

# Climate Outlook

Northern Australia Seasonal Fire Outlook Workshop

Kununurra, Western Australia

20 and 21 June 2017

*David Jones & Greg Browning*

*Climate Services*

*Bureau of Meteorology*



Australian Government  
Bureau of Meteorology



# Overview

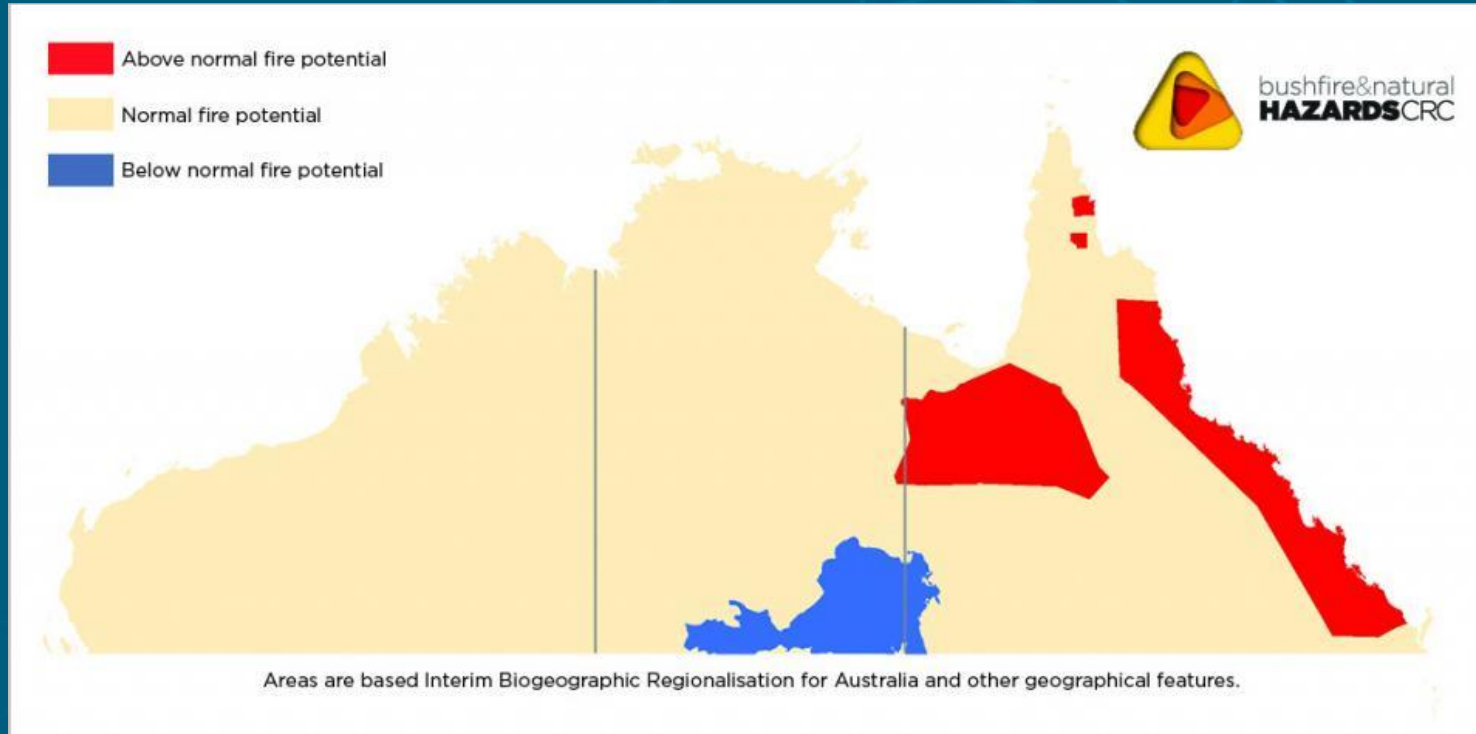
1. **Review of the 2016 season**
2. Background climate change signal
3. Outlook for 2017

Antecedent conditions

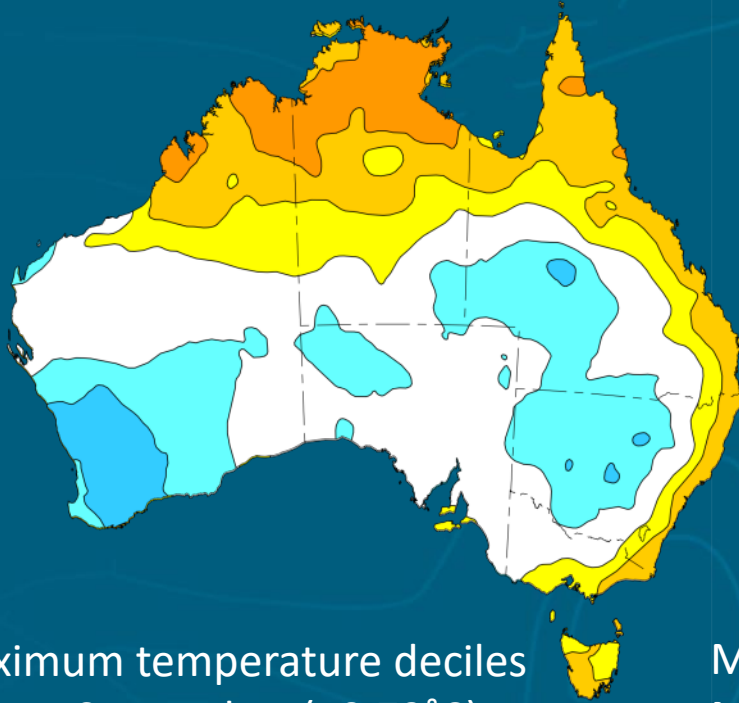
Seasonal Climate Outlook



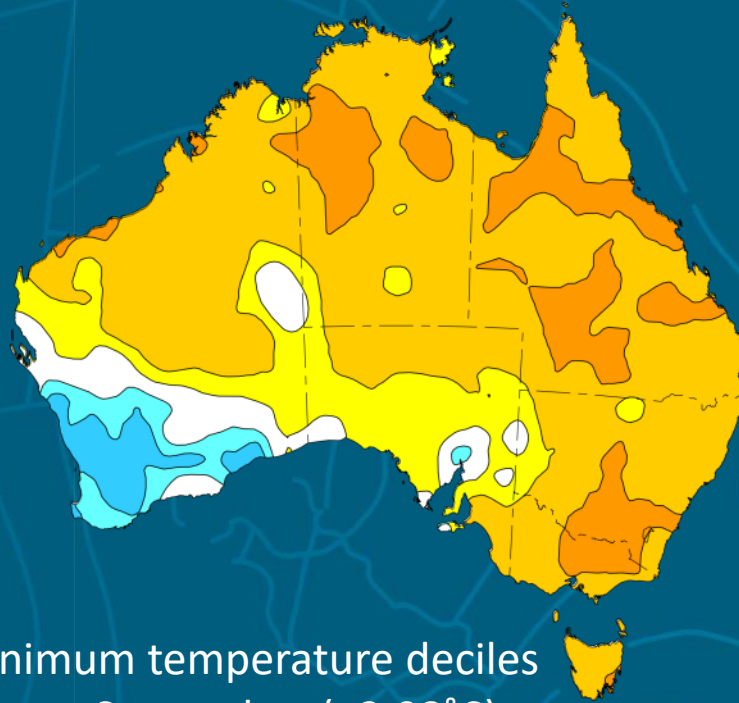
# 2016 fire season outlook



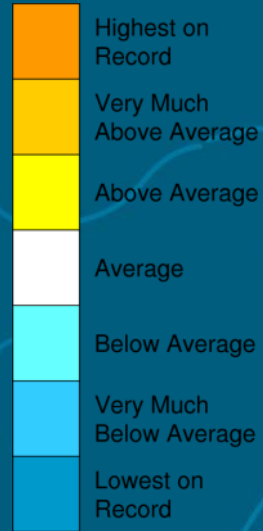
# 2016 season: warm days and record warm nights



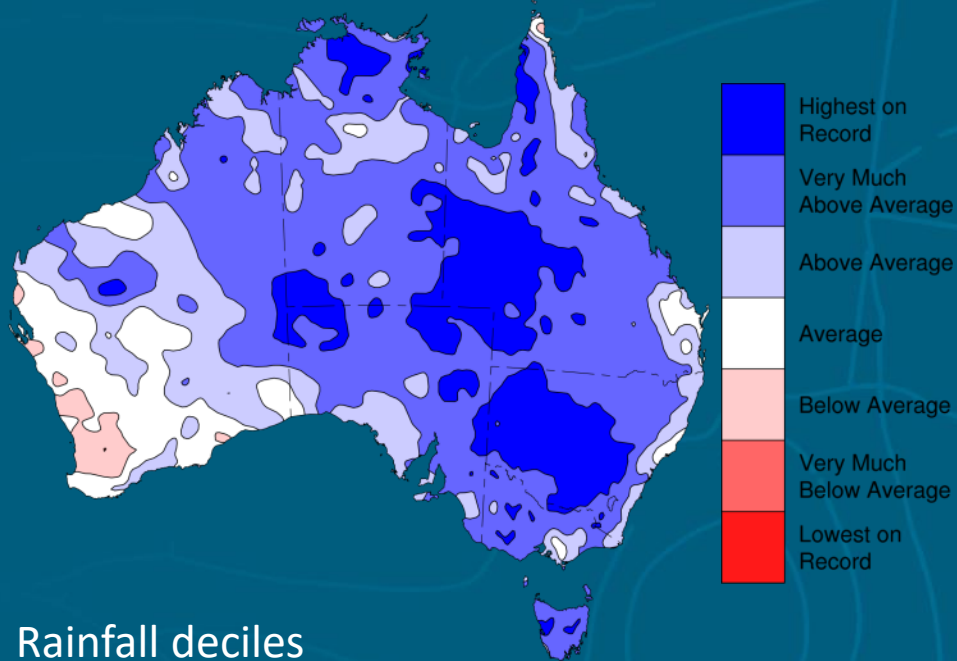
Maximum temperature deciles  
May to September (+0.73°C)



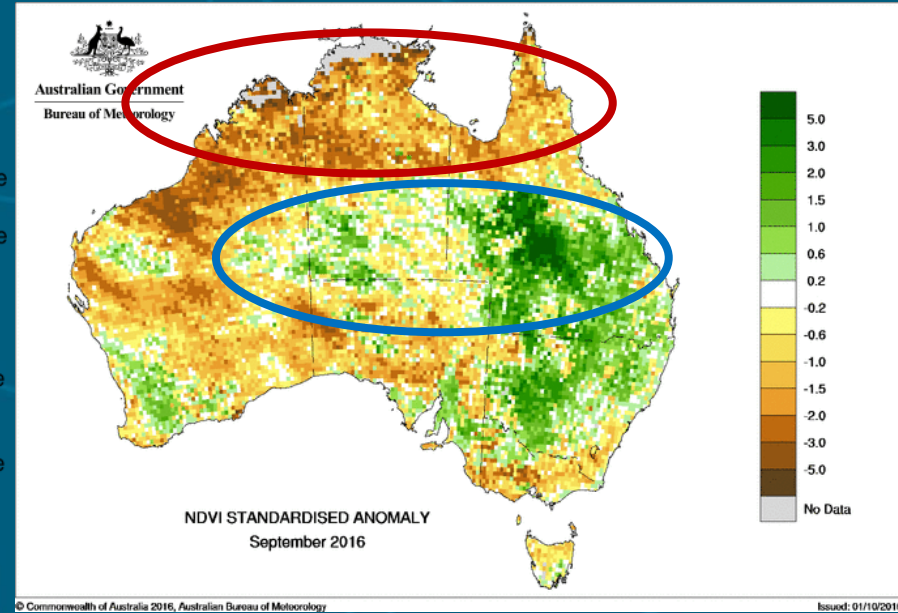
Minimum temperature deciles  
May to September (+2.08°C)



# Seasonal rainfall deciles: Fire season

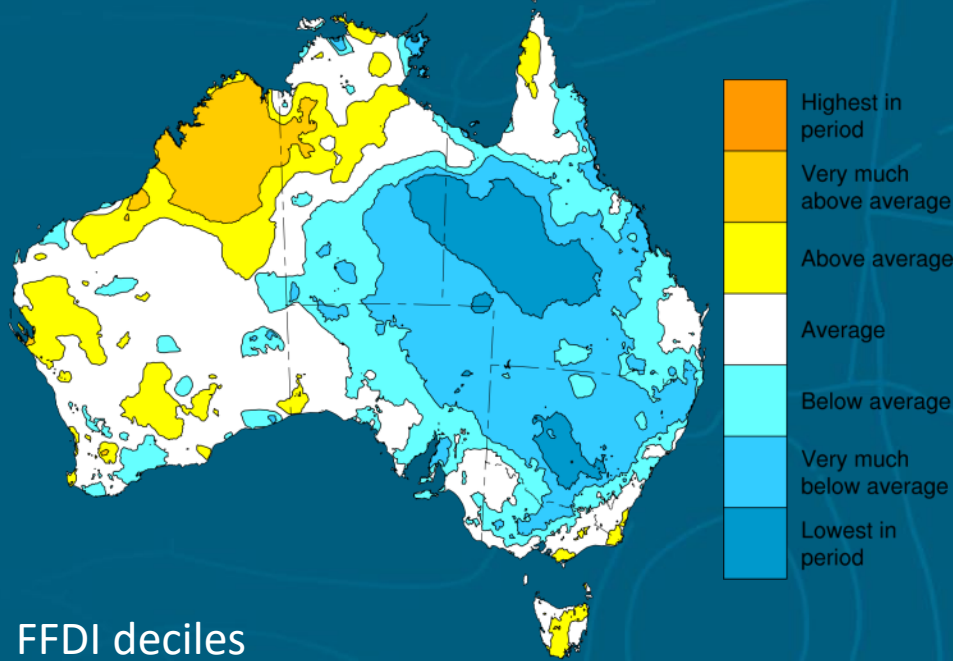


Rainfall deciles  
May - September 2016

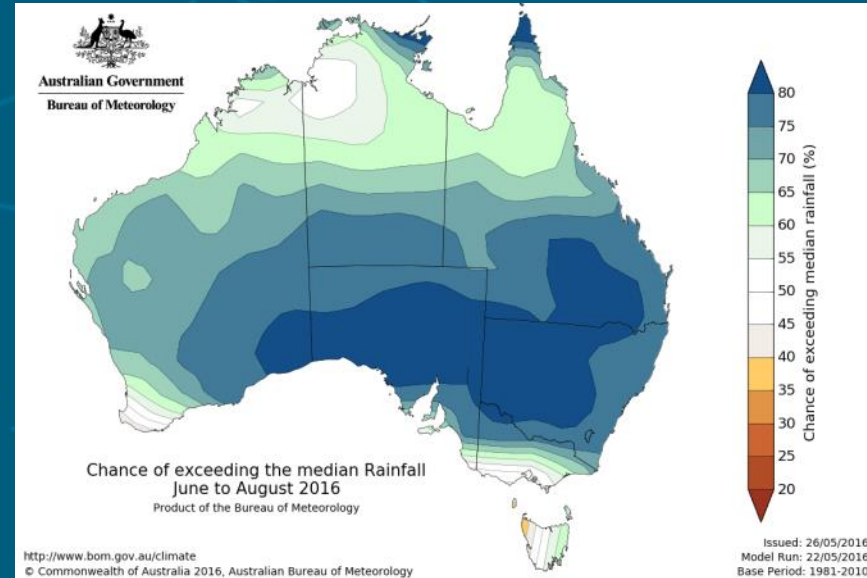


September 2016 NDVI anomaly

# Cumulative FFDI (no GFDI yet): Fire season



FFDI deciles  
May - September 2016



Jun - Aug seasonal outlook 2016

# Overview

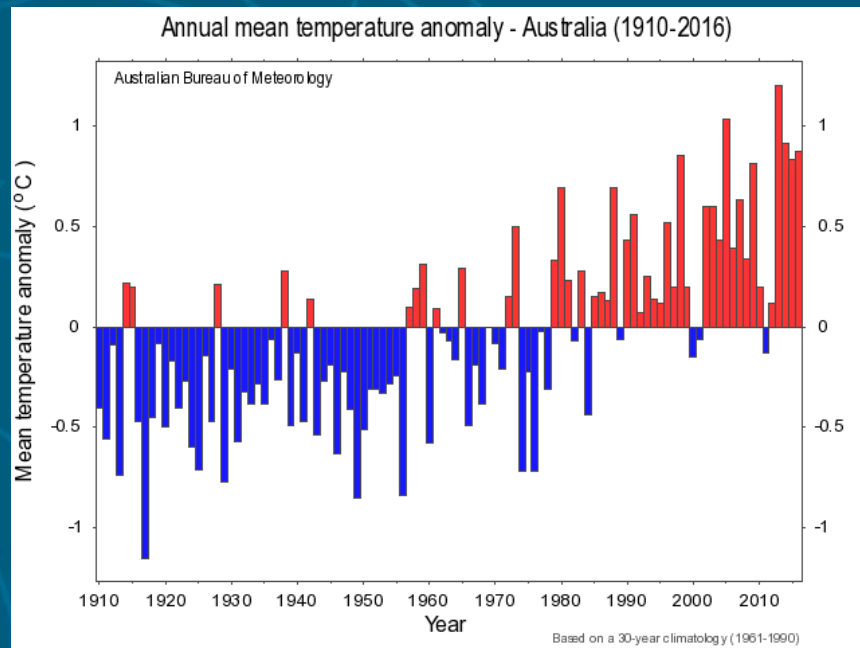
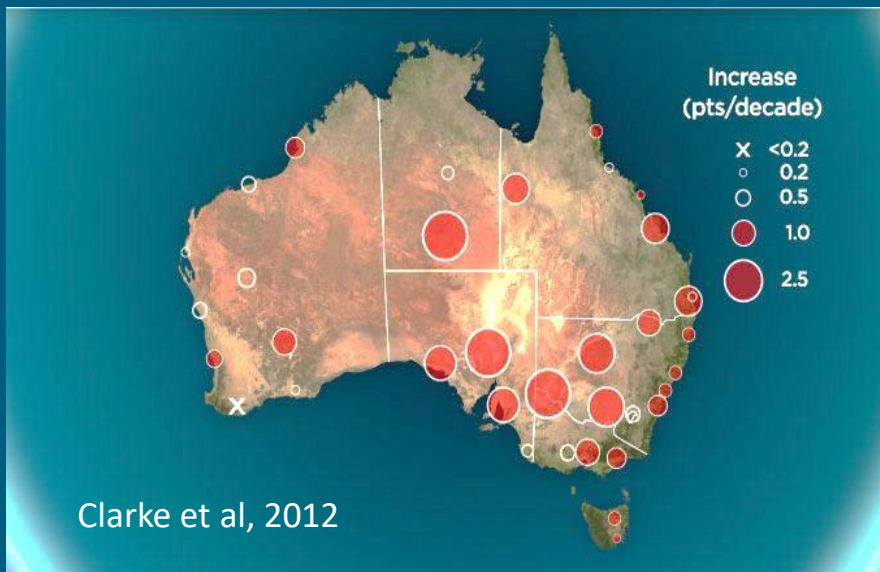
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Seasonal Climate Outlook



# Bushfire weather and a warming planet



## Trends in Forest Fire Danger Index (1973-2010)

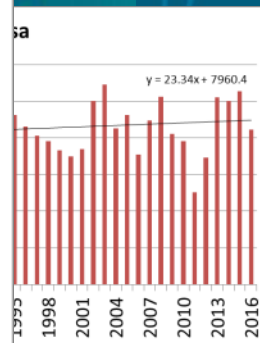
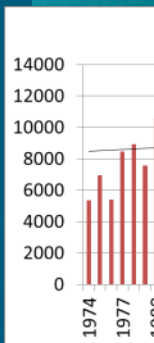
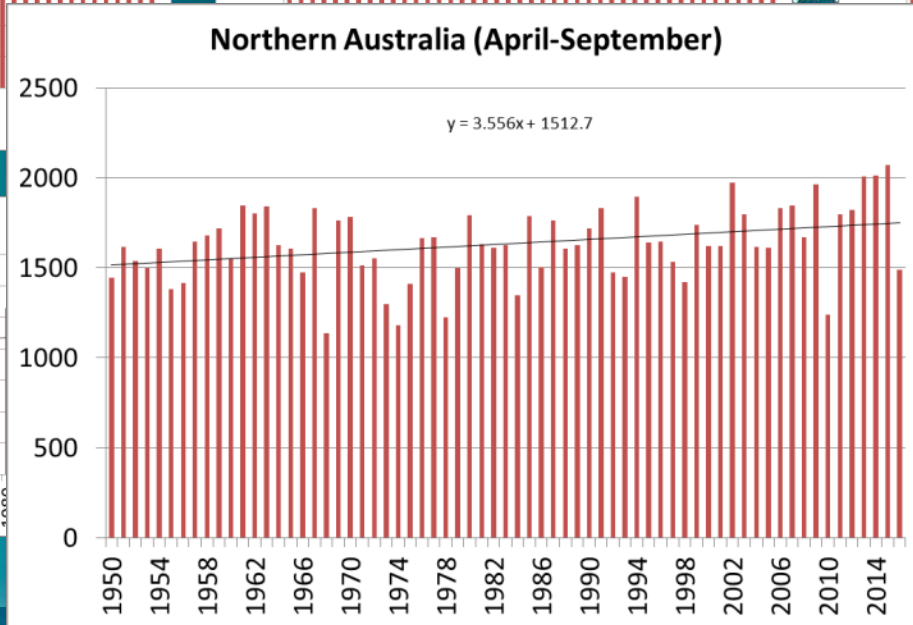
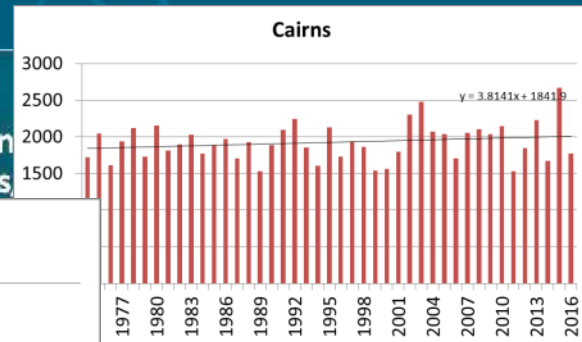
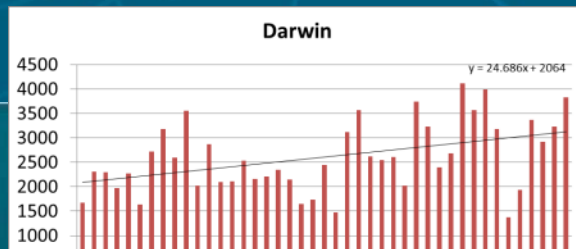
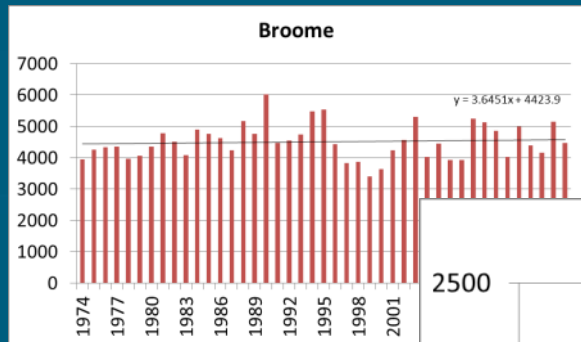


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## Australian temperature trends (1910 – 2016)



# Representative FFDI graphs



# Southern and Northern fire seasons overlapped



Lancefield, 6 October 2015  
FFDI 78 (highest so early in spring  
by nearly a month)

Esperance Fire, 17  
November



Pinery Fire, 25  
November



# Overview

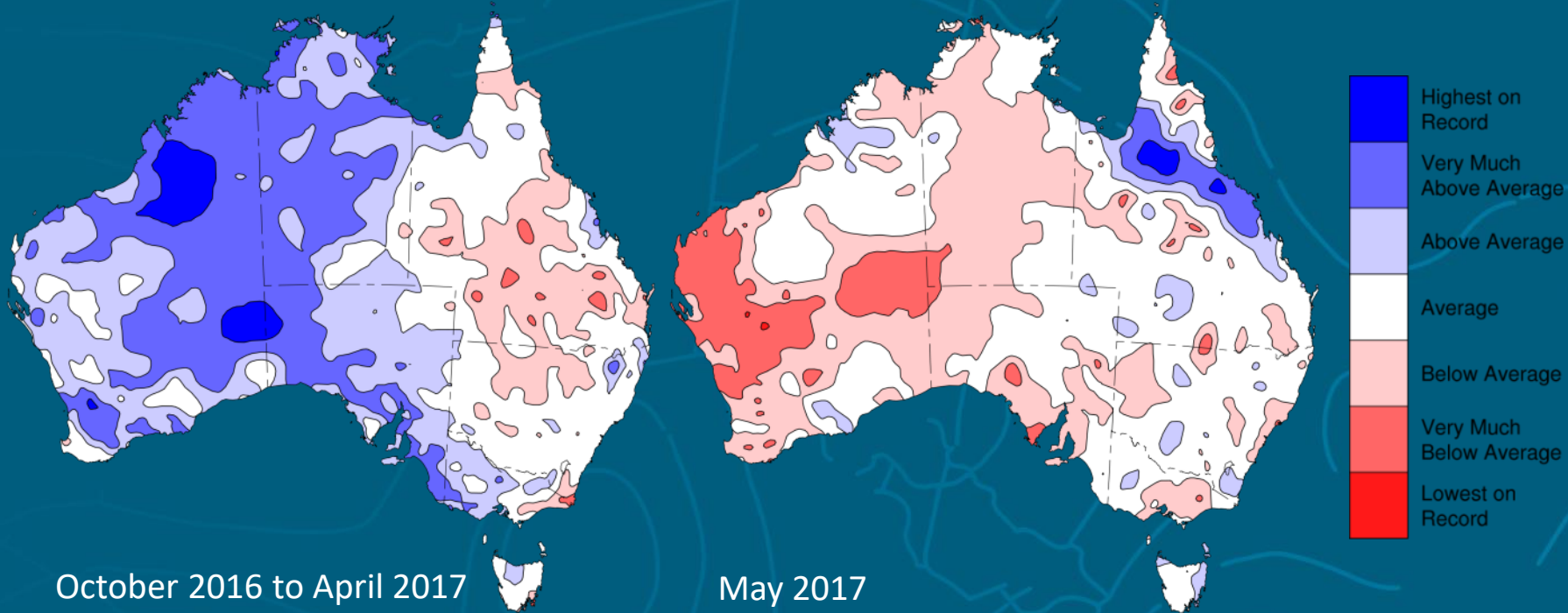
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- 3. Outlook for 2016**

**Antecedent conditions**

**Seasonal Climate Outlook**



# Rainfall: Monsoon season and the dry (so far)

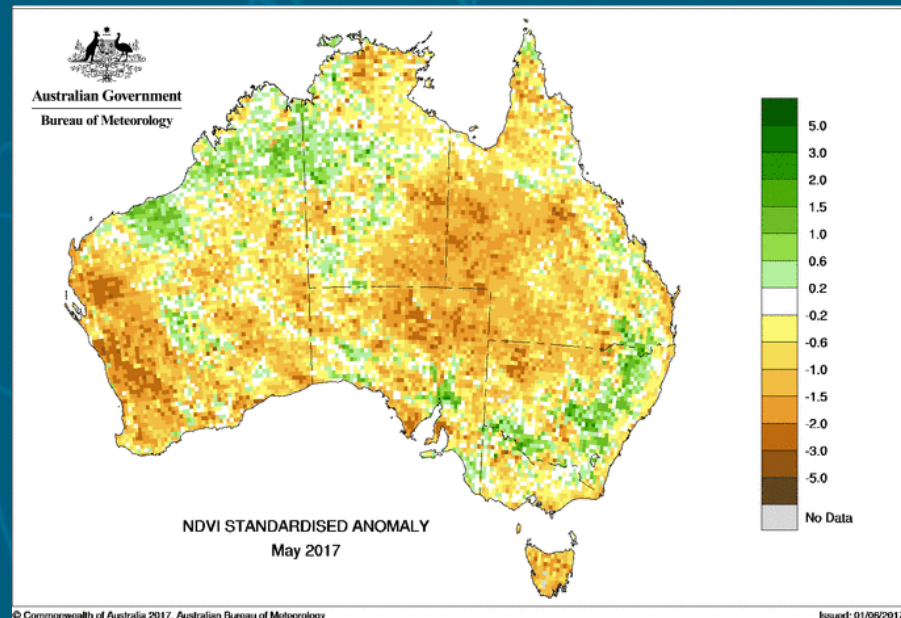
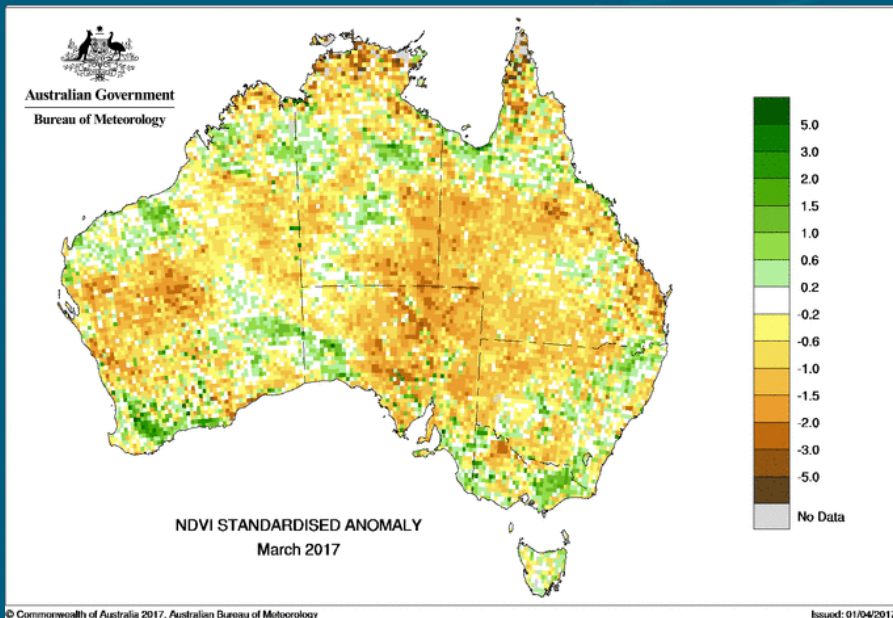


October 2016 to April 2017

May 2017



# Recent NDVI: March & May 2017

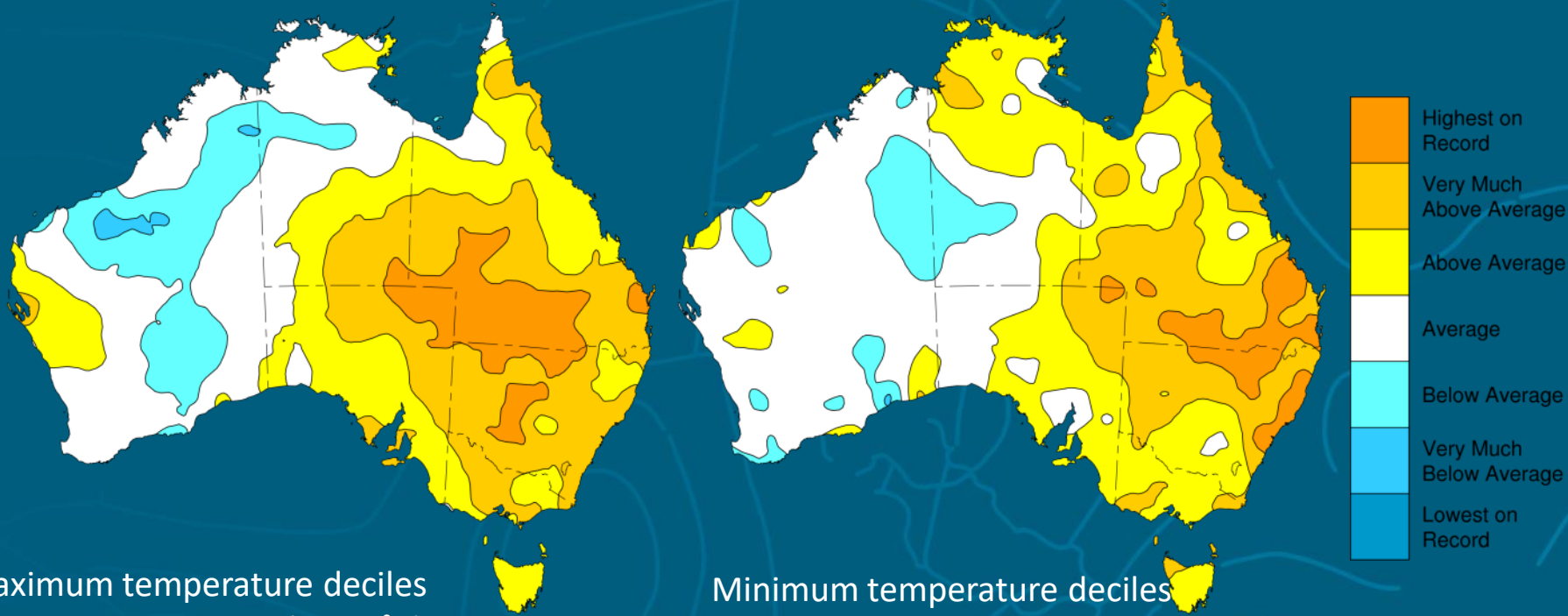


March 2017 NDVI anom

May 2017 NDVI anom



# Temperatures: Warm east, cooler west

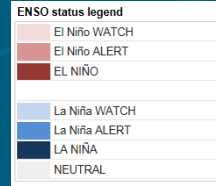
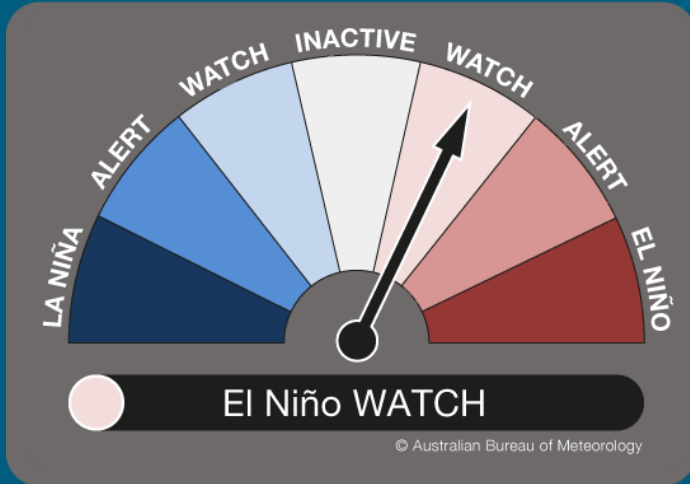


Maximum temperature deciles  
January to May 2017 (+0.58°C)

Minimum temperature deciles  
January to May 2017 (+0.42°C)

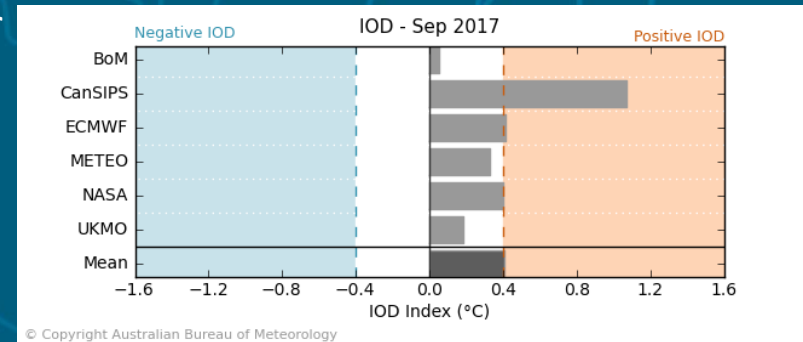
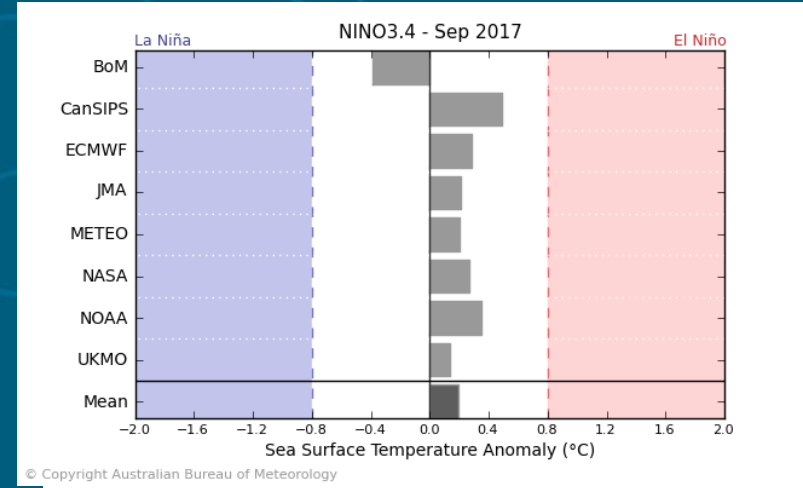


# El Niño watch → 25% probability of an event



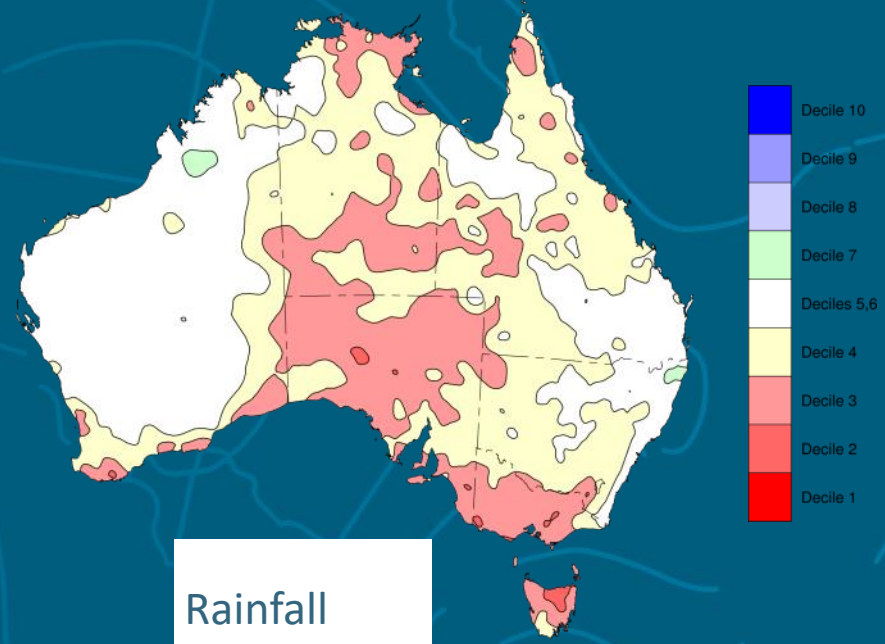
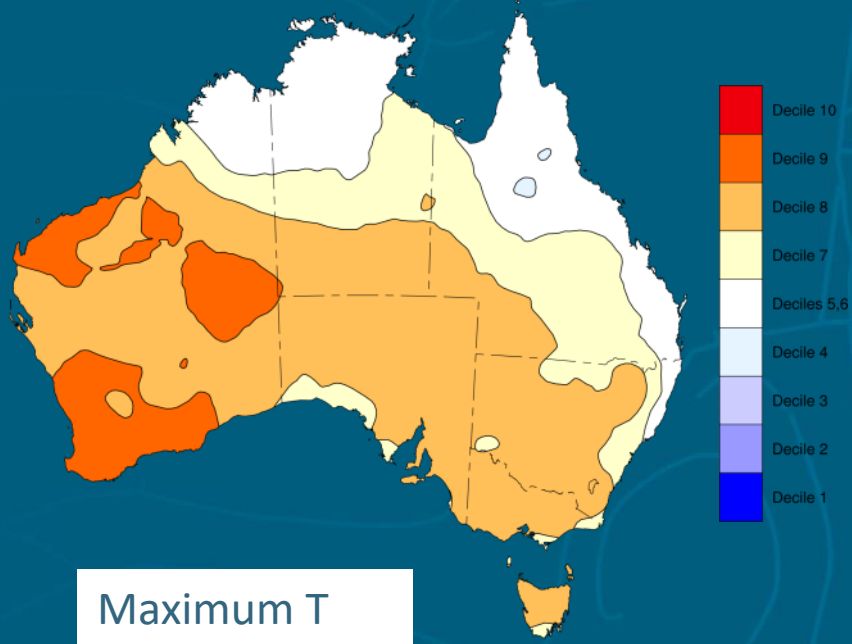
Model forecasts of IOD and El Niño for September

Model forecasts show neutral to El Niño conditions and possible positive IOD



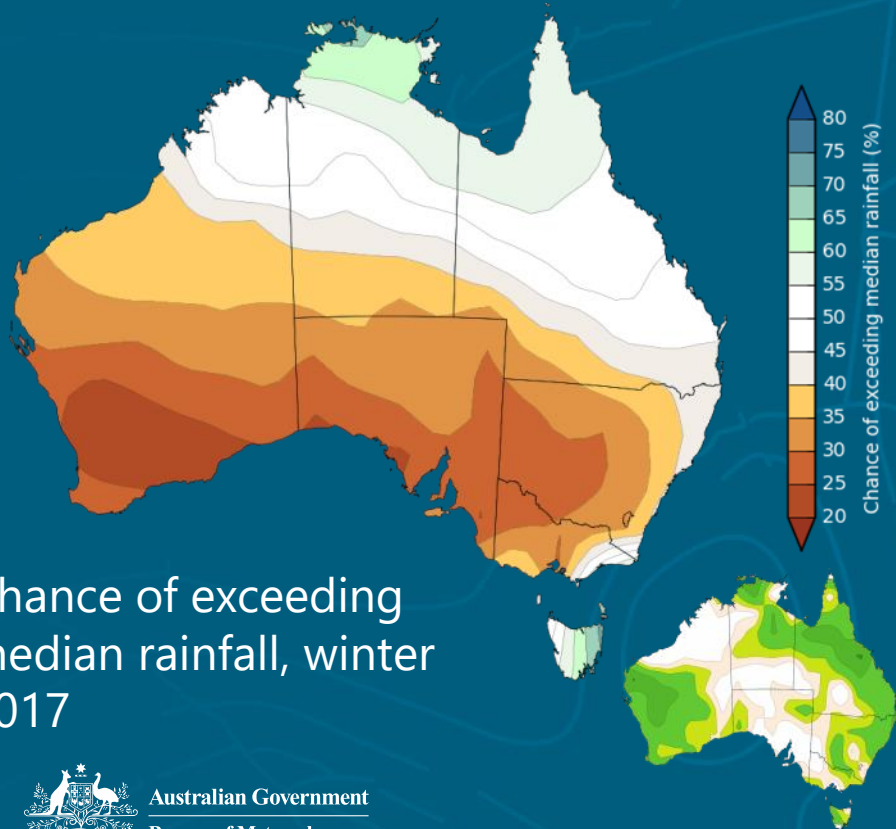
# Positive IOD impacts

July – November rainfall and maximum temperatures

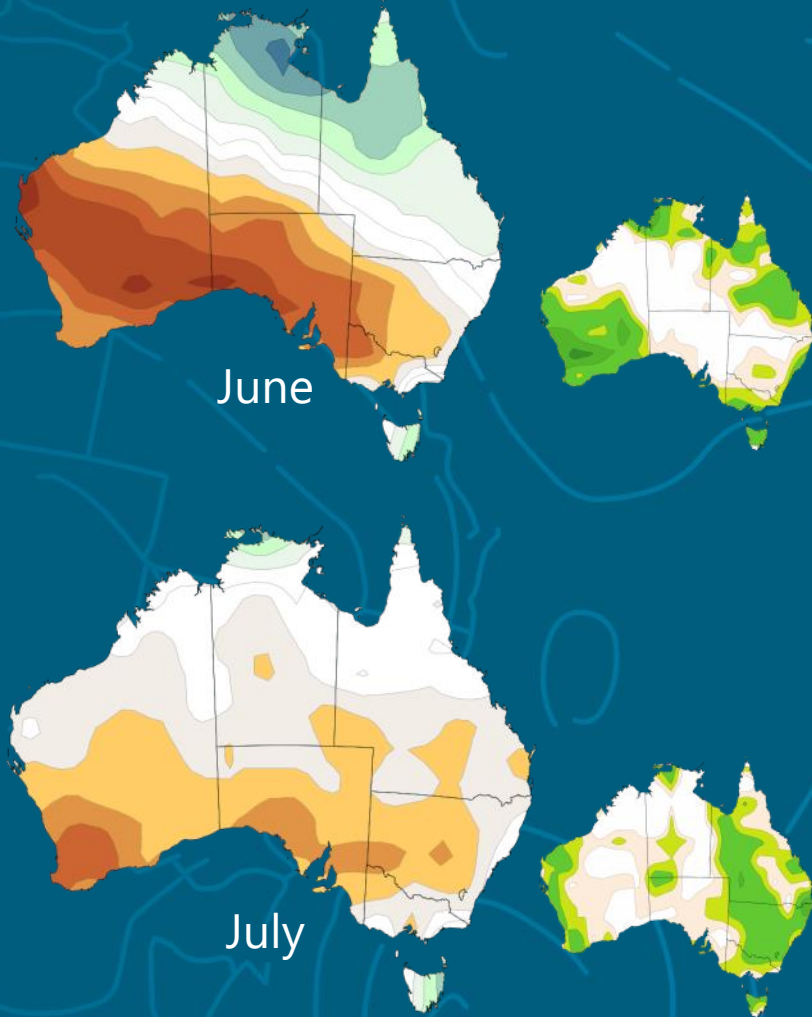




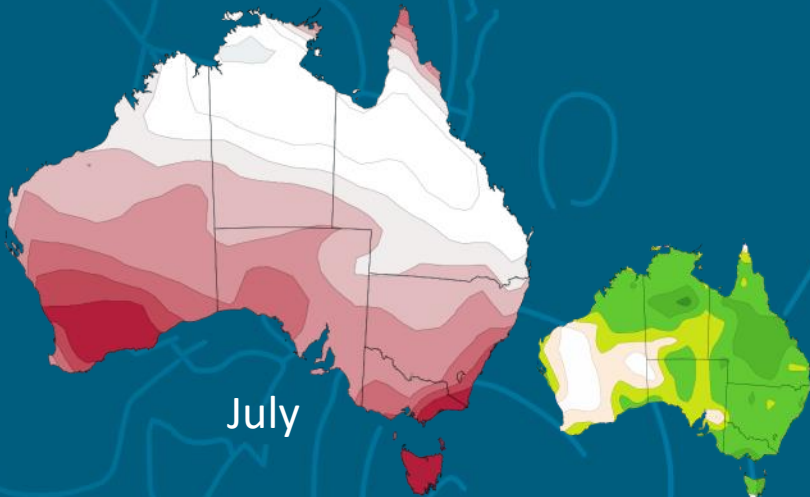
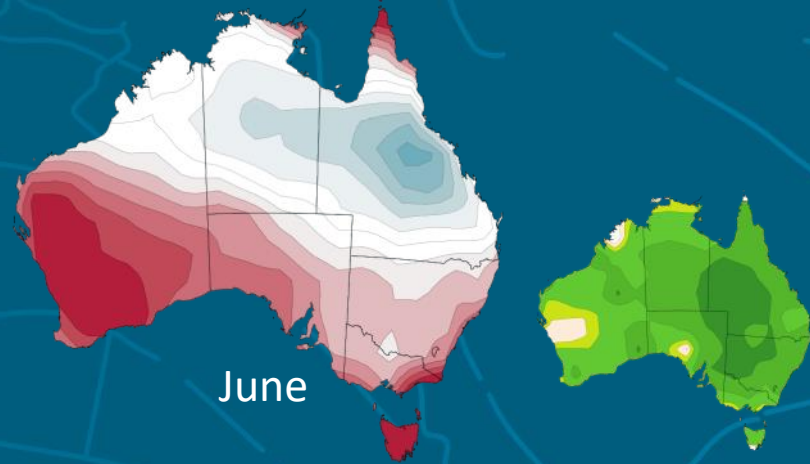
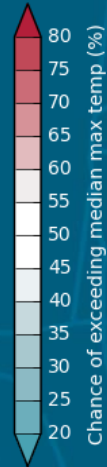
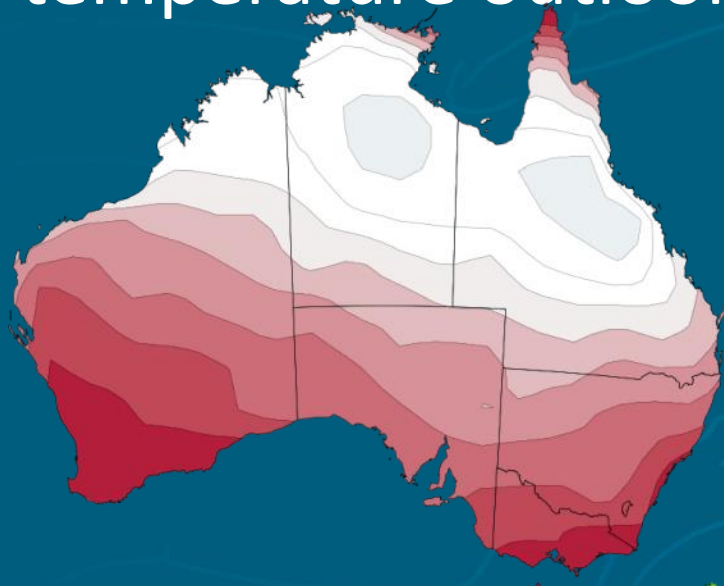
# Jun-Aug rainfall outlook



Chance of exceeding median rainfall, winter 2017



# Jun-Aug maximum temperature outlook

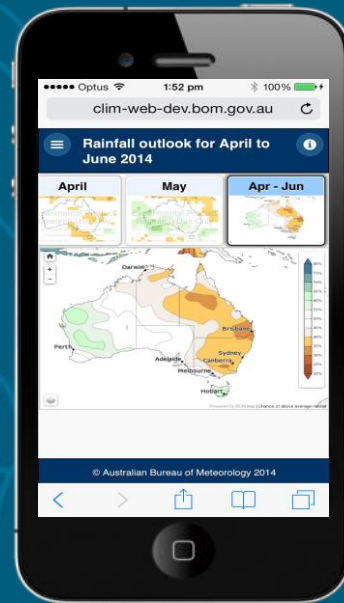
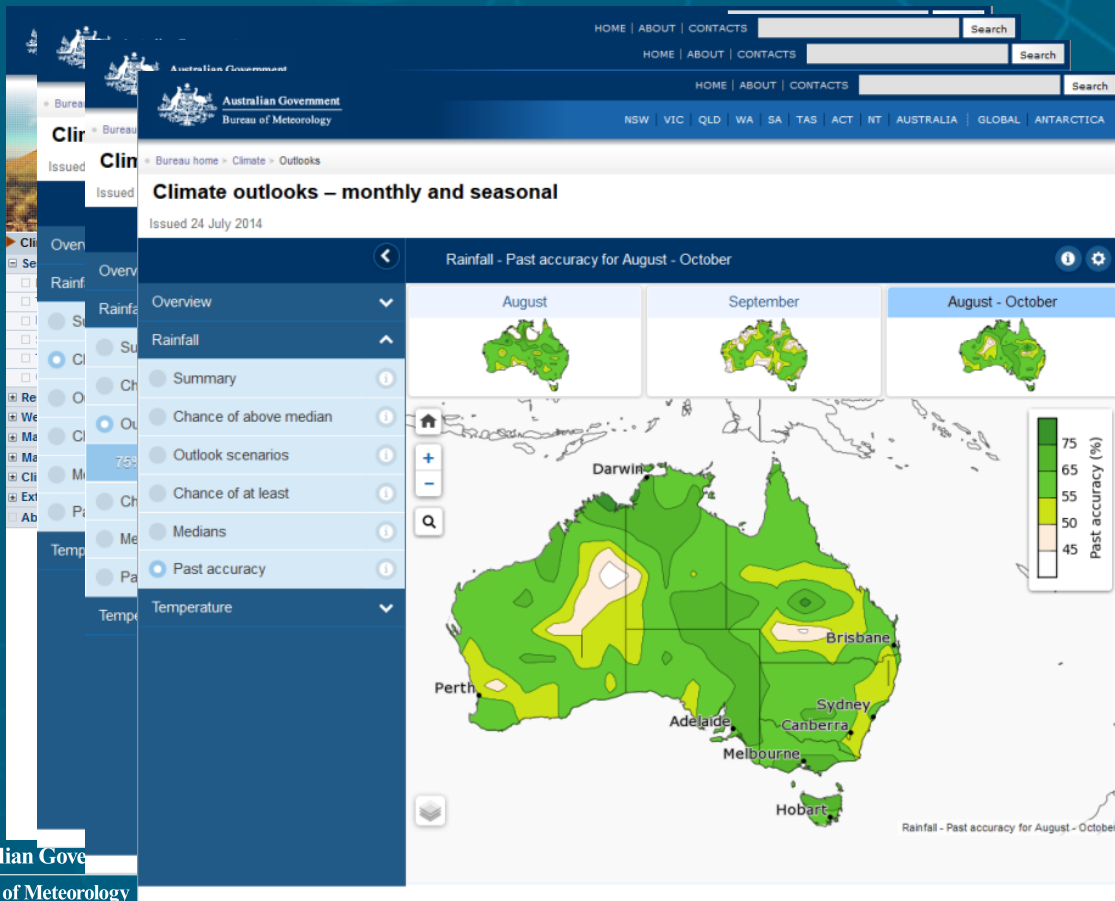


Chance of exceeding median maximum temperature, winter 2017



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# Keeping updated



# Planned improvements to BoM climate forecasts

## Higher resolution

- *From 250 km to 60 km*
- *Downscaling data to 5 km*

## More accurate forecasts

- *On par with the best performing global models*

## New fortnightly forecasts

- *Filling the gap between 7-day weather forecasts and monthly and seasonal outlooks*

## More frequent issue of outlooks



• *Weekly instead of monthly*  
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**BETTER SEASONAL OUTLOOKS**

**FINER MODEL DETAIL**  
MOVING FROM 250 KM TO 60 KM RESOLUTION  
Australia: 120 to 2000 grid points  
meaning more localized information by accounting for local conditions

**MORE OUTLOOK PERIODS**  
SEAMLESS: FILLING THE GAP BETWEEN 7-DAY AND MONTHLY OUTLOOKS  
SEASON  
MONTH  
FORTNIGHT  
WEEK  
outlooks updated weekly

**HIGHER OUTLOOK SKILL**  
SIGNIFICANT IMPROVEMENT IN OUTLOOK ACCURACY  
meaning the best outlooks for Australia of all international models

**WORLD CLASS SERVICE**  
INFORMATION IS CLEAR, CONCISE AND AVAILABLE WHEN AND WHERE YOU NEED IT  
More intelligence possible:

- Evaporation
- Humidity
- Wind
- Drought
- Extremes
- Tropical Cyclones

not only rainfall and temperature

**BIGGER USER RETURNS**  
REDUCE LOSSES:  
by mitigating climate impacts such as the 2010-11 La Niña agriculture production loss of more than \$2 billion  
Potential value of improved seasonal forecasts:  
more than \$1 billion per year

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# Summary

- Heavy monsoon rainfall in northwest, lighter in northeast
- Temperatures somewhat above average
- Pacific currently neutral, with a positive IOD probable
- June – August outlook:
  - Near average rainfall for region of interest – likely wetter in north and drier in south
  - Temperatures near average
  - New Climate Outlooks available 29 June, which will include *monthly and seasonal* rainfall and temperature outlooks



# Thank you

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