

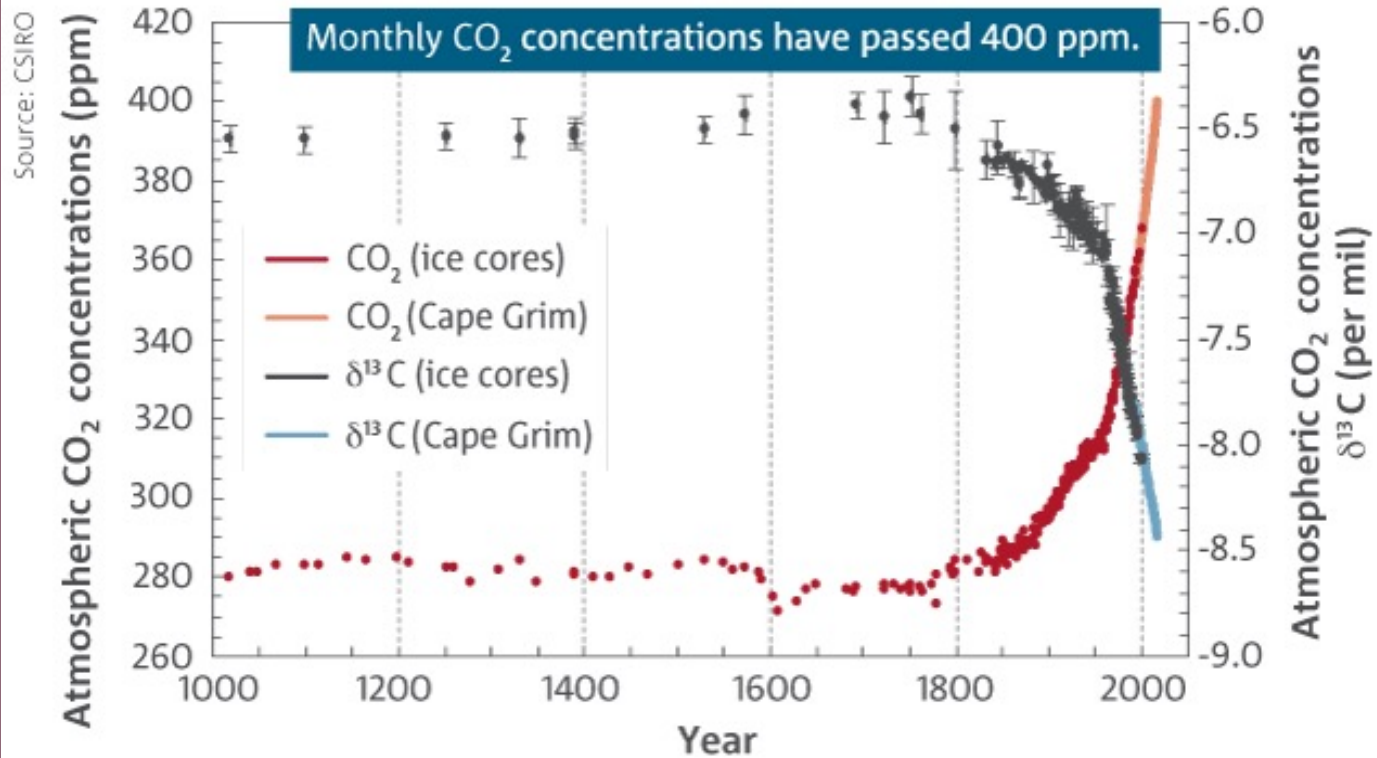


Observed and future climate change in the Northern Territory

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University of Melbourne

Observed
global
climate
change:

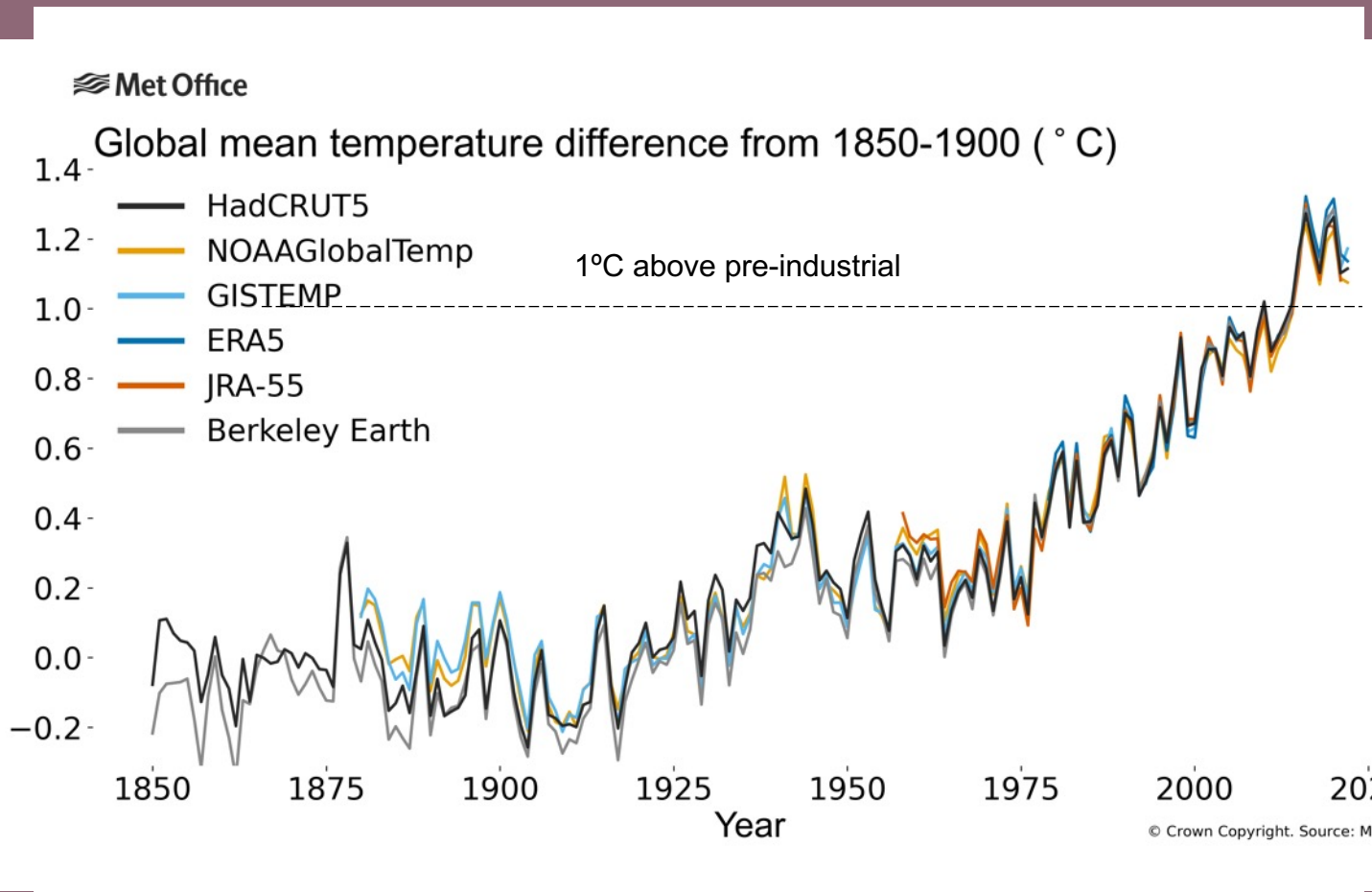
carbon
dioxide



The decrease in the ratio of the carbon-13 isotope ($\delta^{13}\text{C}$) that accompanies increasing CO₂ trends show that the sources are fossil fuel and land-use change.

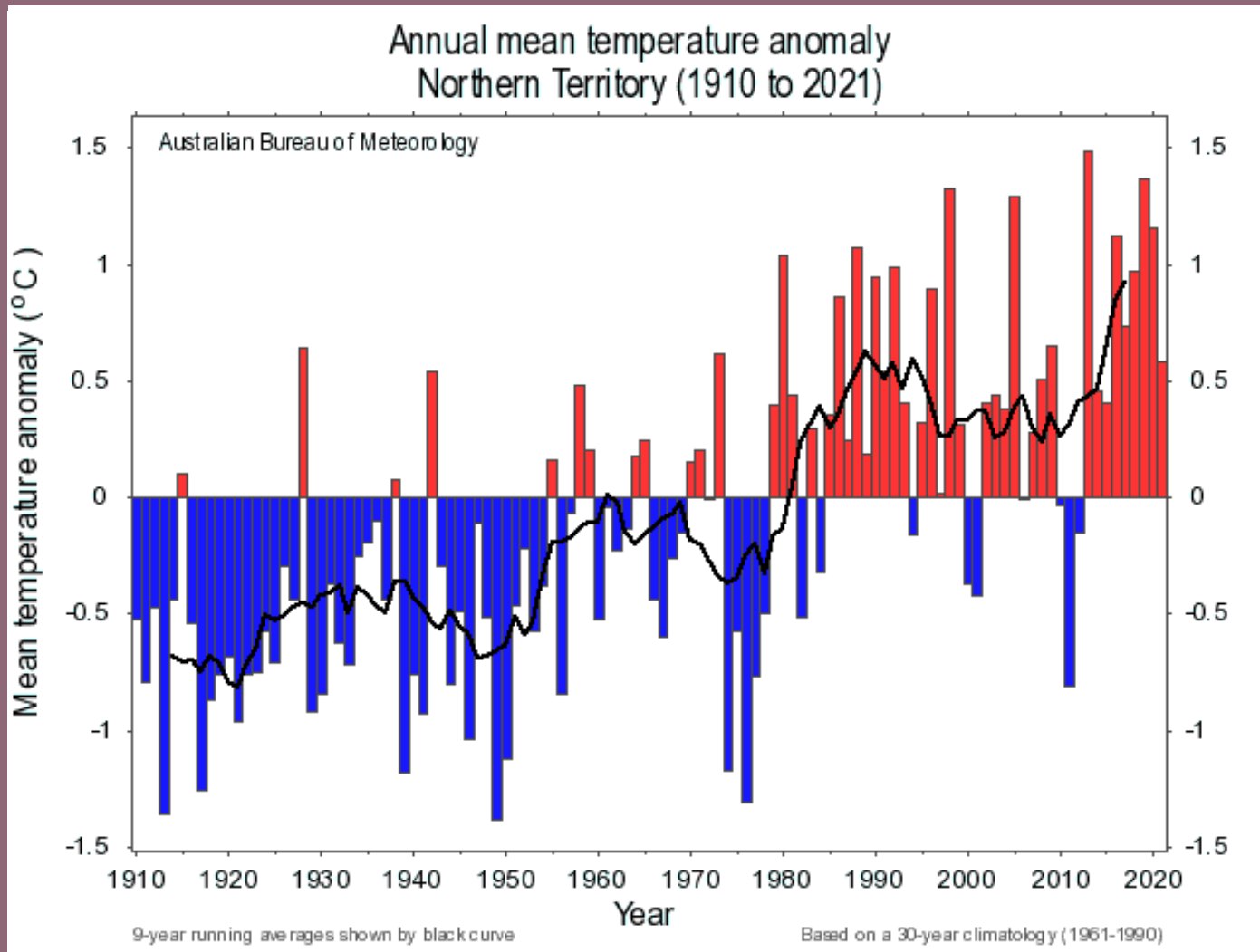
(BOM/CSIRO State of the Climate 2016)

Observed
global
climate
change:
mean
temperature



(WMO 2022)

Observed
Australian
climate
change:
annual
mean
temperature
Northern
Territory

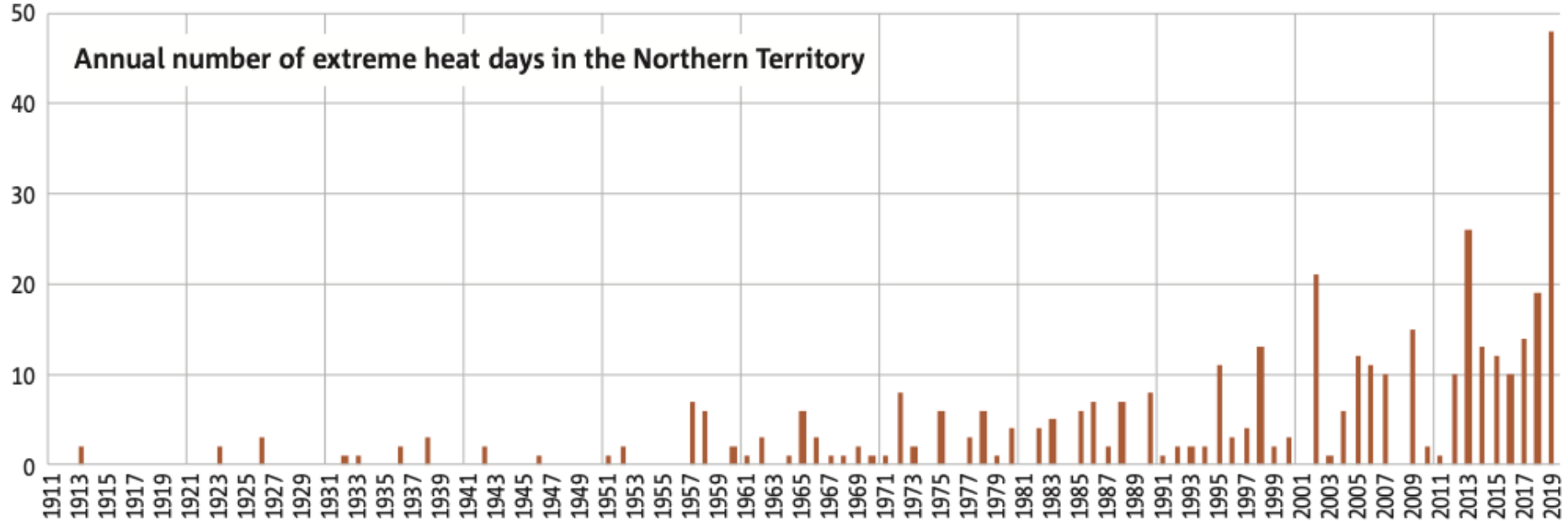


Observed Australian climate change:

Extreme heat days in the Northern Territory

Number of days each year where NT area-averaged daily mean temperature is above the 99th percentile

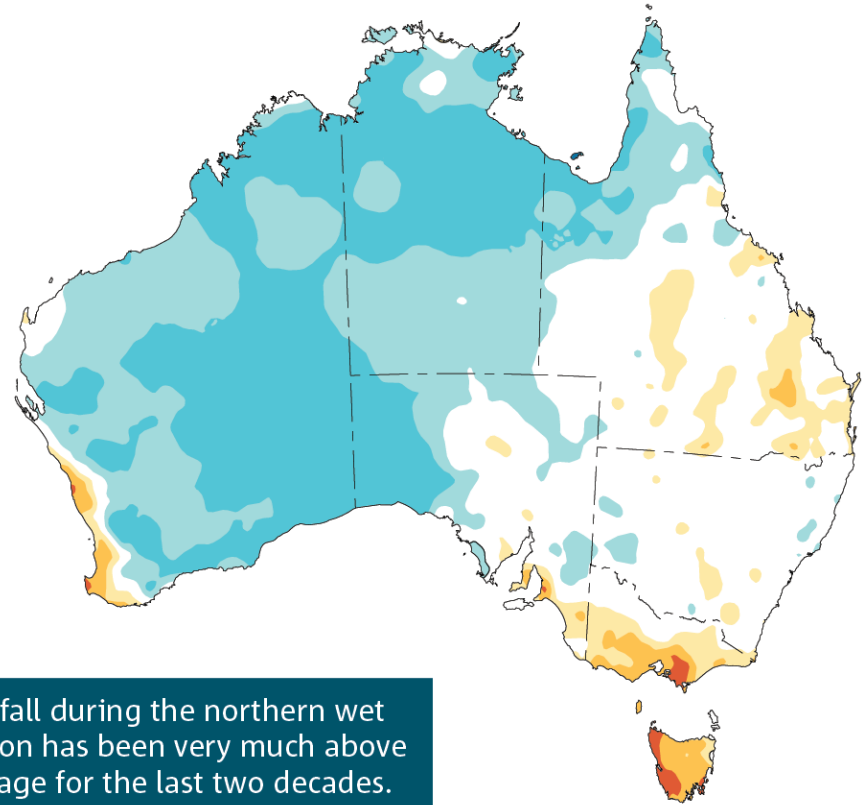
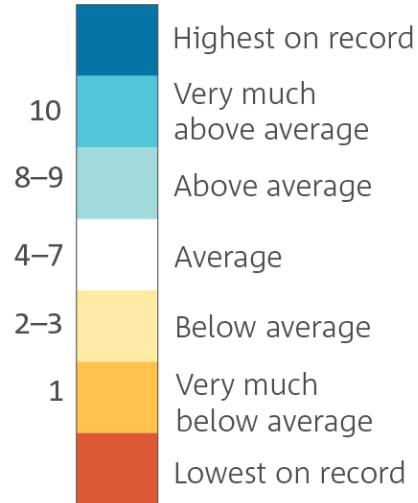
(Climate change in the NT 2020)



Warm season (October–April) 2000-2020

Observed
Australian
climate
change:
rainfall
changes

Rainfall decile ranges



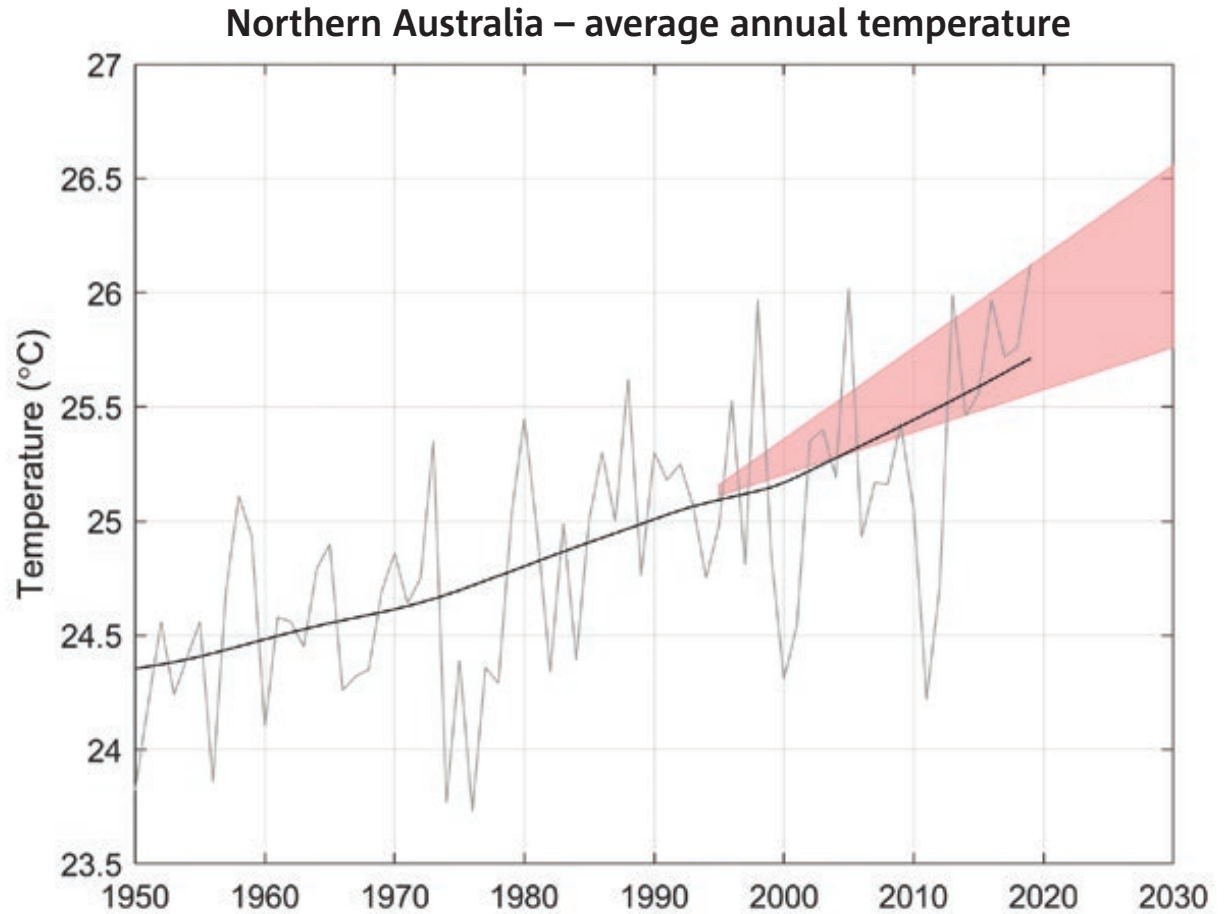
Rainfall during the northern wet season has been very much above average for the last two decades.

Source: Bureau of Meteorology

(State of the Climate 2020)

Projected
climate
change:

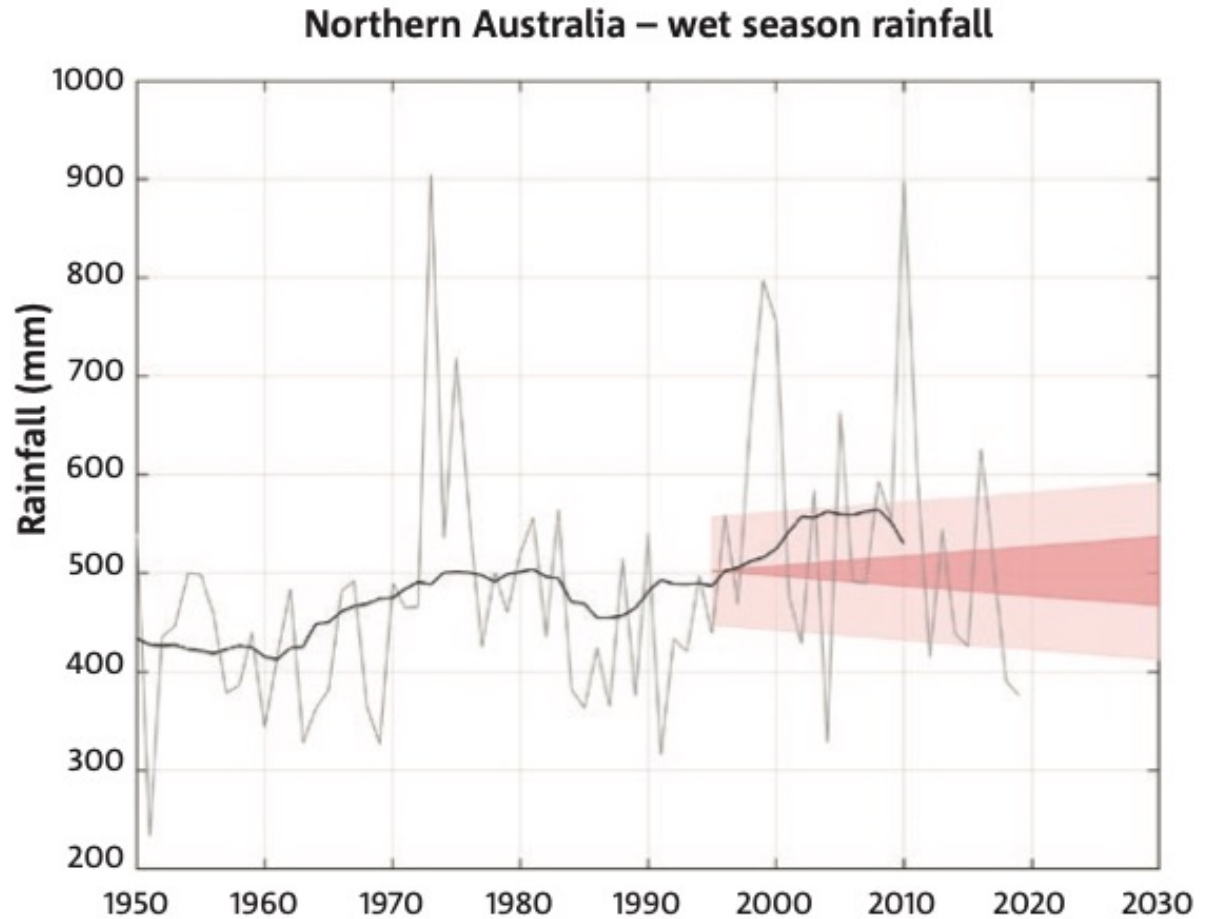
Northern
Australia
average
temperature



(Climate change in the NT 2020)

Projected
climate
change:

Northern
Australia
wet season
rainfall



(Climate change in the NT 2020)

Future climate change in Alice Springs

	Baseline 1981-2010	Present 2011-2020	2030 (2015-45) medium emissions
Ann mean max temp	29.5°C	+0.6°C	+1.0°C (0.6 to 1.5°C)
Days/year over 35°C	98	112	113 (104 to 122)
Days/year over 40°C	16	28	31 (24 to 40)

- Marked increase in heat waves (*high confidence*)
- Increased intensity of extreme daily rainfall (*high confidence*)
- Increased evapotranspiration (*high confidence*)
- A harsher fire-weather climate (*high confidence*)

Projected
climate
change:

Alice Springs



Global temperature rise to continue

Fewer tropical cyclones, but a greater proportion of high-intensity storms



Sea level rise to continue

Cool season rainfall decline in southern and eastern Australia to continue



Marine heatwaves to be more frequent and intense

Heavy rainfall to become more intense



Warmer with more heatwaves, fewer cool days

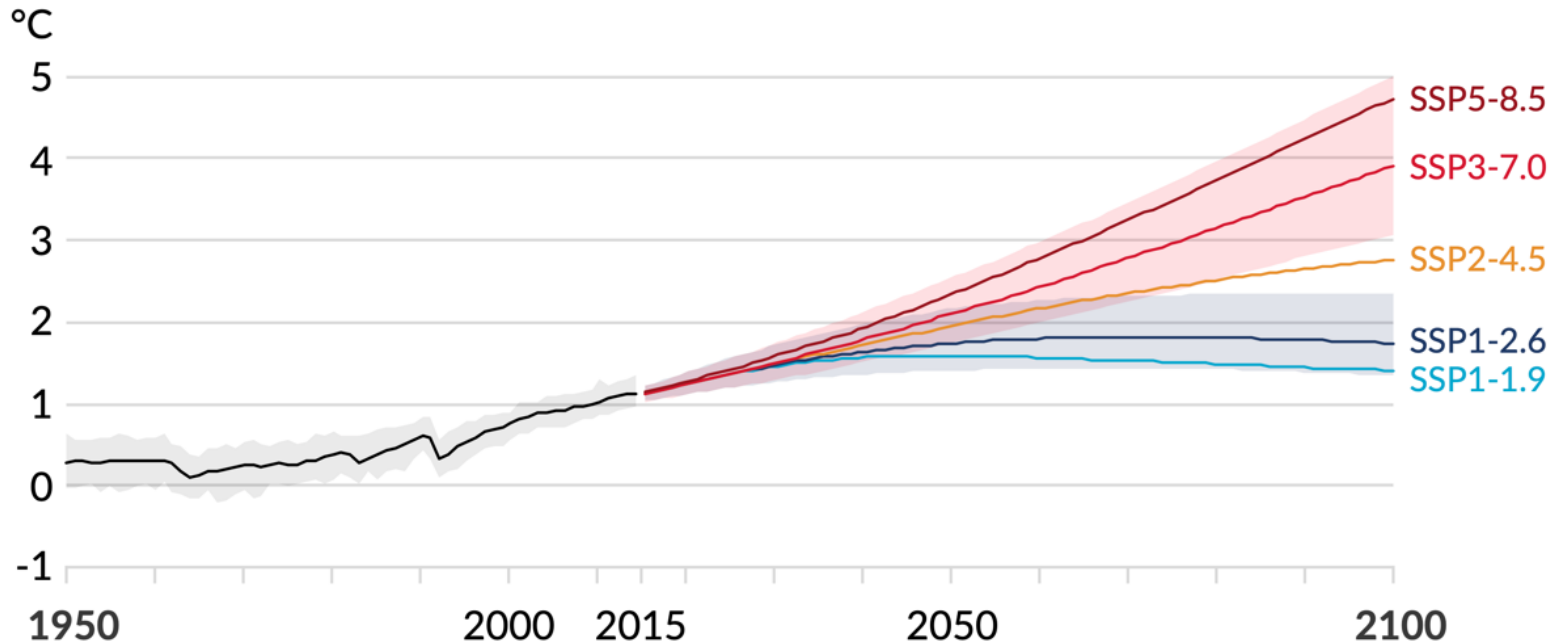
Longer fire season and more dangerous fire weather



(State of the Climate 2020)

Projected climate change

a) Global surface temperature change relative to 1850-1900

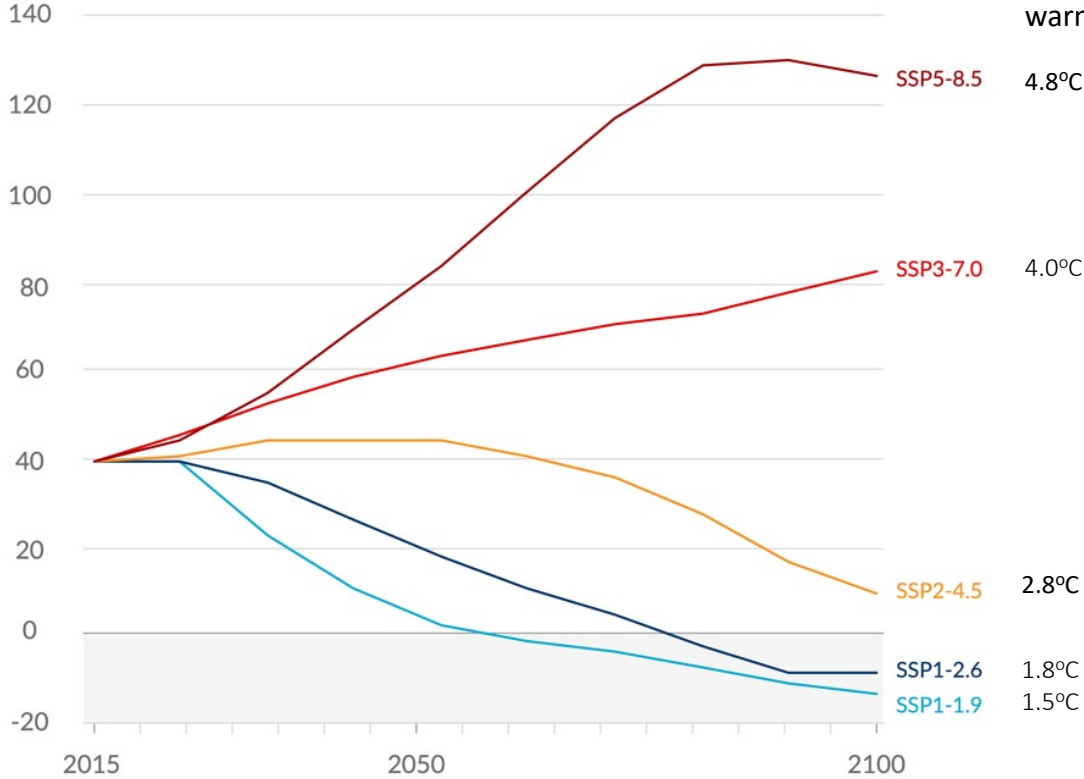


Very low emissions gives >50% chance of warming less than 2°C

Fig SPM.8, IPCC AR6 WG1

Future emission scenarios

Carbon dioxide (GtCO₂/yr)



Global warming

Temp change for very low emissions

SSP1-2.6

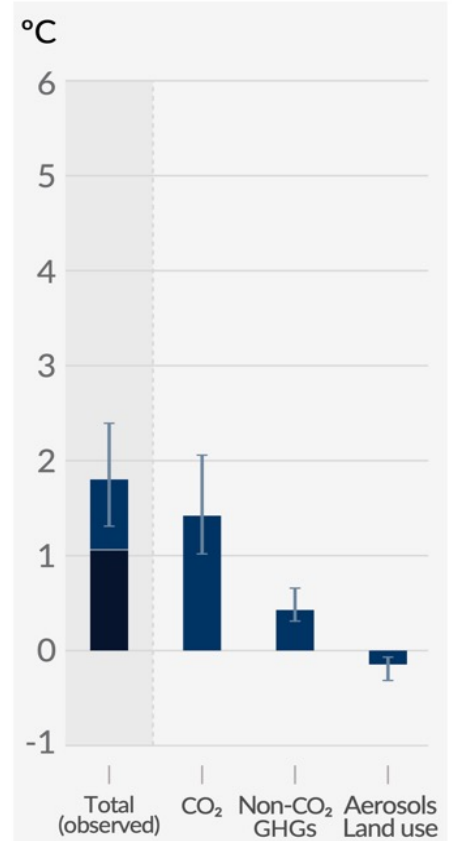


Fig SPM.4
IPCC AR6
WG1

“Every tonne of CO₂ emissions adds to global warming”

Manage the risks, seize the opportunities

- The climate of the past is not a good guide for the future, except perhaps for mean rainfall
- Make choices consistent with a hotter climate, and more variable rainfall, with more evaporation
- Seize opportunities for carbon farming and renewable energy generation
- Adapt to the impacts of climate change already occurring and very likely to get worse

References

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