



Climate Update

Recent conditions and long-range forecasts

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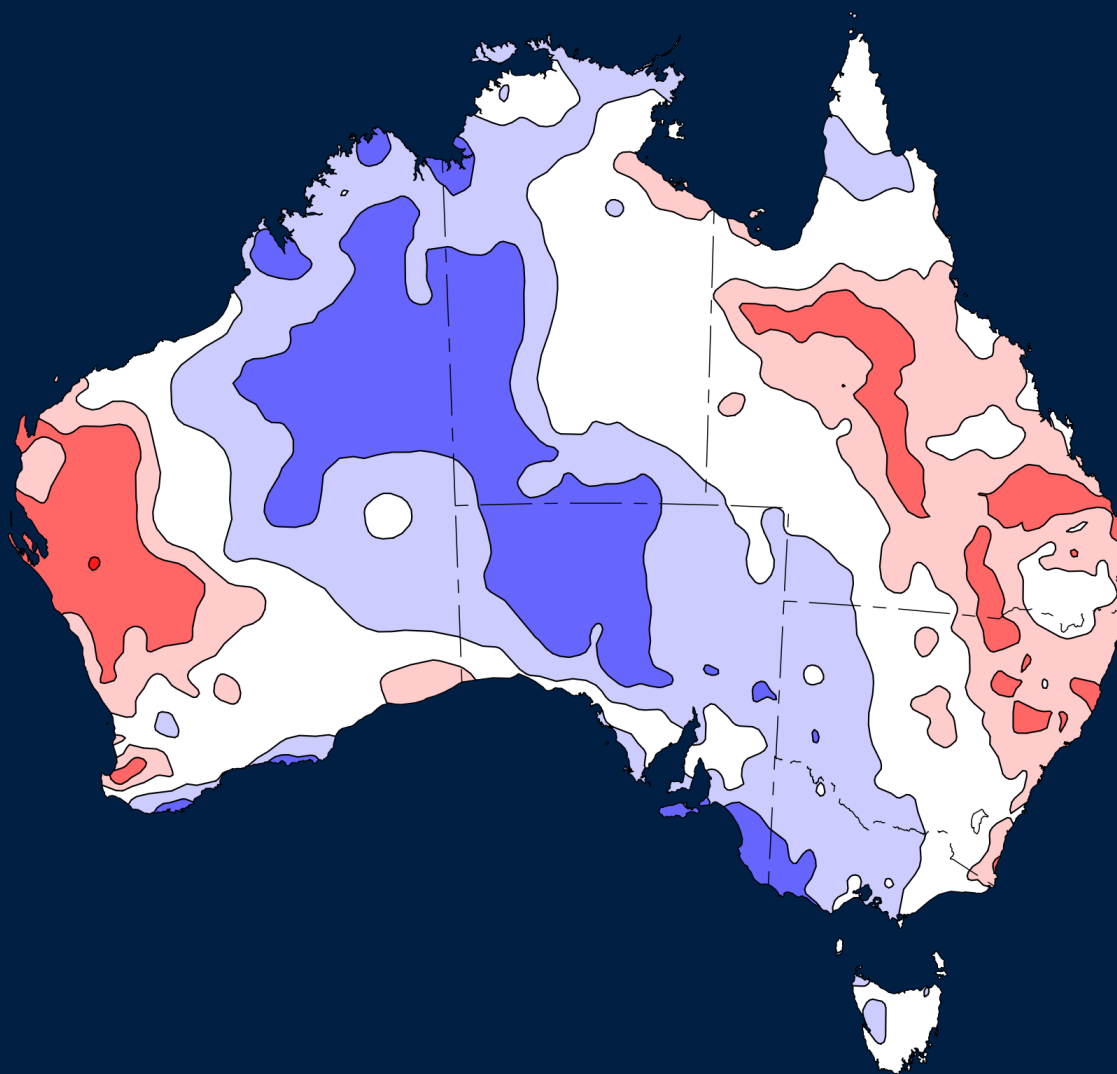
20 July 2023



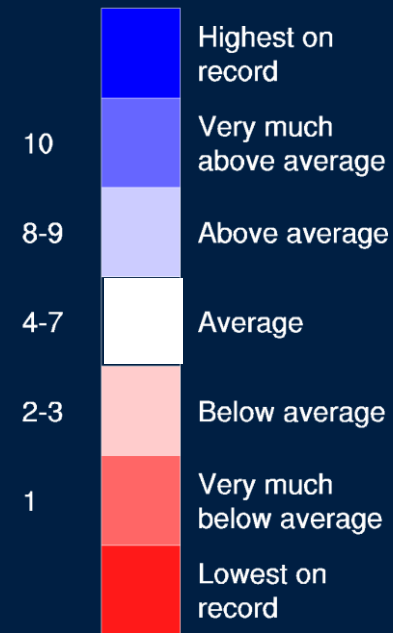


Recent rainfall—April to June 2023

- Nationally, April to June close to average rainfall
- For SA, 11th wettest such period in 124 years



Rainfall decile ranges



Deciles compared to 1900–2023



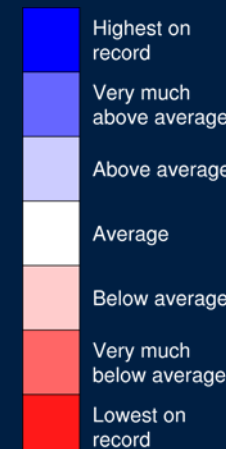
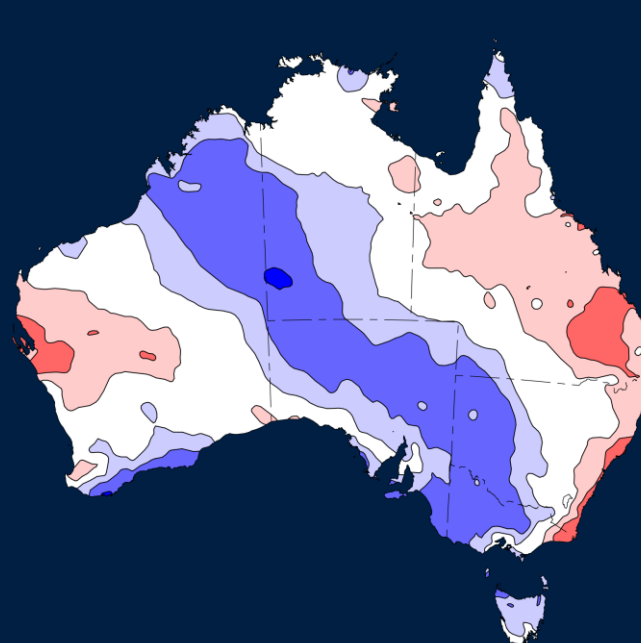
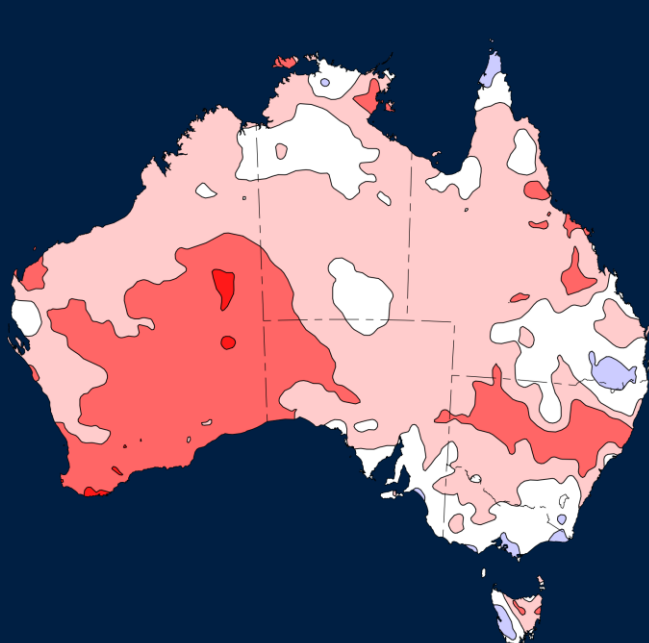
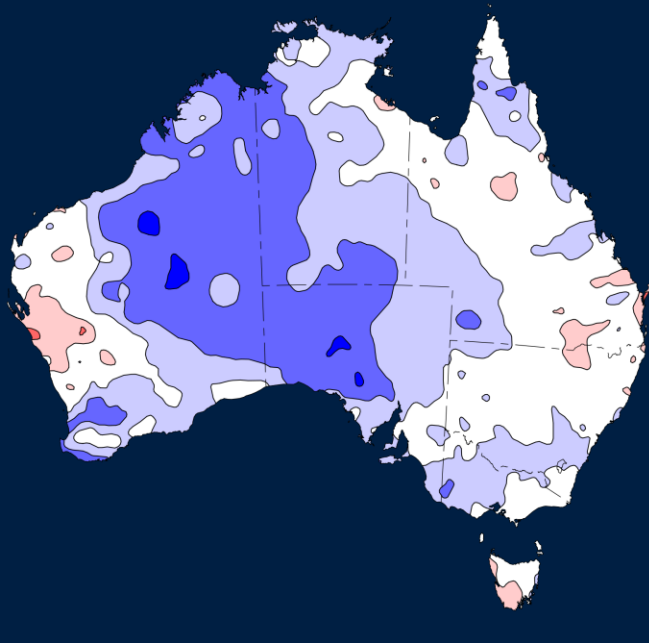


Recent rainfall—April, May, June

April

May

June



Deciles
Compared to
1900–2023

- WA 9th highest

- Nationally, 2nd lowest
- WA lowest May on record

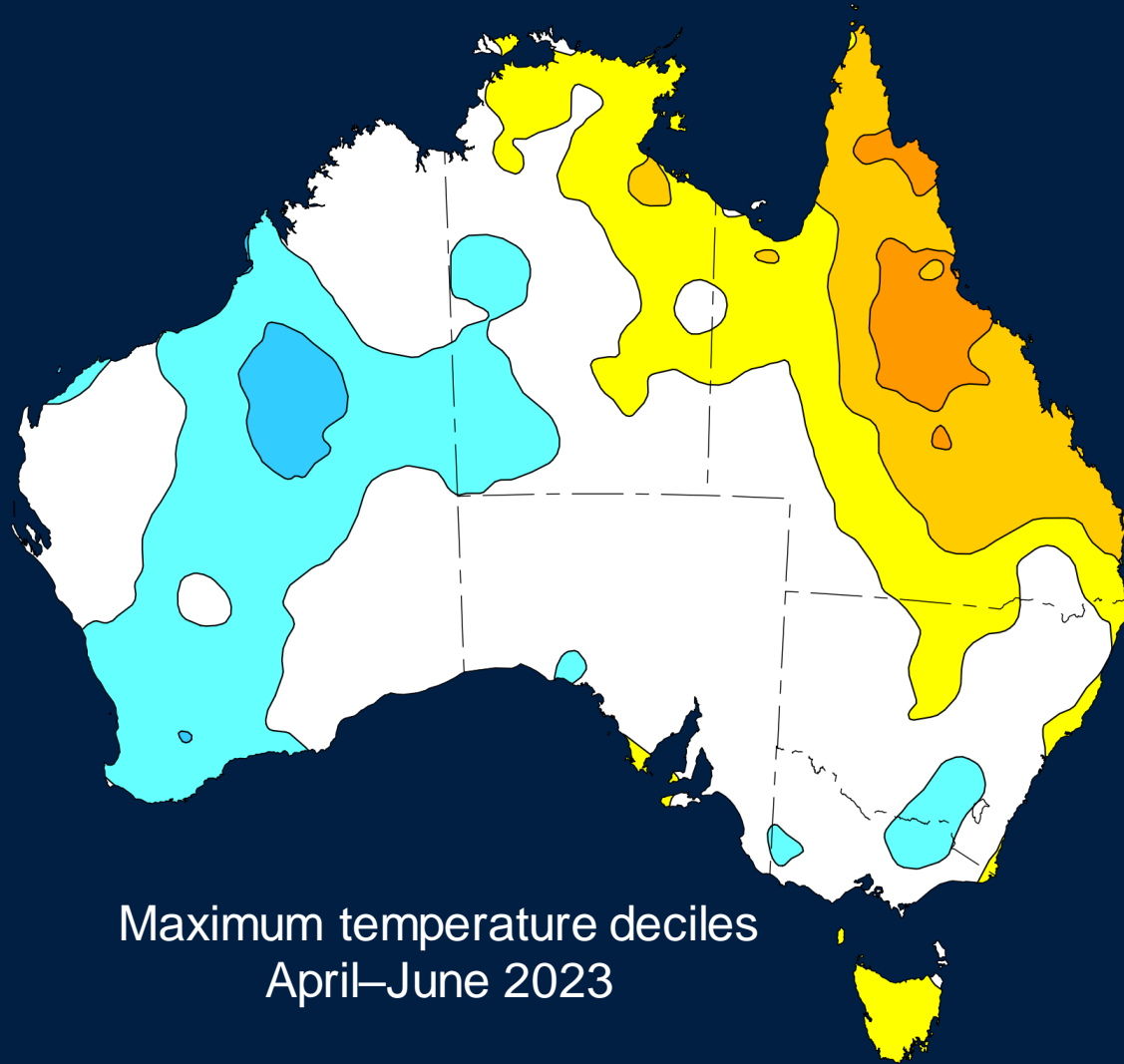
- SA 7th highest
- Victoria 8th highest





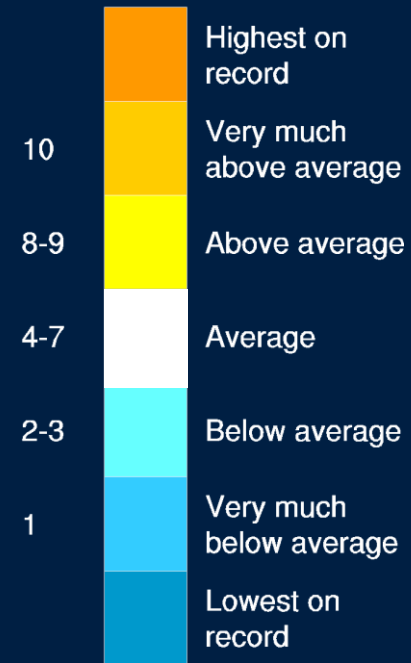
Maximum temperature—April to June 2023

- **April to June** overall slightly above average, but 6th highest for Queensland
- Maximum temperatures in **June**:
 - 10th highest for Australia
 - Queensland warmest on record
 - NT 3rd warmest



Maximum temperature deciles
April–June 2023

Temperature decile ranges



Deciles compared to 1910–2023

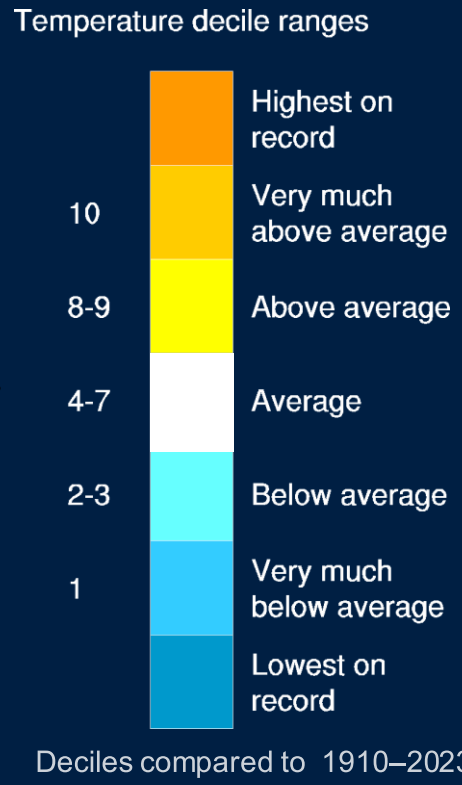
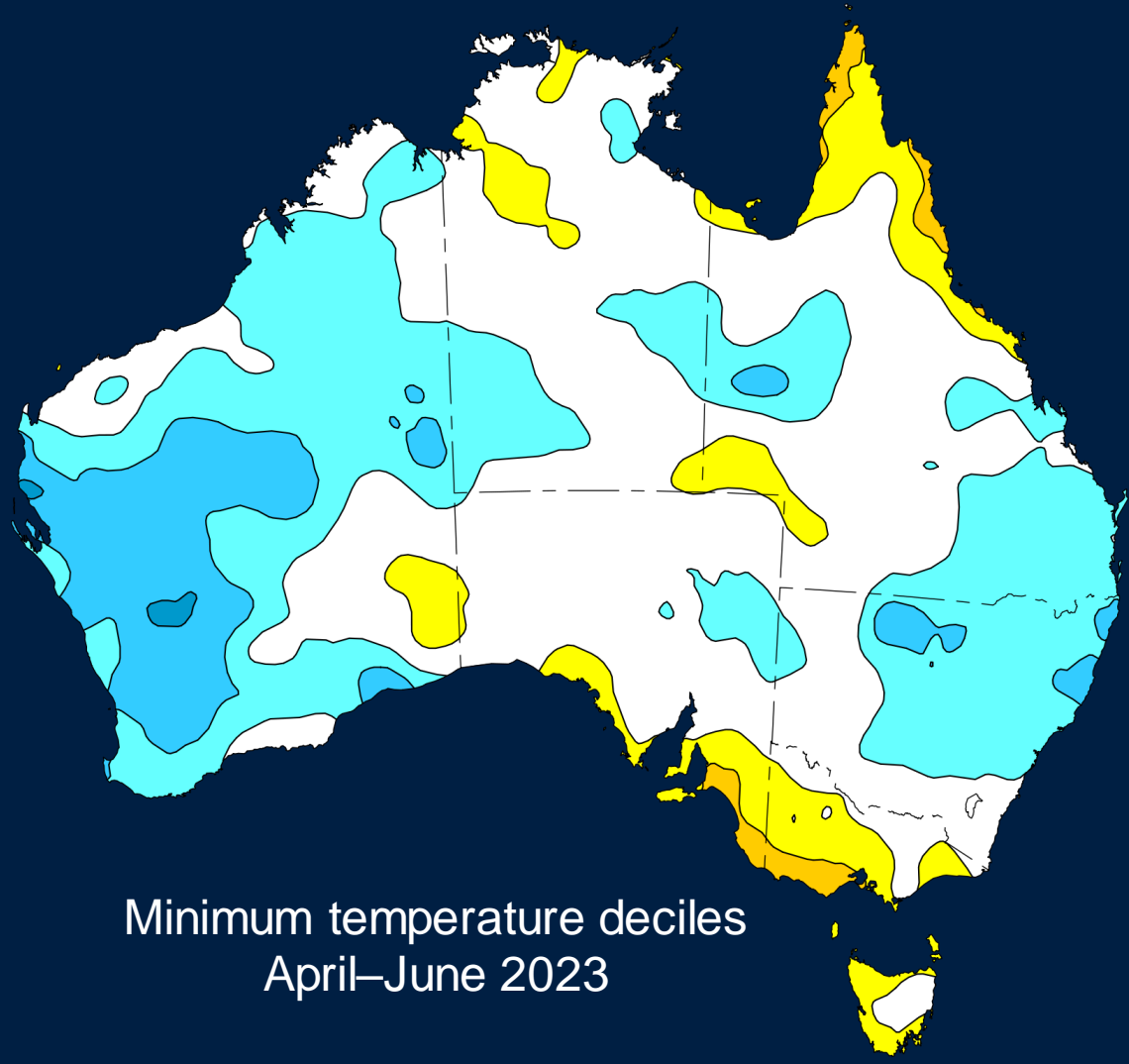
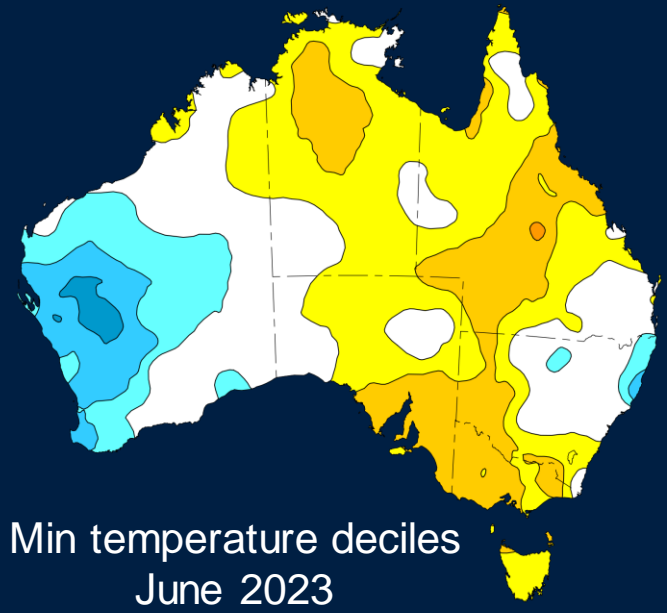
Max temperature deciles
June 2023





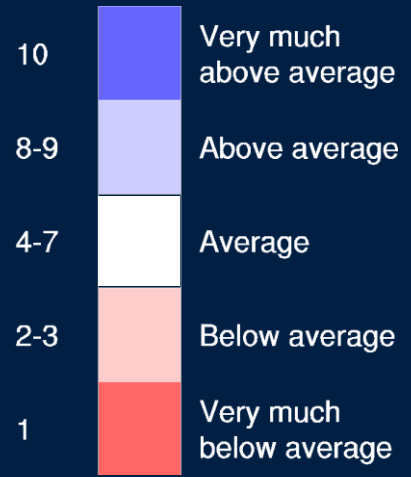
Minimum temperature—April to June 2023

- **April to June** nights slightly below average overall
- Minimum temperatures in **June**:
 - Equal 5th highest for Victoria
 - 8th highest for Queensland

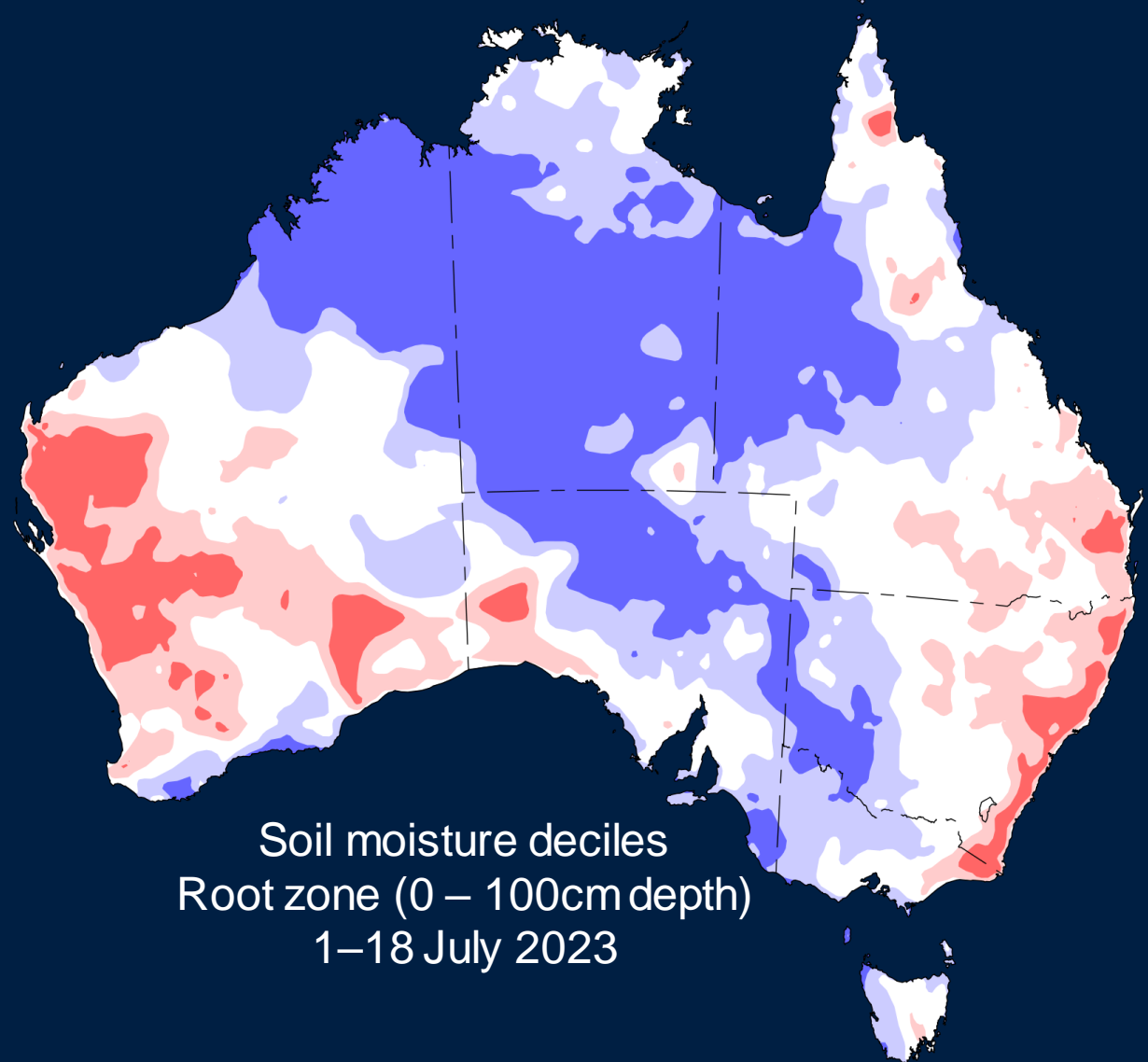




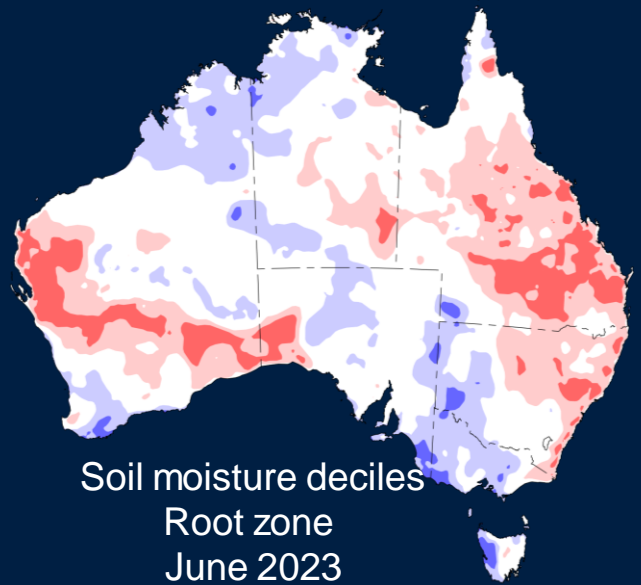
Soil moisture



Compared to 1980–2023



Soil moisture deciles
 Root zone (0 – 100cm depth)
 1–18 July 2023

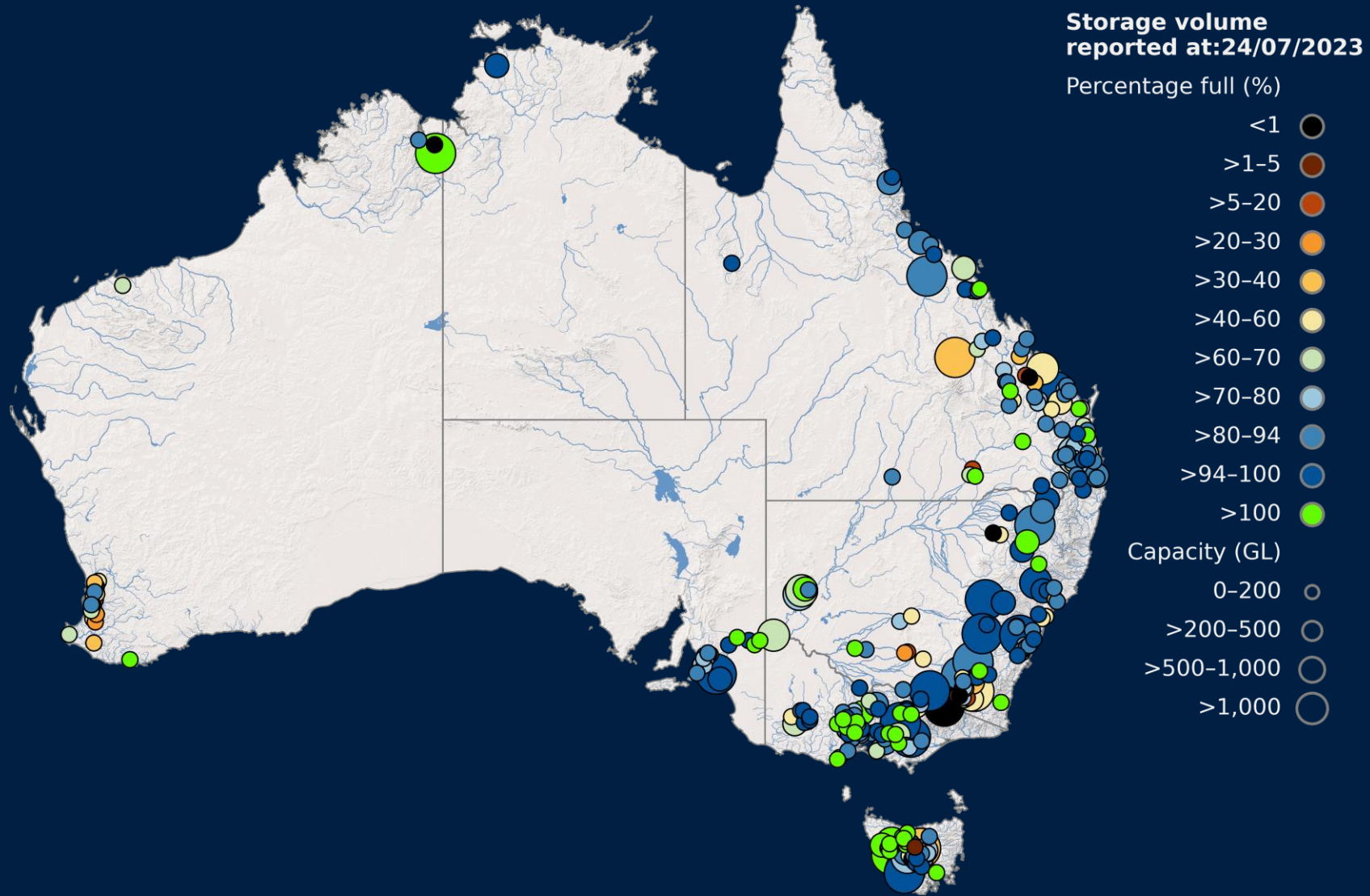


Soil moisture deciles
 Root zone
 June 2023





Water storage status





Climate Drivers

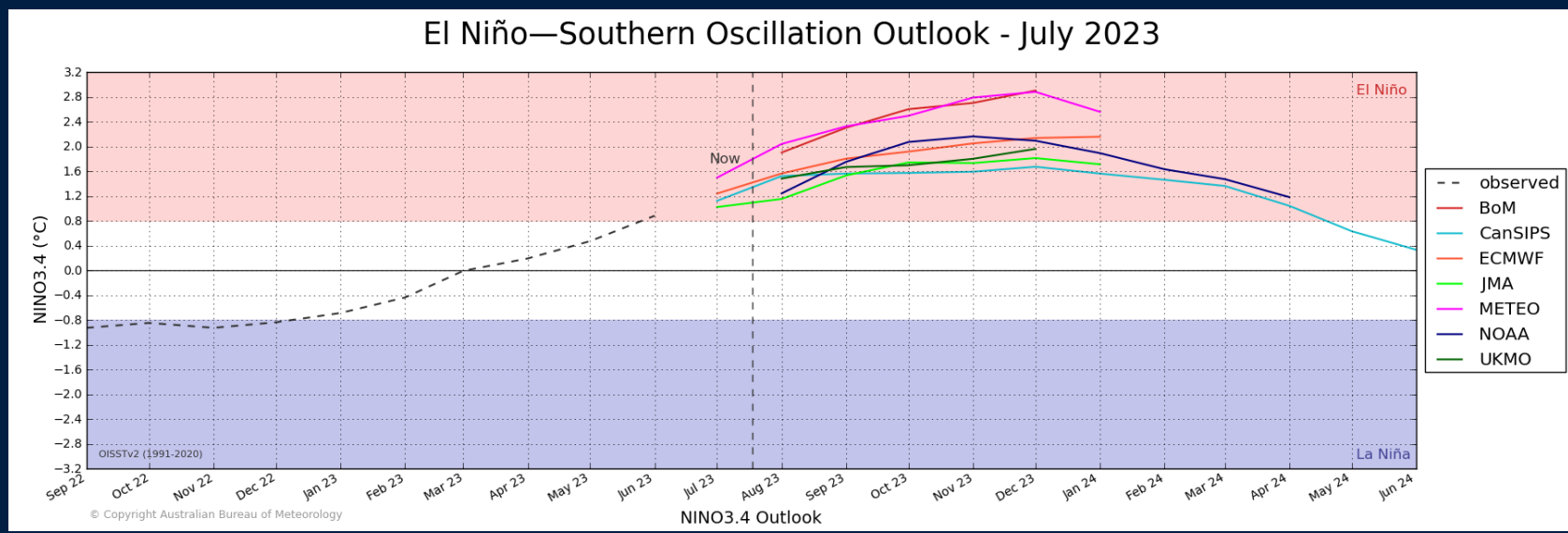
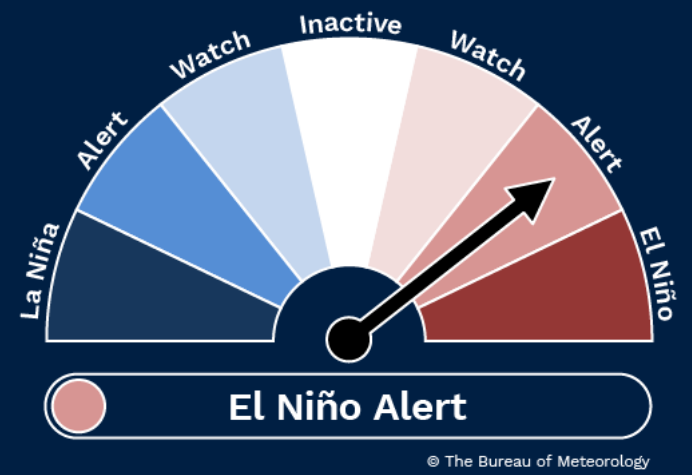




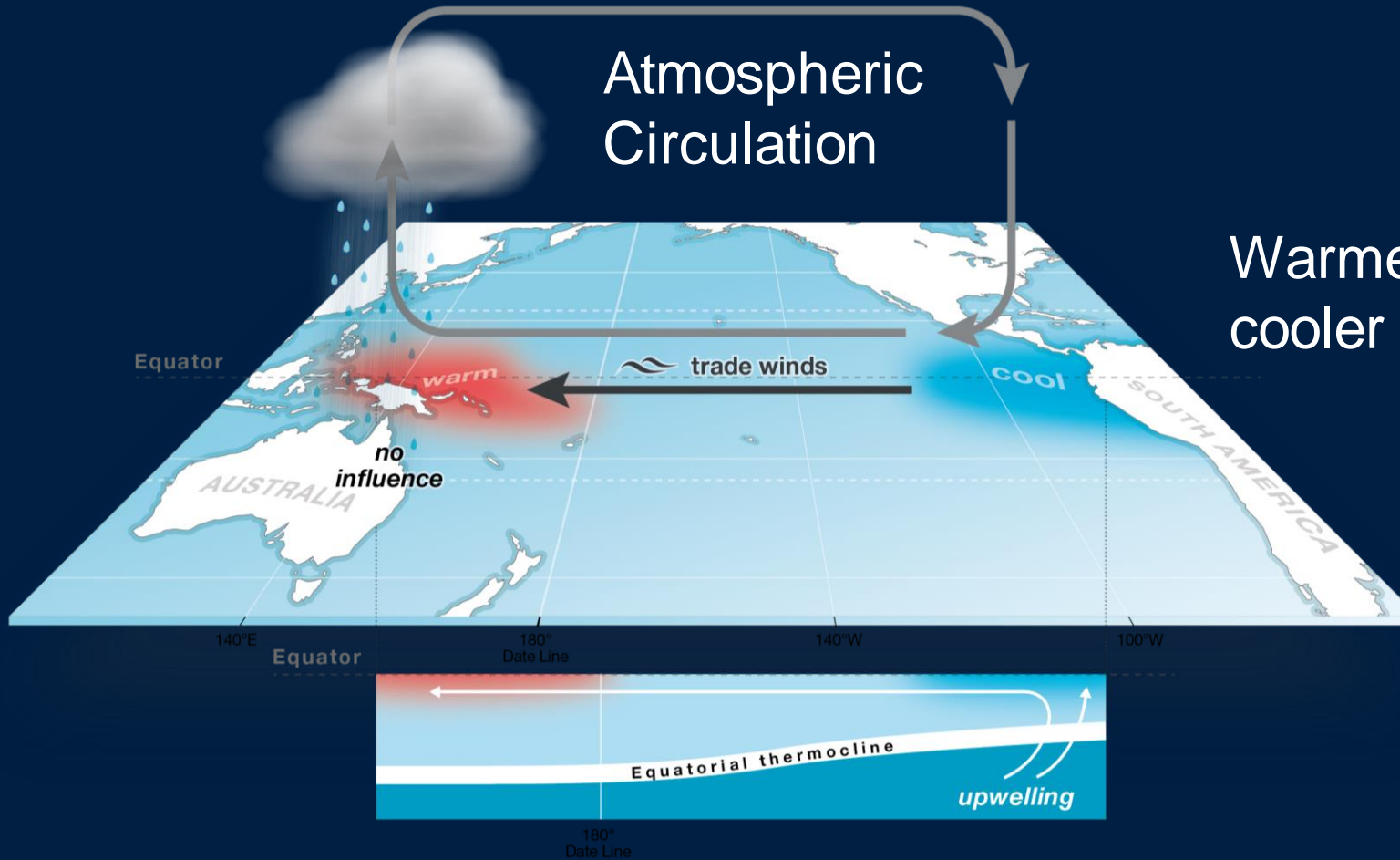
El Niño–Southern Oscillation forecast

18 July 2023

- The Bureau's ENSO outlook is at El Niño Alert.
- When El Niño Alert criteria have been met in the past, an El Niño event has developed around 70% of the time.

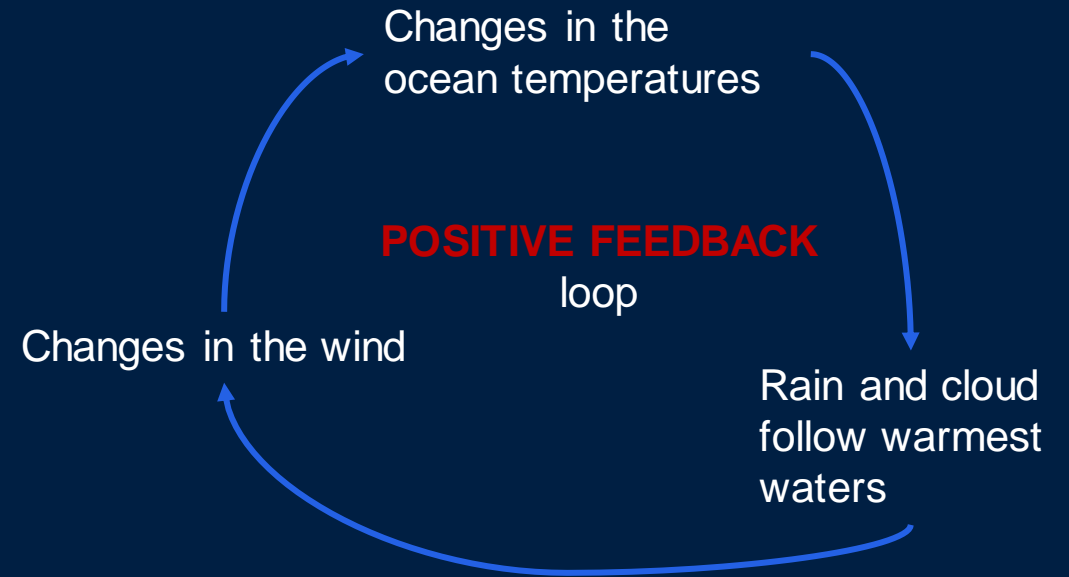
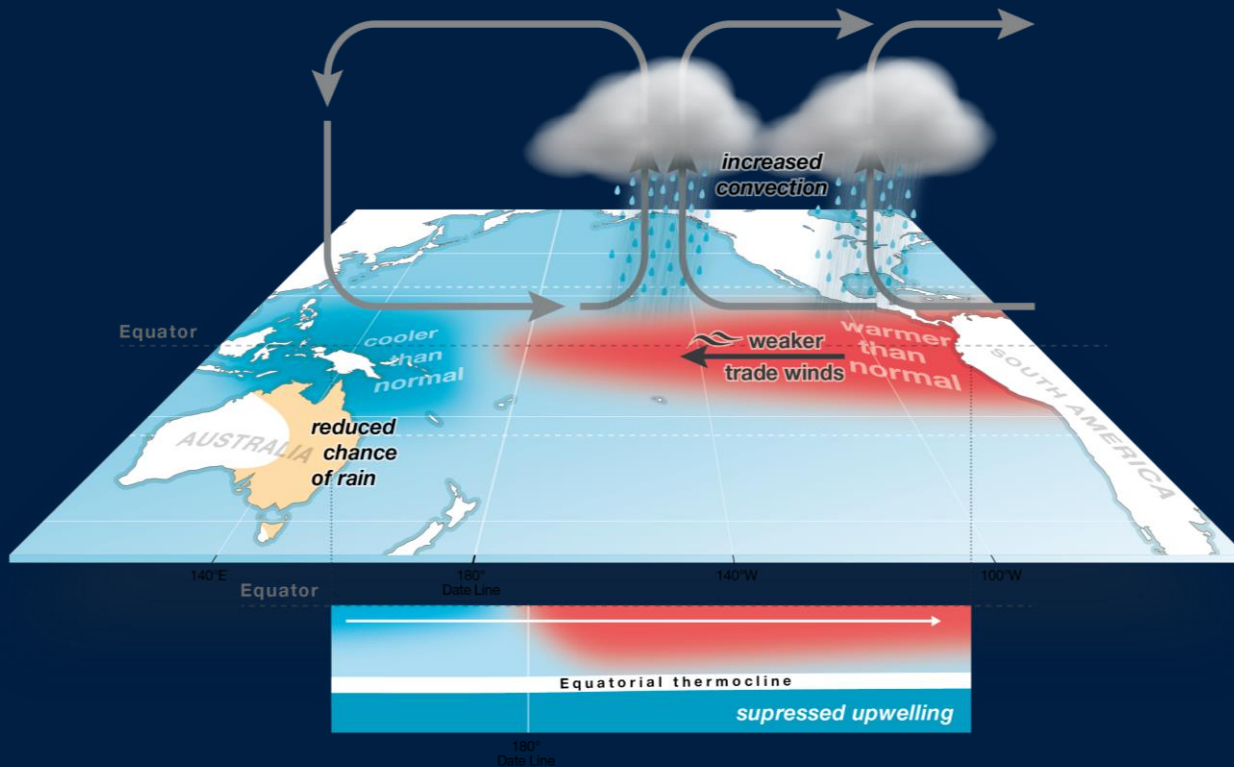


El Niño–Southern Oscillation: neutral



Warmer waters in the west,
cooler waters in the east.

El Niño–Southern Oscillation: El Niño



Atmospheric Circulation weakens, moves east and sometimes reverses during an El Niño

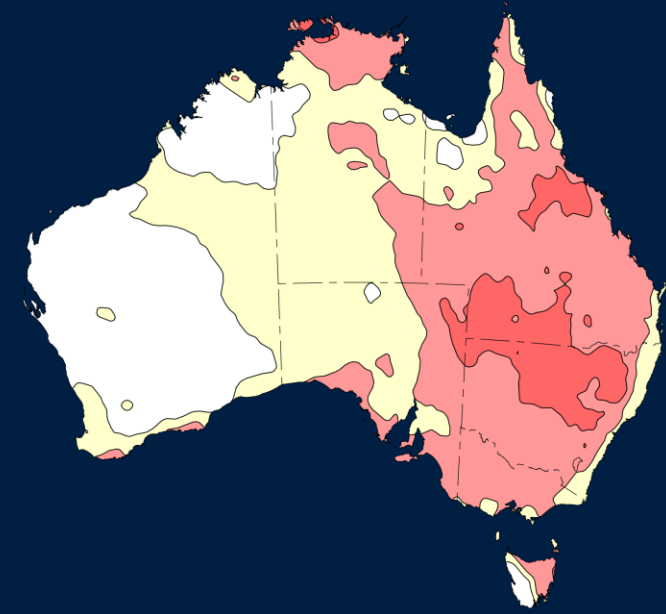
Warmer waters move east, dragging the cloud and rain with it

ENSO events develop in autumn to winter and decay in summer.

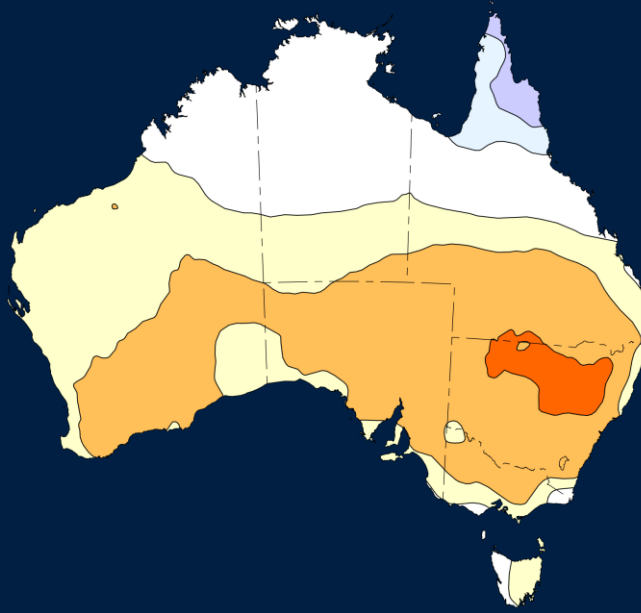
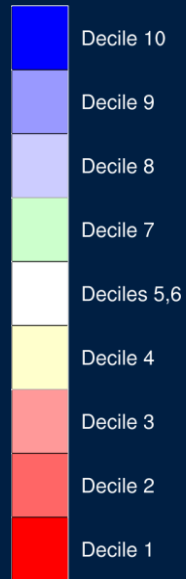
ENSO lifecycle is a source of predictability in the Pacific.



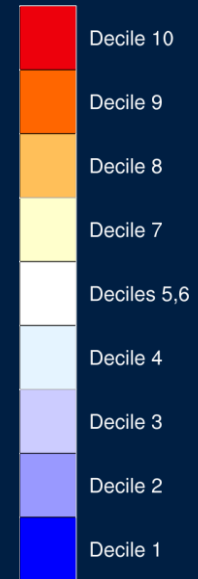
El Niño–Southern Oscillation: El Niño



Winter–spring rainfall
Previous El Niño years



Winter–spring max. temp.
Previous El Niño years



OTHER IMPACTS

INCREASED BUSHFIRE RISK



FEWER TROPICAL CYCLONES



LATER START TO NORTHERN WET SEASON



MORE HEATWAVES



LONGER FROST RISK SEASON



REDUCED CHANGE OF WIDESPREAD FLOODS



LESS CHANCE OF INDIAN OCEAN HEATWAVES



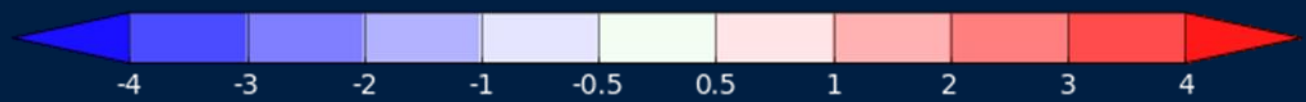
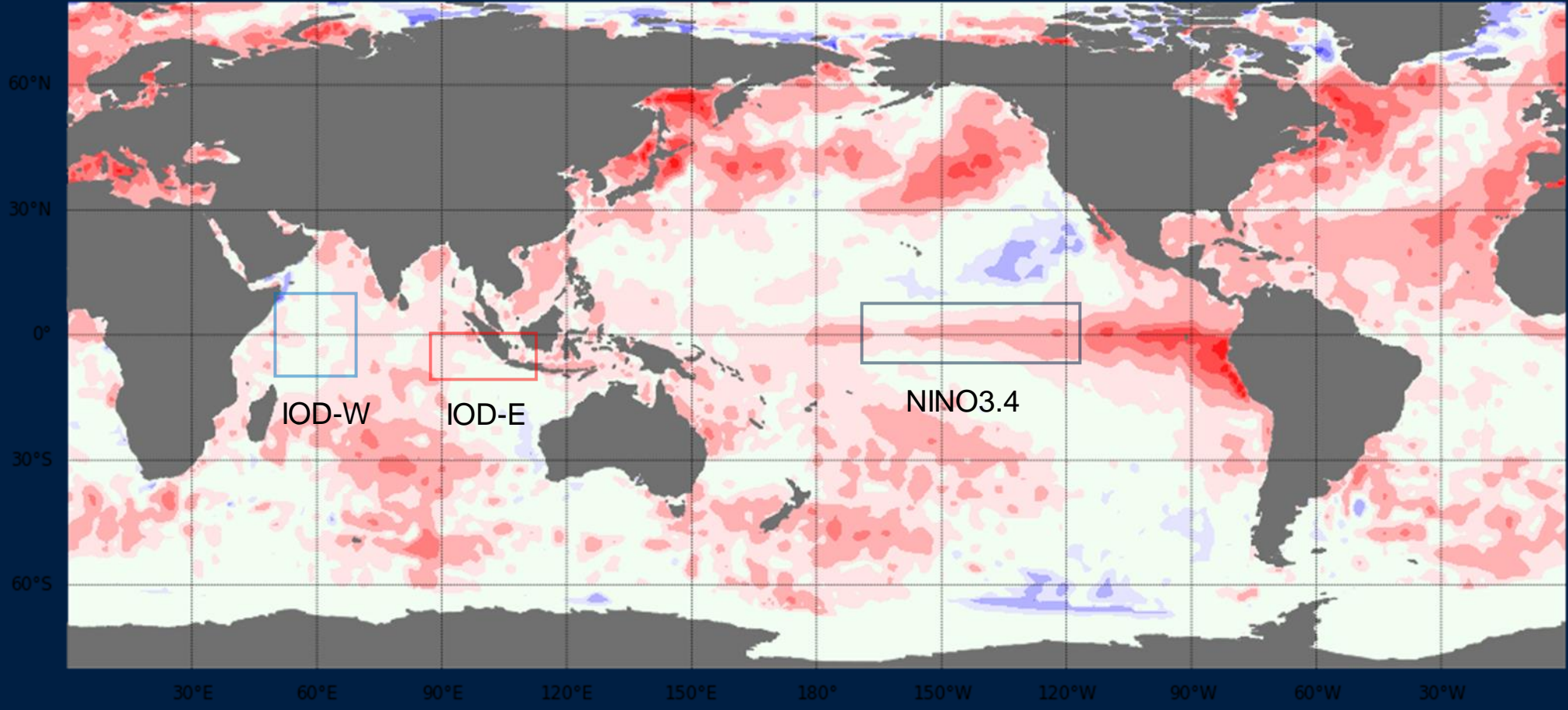
STRONGER SEABREEZES





Sea surface temperature: Latest weekly anomalies

Sea surface temperature anomaly: 10/07/2023 to 16/07/2023



Data: ABOM BNOC
Climatology baseline: 1961 to 1990
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<http://www.bom.gov.au/climate>

Week ending: 16/07/2023
Created: 17/07/2023



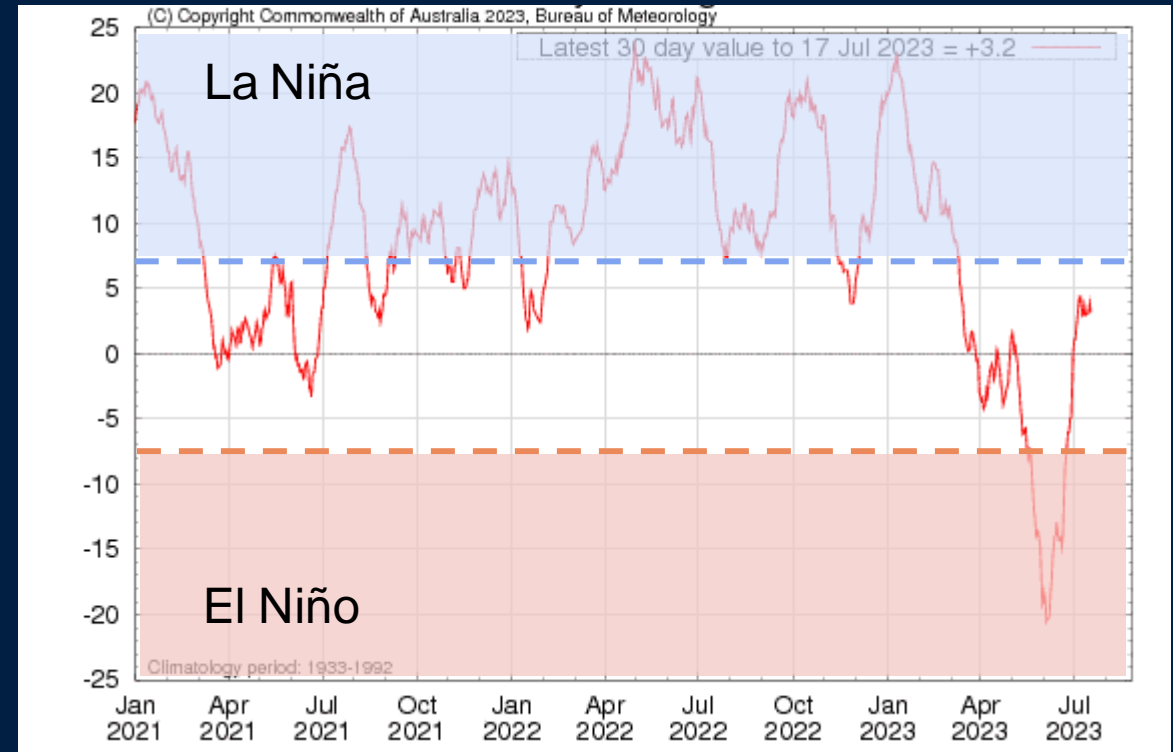


El Niño–Southern Oscillation

18 July 2023

- Signs in the atmosphere of El Niño have not shifted towards an El Niño-like state, with most indicators neutral
- Trade winds, cloudiness, and the Southern Oscillation index are mostly neutral.

Southern Oscillation Index (SOI)

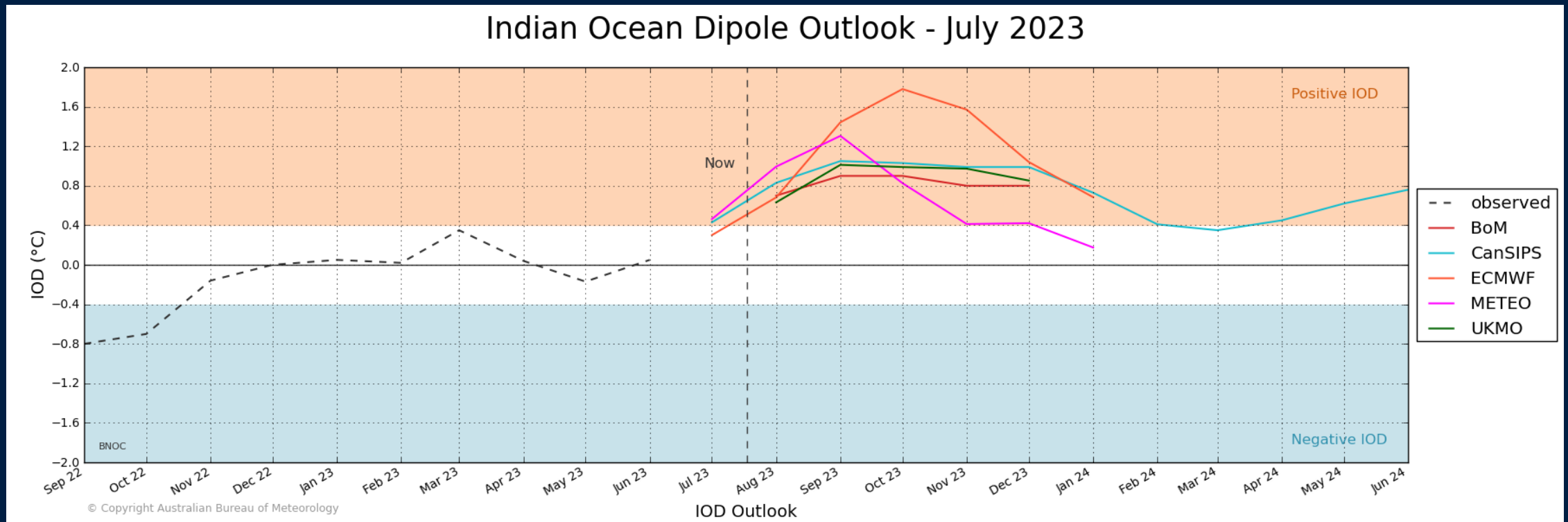




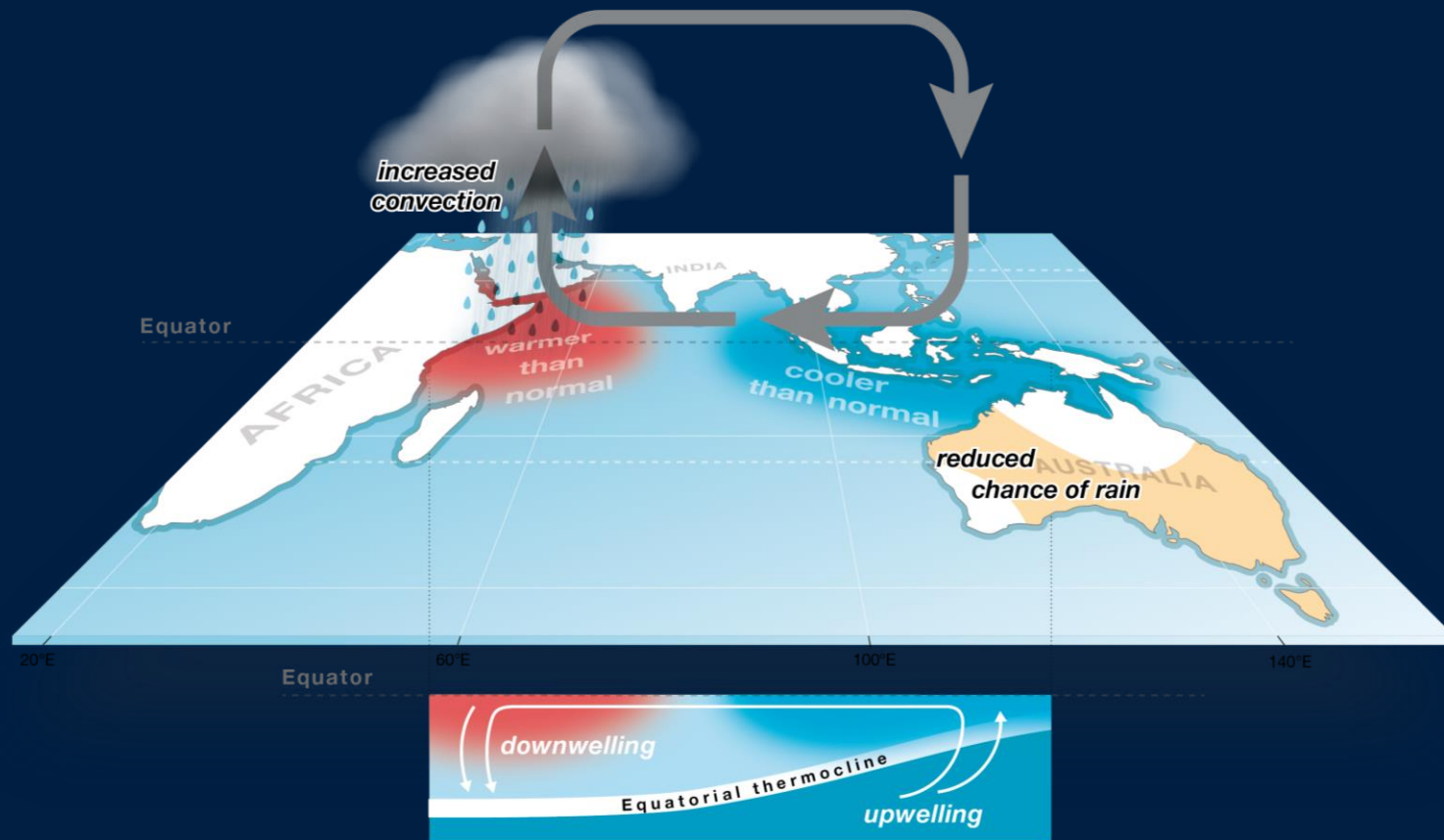
Indian Ocean Dipole

18 July 2023

- Climate models are suggesting a positive Indian Ocean Dipole event is likely to develop in the coming months.

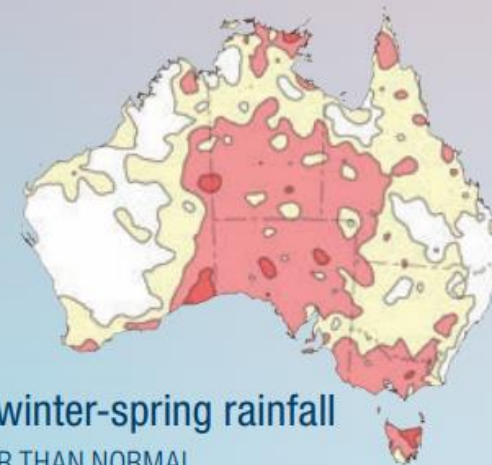


Indian Ocean Dipole impacts



Positive phase of the Indian Ocean Dipole (IOD)

TYPICAL IMPACTS IN A POSITIVE PHASE



LESS RAINFALL OVER CENTRAL AND SOUTHERN AUSTRALIA



WARMER DAYS IN WEST AND SOUTH



WARMER NIGHTS IN SOUTHWEST, COOLER IN NORTH



SHORTER SNOW SEASON, LOWER SNOW DEPTHS



INCREASED FIRE RISK IN SOUTHEAST

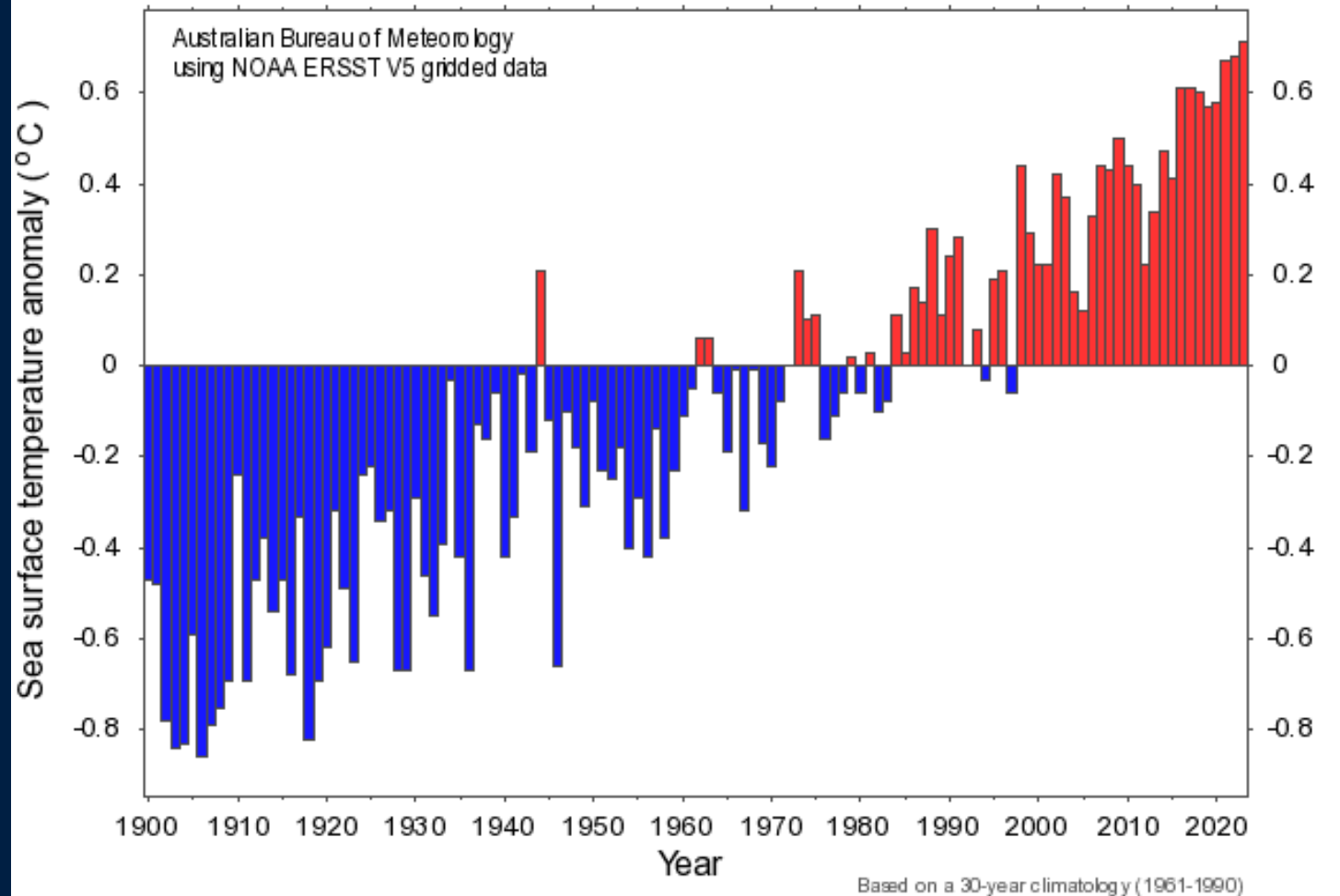




Global sea surface temperatures (SSTs)

- Global warming continues to influence Australian and global climates. Global SSTs have been the warmest on record (since 1900) for each month since April.
- Australia's climate has warmed by $\sim 1.47\text{ }^{\circ}\text{C}$ over 1910–2021, leading to an increase in the frequency of extreme heat events.
- Southern Australia has seen a reduction of 10-20% in cool season (April–October) rainfall in recent decades.

Global sea surface temperatures for June (1900 to 2023)





Long-range forecast



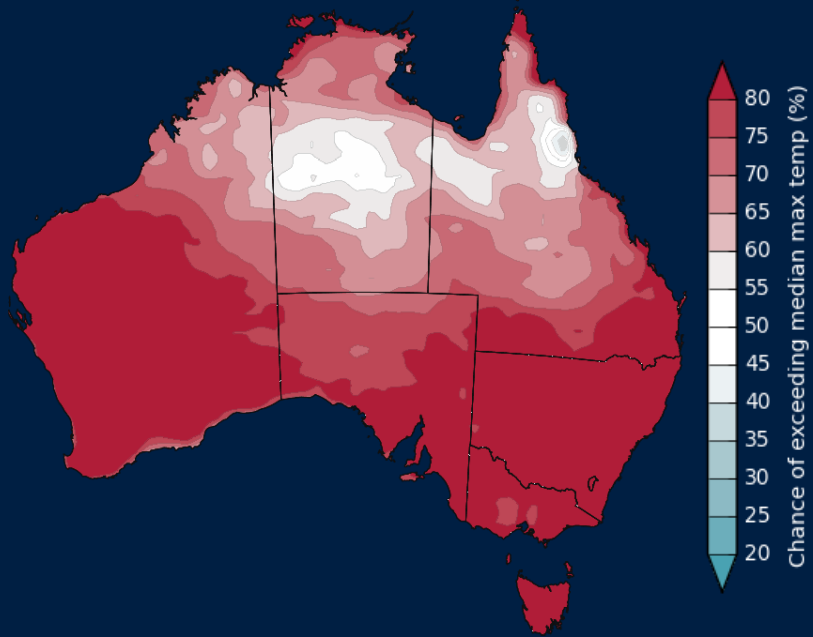


August 2023 long-range forecast

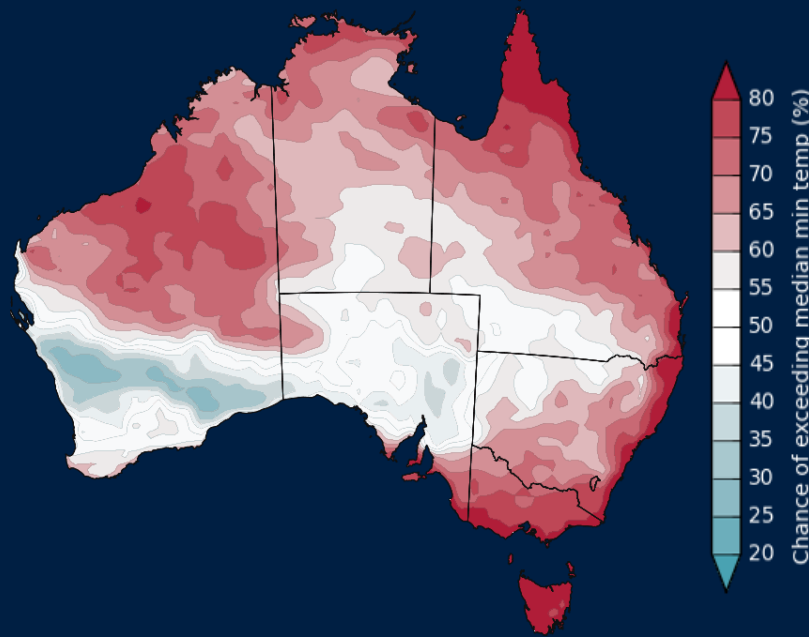
Chance of above median



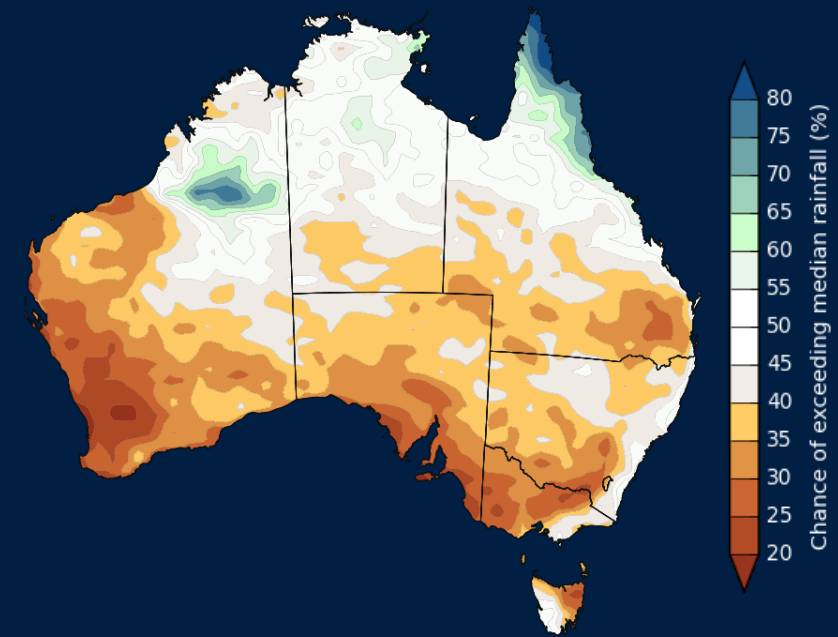
Maximum temperature



Minimum temperature



Rainfall

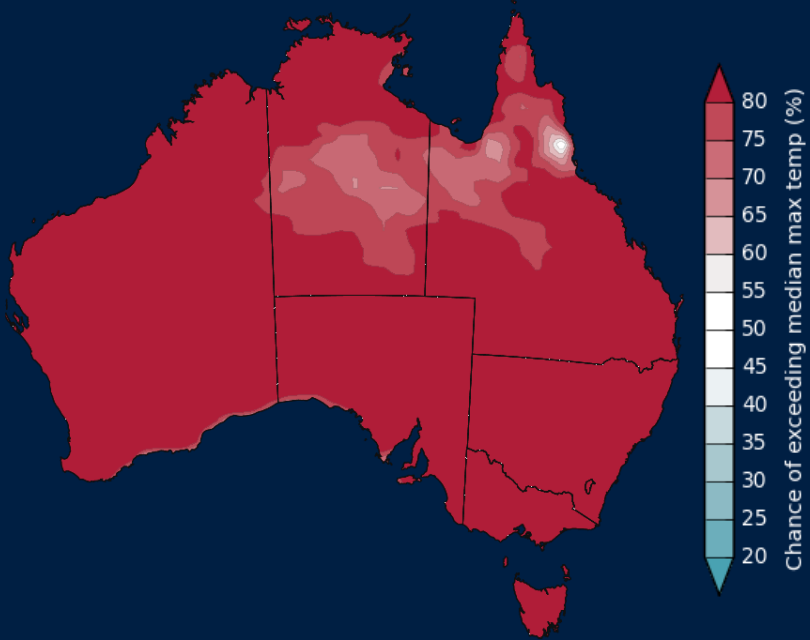




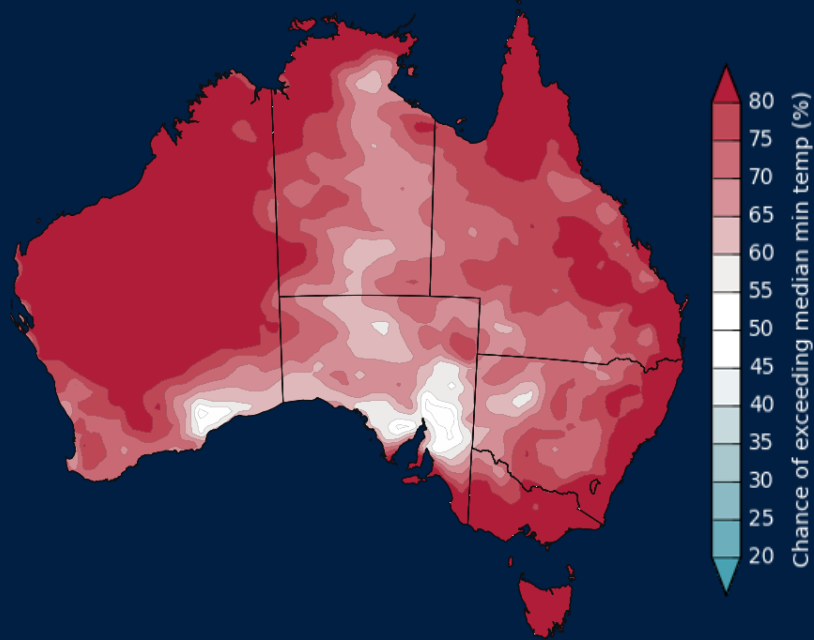
August – October 2023 long-range forecast

Chance of above median

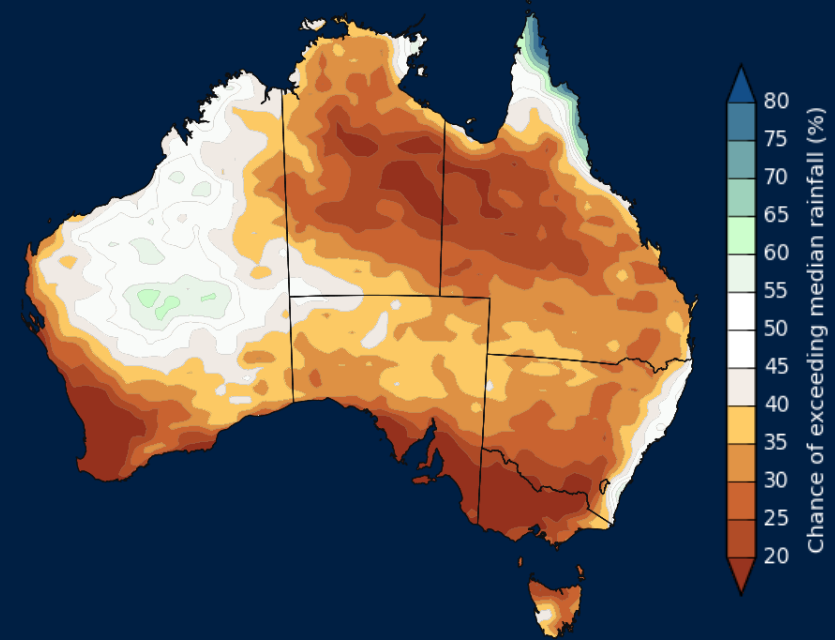
Maximum temperature



Minimum temperature



Rainfall



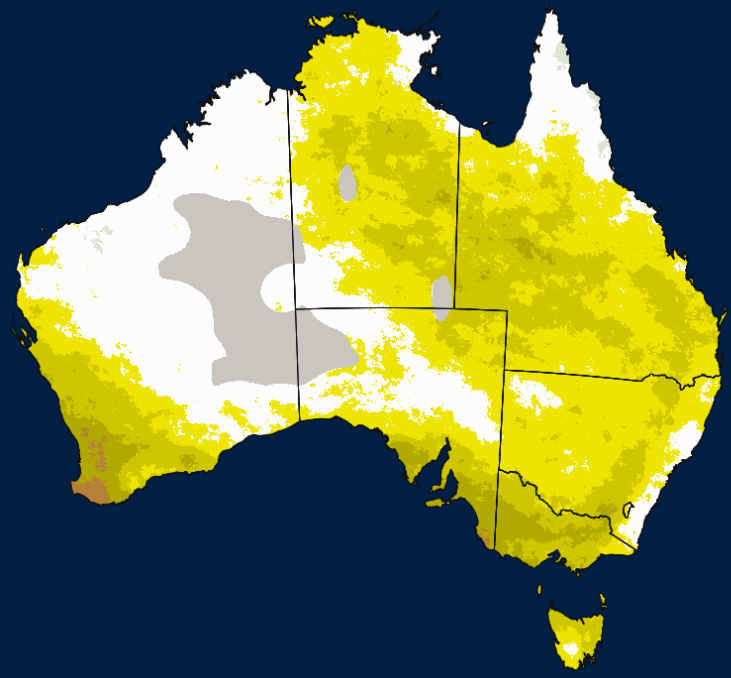
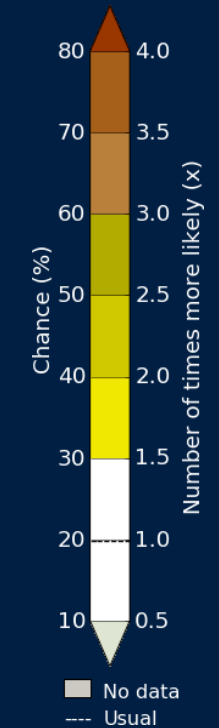
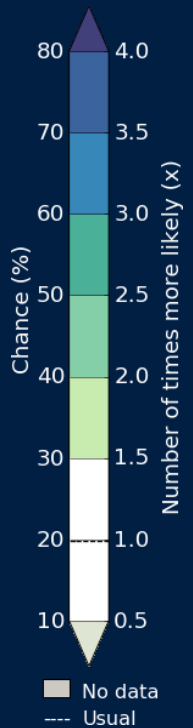


August – October 2023 long-range forecast

Chance of unusually wet/dry

Chance of unusually wet (top 20% of historical range)

Chance of unusually dry (bottom 20% of historical range)



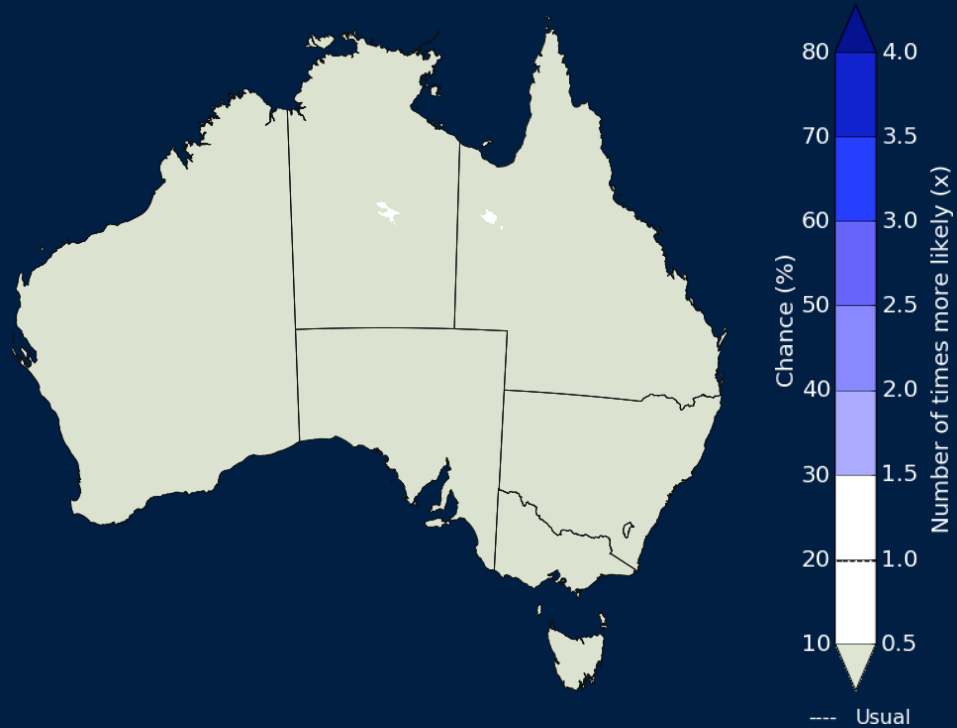
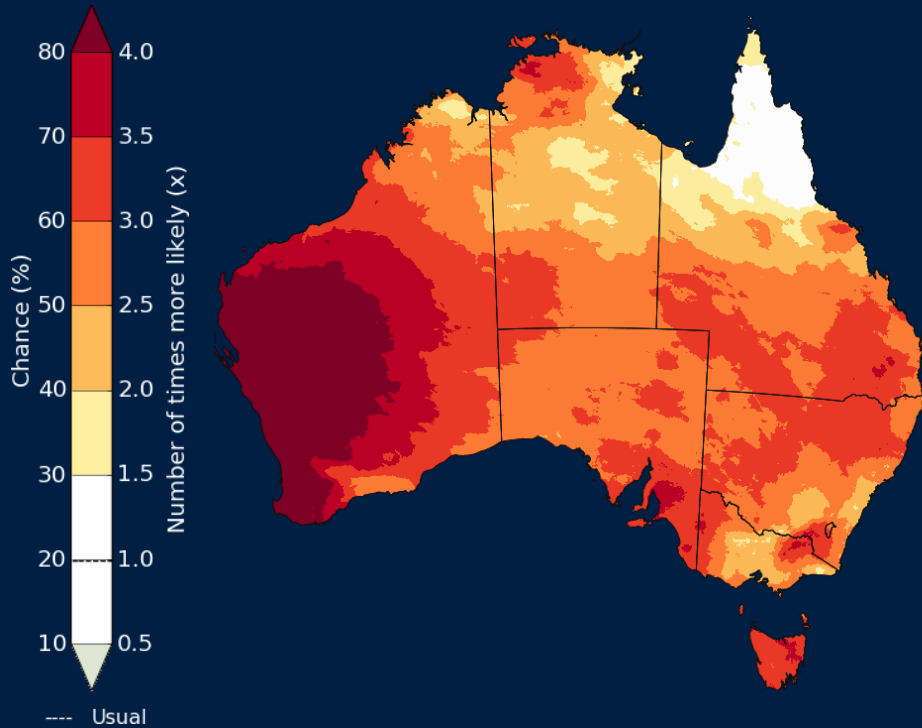


August – October 2023 long-range forecast

Chance of unusually warm/cool maximum temperatures

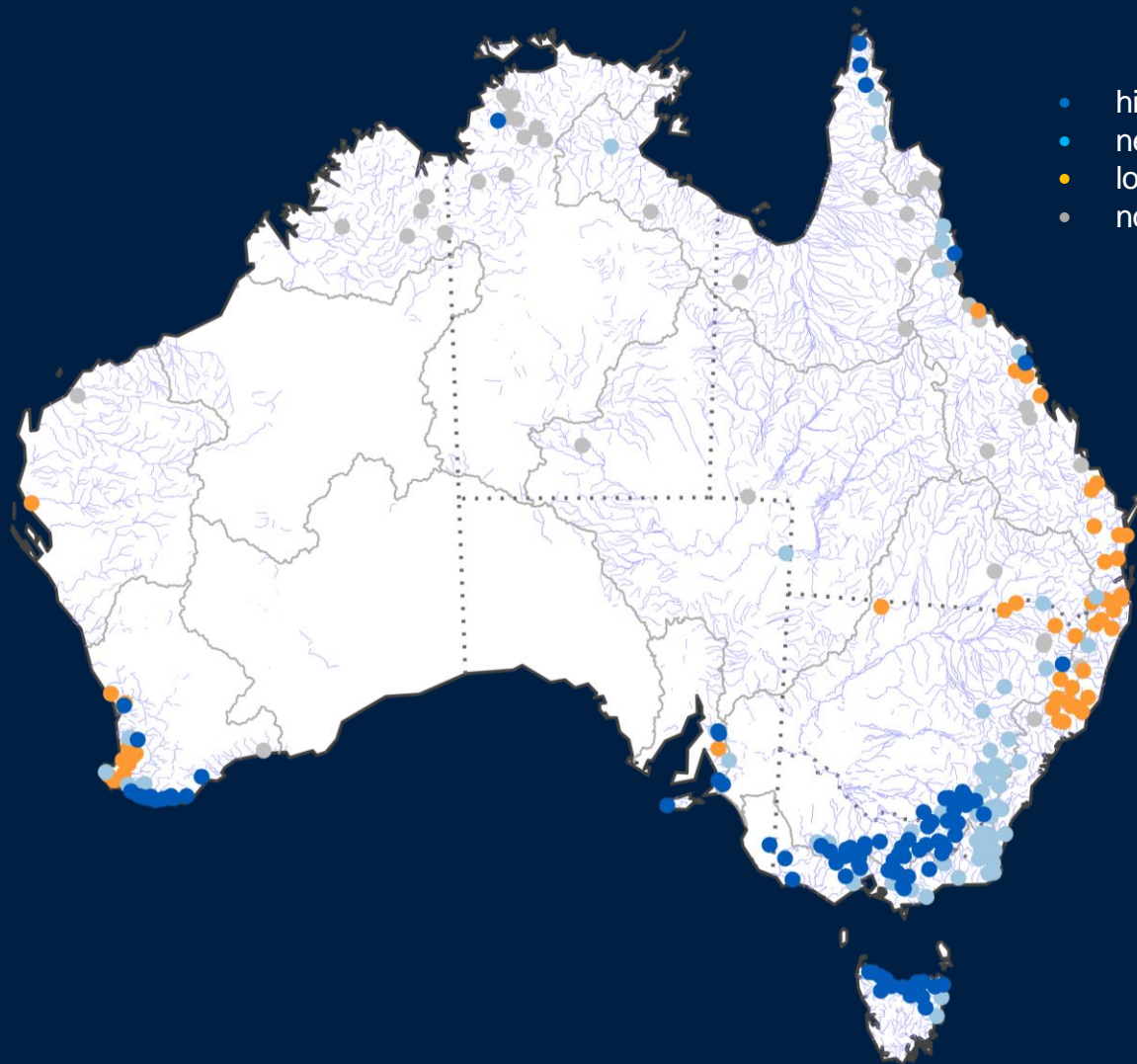
Chance of unusually warm
(top 20% of historical range)

Chance of unusually cool
(bottom 20% of historical range)

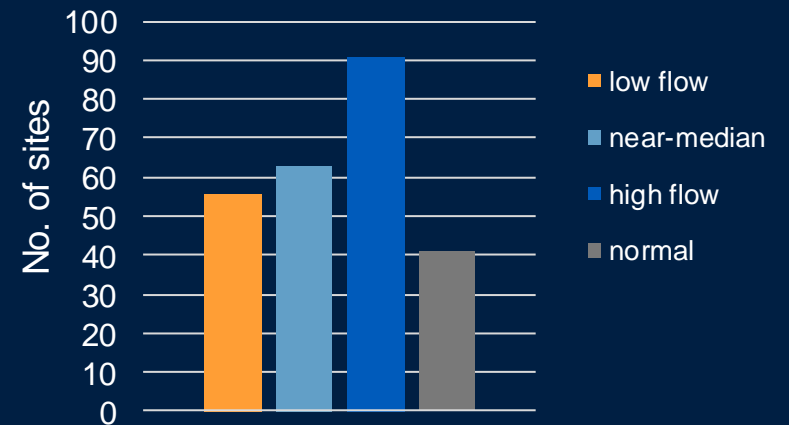




Streamflow forecast: July – September 2023



- high flow
- near-median flow
- low flow
- normal



National severe weather outlook: July – October 2023 summary

Impact

Likelihood compared to recent decades



Bushfire



Winter: central Australia, parts of NSW, parts of north-east QLD, parts of far northern NT and WA

Early spring: parts of western WA, eastern QLD, north-east NSW



Drought



Watchpoints: South-west WA, south-east QLD, north-east NSW



Frost



Dry outlook suggests increased frost risk for susceptible parts of inland southern Australia



Widespread flooding (inc. landslides, tree falls)



Close to average



Coastal flooding



Close to average



Storm



Close to average



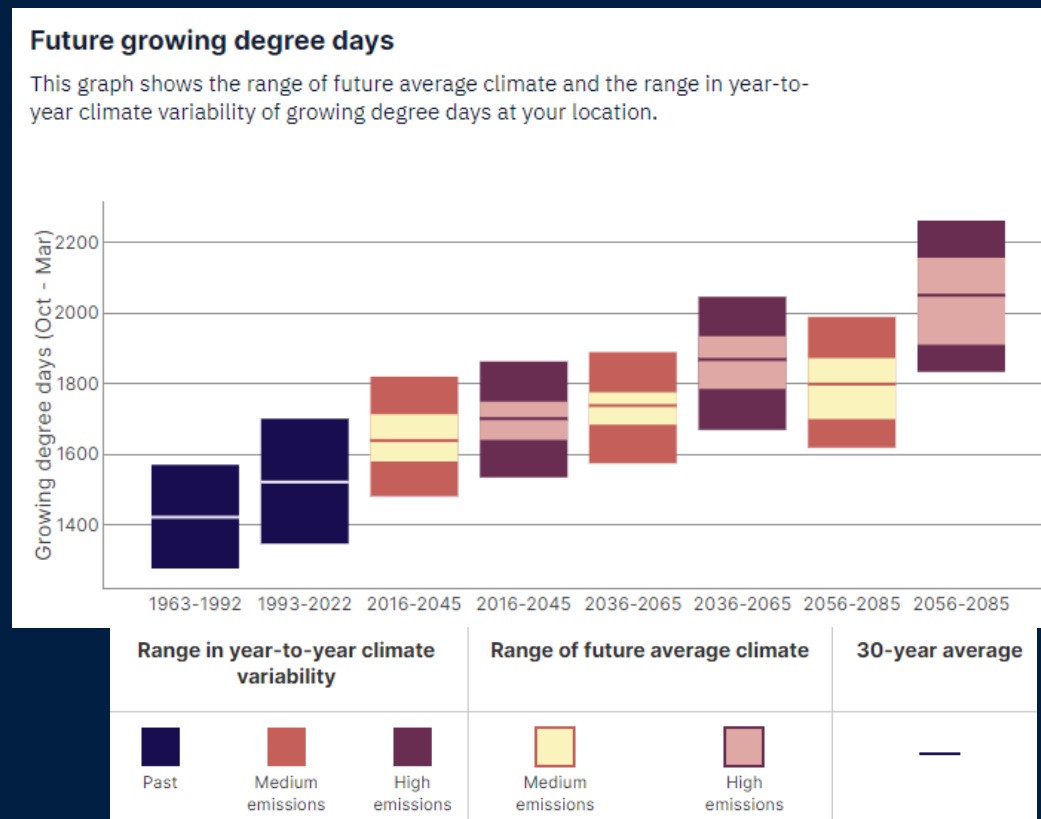
Dust



Close to average

What are we doing?

- **Climate Services for Agriculture (CSA).**
 - Helping every farm to understand its weather and climate trends.
 - Historical data and projected outlooks
 - Long-term risks and opportunities at farm and commodity scale.
- **Agri-Climate Outlooks (ACO).**
 - Providing Australia's farmers, fishers and foresters with confidence to better manage their current season climate risks and opportunities.
 - Easy to understand, commodity specific climate products, decision support, training.



Cotton, Dalby QLD

