



Australian Government  
Bureau of Meteorology

# Climate and water briefing

**Matthew Coulton**

Manager Water Sector Engagement



25 Aug 2018 Sheep on a drought affected farm near the NSW town of Bigga. Source ABC News Franklin Hood

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



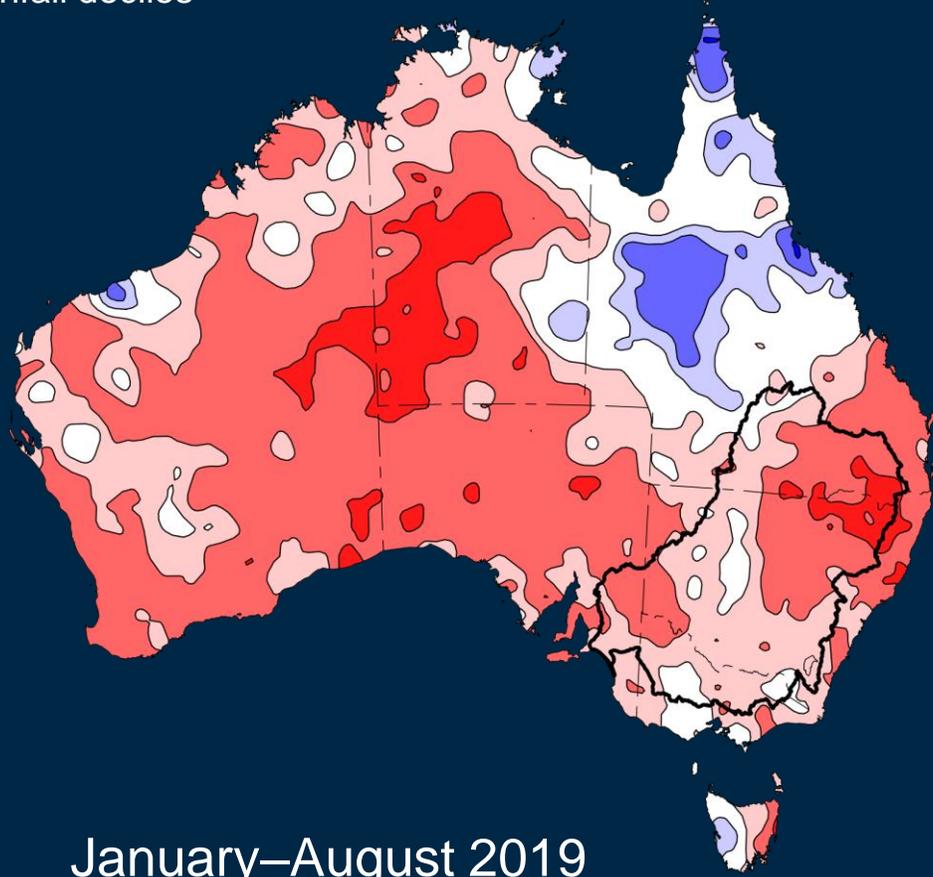
# Antecedent conditions

- **Antecedent conditions**
- Long-term trends
- Current climate drivers
- Climate outlook: rainfall and temperature

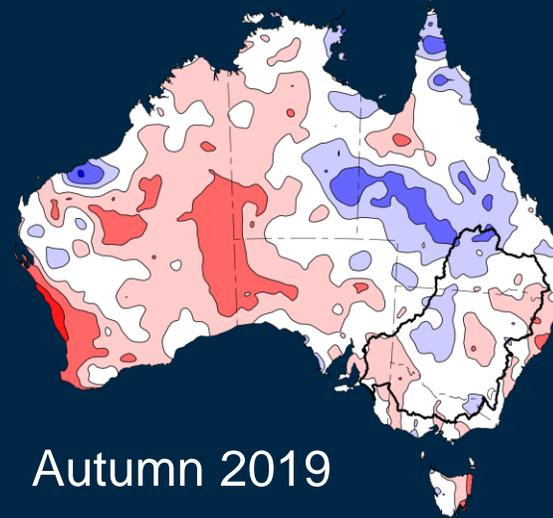


# Recent rainfall

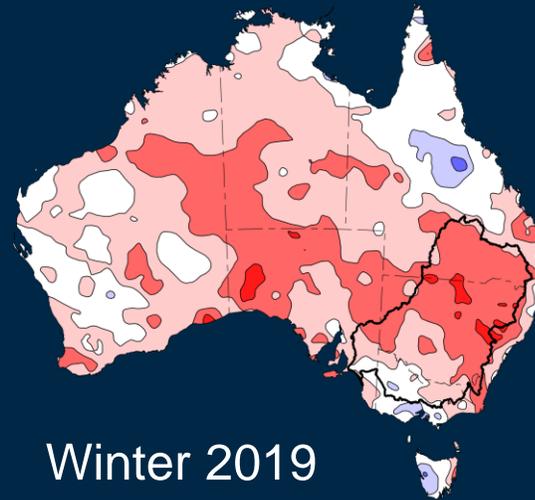
Rainfall deciles



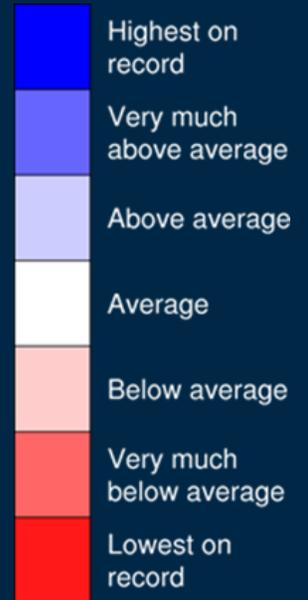
January–August 2019



Autumn 2019  
(March-May)



Winter 2019  
(June-August)

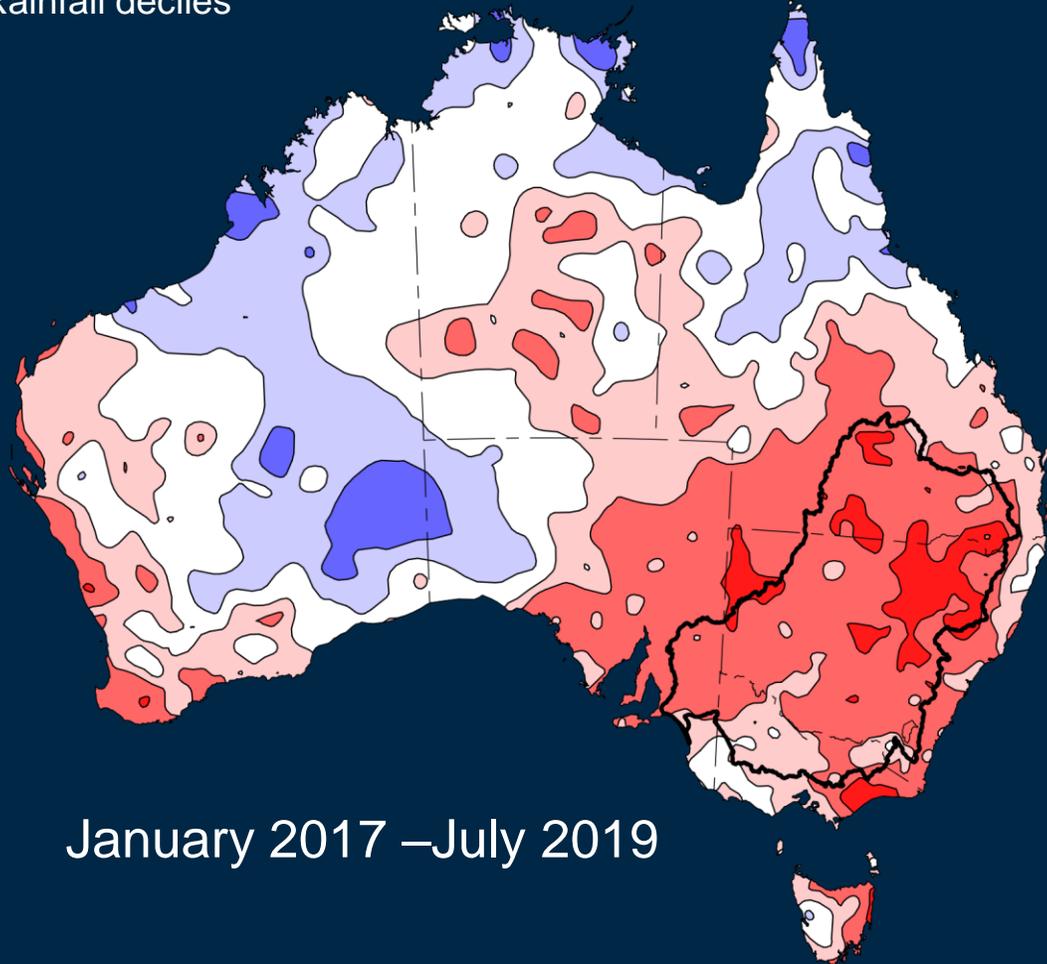


- Very dry winter across most of the date. Very dry year so far, particularly in the north east.

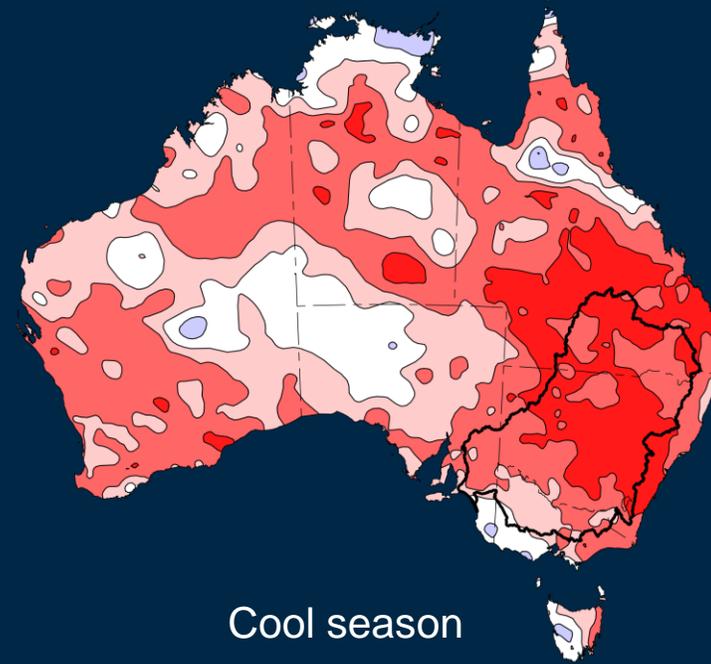


# Long-term dry: 2017-2019

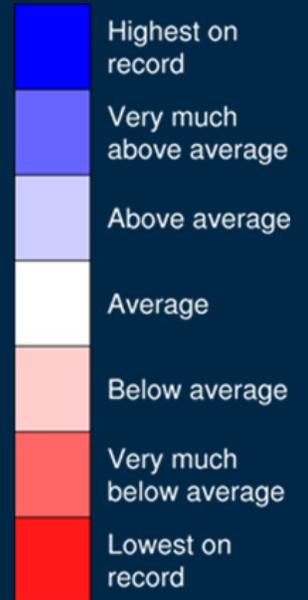
Rainfall deciles



January 2017 – July 2019



Cool season  
(April-September)  
2017 and 2018



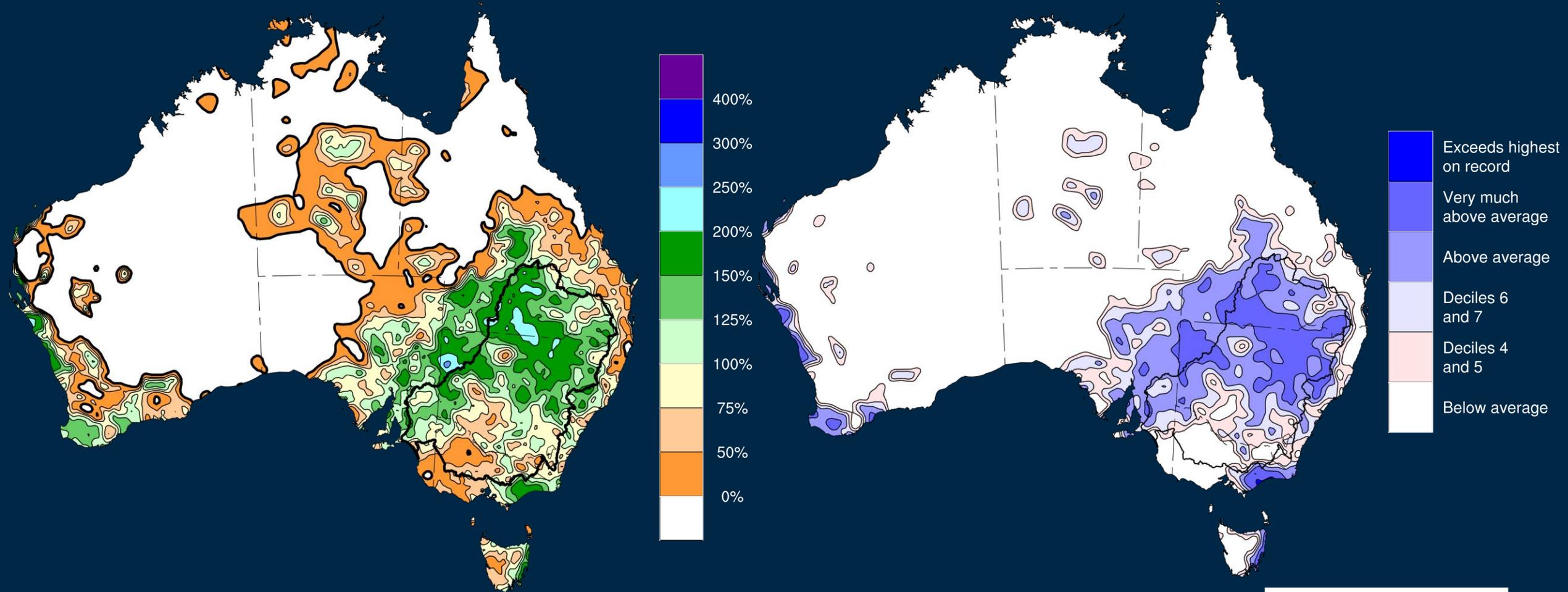
• Jan 2017-Jul 2019 – Lowest 31 month rainfall total on record for NSW

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



Australian Government  
Bureau of Meteorology

# Rainfall needed over next 6 months to get rainfall since January 2017 out of the bottom 10%



**KNOW YOUR WEATHER.**  
**KNOW YOUR RISK.**

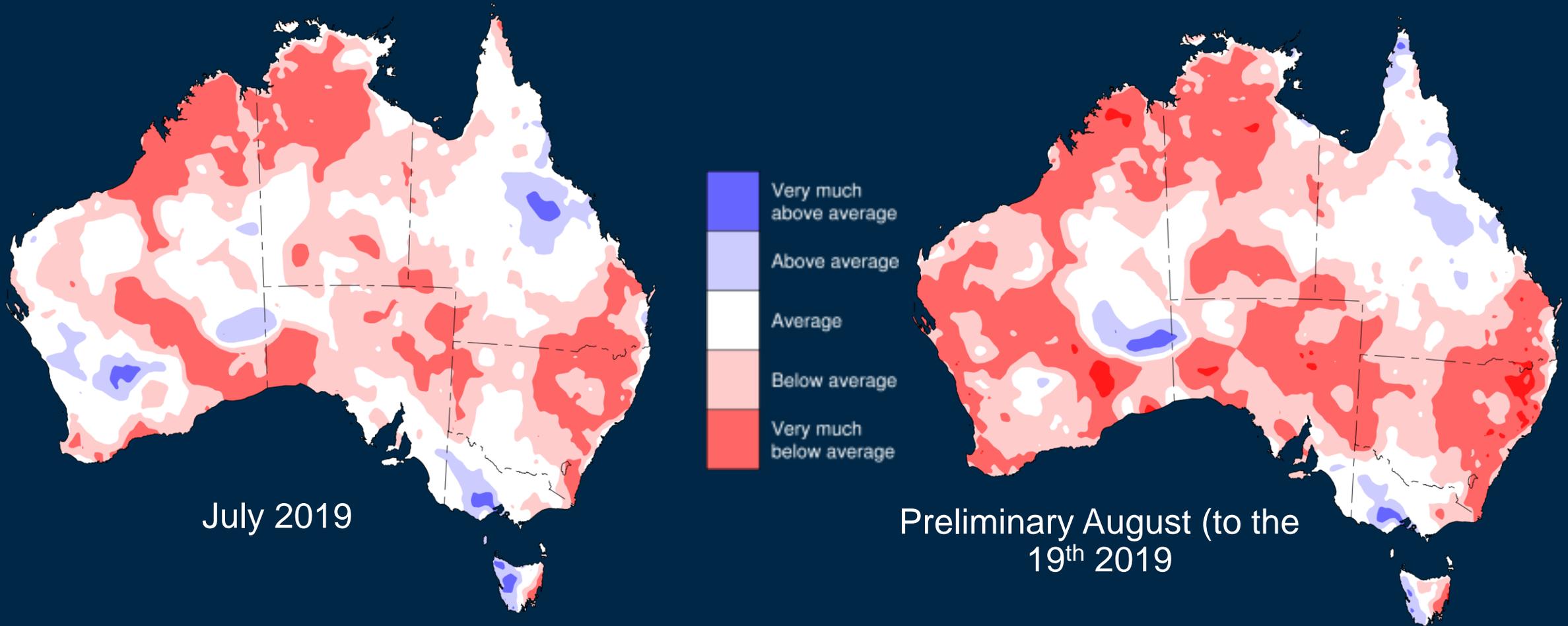


Australian Government

Bureau of Meteorology

# Soil moisture

Lower-layer soil moisture deciles



July 2019

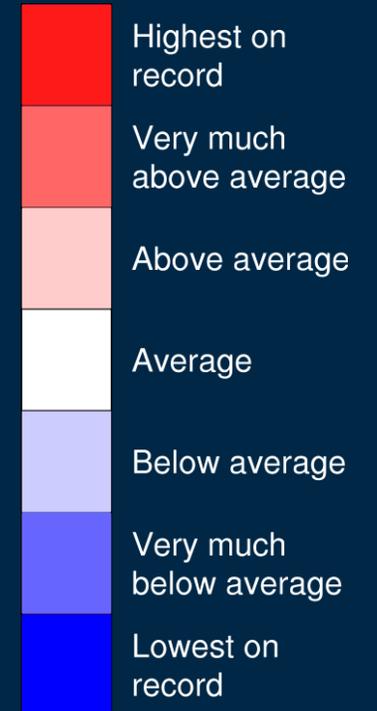
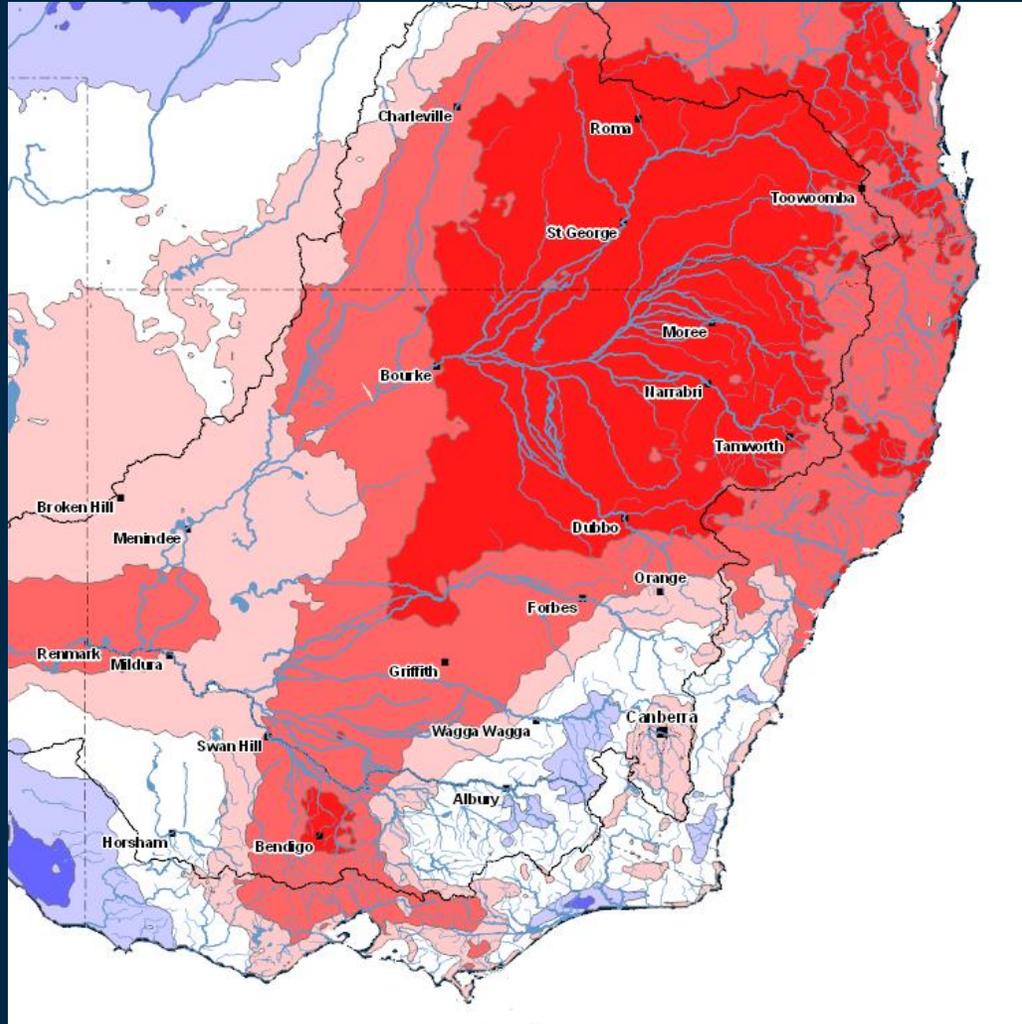
Preliminary August (to the 19<sup>th</sup> 2019)

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



# Recent evaporation demand

Potential evapotranspiration deciles – January to July 2019



**KNOW YOUR WEATHER.**  
**KNOW YOUR RISK.**



# Storage levels – MDB

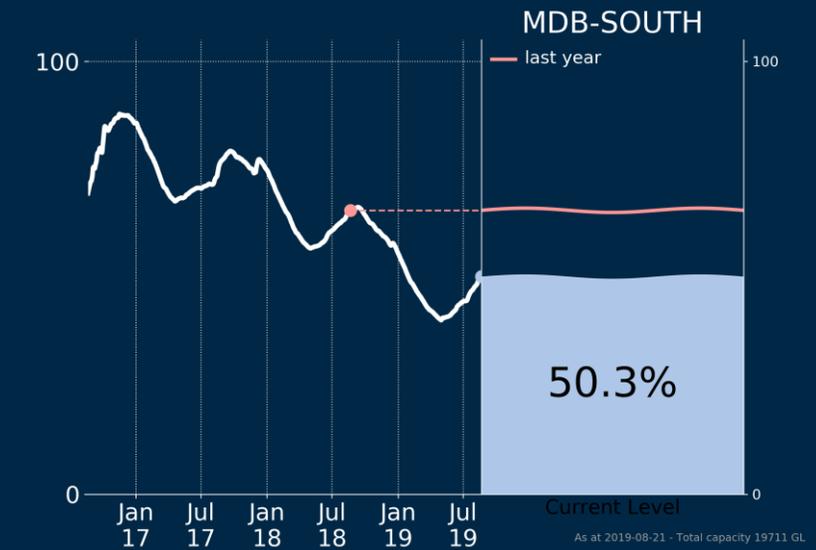
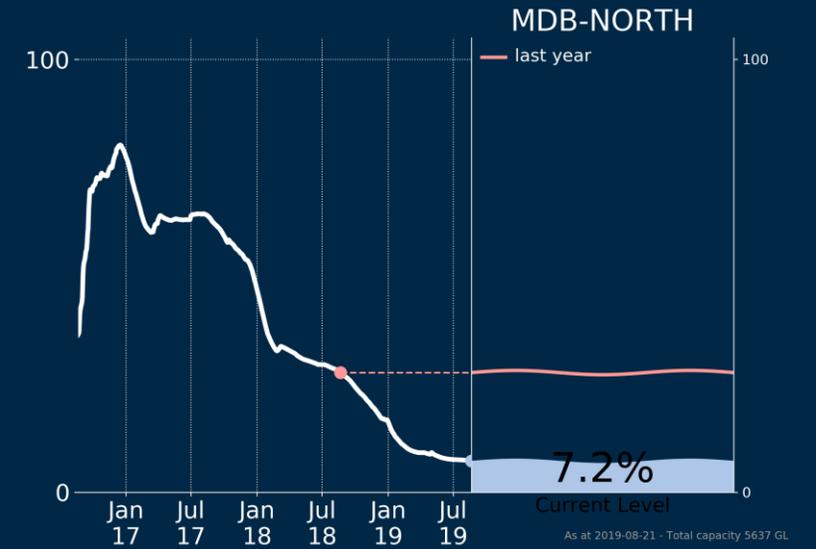
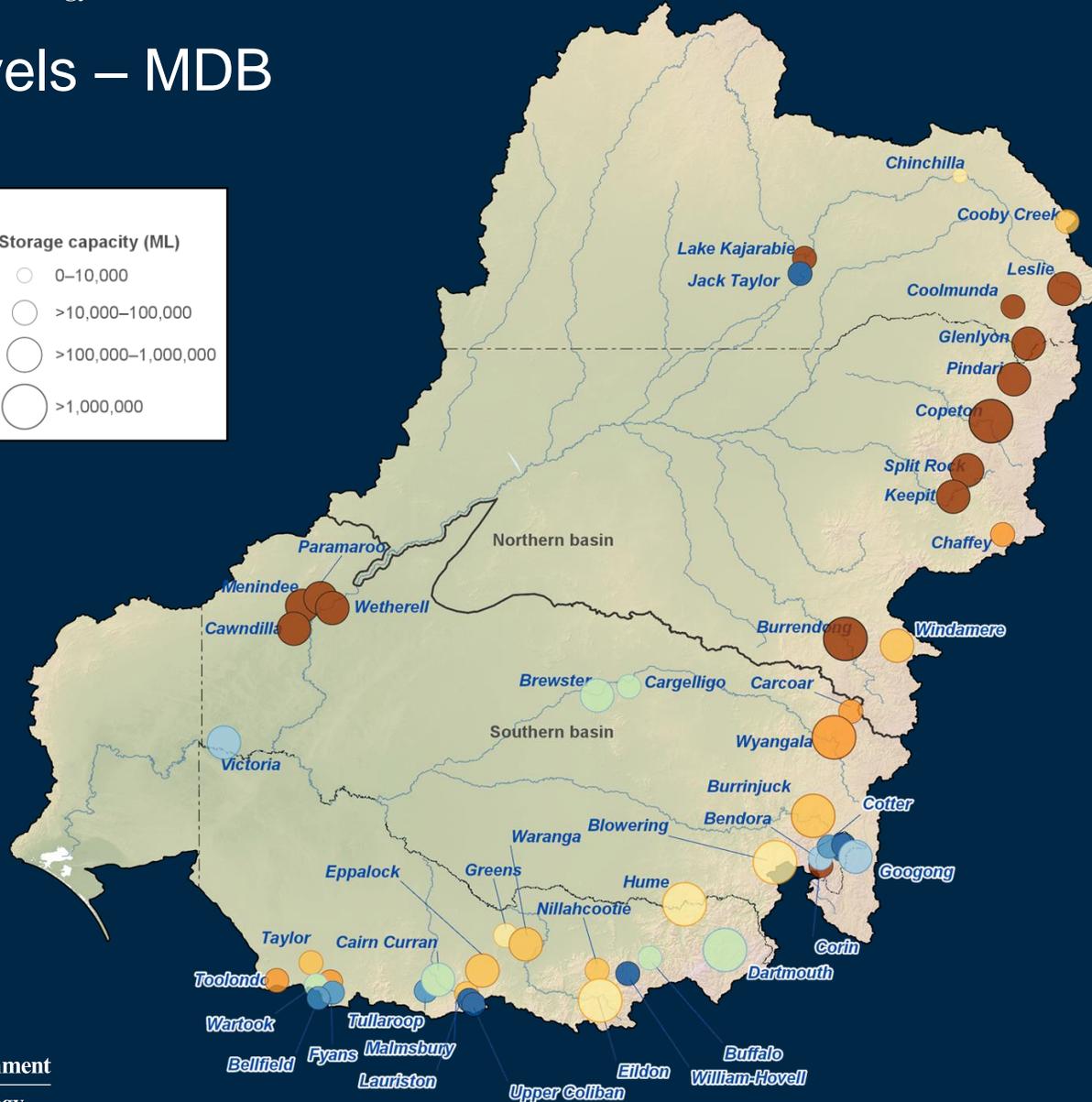
Storage level: 21 August 2019

Percentage full (%)

- >80
- >70–80
- >60–70
- >50–60

Storage capacity (ML)

- 0–10,000
- >10,000–100,000
- >100,000–1,000,000
- >1,000,000



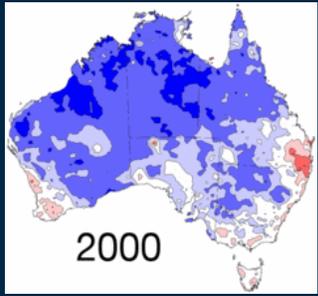


# Long-term trends

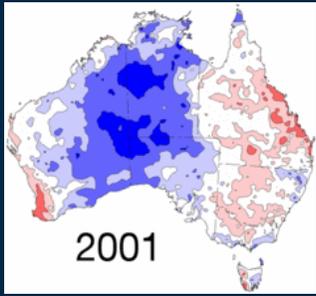
- Antecedent conditions
- **Long-term trends**
- Current climate drivers
- Climate outlook: rainfall and temperature

This data was accurate as of 21 August 2019. For long-term trends, visit <http://www.bom.gov.au/climate/change>

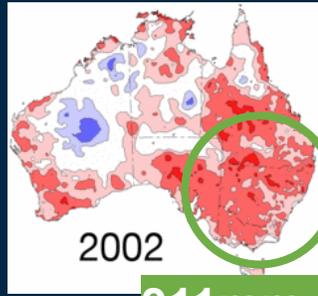
# Long-term rainfall trends – annual



2000

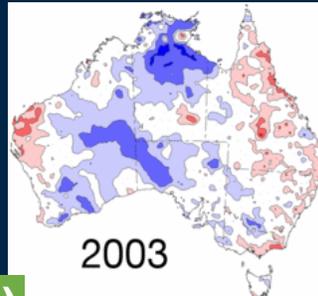


2001

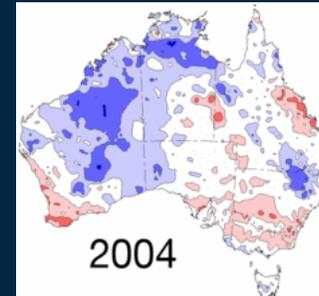


2002

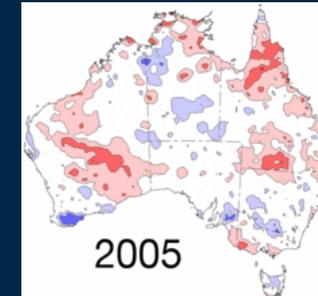
311mm (4)



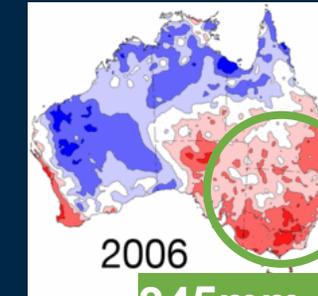
2003



2004

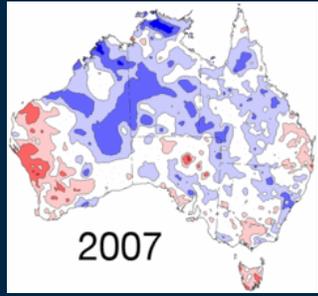


2005

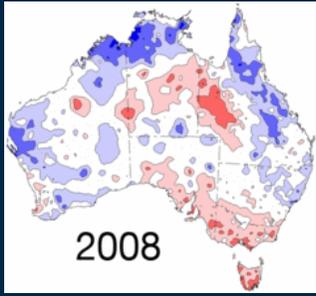


2006

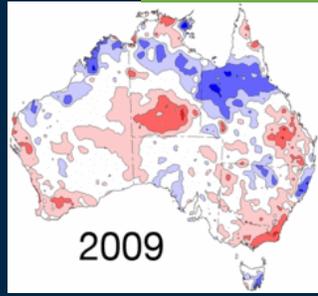
345mm (9)



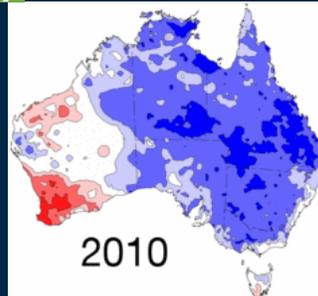
2007



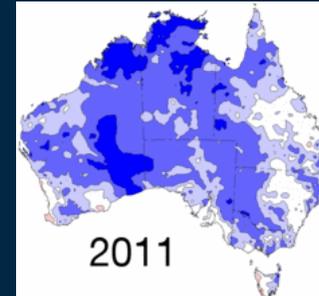
2008



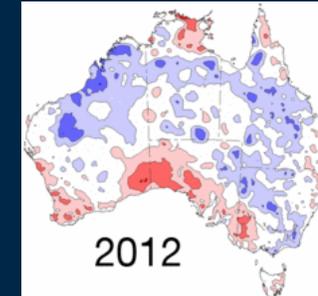
2009



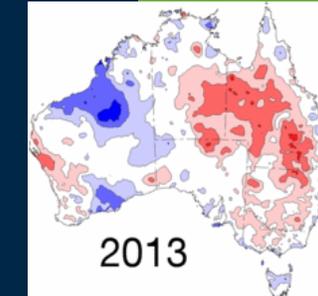
2010



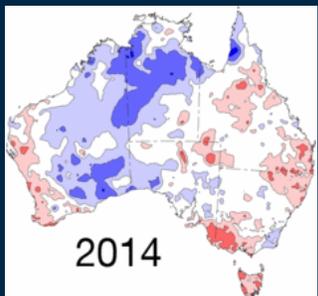
2011



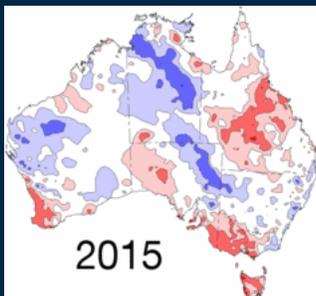
2012



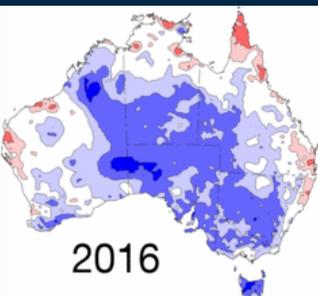
2013



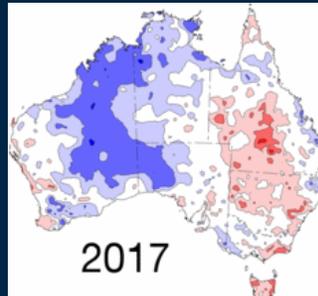
2014



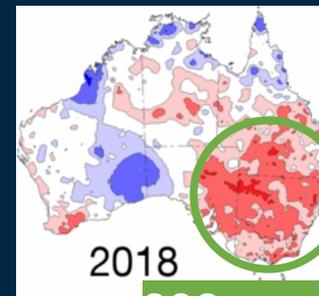
2015



2016

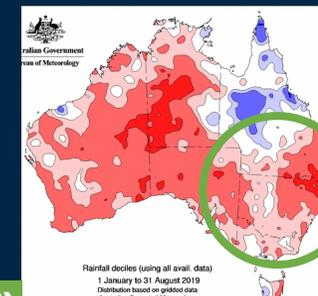


2017



2018

333mm (7)



If rest of 2019 is average, total of ~342mm (new 9)

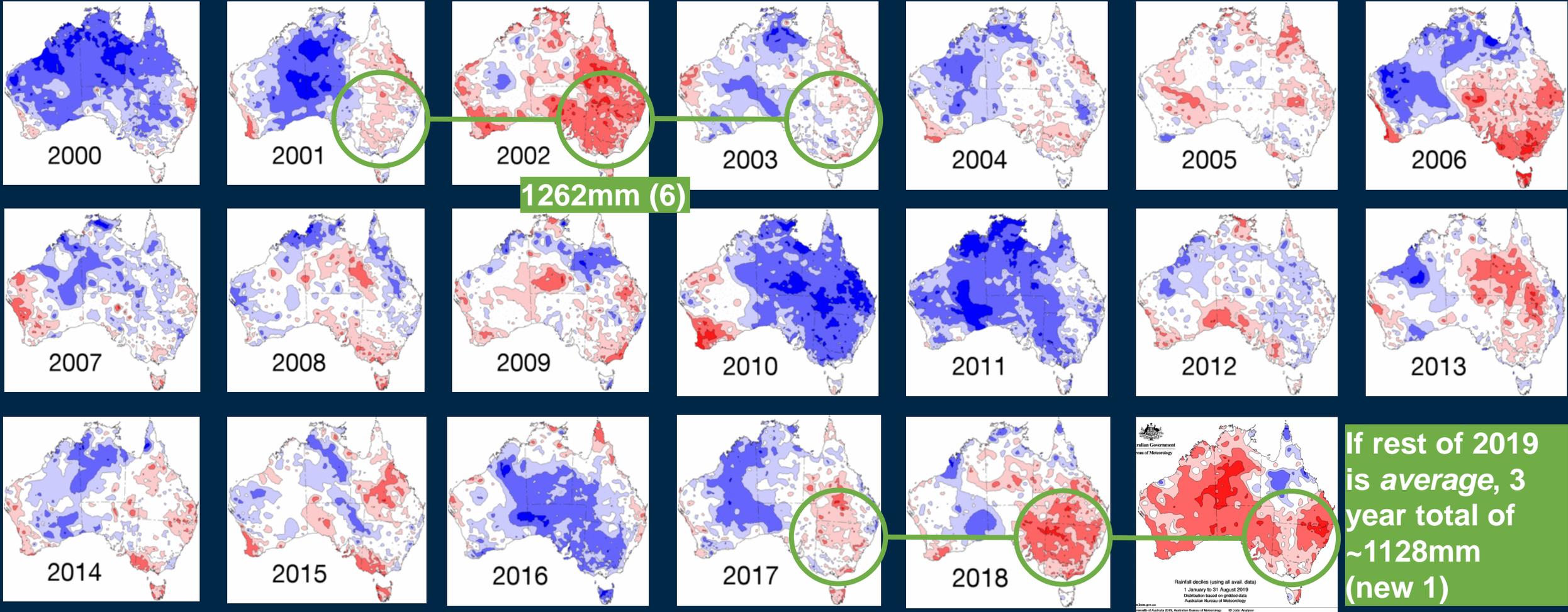
Rainfall declines (using all available data)  
1 January to 31 August 2019  
Distribution based on gridded data  
Australian Bureau of Meteorology  
bom.gov.au  
© Commonwealth of Australia 2019, Australian Bureau of Meteorology. © 2019, Australia

Numbers represent area-averaged annual rainfall within the NSW. Number in brackets is dryness rank out of 119 years.

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**

This data was accurate as of 21 August 2019.  
 For long-term trends, visit  
<http://www.bom.gov.au/climate/change>

# NSW Long-term rainfall trends – 3 years



1262mm (6)

If rest of 2019 is average, 3 year total of ~1128mm (new 1)

**Current rank**  
 1944-1946 – 1200mm (1)  
 1965-1967 – 1205mm (2)  
 1900-1902 – 1207mm (3)

Numbers represent area-averaged 3-year rainfall within the NSW. Average for 1900-2018 is 1566mm. Number in brackets is dryness rank out of 117 periods.



# Vegetation Coverage

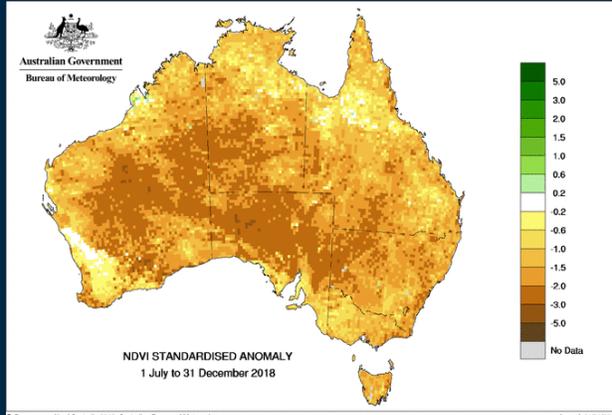
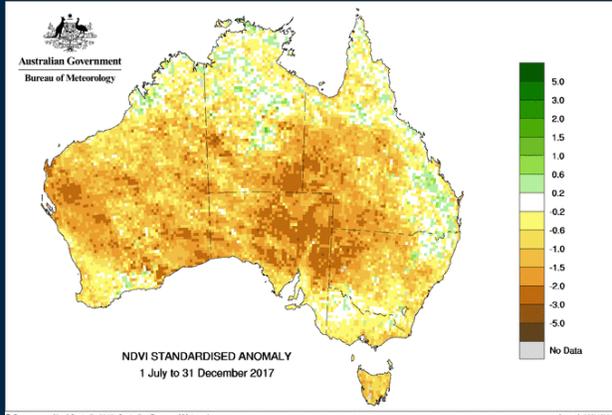
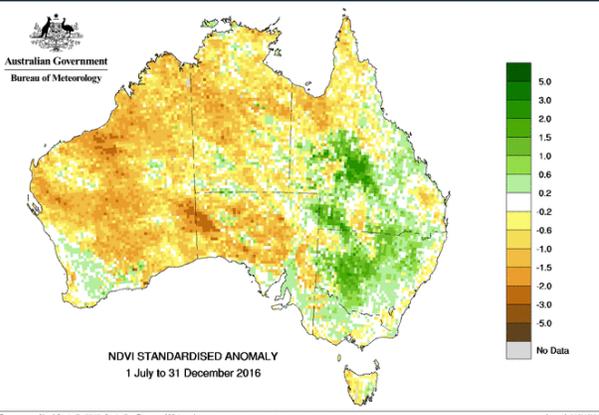
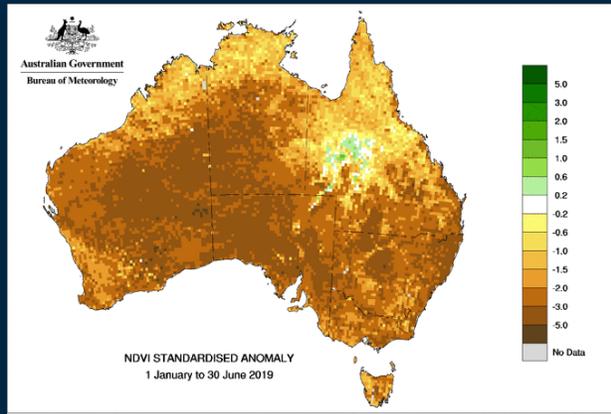
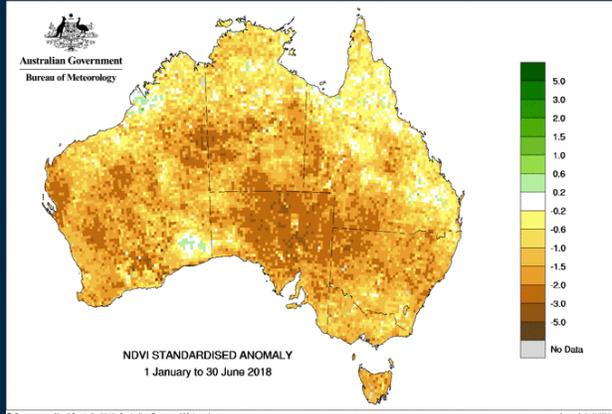
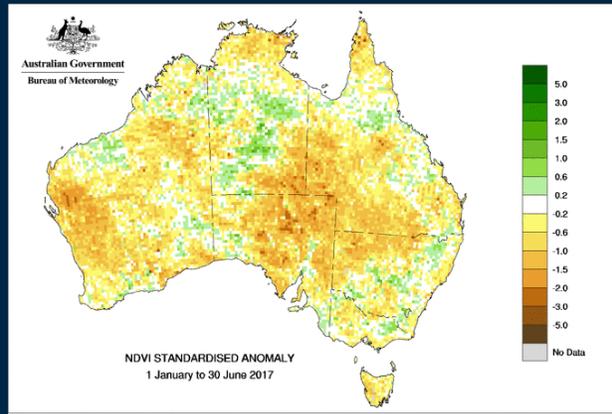
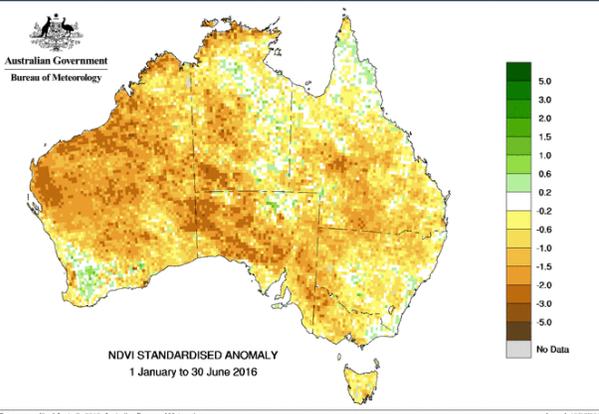
Vegetation anomalies – "average" is white

2016

2017

2018

2019



**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**

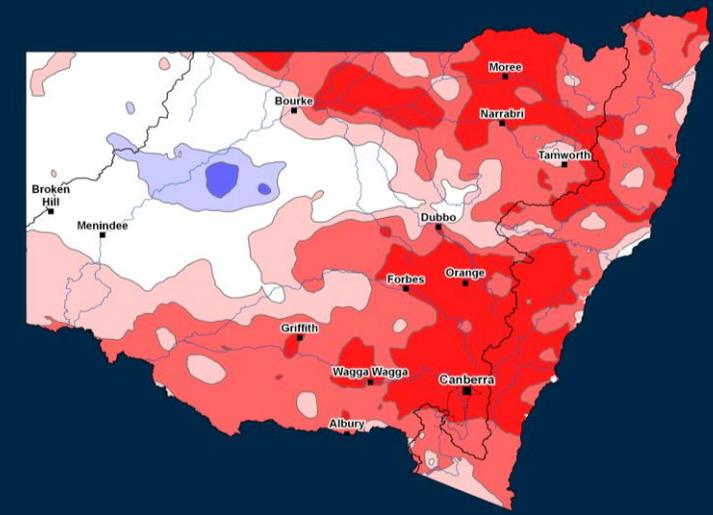
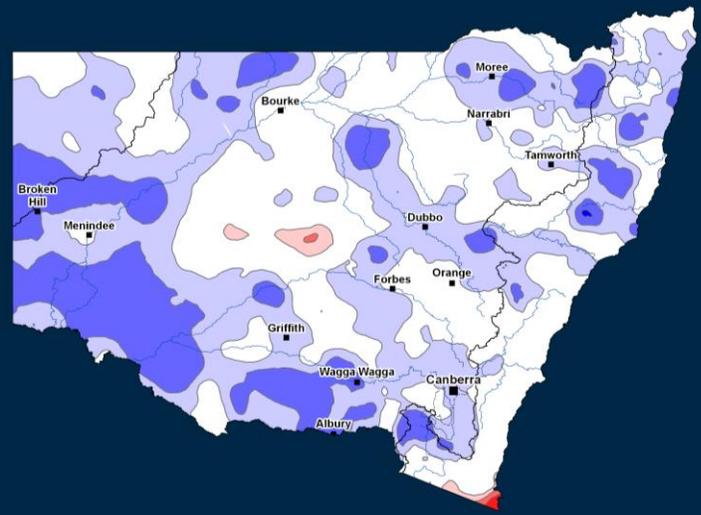
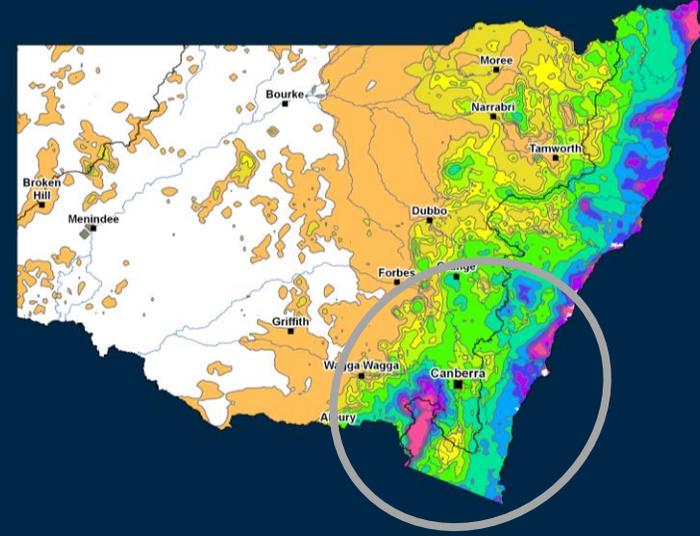
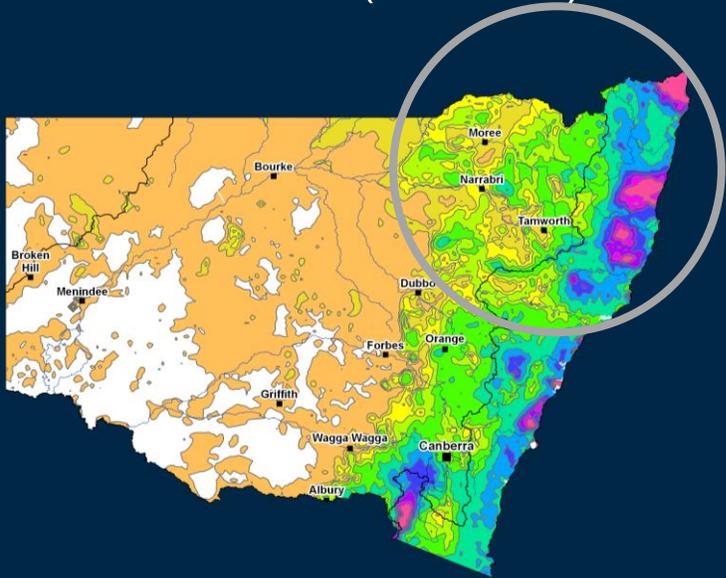
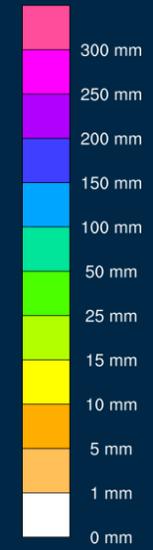
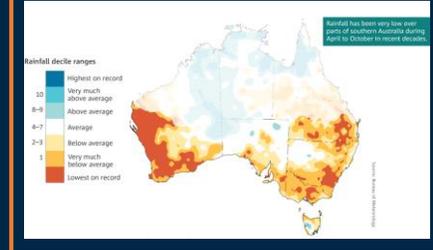


# Seasonal trends

## Warm season (Oct-Mar)

## Cool season (Apr-Sep)

### State of the Climate Report



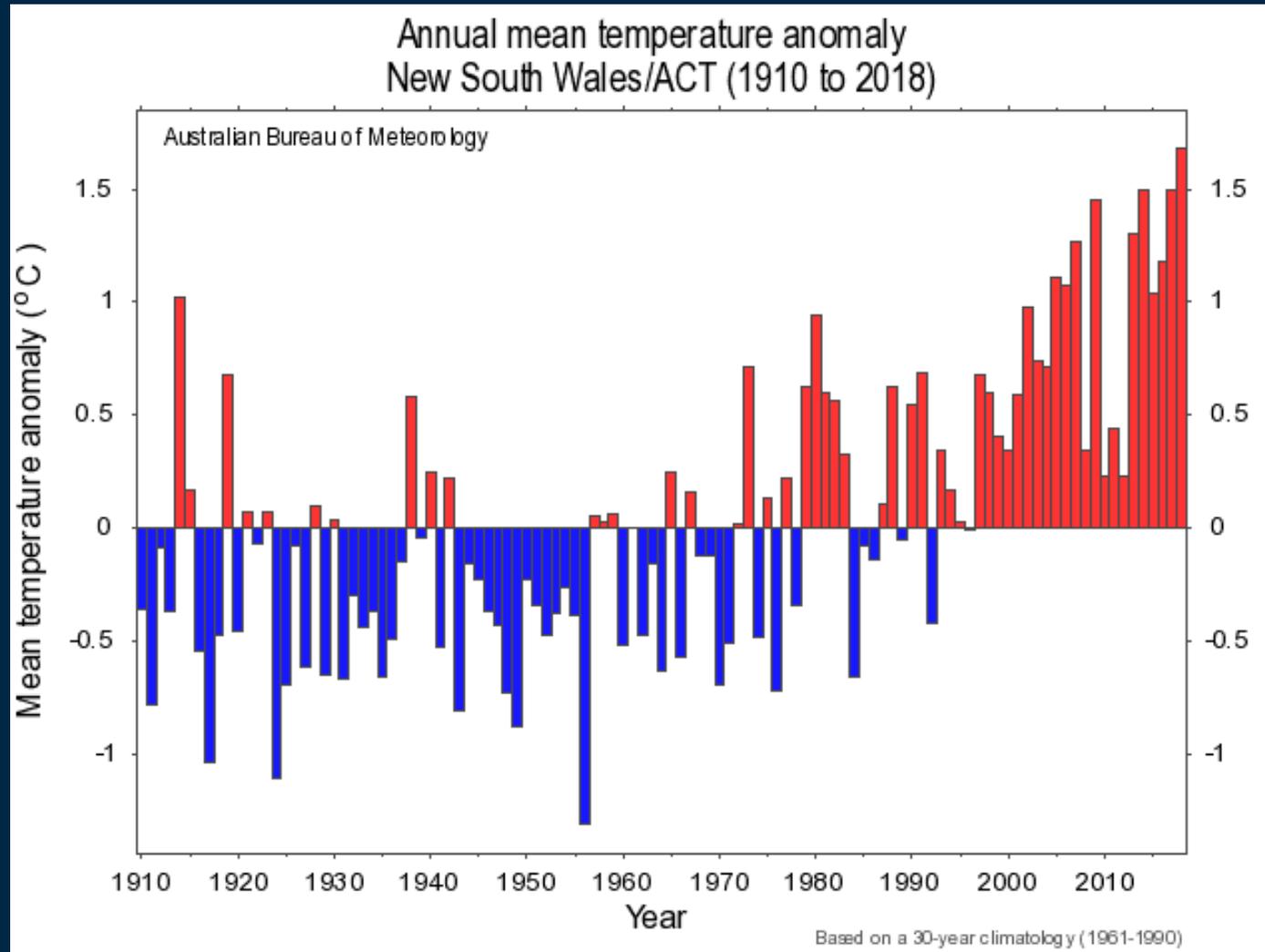
Average runoff  
1911-2018

Rainfall  
percentiles  
2000-2018

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**

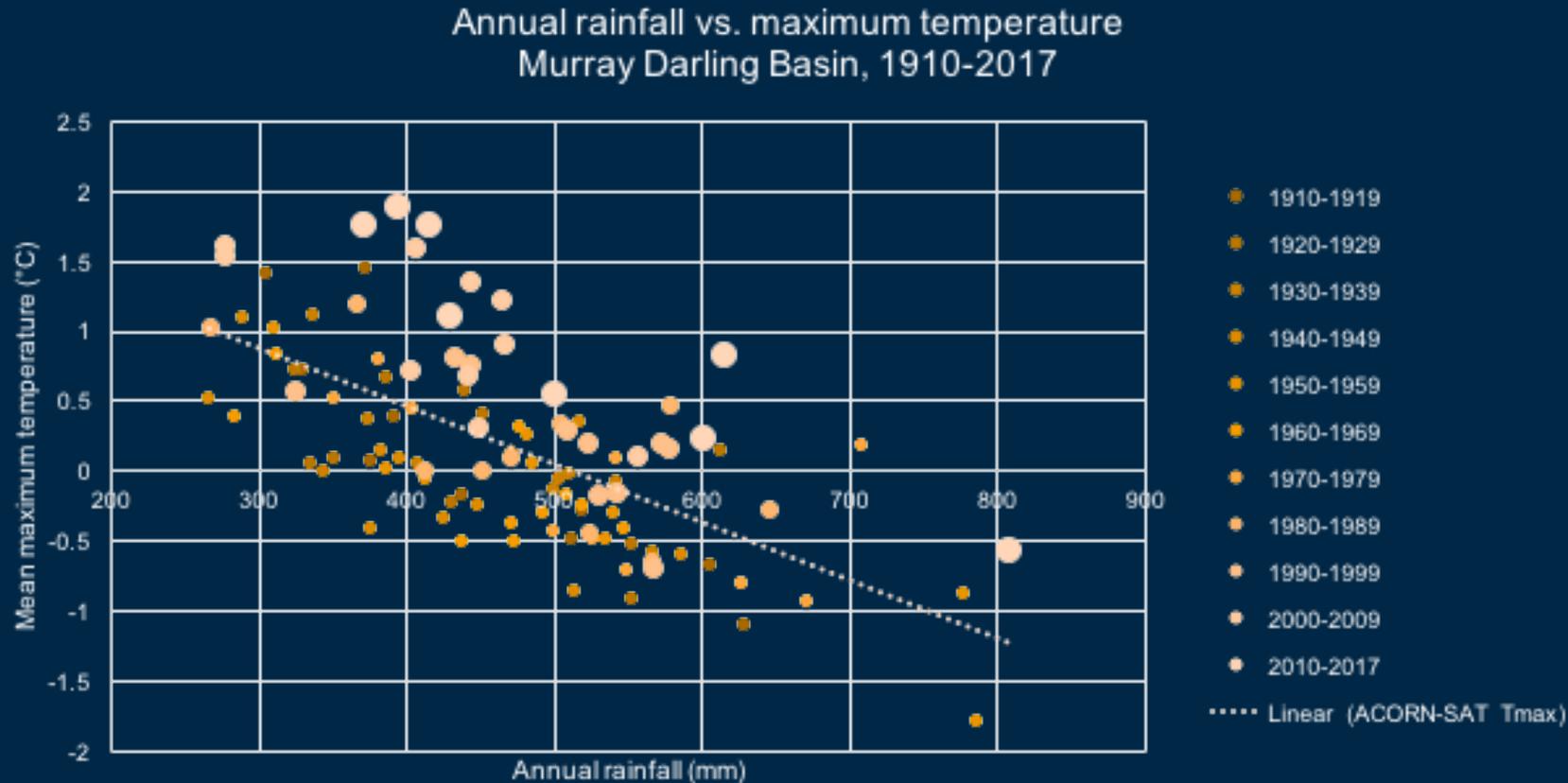


# Long-term temperature trends for NSW





# MDB droughts are getting warmer



Background warming temperature trend causing a permanent change to the characteristics of drought in the basin



Australian Government  
Bureau of Meteorology

# Climate outlook

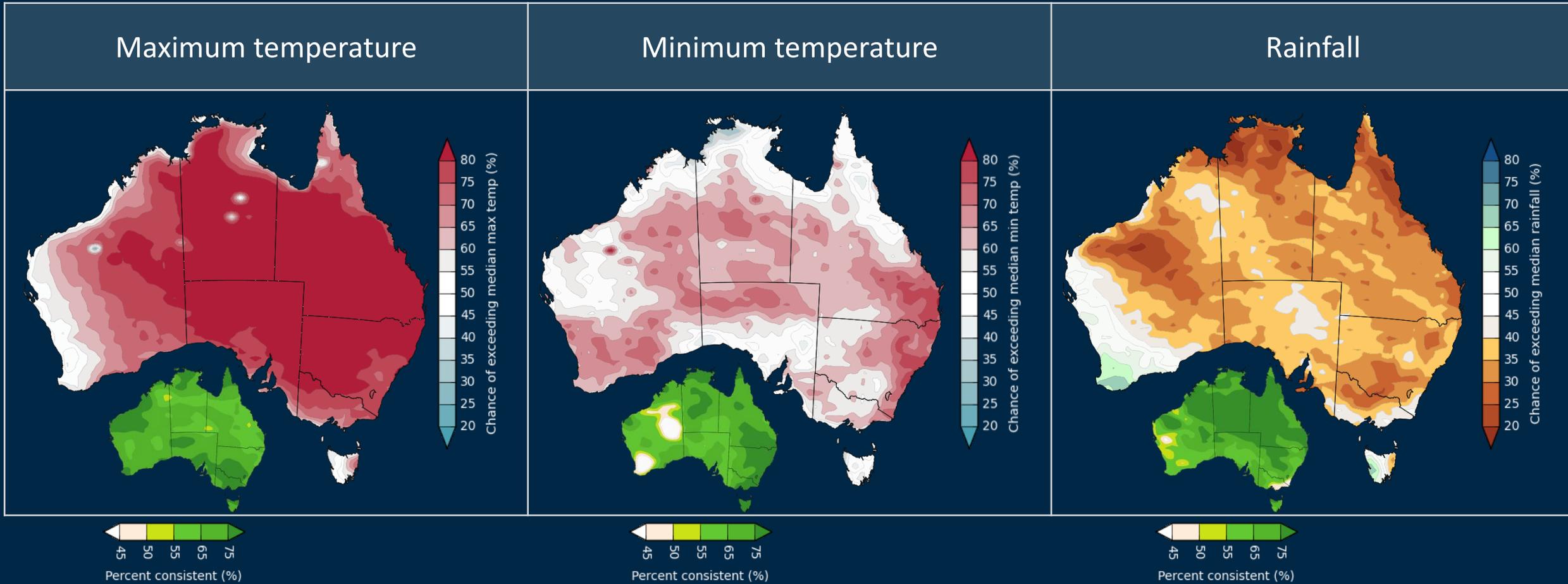
## Rainfall / temperature

- Antecedent conditions
- Long-term trends
- **Climate outlook: rainfall and temperature**
- Current climate drivers

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**

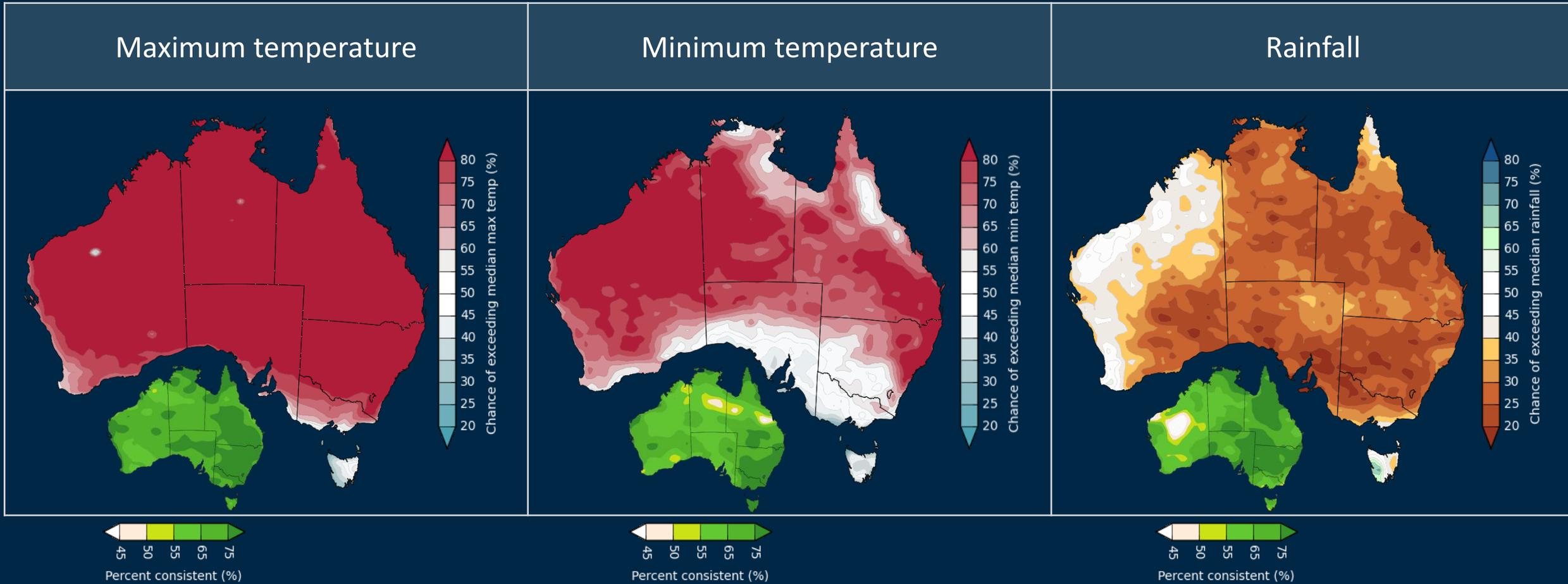


# September 2019 outlook



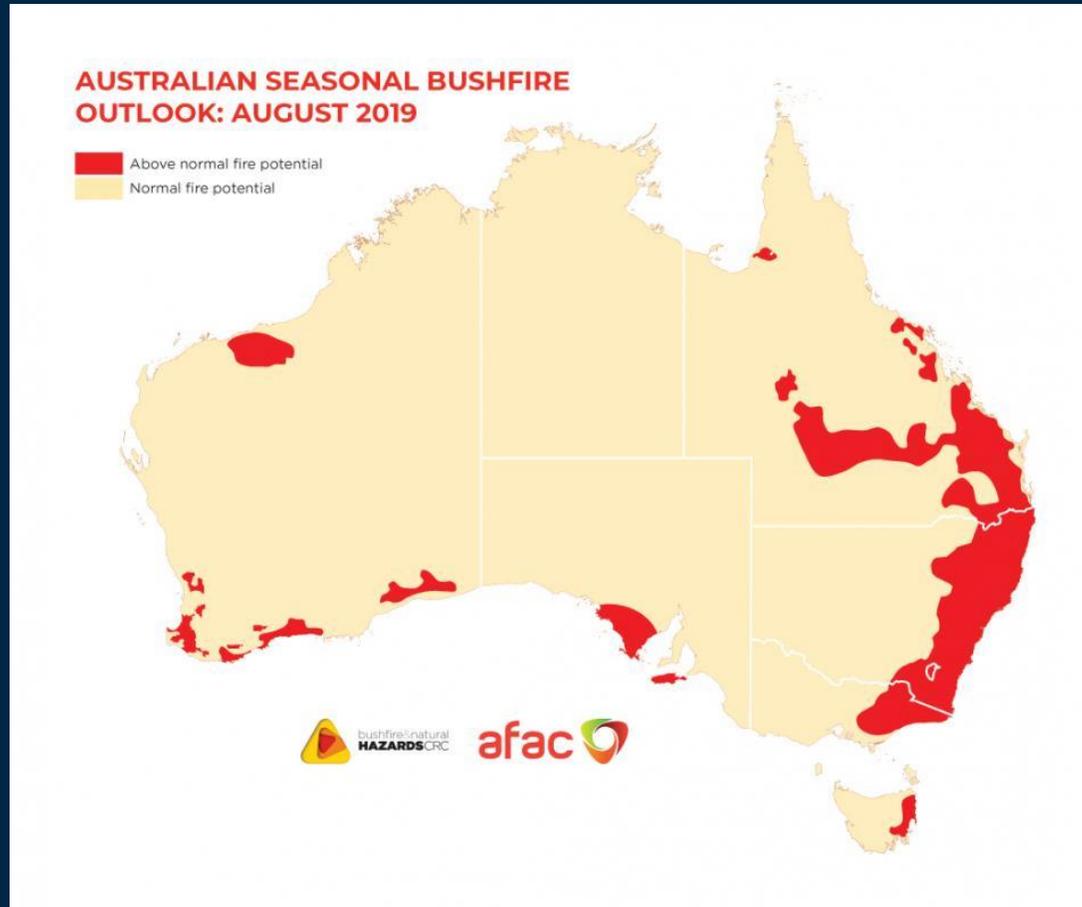


# September–November 2019 outlook





## Australian seasonal bushfire outlook



- Above normal fire potential for much of eastern Australia (inc. Tasmania) and parts of southern WA and SA
- Poor vegetation growth means fuel loads are reduced in many drought-affected regions.



# Current climate drivers

## Rainfall / temperature

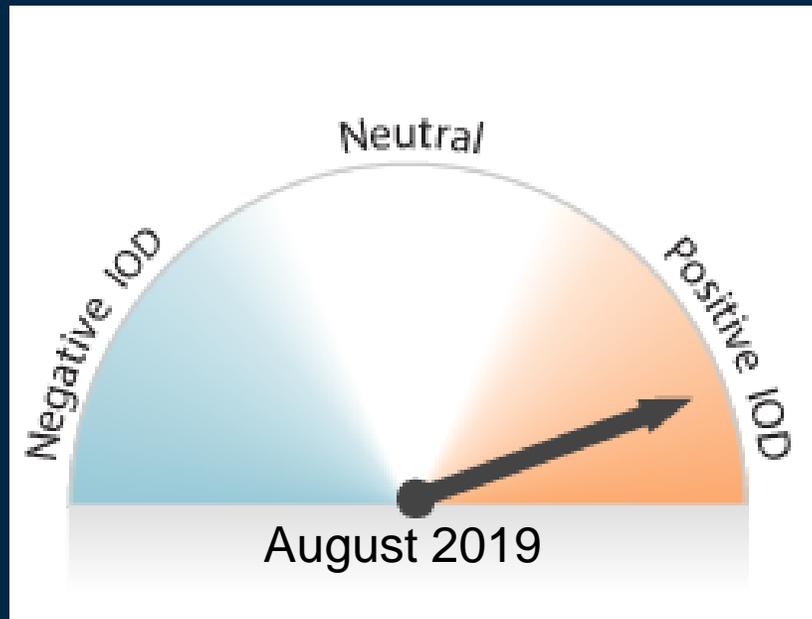
- Antecedent conditions
- Long-term trends
- Climate outlook: rainfall and temperature
- **Current climate drivers**



# Indian Ocean Dipole outlook

Indian Ocean sea surface temperature patterns remain consistent with a positive IOD.

Positive IOD is likely to be main climate driver through spring 2019



Understanding the IOD: <https://youtu.be/J6hOVatamYs>

## TYPICAL IMPACTS IN A POSITIVE PHASE



Average winter-spring rainfall

**RED** = DRIER THAN NORMAL



**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

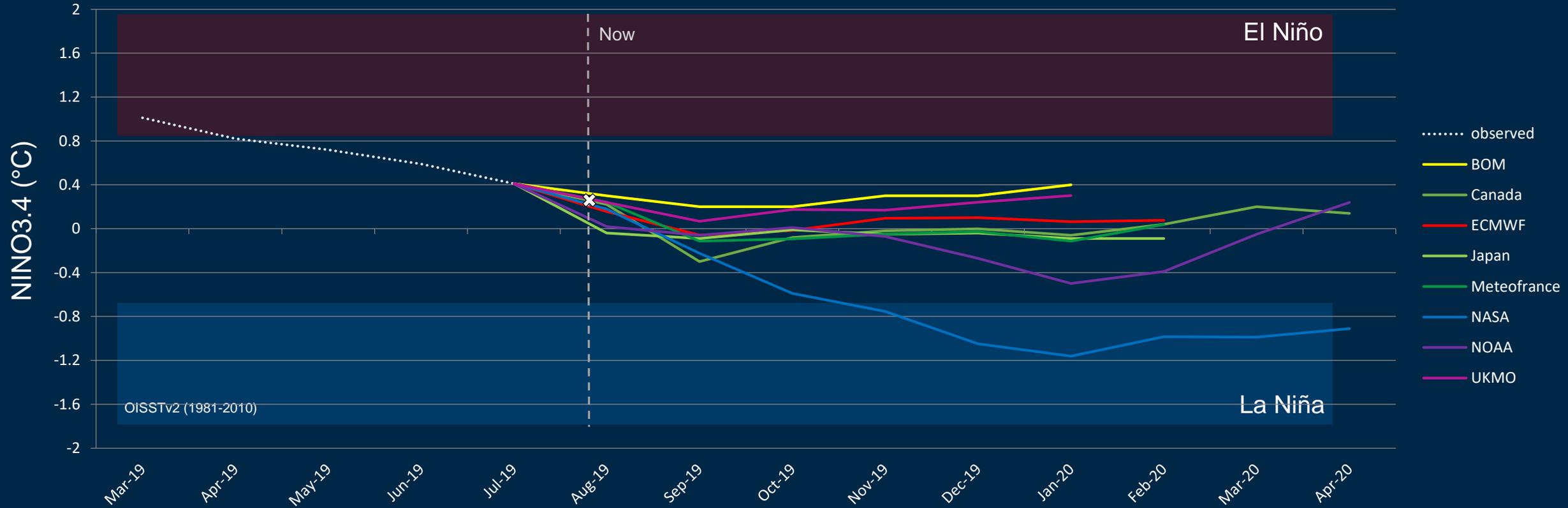


**INCREASED FIRE RISK** IN SOUTHEAST



# El Niño–Southern Oscillation outlook: August 2019

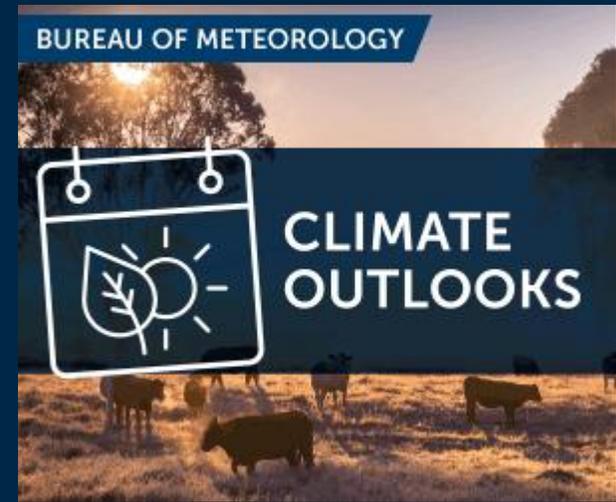
## NINO3.4 outlook





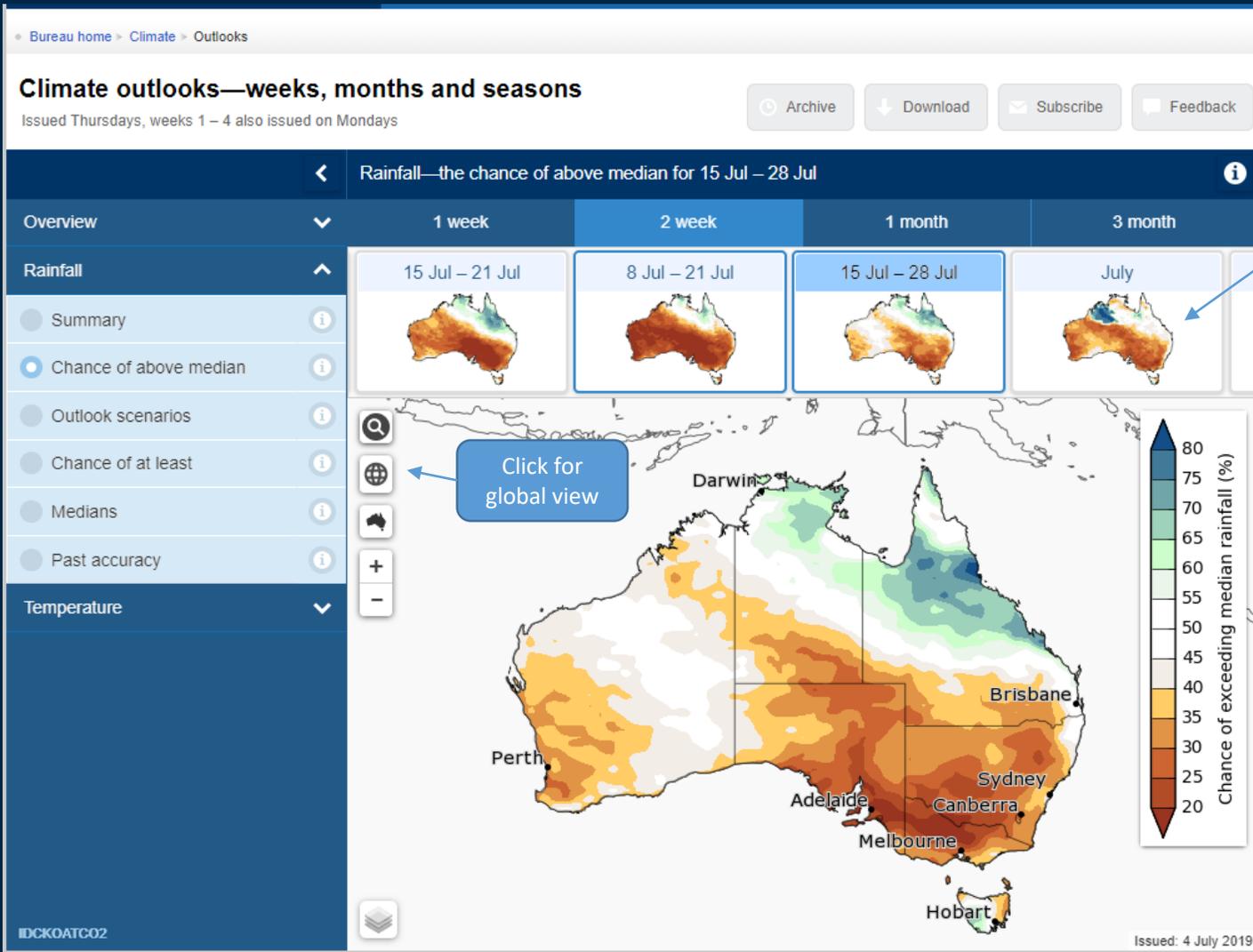
NEW!

# New outlook periods: from 29 August



Scrolling thumbnail 'film-strip'

- New outlook periods:
  - Medium-range (weekly to fortnightly)
  - Season 2
- More frequent updates
  - Medium-range : twice-weekly
  - Long-range (monthly and seasonal): weekly
- Scrolling thumbnails on interface

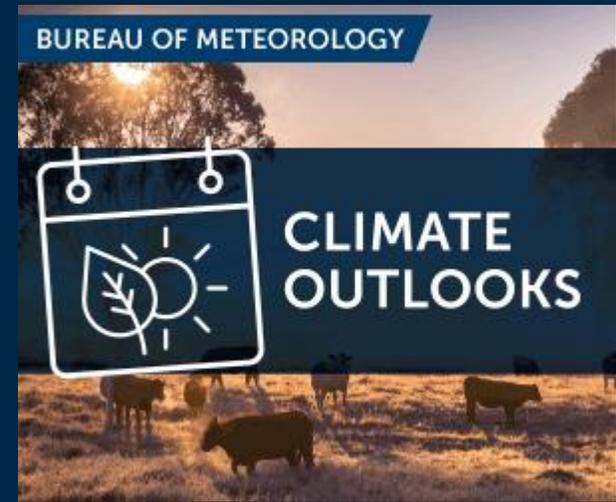


**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



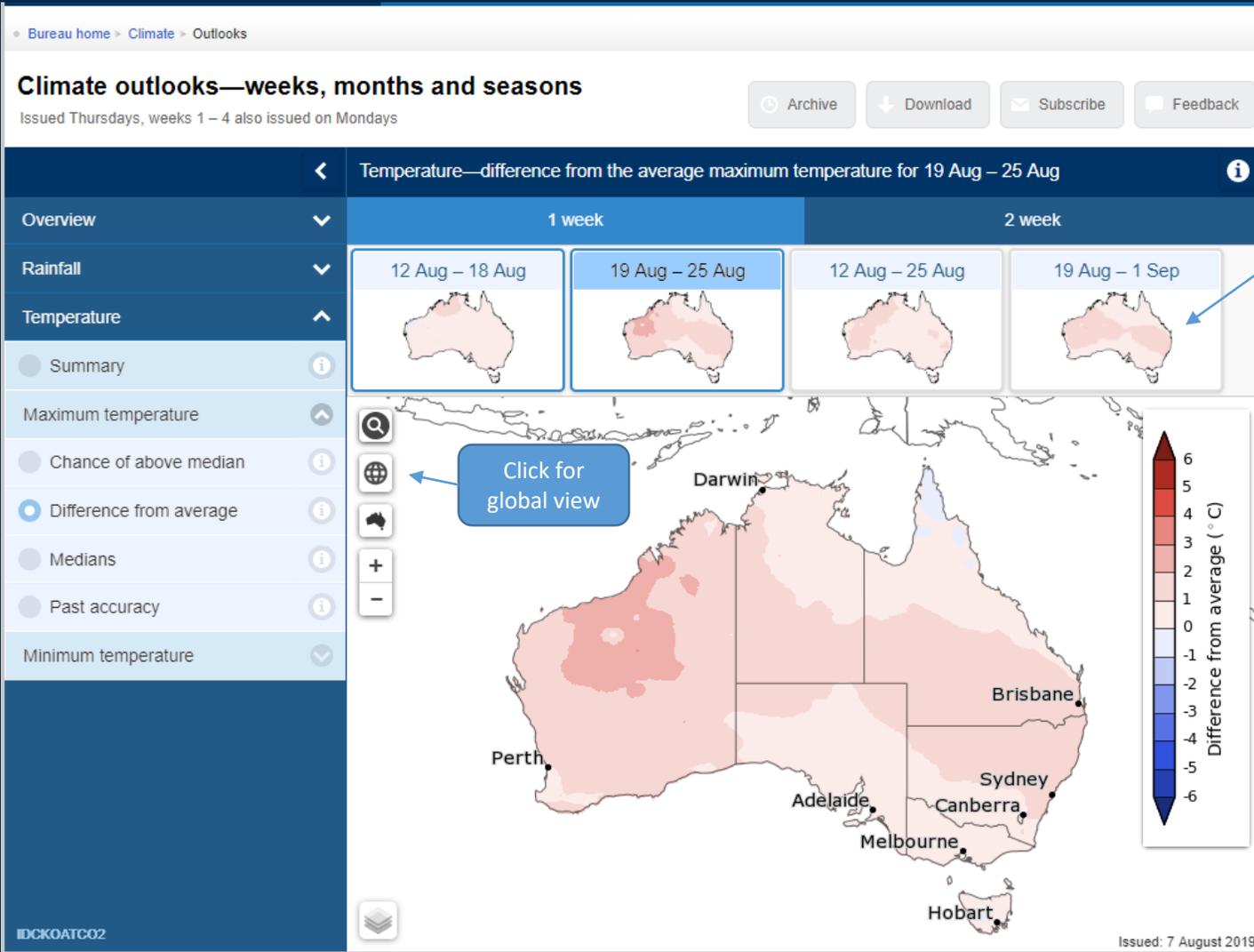
NEW!

# New outlook periods: from 29 August



Scrolling thumbnail 'film-strip'

- New outlook periods:
  - Medium-range (weekly to fortnightly)
  - Season 2
- More frequent updates
  - Medium-range : twice-weekly
  - Long-range (monthly and seasonal): weekly
- Scrolling thumbnails on interface
- New temperature anomaly maps

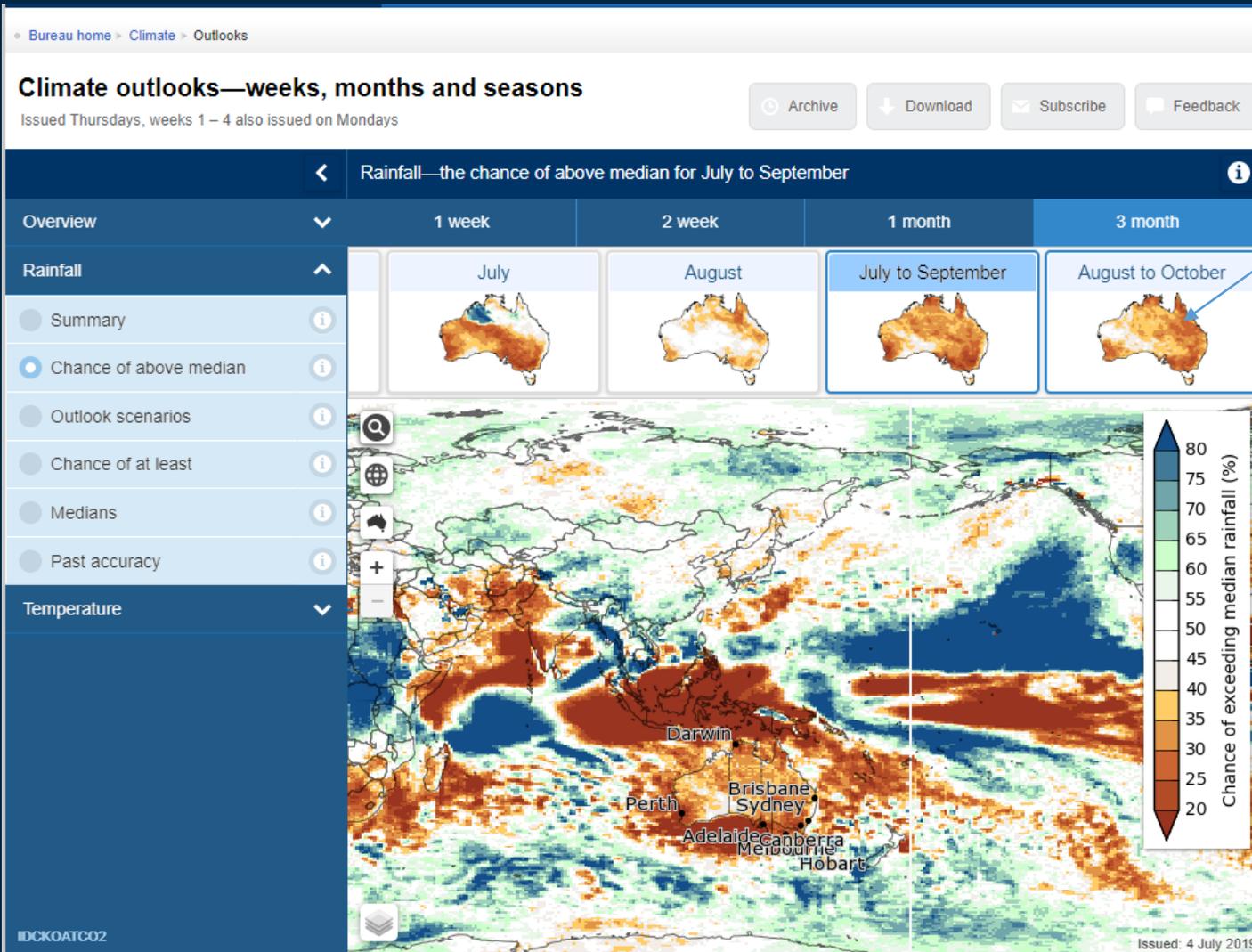
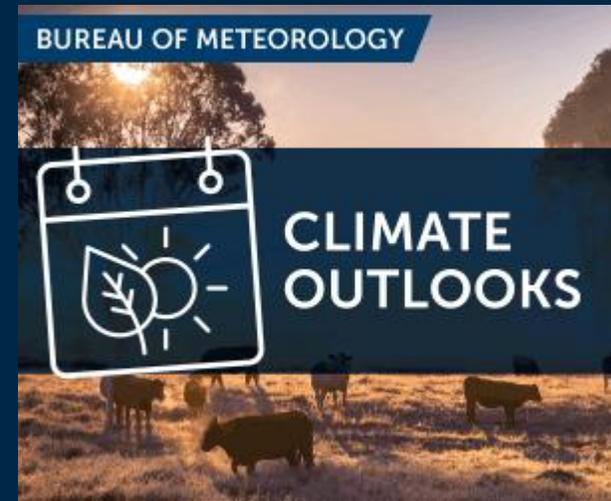


**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



NEW!

# New outlook periods: from 29 August



Scrolling thumbnail 'film-strip'

- New outlook periods:
  - Medium-range (weekly to fortnightly)
  - Season 2
- More frequent updates
  - Medium-range : twice-weekly
  - Long-range (monthly and seasonal): weekly
- Scrolling thumbnails on interface
- New temperature anomaly maps
- Global view available

**KNOW YOUR WEATHER.  
KNOW YOUR RISK.**



# Water Functions – How it started

- Pre 2007: Bureau's focus is weather & climate
- Water Act 2007
  - Requires the Bureau to collect, hold, manage, interpret and disseminate Australia's water information.
- The Water Regulations 2008
  - Commenced on 30 June 2008 and give effect to a range of matters provided for in the Water Act 2007
  - Specify the water information that certain organisations must give to the Bureau of Meteorology



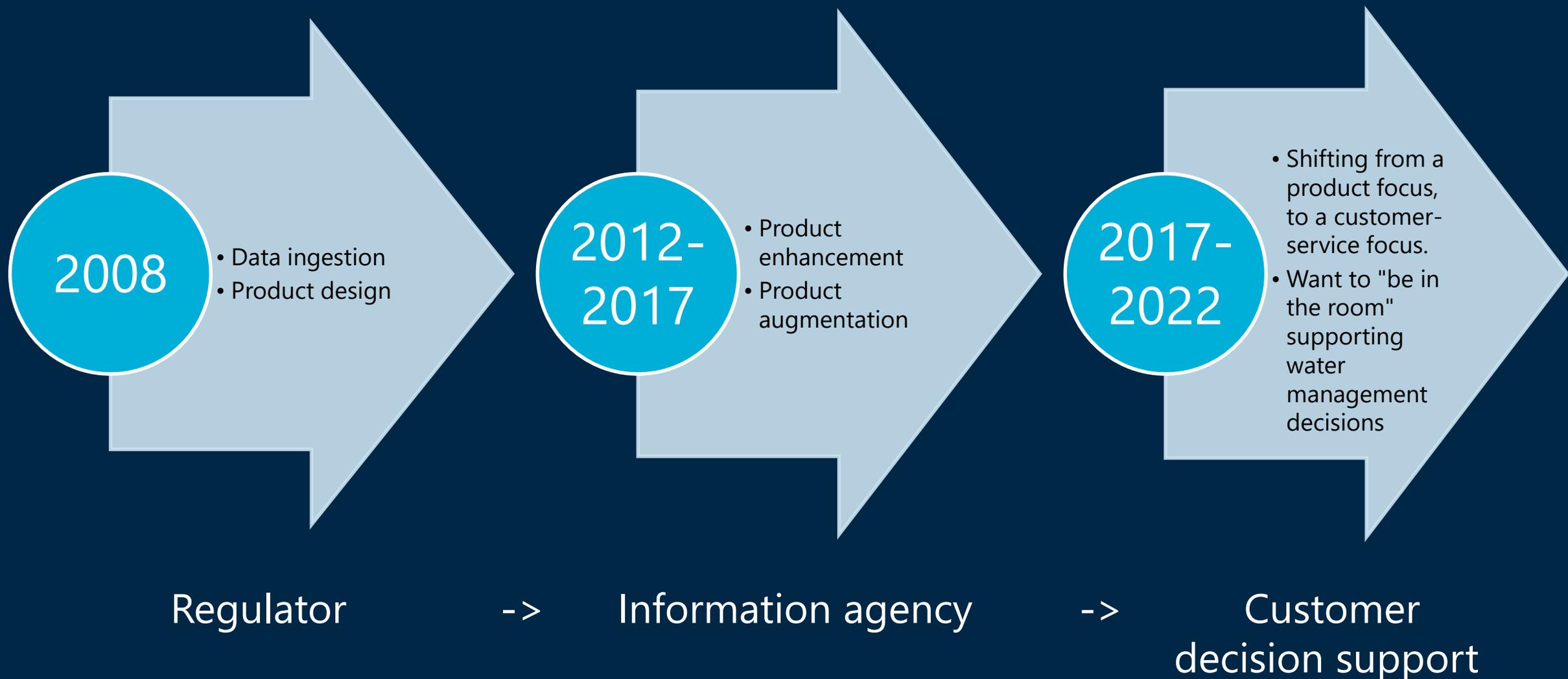
# Bureau's Water Act 2007 responsibilities

The Bureau's responsibilities under the Water Act 2007 include to:

- issue national water information standards
- collect and publishing water information
- conduct regular national water resources assessments
- publish an annual National Water Account
- provide regular water availability forecasts
- give advice on matters relating to water information
- enhance understanding of Australia's water resources.



# Where we are going:





Australian Government  
Bureau of Meteorology

# Thank you

[Matthew.Coulton@bom.gov.au](mailto:Matthew.Coulton@bom.gov.au)

25 Aug 2018 Sheep on a drought affected farm near the NSW town of Bigga. Source ABC News Franklin Hood

**KNOW YOUR WEATHER.**  
**KNOW YOUR RISK.**