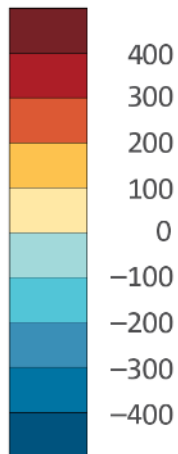
20 year decile of heavy
rainfall days (>25mm)

Australia's changing climate



Fire weather

Forest Fire
Danger Index
points/decade



Fire weather conditions are
mostly worsening, particularly
in the south and east.

Source: Bureau of Meteorology

**Summer
2018/19:
When
trends and
variations
come
together**

**Queensland fires
Record heatwaves
Southeast fires
Severe drought
Queensland floods**

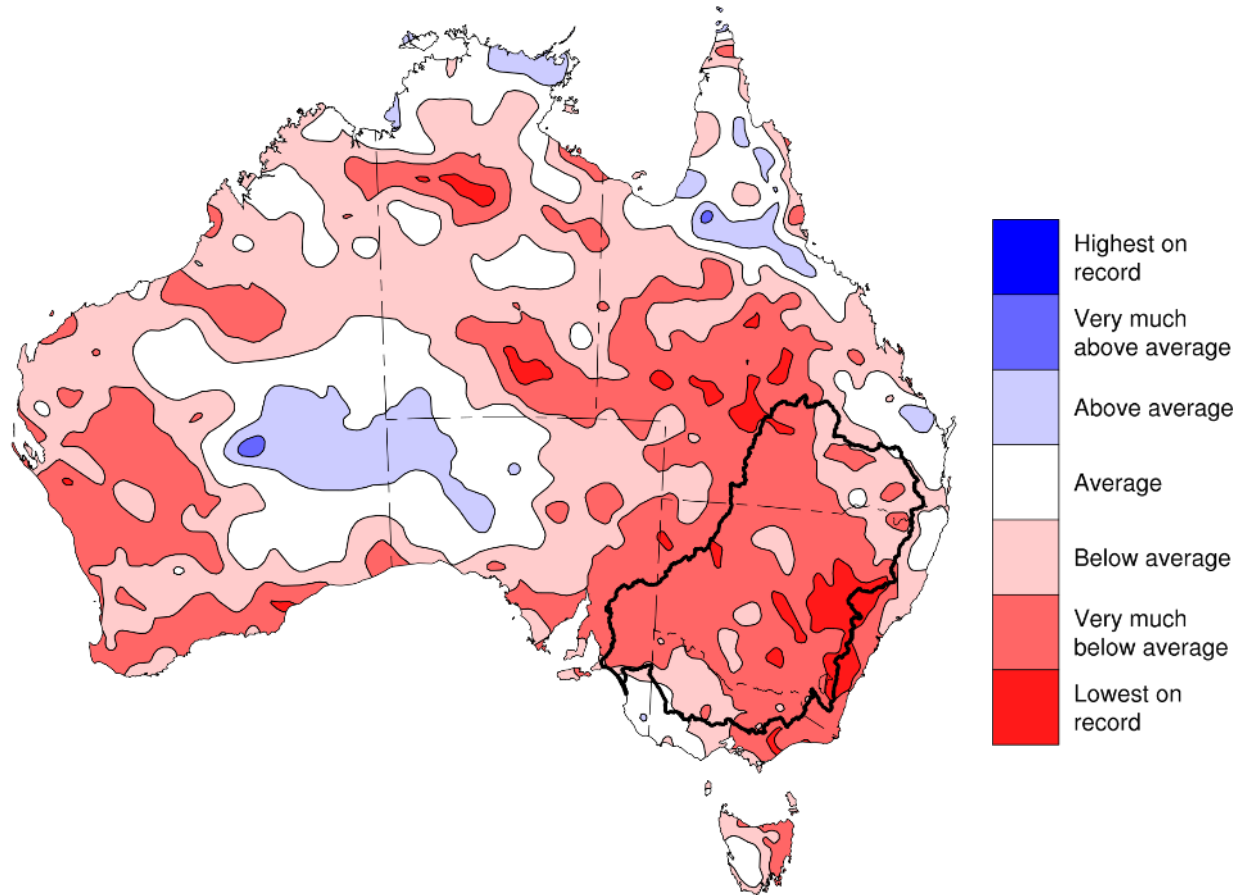


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Timburra Fires Gippsland Helenka King @HelenkaKingTwitter

Two years of cool season rainfall

April-October



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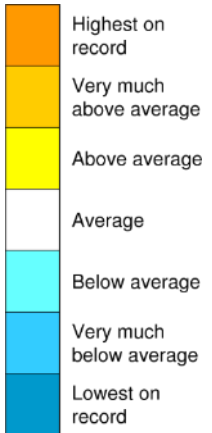
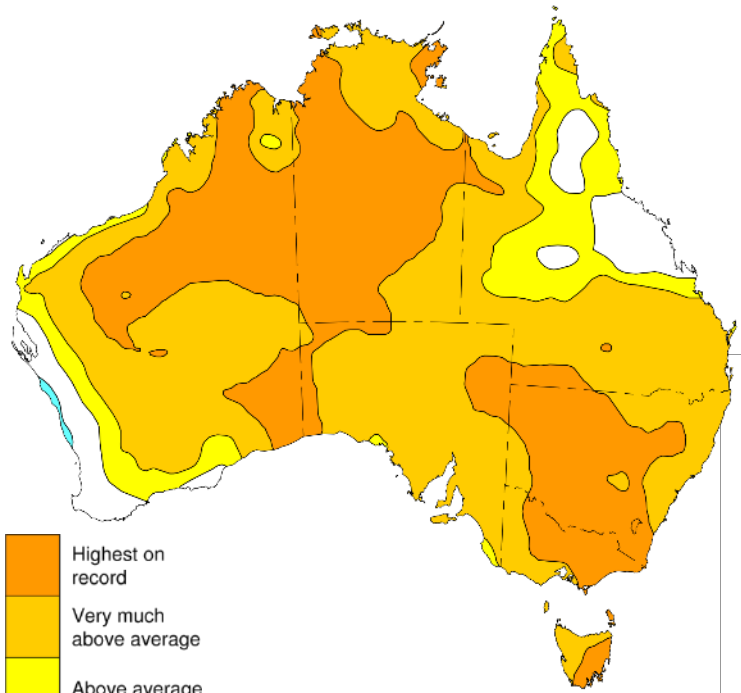
Recent events the east



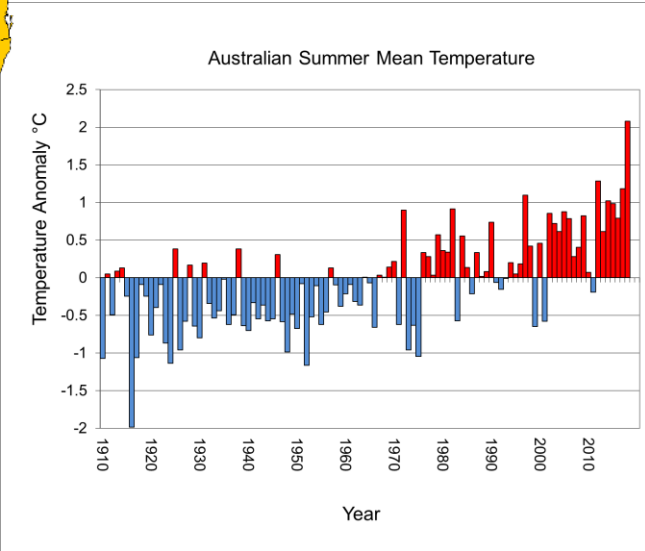
January 29 fires across Tasmania

Summer
2018/19
temperature
decile

Australia hottest summer on record



Summer 2018/19 Temperatures



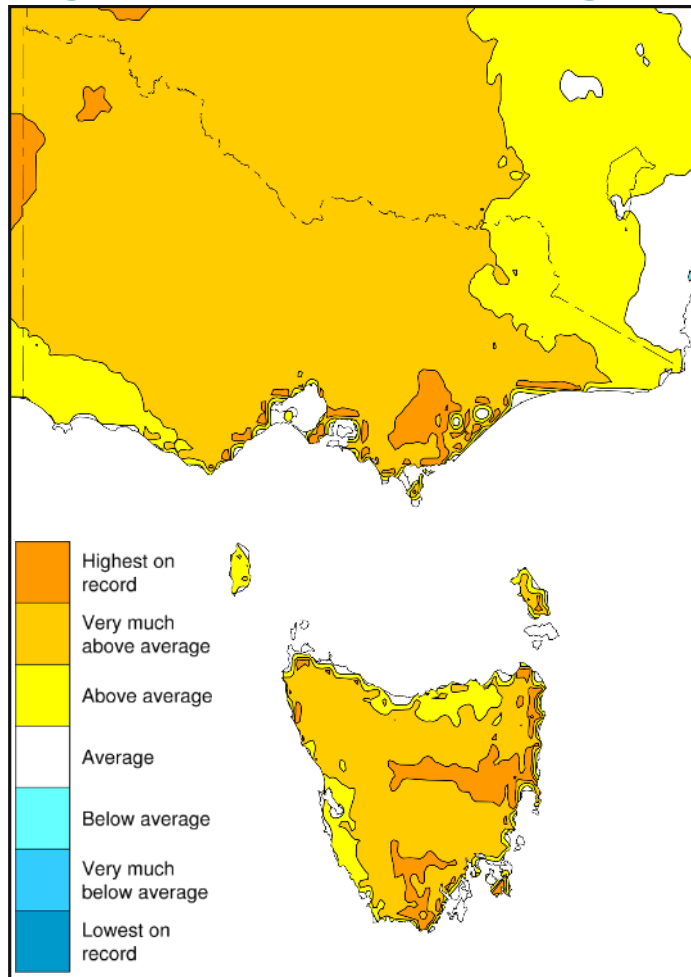
Recent events in the east

January/February Fire Danger



Australian Government
Bureau of Meteorology

High to record fire danger



Bunyip fire, ABC News

Bunyip State Park fire destroyed 29 houses, Victorian authorities confirm

Updated 8 Mar 2019, 8:32pm



Recent events in the east



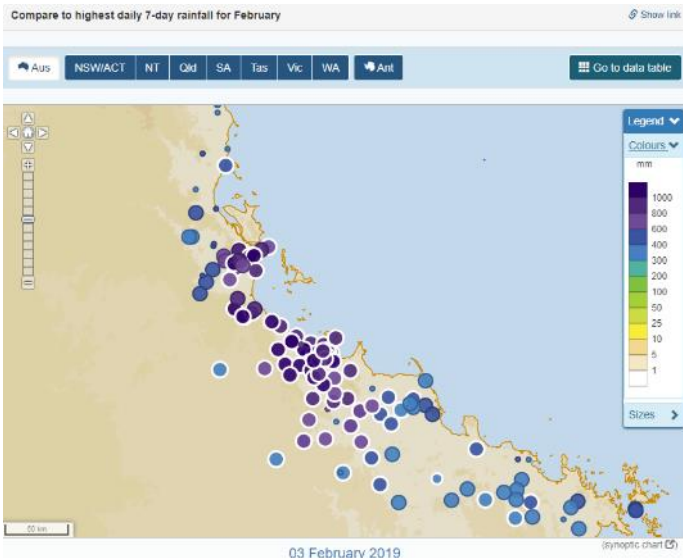
Monsoon low over Queensland, 4
February 2019

Record high
multi-day
rainfall
widespread



Australian Government
Bureau of Meteorology

Record flooding in coastal Queensland



Flooding in Townsville and
Mt Isa
ABC News



What are our options?

"belief in climate change is optional, but participation is mandatory"

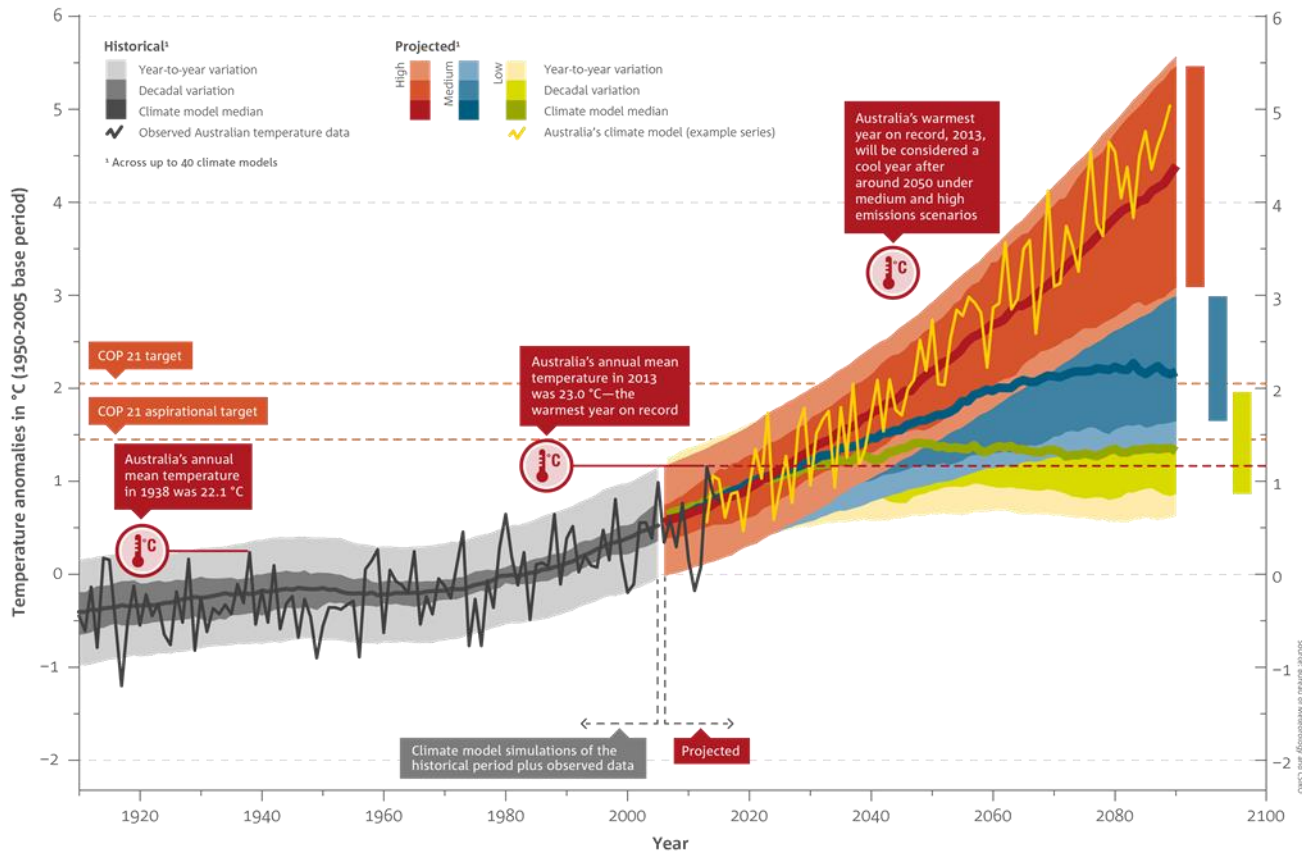
*Jim Beever,
southwest
Florida Regional
Planning Council*



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Australian temperature projections



Thank you



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More information

www.bom.gov.au/state-of-the-climate

www.csiro.au/state-of-the-climate