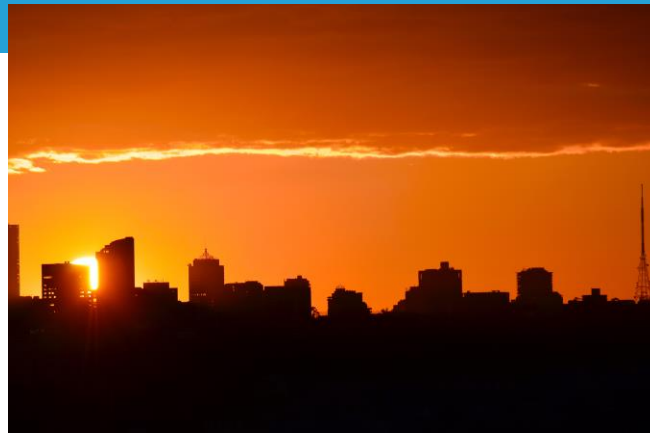


Summer/Autumn Outlook

AEMO November 2023

Ashleigh Lange

Head Communications Meteorologist

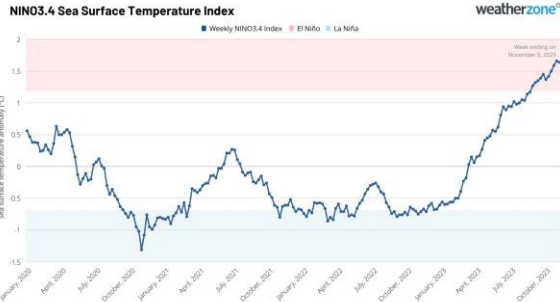
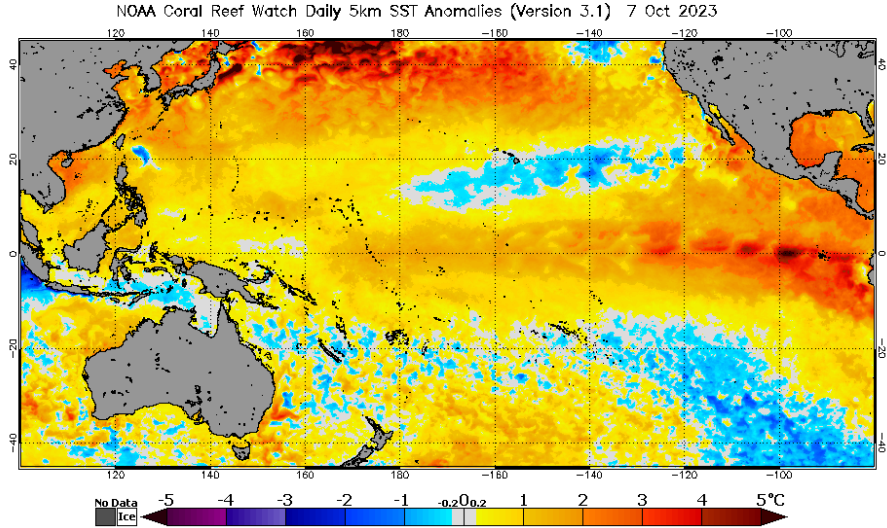
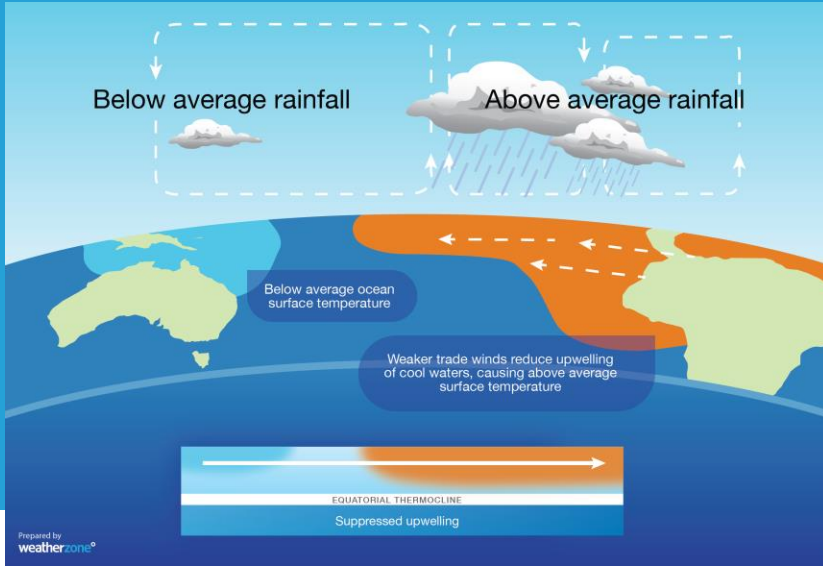


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Overview

- State of the climate
 - Pacific Ocean
 - Indian Ocean
 - Southern Ocean
- Outlook
 - Overall Rain and Temperature
 - Capital Cities
 - Weather Impacts

ENSO – El Niño



“ El Niño is underway

“ El Niño Southern Oscillation (ENSO) can be in phases grading from El Niño to Neutral to La Niña

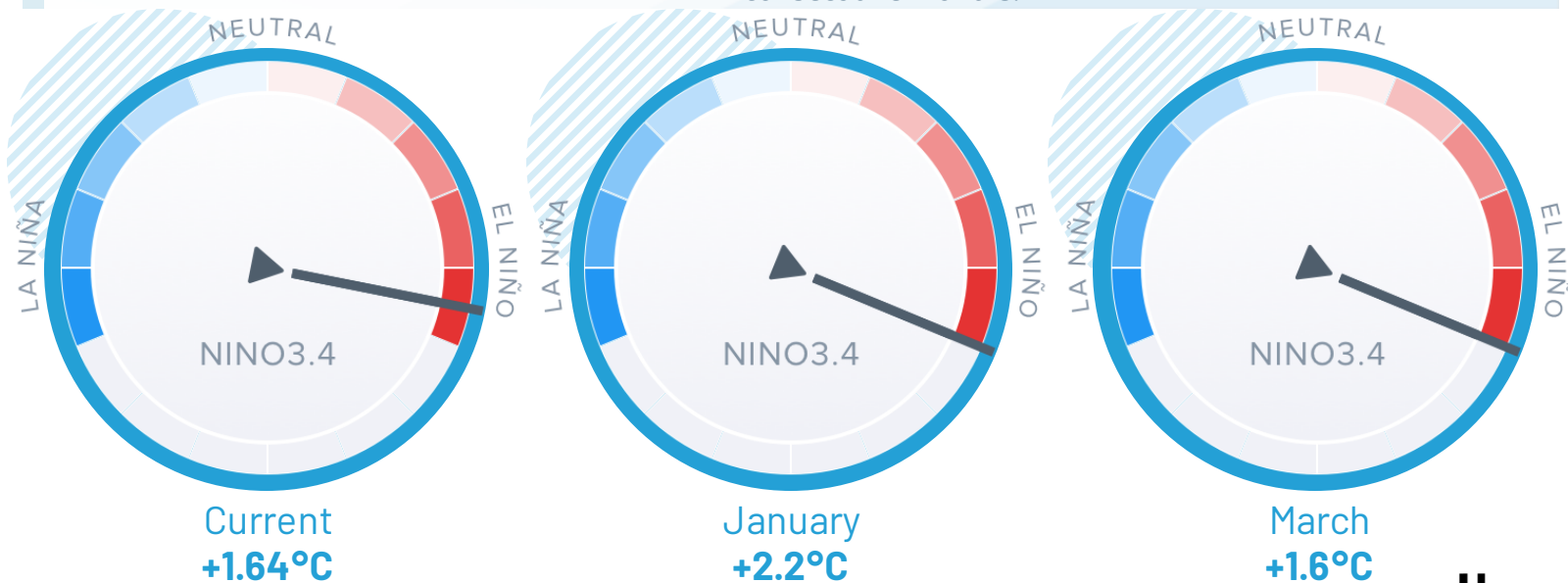
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ENSO Outlook - NINO3.4 Index

Current International Consensus

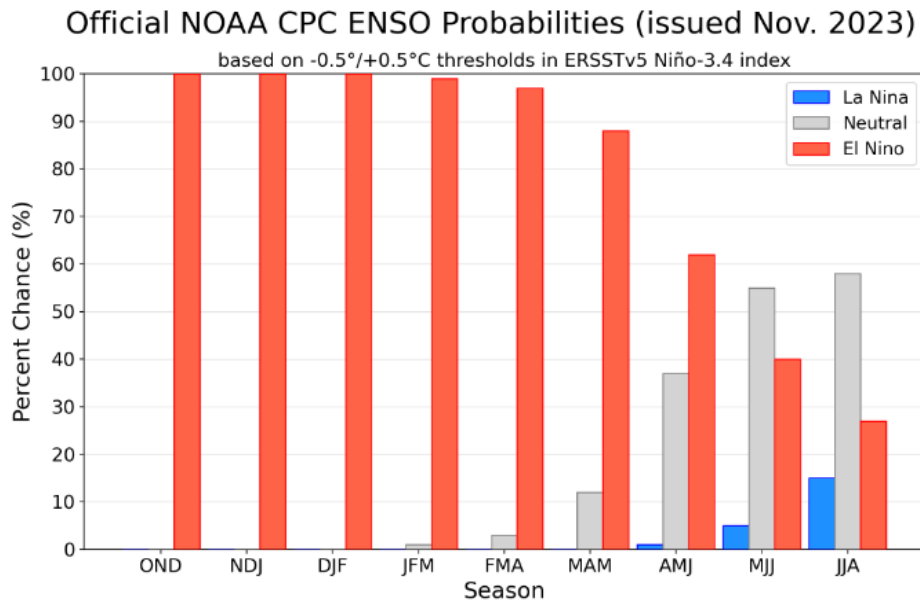


For a **La Niña** (-0.8°C) or **El Niño** ($+0.8^{\circ}\text{C}$) to be declared, thresholds need to be met for at least 3 consecutive months.



El Niño thresholds have been met and a strong event is expected

Probability of ENSO phases- CPC/IRI



El Niño

- 88% chance in Autumn

Neutral

- 55% in MJJ

La Niña

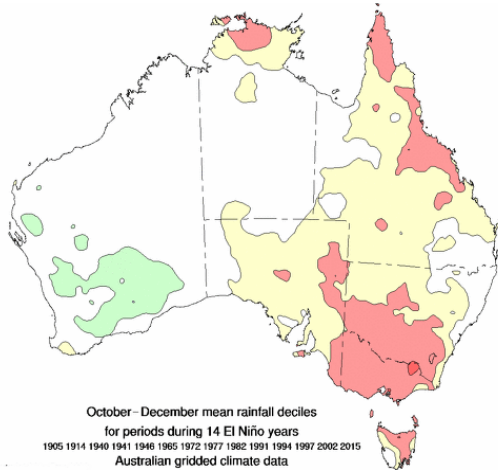
- 6% chance in MJJ

“ vast majority of models expect El Niño to develop and linger till at least the end of the end of summer

“ The strength of El Niño forecast in late summer suggests it could continue into Autumn

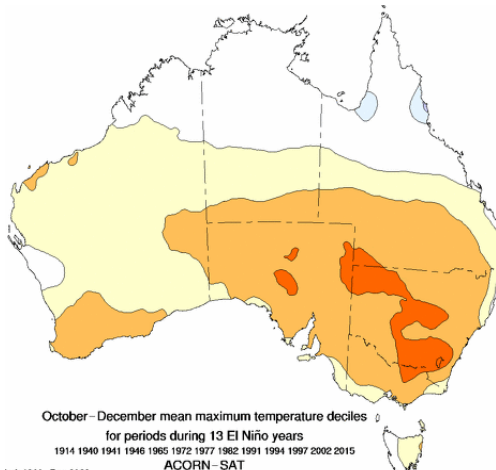
El Niño impacts

Rainfall



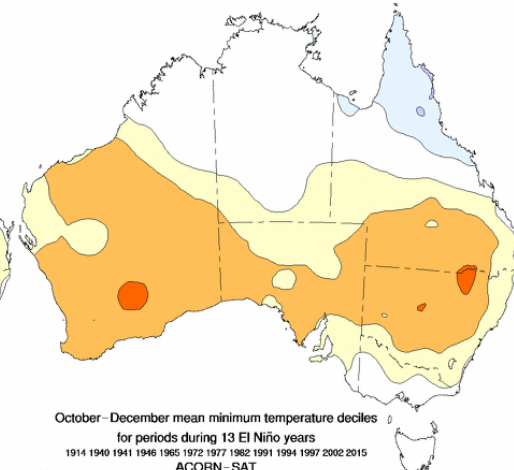
Base period: 1900 - Nov 2022

Maximums



iod: 1900 - Dec 2022

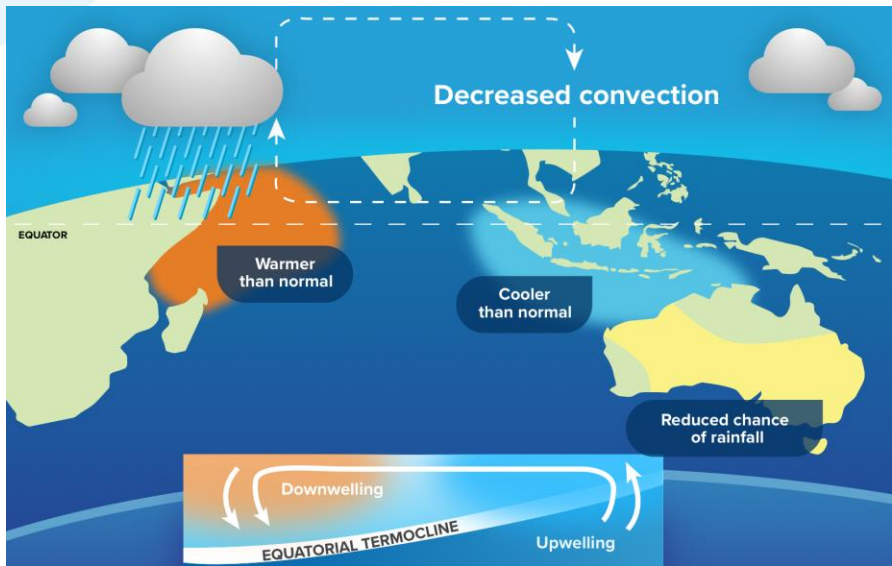
Minimums



iod: 1900 - Dec 2022

Dataset: ACORN-SAT v2.3

Indian Ocean Dipole (IOD) – Positive



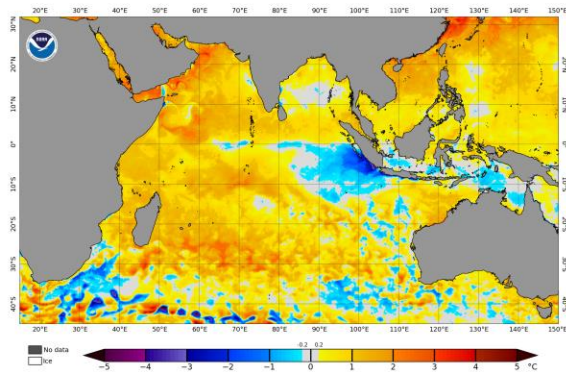
Indian Ocean Dipole (IOD) Index



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Data: Bureau of Meteorology

NOAA Coral Reef Watch Daily 5km SST Anomalies (v3.1) 2 Oct 2023



Positive IOD:

- Cold SST gradient across the Indian Ocean
- Less moisture in the NW
- Reduced rainfall across northern/western Aus
- Decreased (sometime none) NW cloud bands

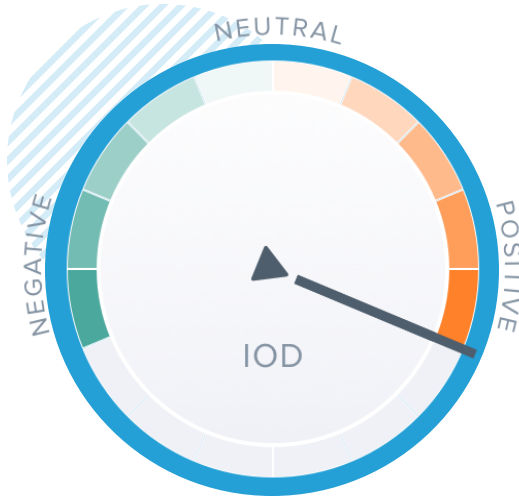
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IOD Outlook - DMI Index

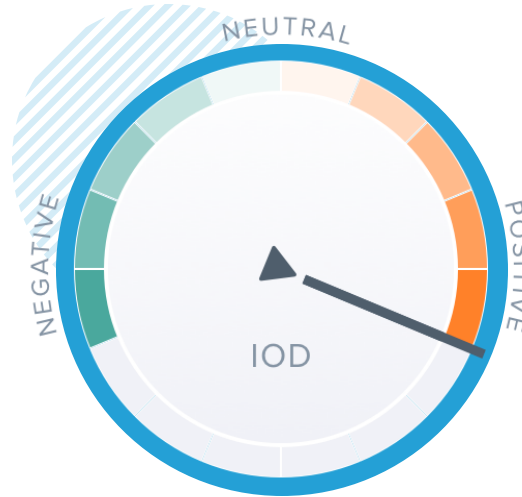
Current International Consensus



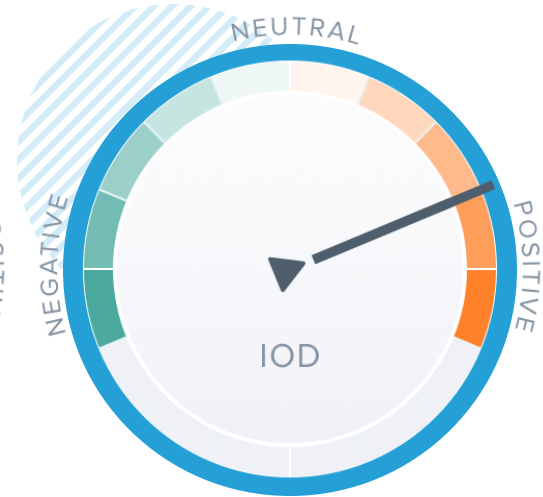
For a **Negative** (-0.4°C) / **Positive** (+0.4°C) IOD to be declared, thresholds need to be met for at least 3 consecutive months.



Current
+1.55°C



January
+0.8°C



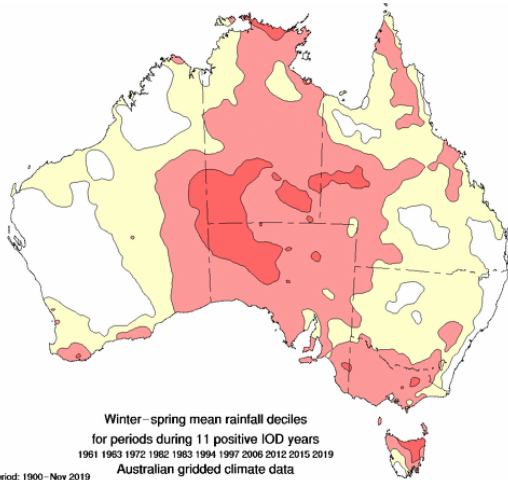
February
0.3°C



The IOD usually breaks down at the latest with the arrival of the first monsoon, usually mid-December. Getting close to +2.15C peak in 2019

Positive IOD impacts

Rainfall

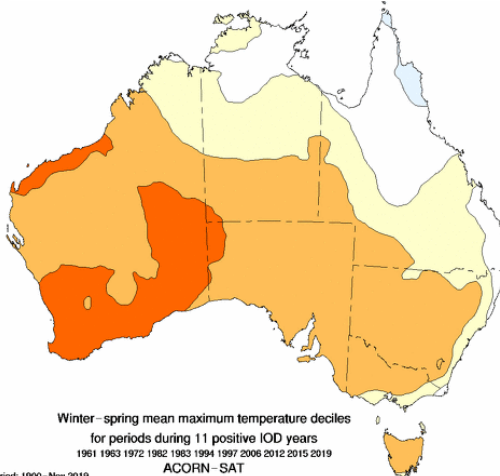


Base period: 1900 - Nov 2019

Mean rainfall decile ranges

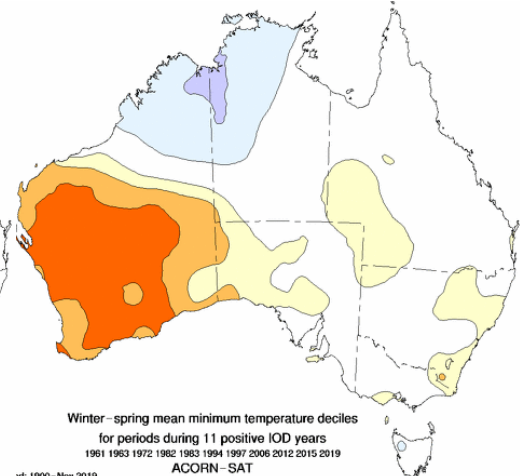


Maximums



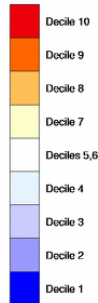
Dataset: AGCD_{grid}: 1900 - Nov 2019

Minimums



sd: 1900 - Nov 2019

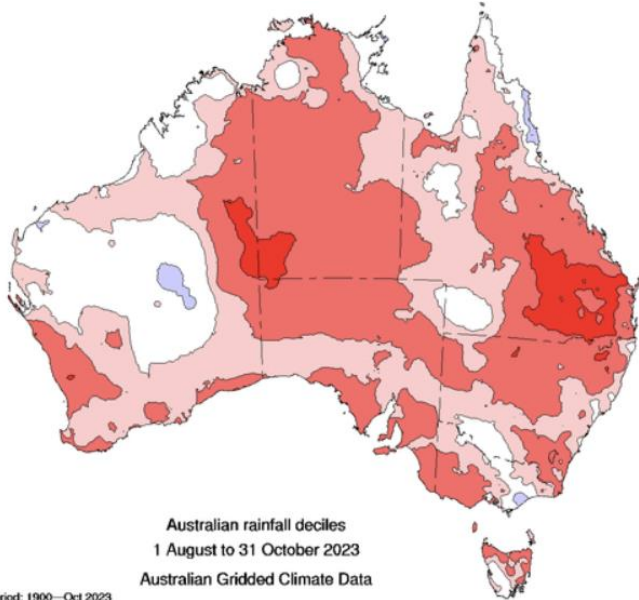
Mean temp. decile ranges



Dataset: ACORN-SAT v2.1

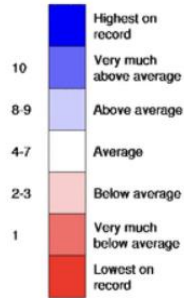
El Niño and Positive IOD impacts

2023

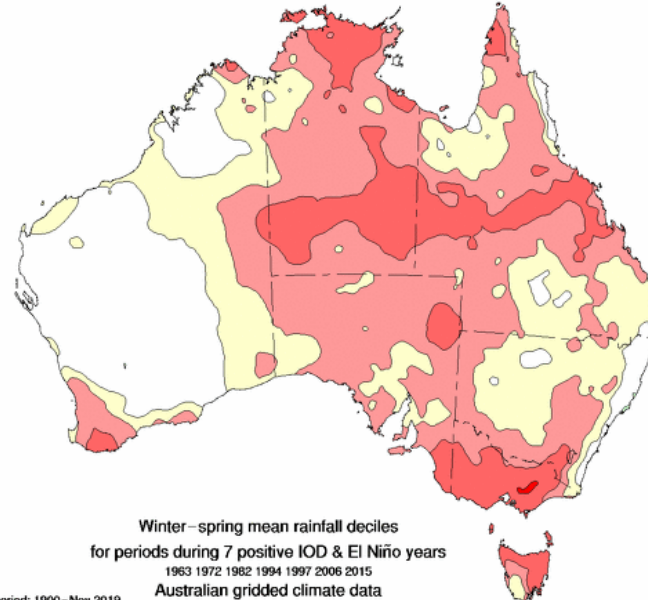


Base period: 1900–Oct 2023

Rainfall decile ranges



Climate Average

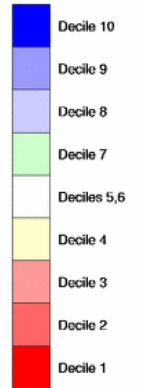


Dataset: AGCD v2

Base period: 1900–Nov 2019

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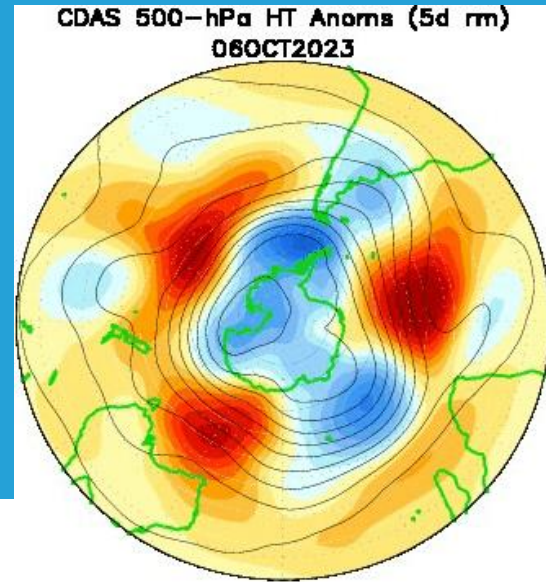
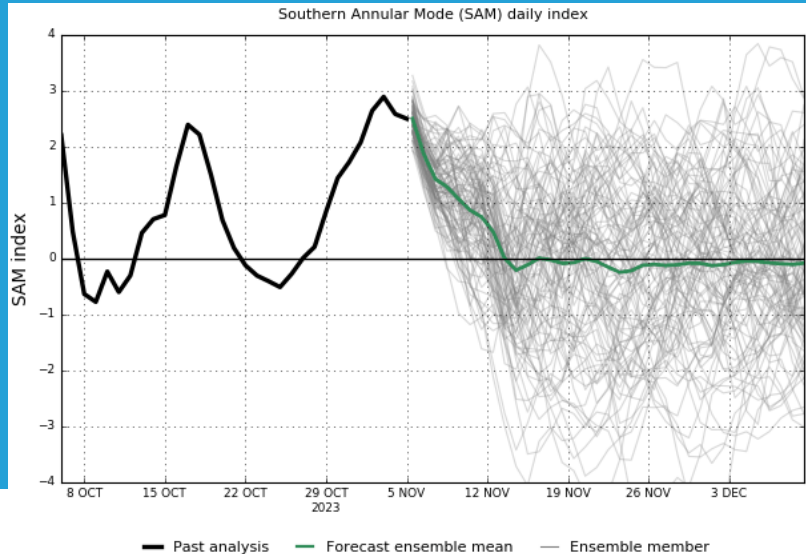
Mean rainfall decile ranges



Dataset: AGCD V2

Issued: 17/11/2020

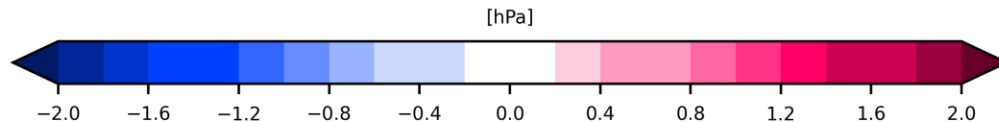
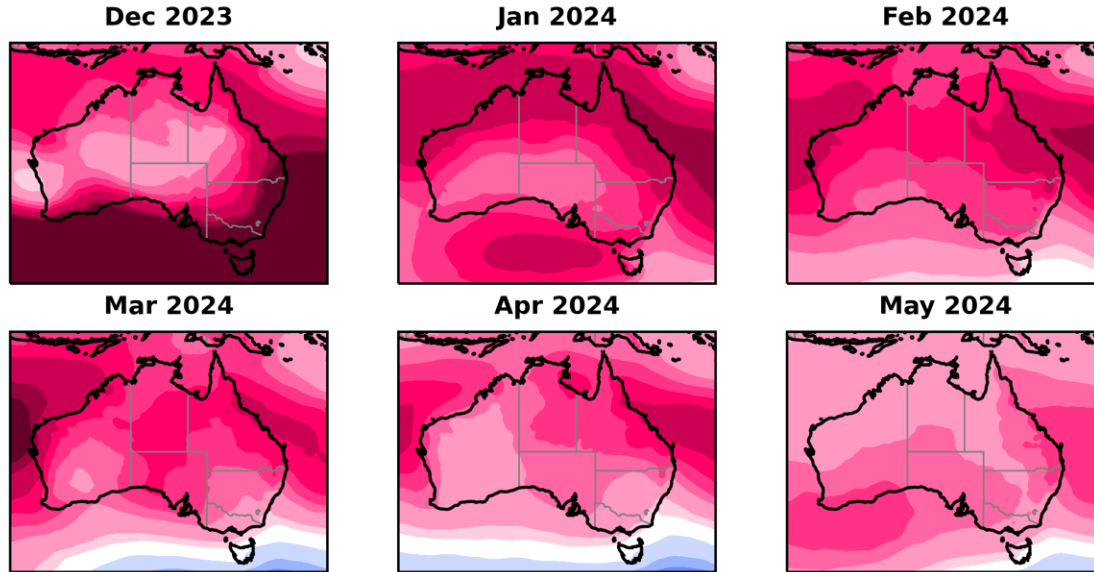
Southern Annular Mode (SAM)



- “ Negative SAM – more fronts & westerlies for Aus,
Positive SAM - less fronts, more easterly winds
- “ The SAM is positive and is expected to return to neutral in coming weeks
- “ El Niño is commonly associated with a negative SAM

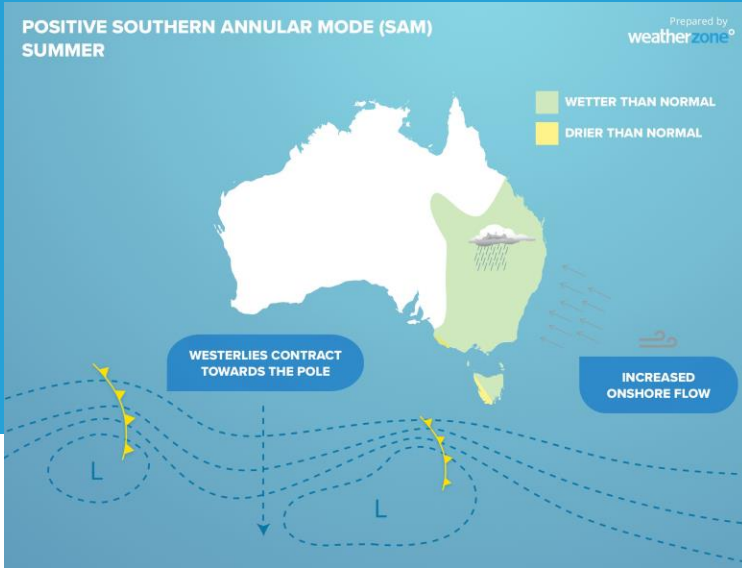
National Outlook - Monthly

Mean Sea Level Pressure Anomalies

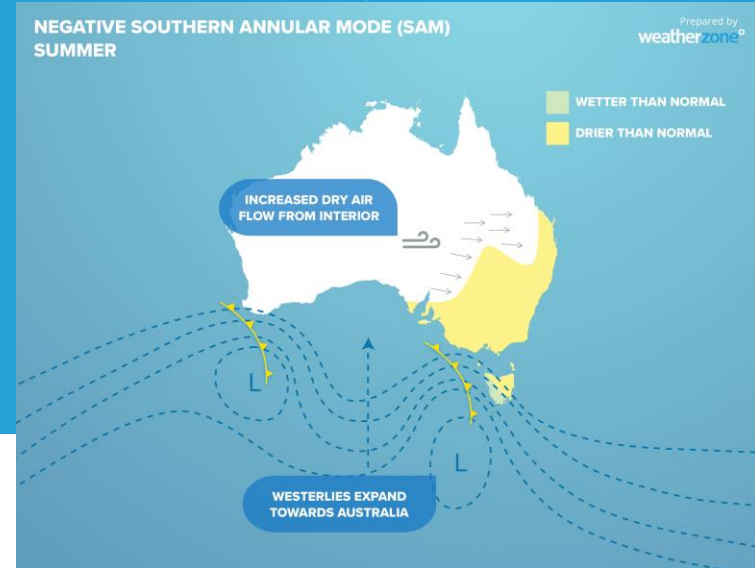


SAM Phases in Summer

Positive



Negative



Climate Summary

- **ENSO:** El Niño, is expected to persist into Autumn
- **IOD:** Positive, forecast to continue into at least early summer.
- **SAM:** Positive. Negative SAM more likely during late summer but positive events are still expected at times.

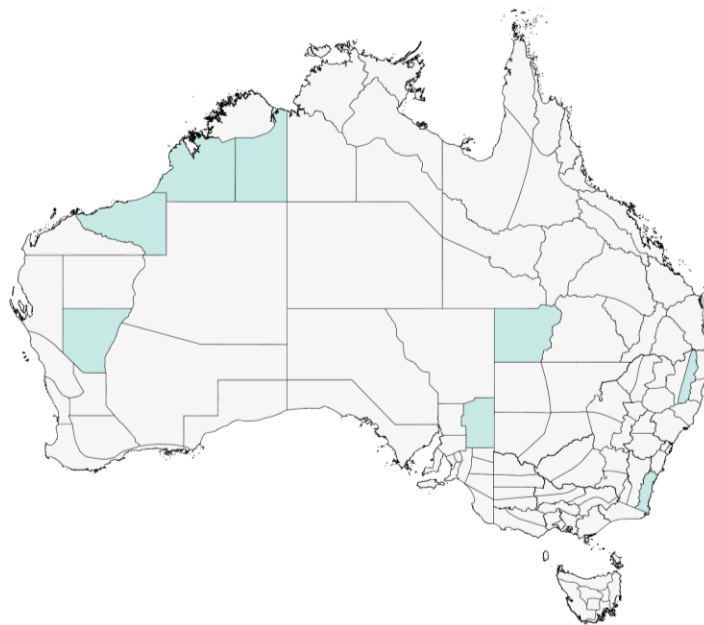
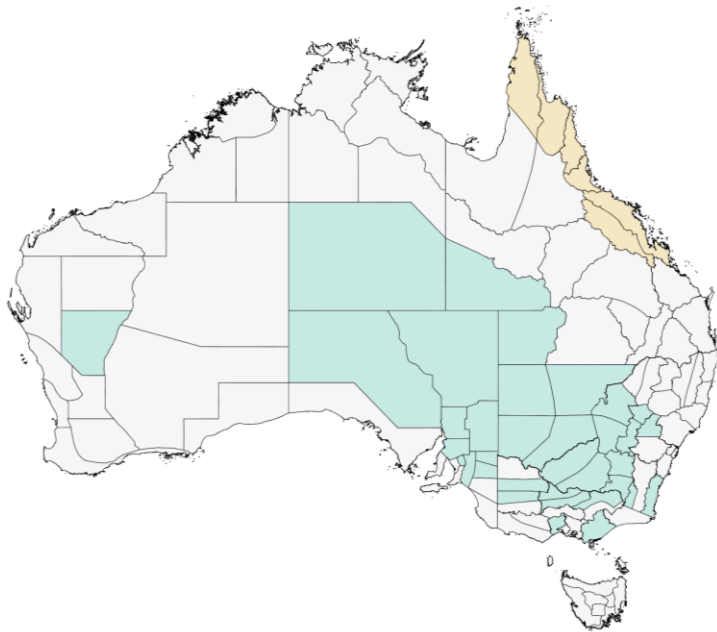
Outlook

Summer/Autumn 2023-24

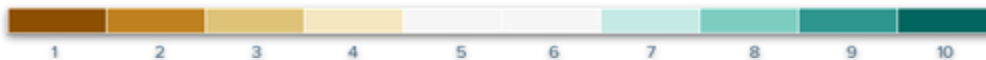
National Outlook – Rainfall

DJF

MAM

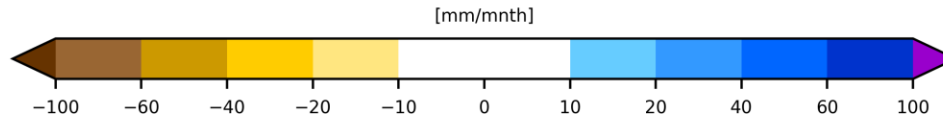
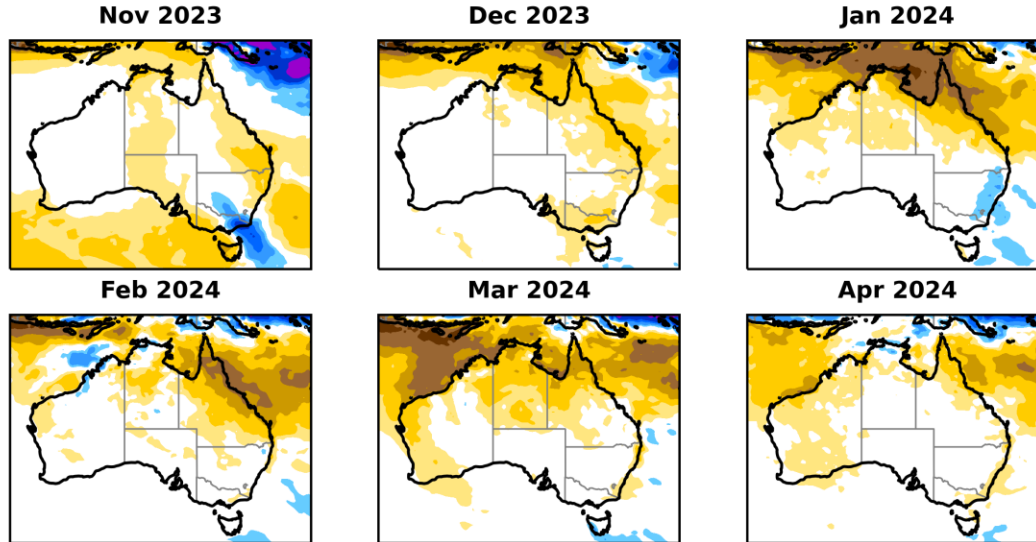


DECILES



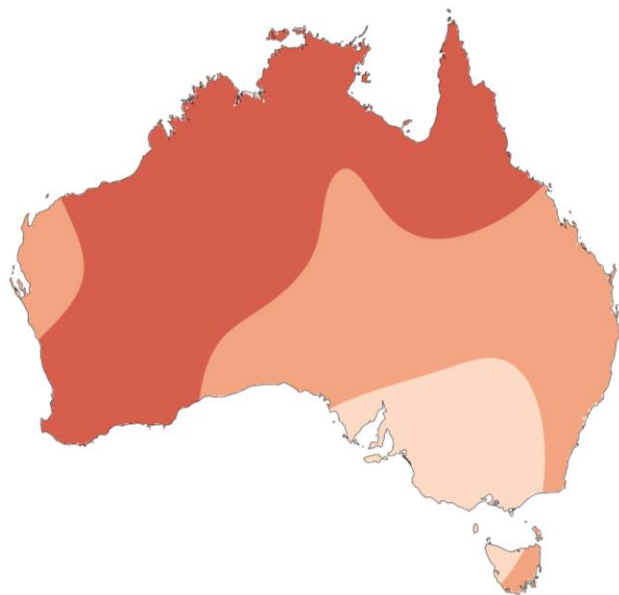
National Outlook - Monthly

Mean Rainfall Anomalies

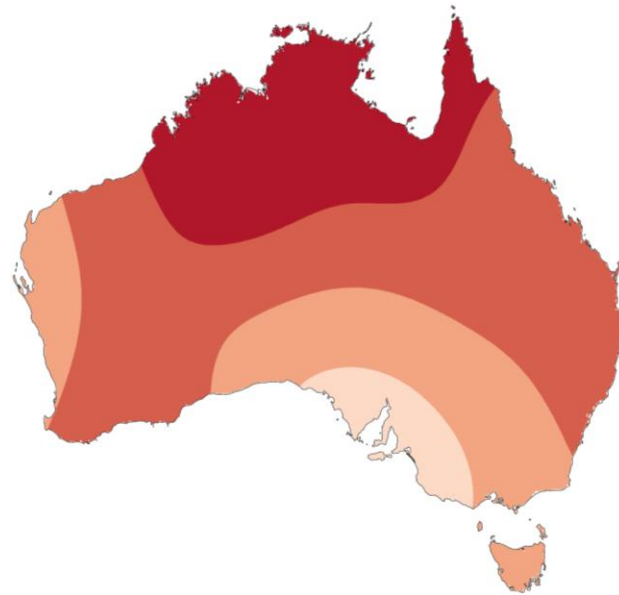


National Outlook – Summer Temperature

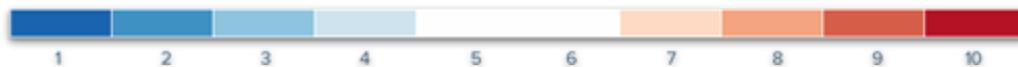
Maximums



Minimums

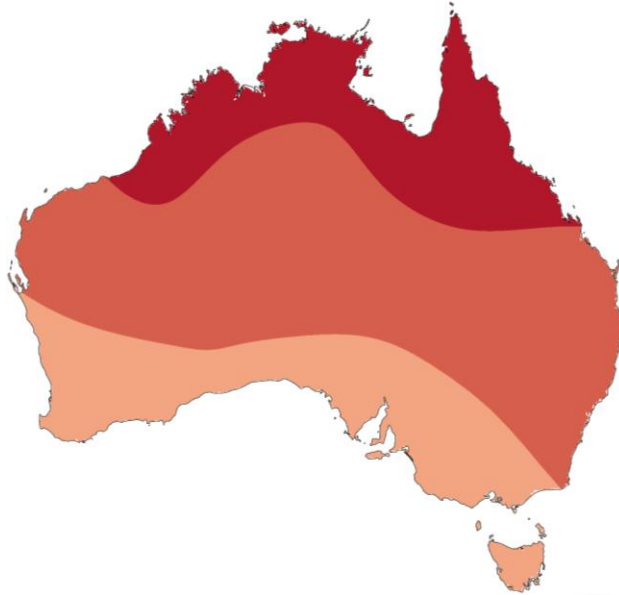


DECILES

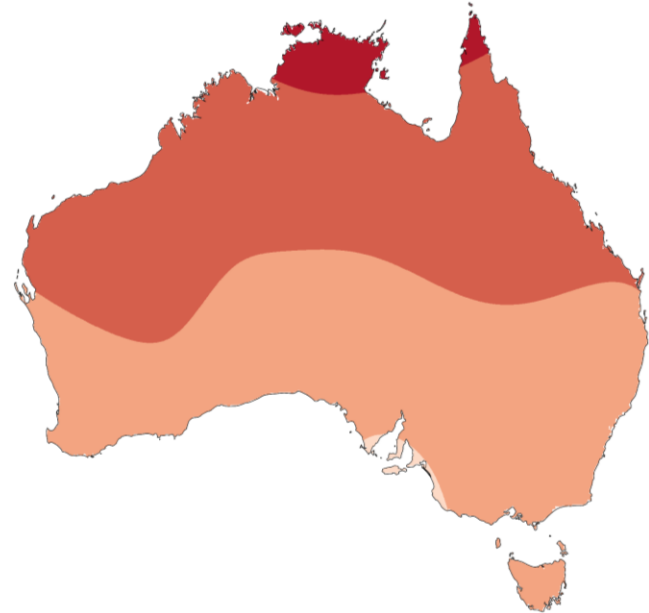


National Outlook – Autumn Temperature

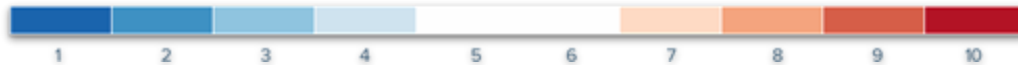
Maximums



Minimums

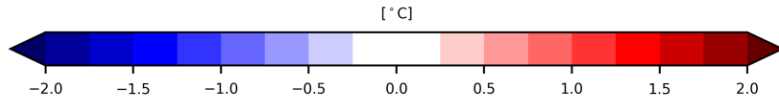
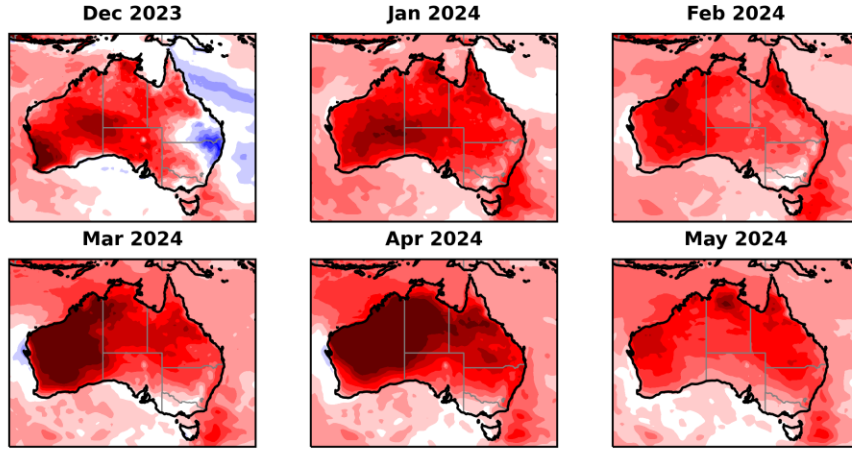


DECILES

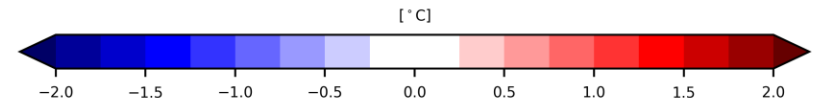
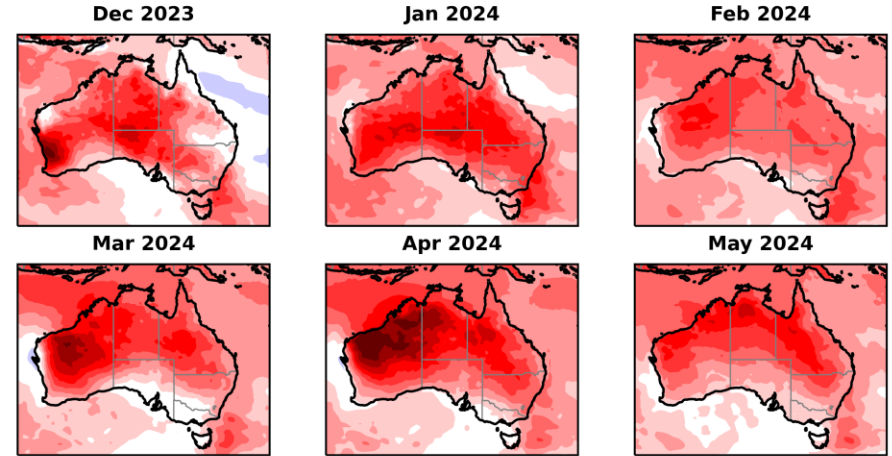


National Outlook - Monthly

Mean Maximum Temperature Anomalies

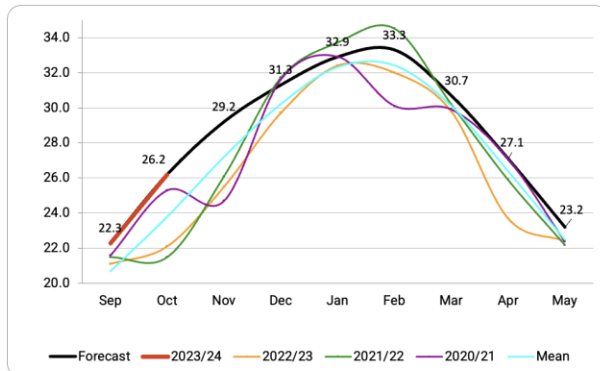


Mean Minimum Temperature Anomalies

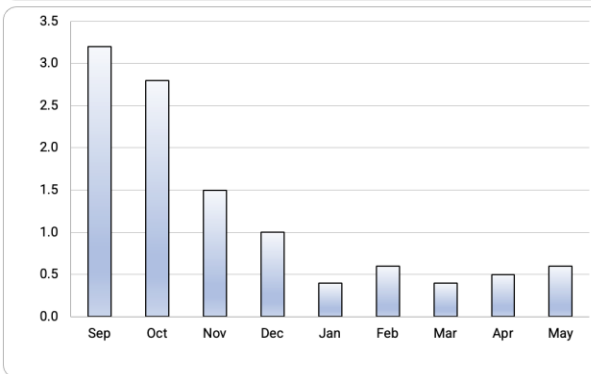
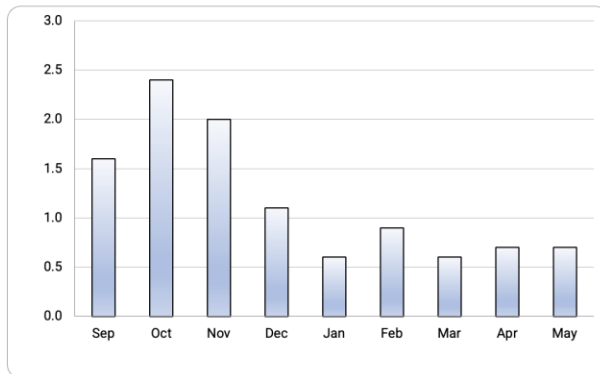
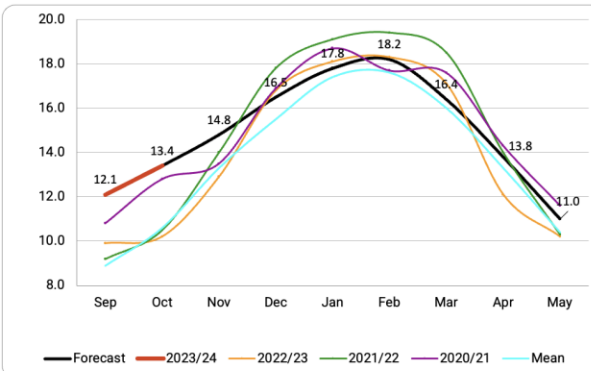


Perth

Maximums

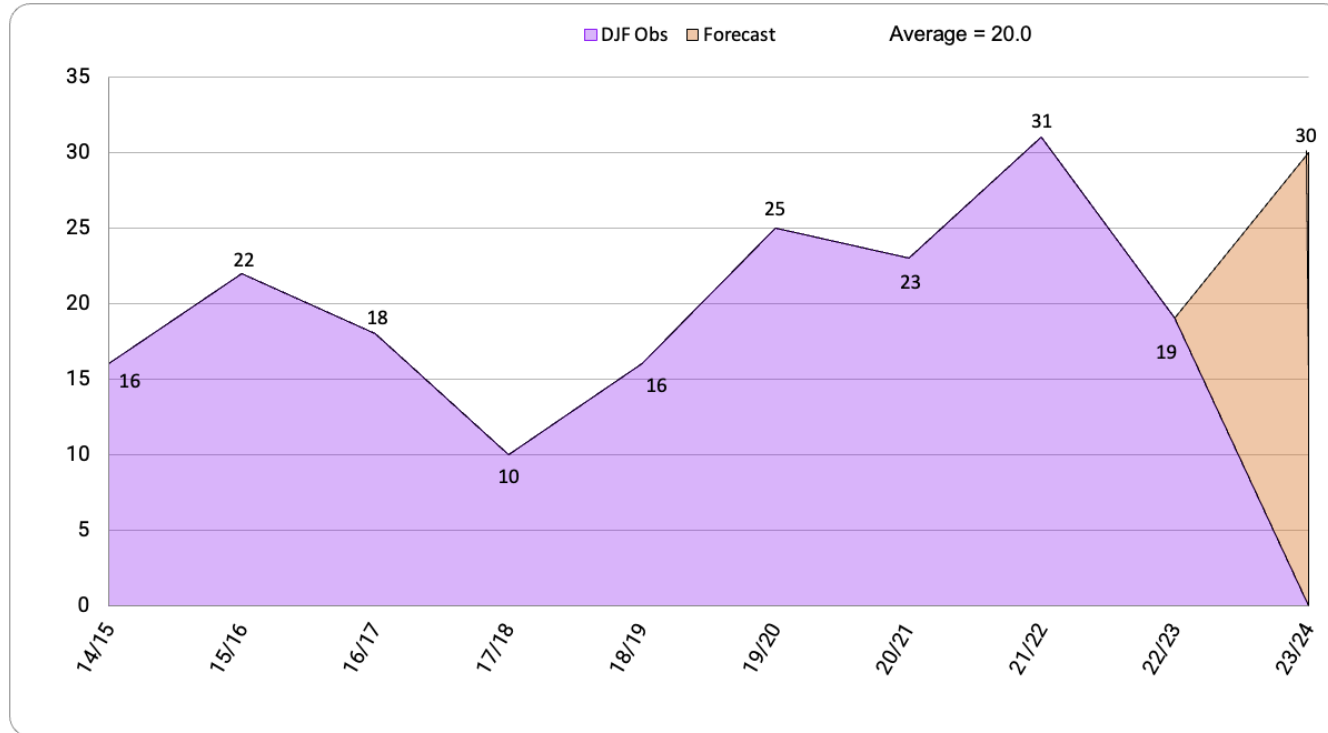


Minimums



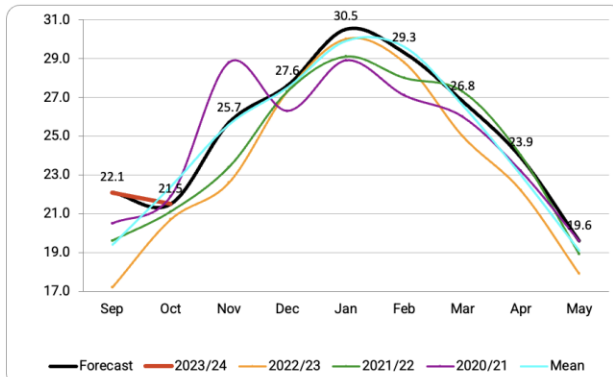
Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C – Perth

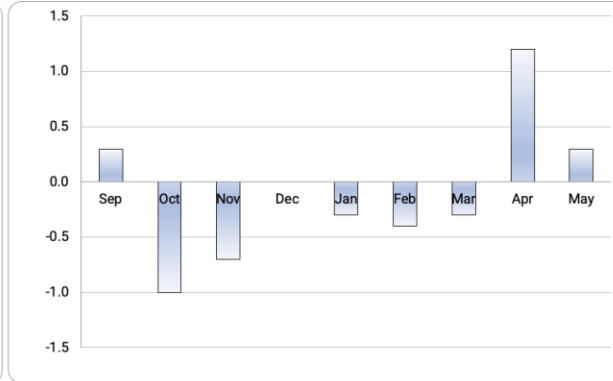
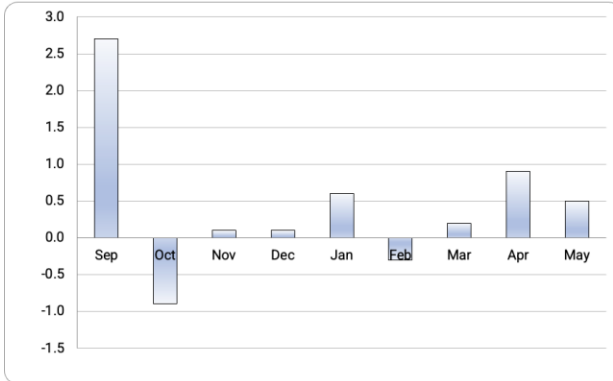
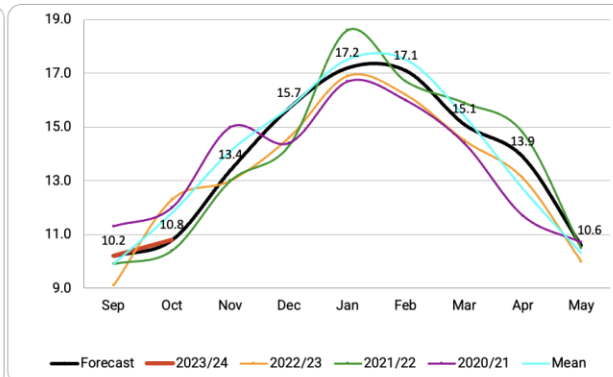


Adelaide

Maximums

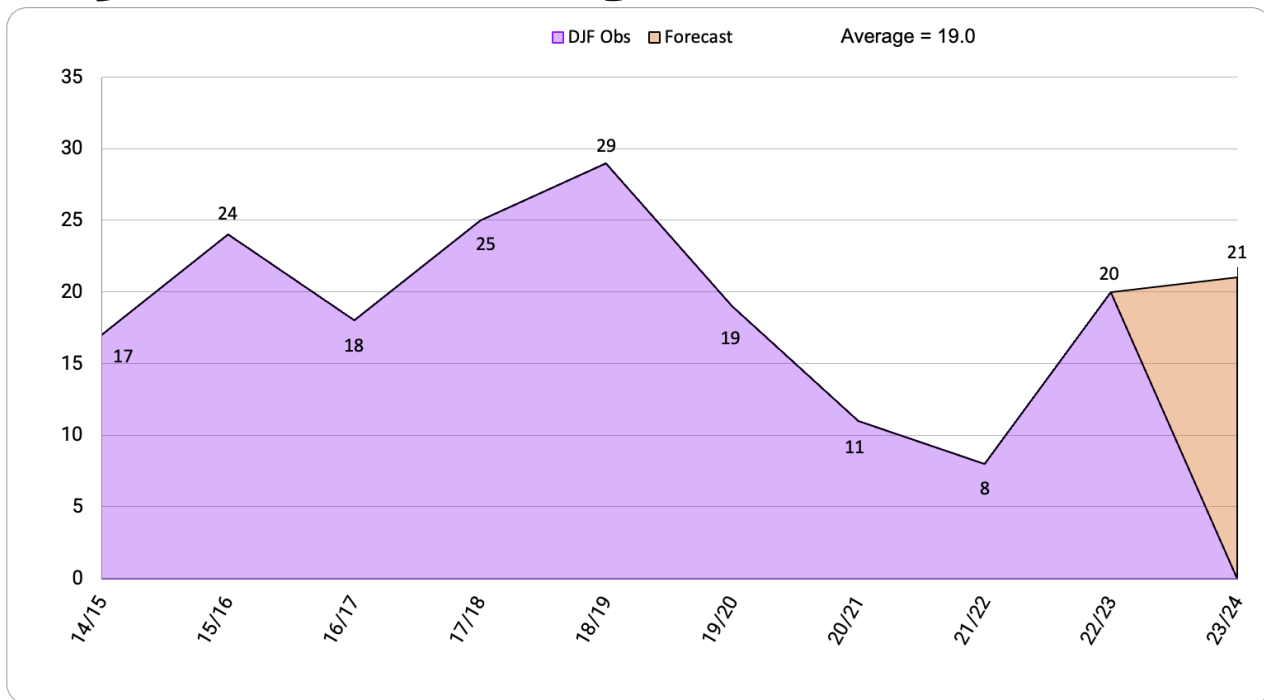


Minimums



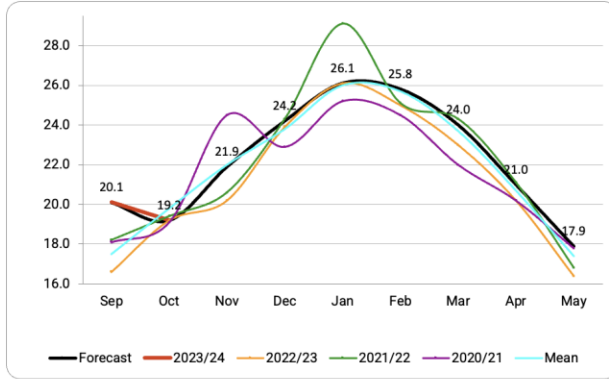
Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C - Adelaide

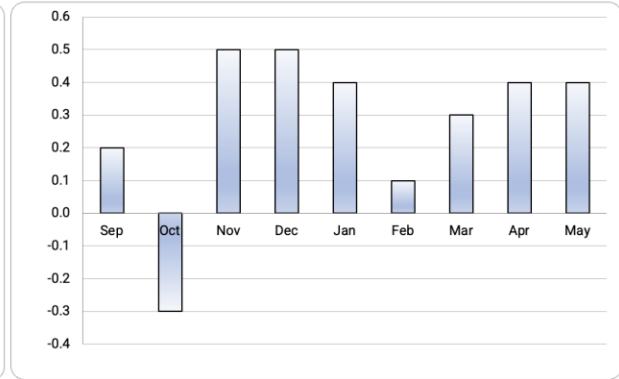
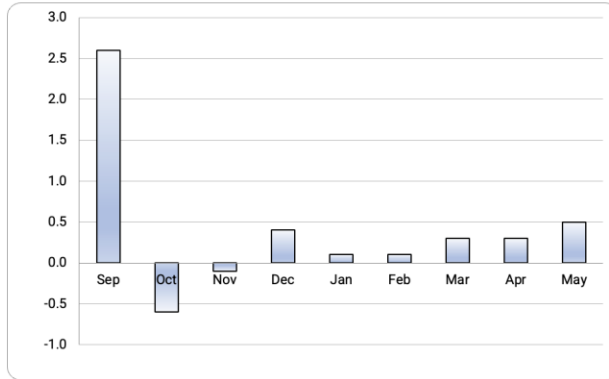
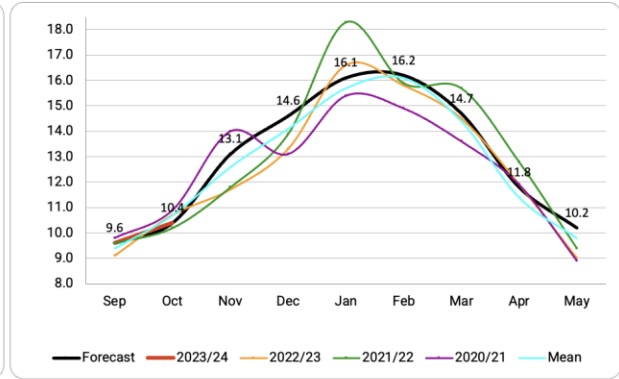


Melbourne

Maximums

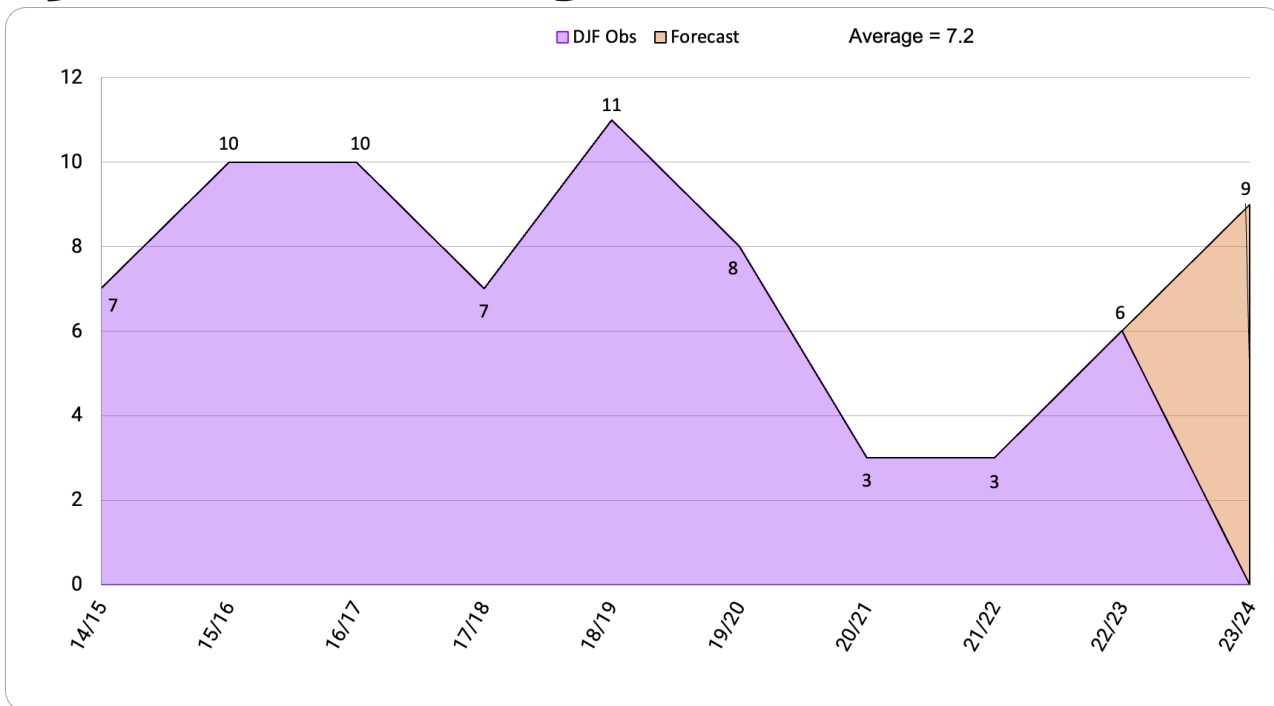


Minimums



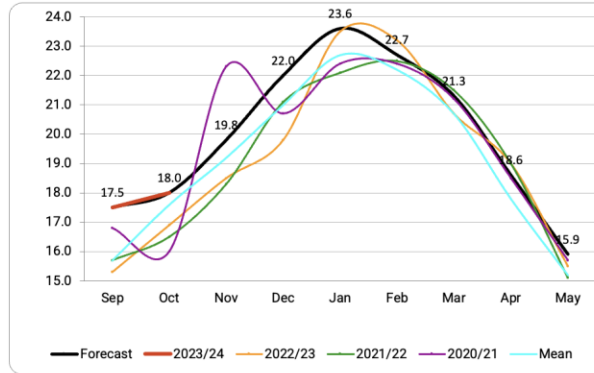
Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C - Melbourne

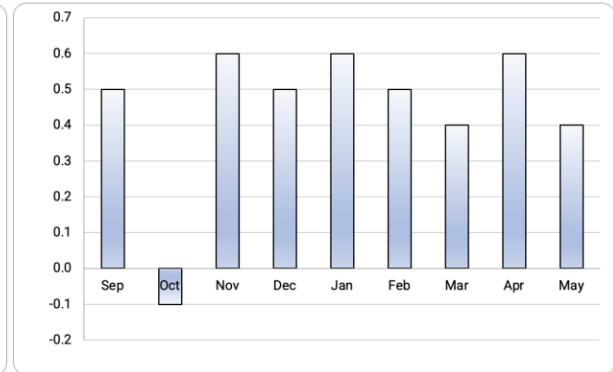
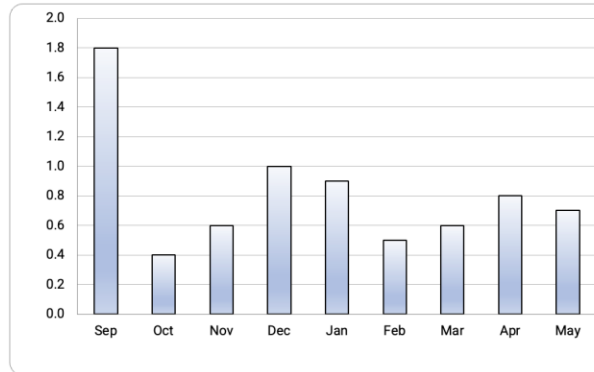
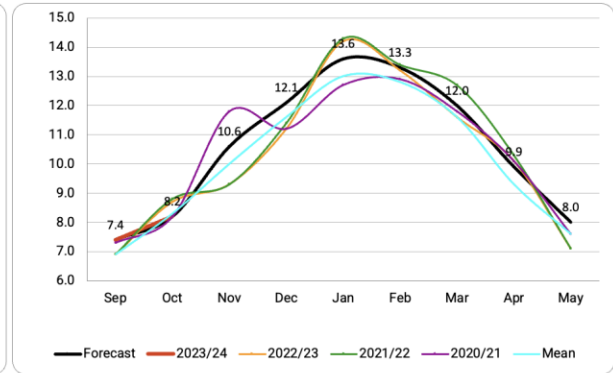


Hobart

Maximums

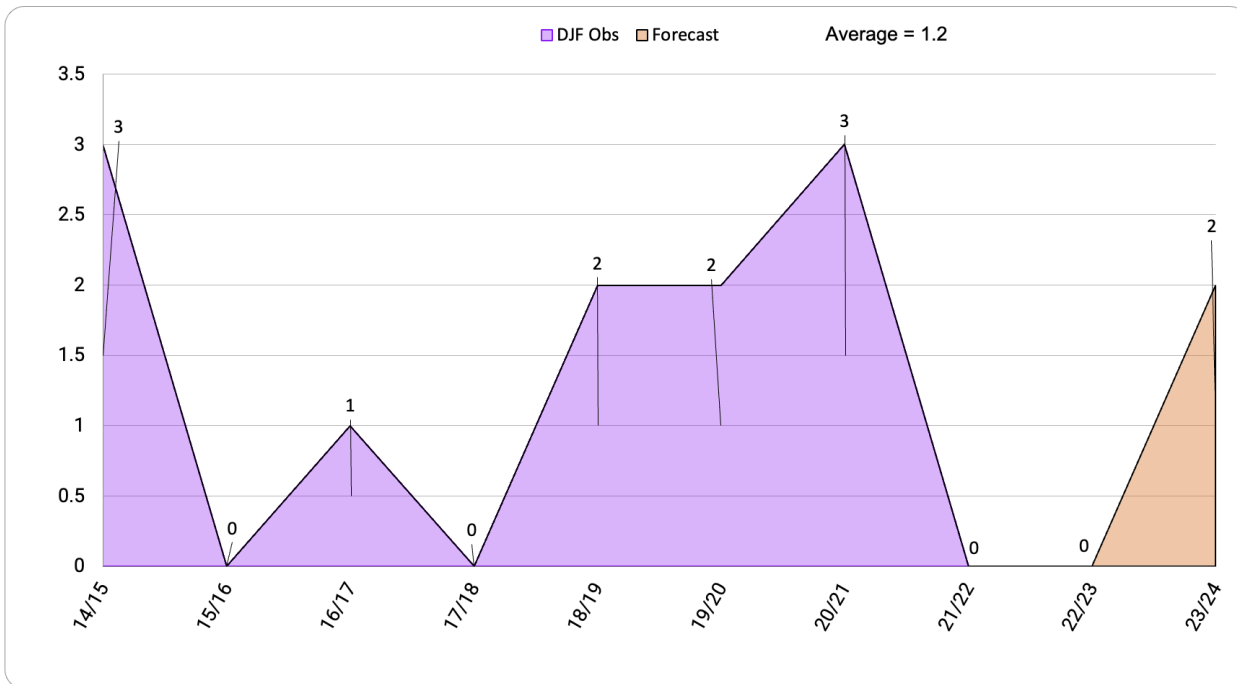


Minimums



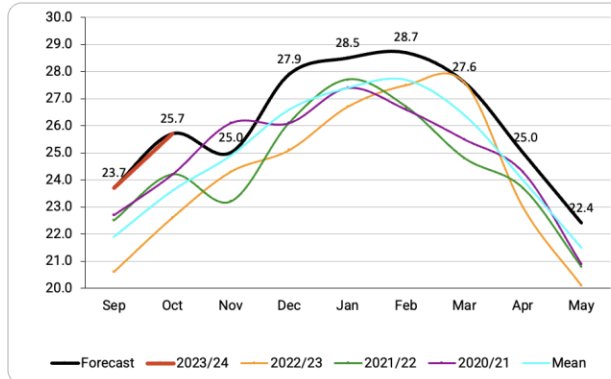
Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C - Hobart

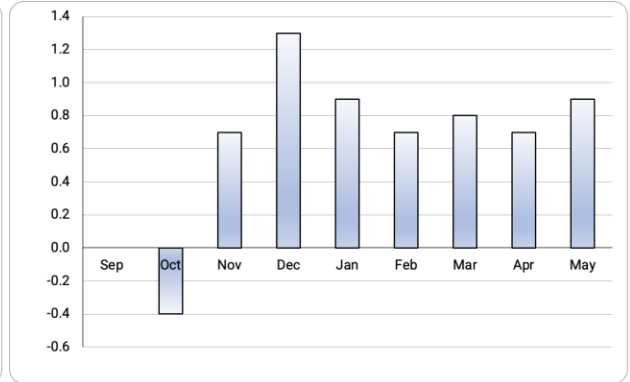
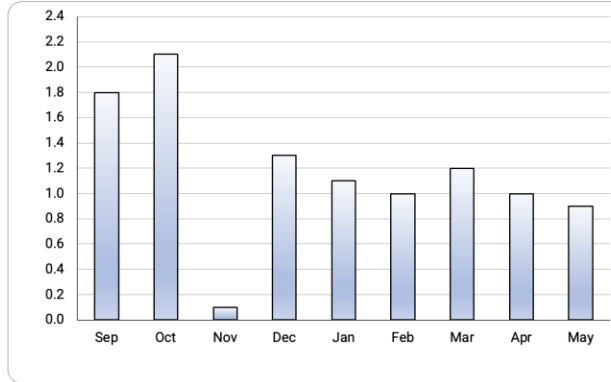
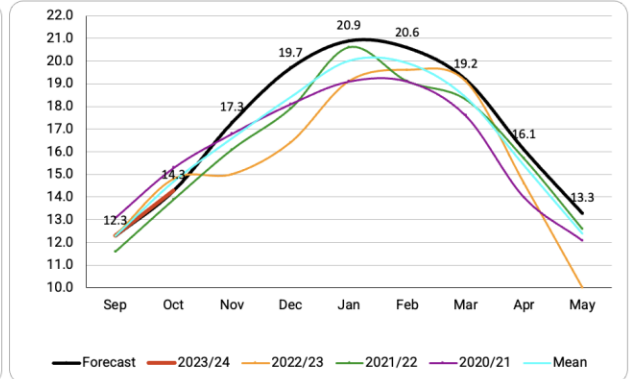


Sydney

Maximums



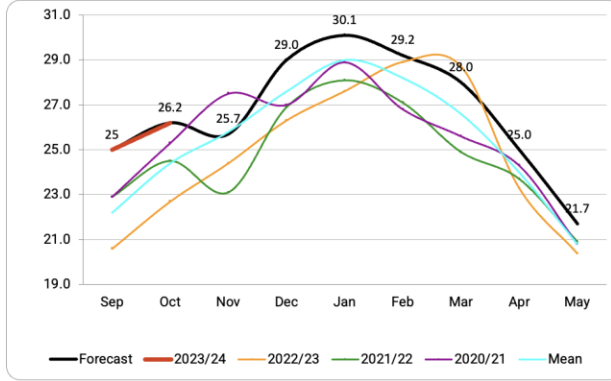
Minimums



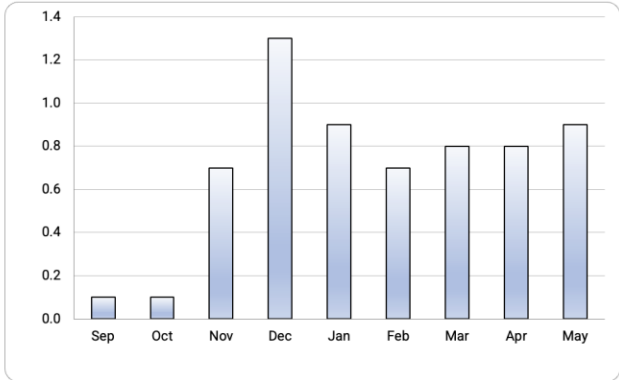
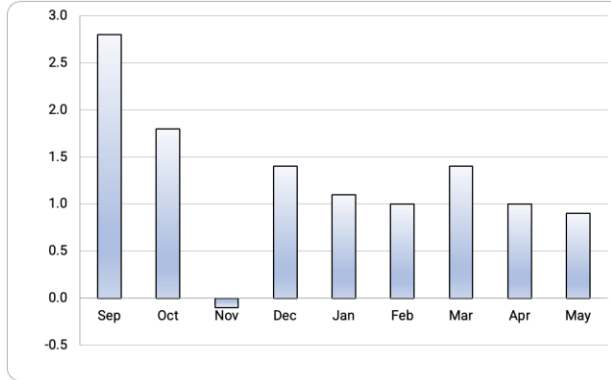
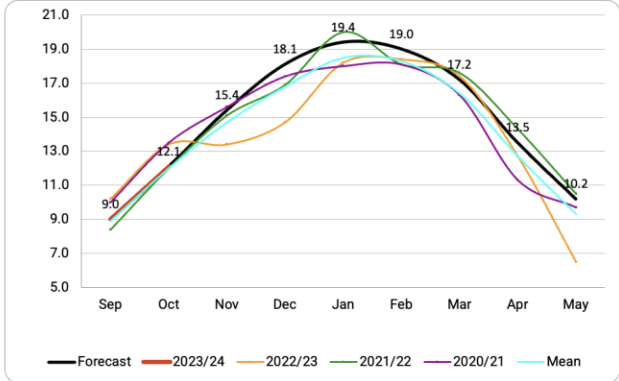
Forecast Anomaly
(1991-2020 mean)

Bankstown

Maximums

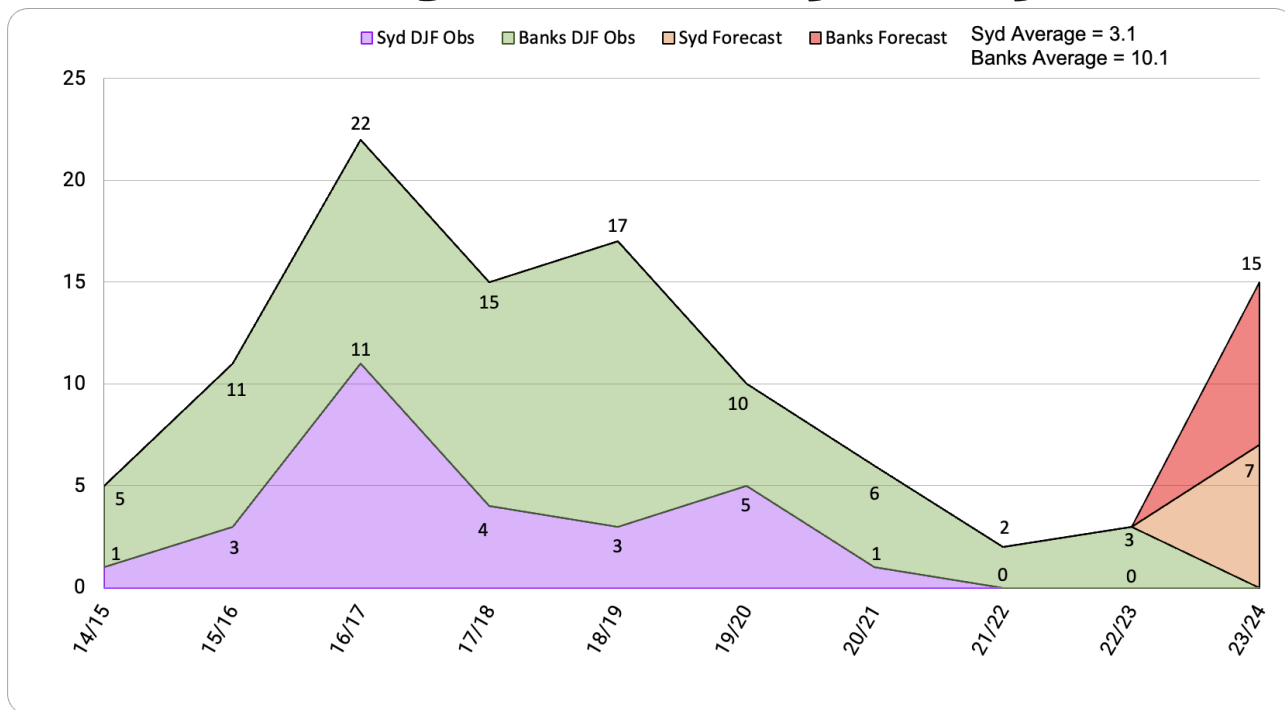


Minimums



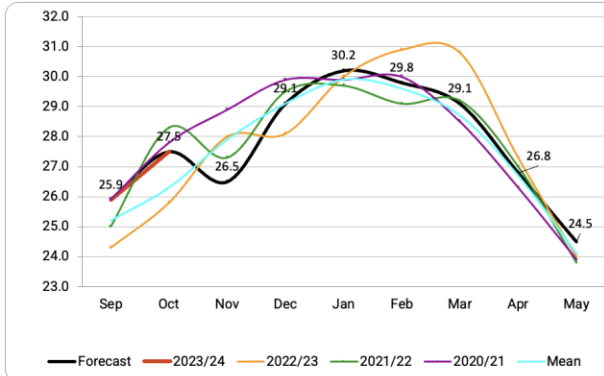
Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C – Sydney/Bankstown

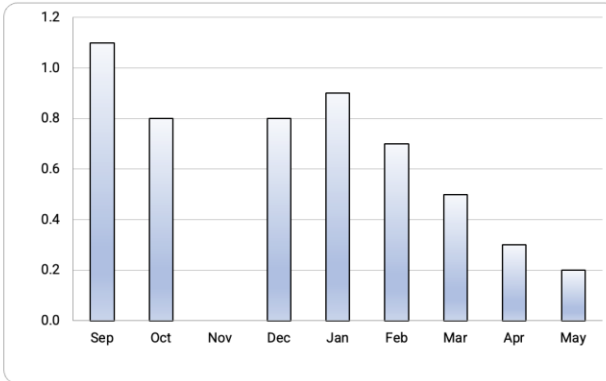
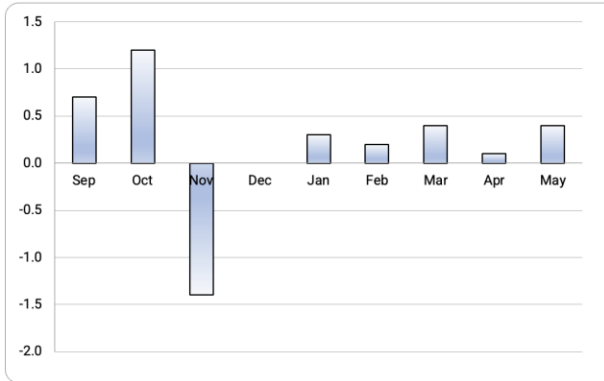
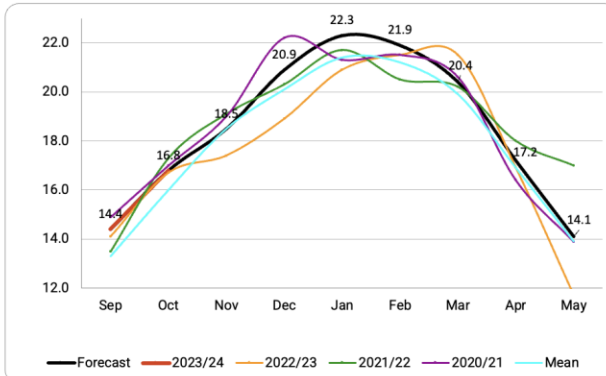


Brisbane

Maximums



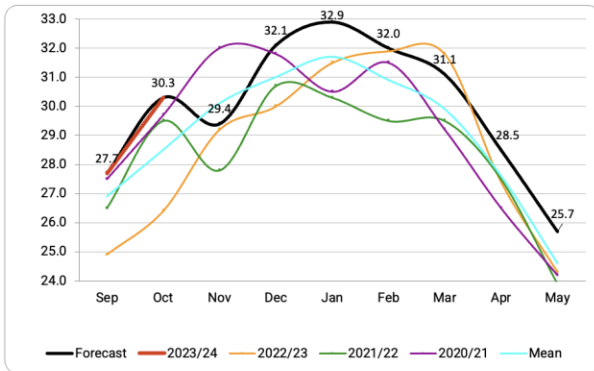
Minimums



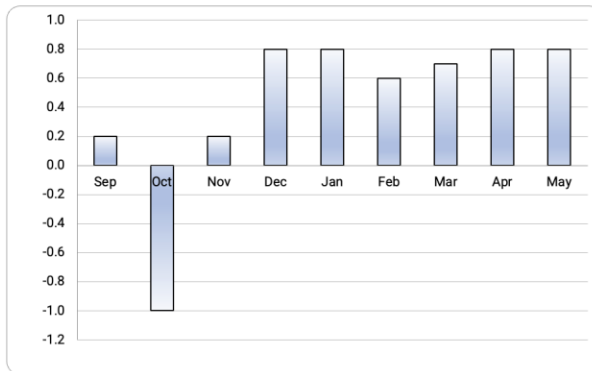
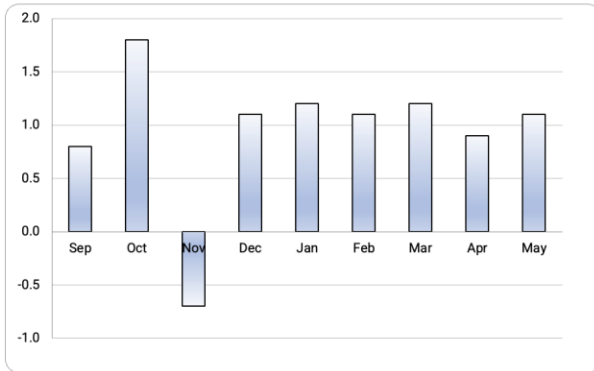
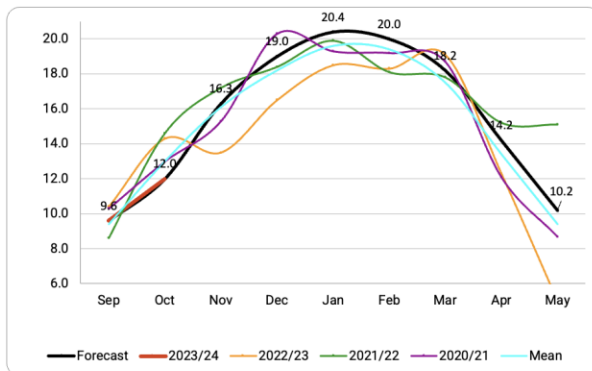
Forecast Anomaly
(1991-2020 mean)

Ipswich

Maximums

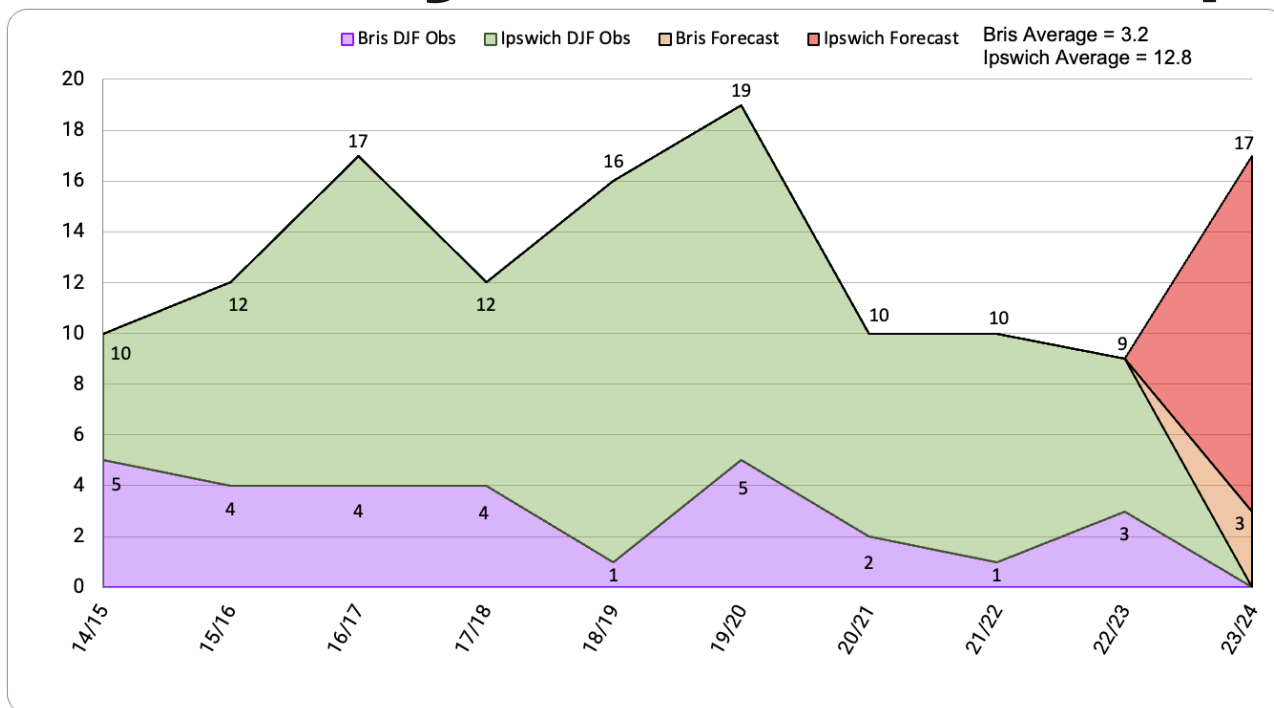


Minimums



Forecast Anomaly
(1991-2020 mean)

Days exceeding 35°C – Brisbane/Ipswich



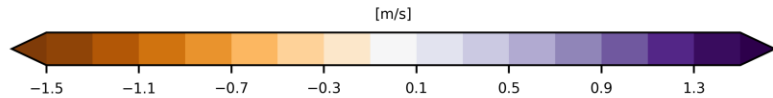
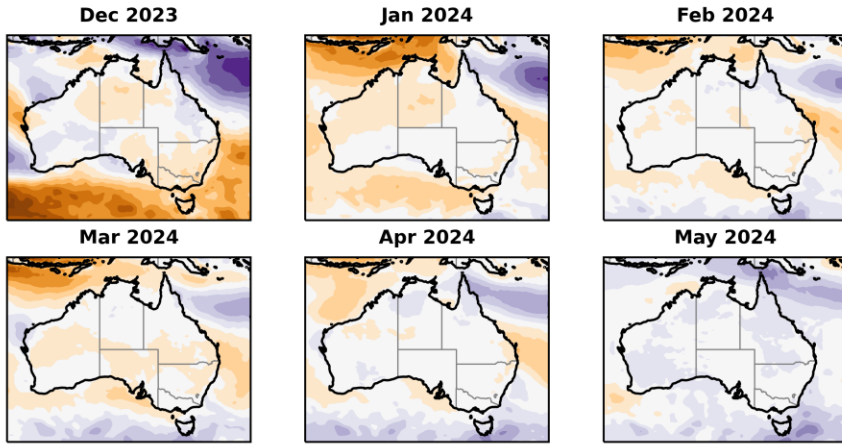
Strong wind events (cold fronts)

- Strong wind events may become more frequent in summer
- Negative SAM periods most likely
- More likely to have stronger westerlies

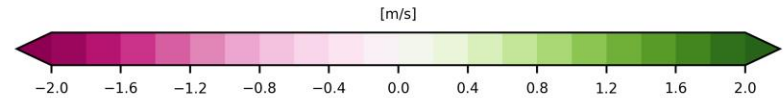
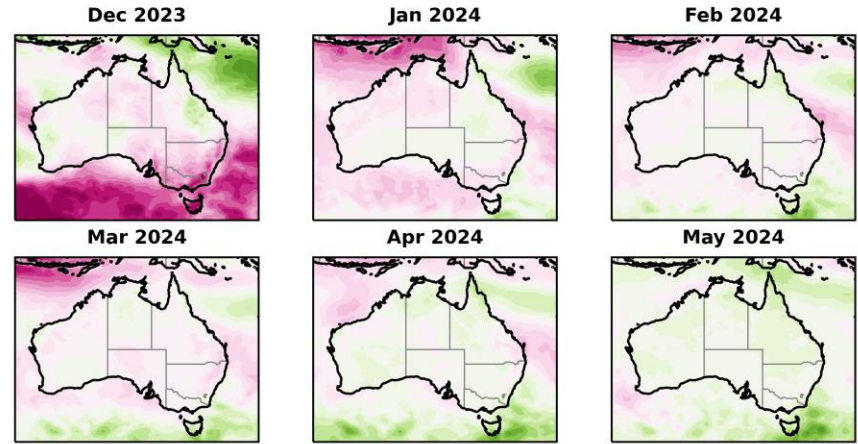


National Outlook - Monthly

Mean Wind Speed Anomalies

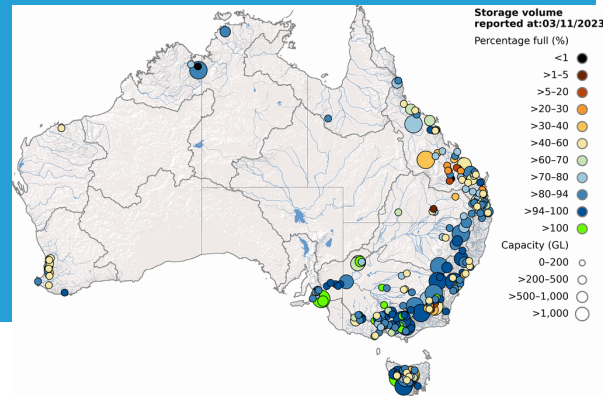


Mean Wind Gust Anomalies



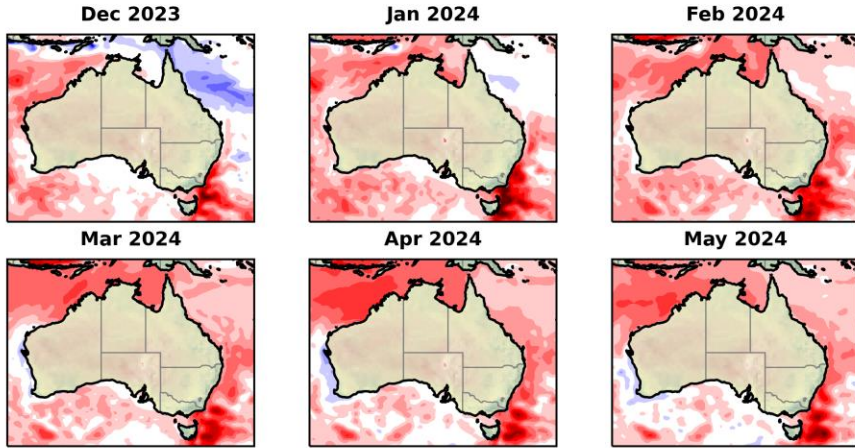
Heavy rainfall and flooding

- Heavy rainfall events are less likely to occur through as we go deeper into the year
- El Niño/Positive IOD reduces chances
- A lot of dams are still around 80% for most areas, so flooding is still a possibility

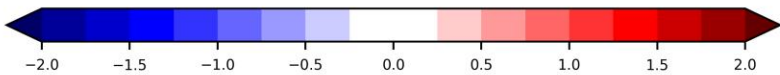


National Outlook - Monthly

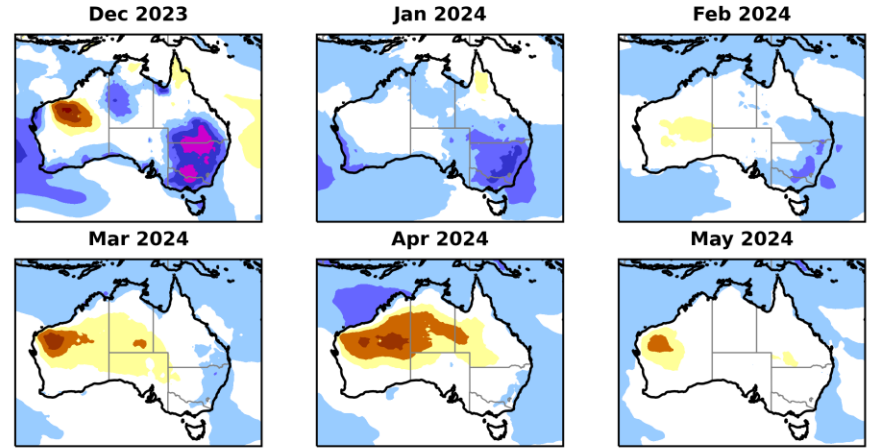
Mean Sea Surface Temperature Anomalies



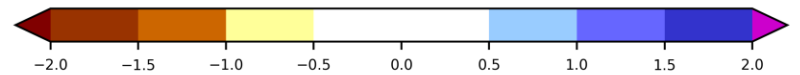
[°C]



Mean Dew Point Anomalies

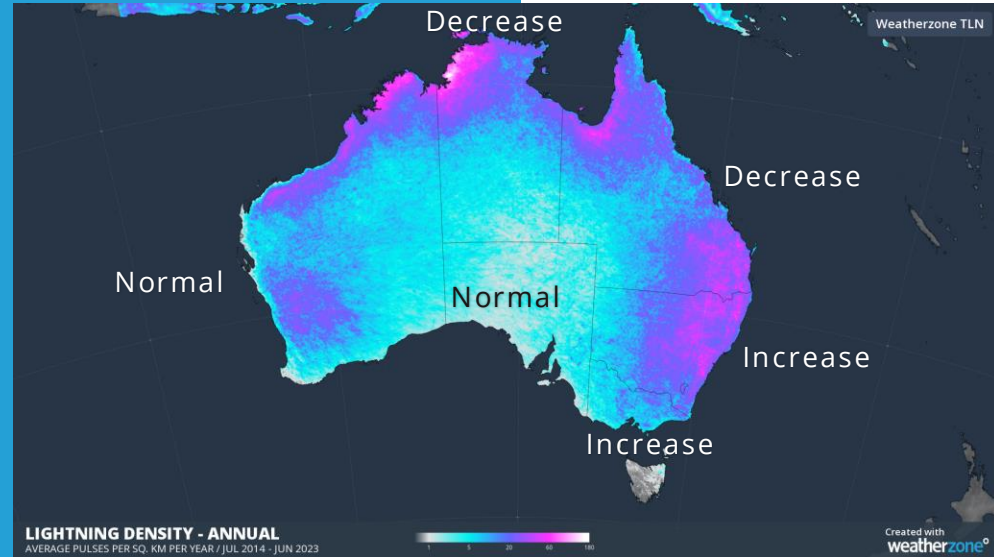


[°C]



Thunderstorms

- Spring Increased surface heat and humidity (SSTs) increases the risk
- Increased chance for the southeast, below average for Qld and the NT, normal for WA and SA
- Damaging winds and hail with storms are more likely
- Increased chance of seeing dry lightning

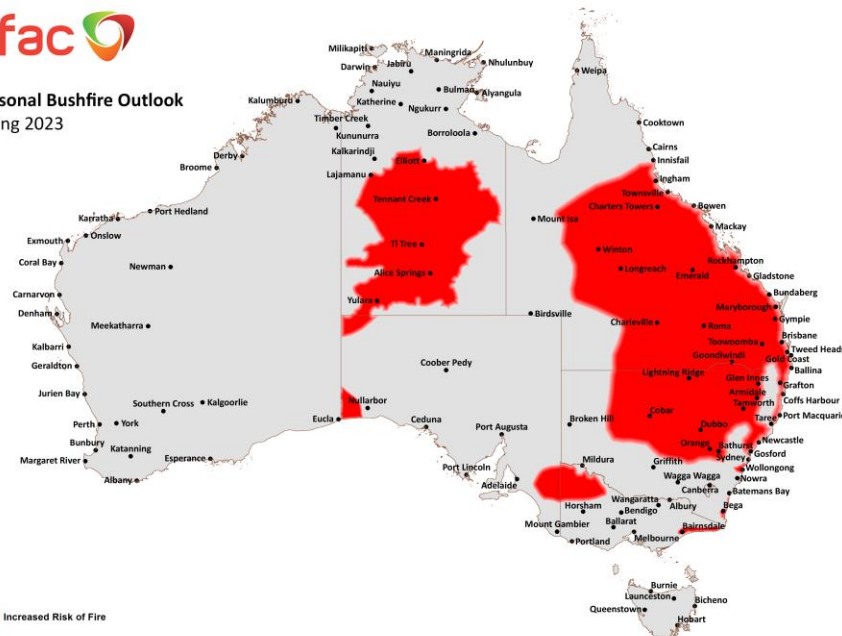


Bushfire Risk









- Increased chance of grassfires and scrub fires
- Warm, dry and windy conditions will increase the bushfire risk this season
- Qld, NSW, eastern Vic and the NT are most at risk of above average bushfire conditions



Seasonal Bushfire Outlook Spring 2023



SEVERE WEATHER SEASON 2023/24

-  Less frequent heatwaves in the south
-  Increased high temperature extremes
-  Below average rain and cloud in the north
-  Reduced risk of heavy rain and flooding
-  Slightly increased thunderstorm activity
-  Increased frequency of strong wind events
-  Above average bushfire risk
-  Below average northern wet season rain

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Questions?

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