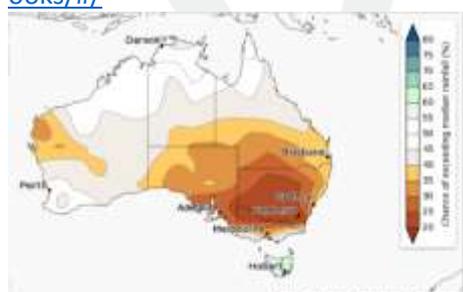


Climate and Weather Forecasting

Connecting people in the business of sheep

Developments in Weather Forecasting

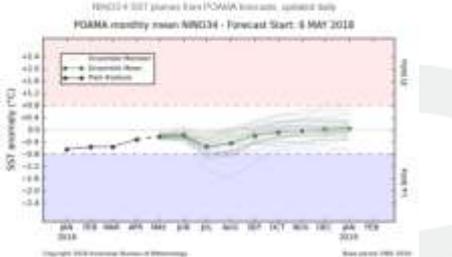
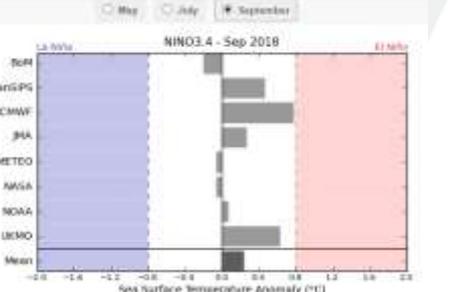
Over the last 10 years, the Bureau of Meteorology (BOM) has greatly improved both its short-term and long-term weather forecasts. This has been made possible by the development of improved climate models and collaboration between the different weather forecasting agencies around the world. BOM now has a large range of weather information on its website, to help farm business managers make decisions that are more informed.

WEBSITE	CONTENT/USES
Short term (weather)	
MetEye – http://www.bom.gov.au/australia/meteye/	Interactive weather forecast information Current weather conditions <ul style="list-style-type: none"> - 3 hourly forecast for following 7 days for: <ul style="list-style-type: none"> o Rainfall, Wind speed and direction, Temperature, storm, fog, and frost o Click on map to get specific local information
Current weather situation	
Climate and past weather http://www.bom.gov.au/climate/	Maps of recent and past weather conditions <ul style="list-style-type: none"> • ENSO wrap-up • Weekly rainfall update • “Monthly drought statement” and “Special climate statement”
Climate Data Online http://www.bom.gov.au/climate/data/	Search to view daily and monthly statistics, historical weather observations, rainfall, temperature and solar tables, graphs and data at weather stations
Australian Landscape Water Balance http://www.bom.gov.au/water/landscape/	Soil moisture levels across districts/regions
Climate outlooks – monthly and seasonal http://www.bom.gov.au/climate/outlooks/#/	<ul style="list-style-type: none"> • Provides climate outlook overview for rainfall and temperature • The historical accuracy of these forecasts can be checked as it can vary significantly from month to month http://www.bom.gov.au/climate/outlooks/#/rainfall/skill/seasonal/0
	

CONTACT

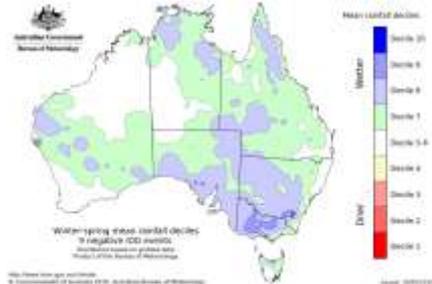
Ian McFarland

M: 0437 659 353 • E: Ian.McFarland@sa.gov.au

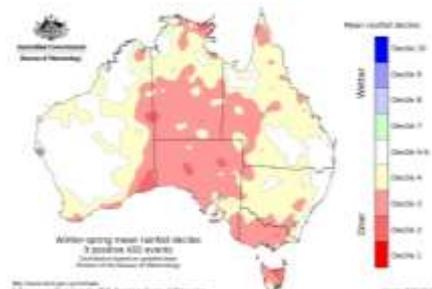
WEBSITE	CONTENTS/USES
<p>Australian Climate Influences</p> <p>ENSO (El Nino Southern Oscillation) http://www.bom.gov.au/climate/about/?bookmark=enso</p>  <p>Australian climate influences</p>	<p>El Nino – cool sea surface temperatures off north eastern Australia; Walker Circulation breaks down</p> <ul style="list-style-type: none"> - Can predict 3 to 6 months ahead - Events can last for 9 to 12 months. - Although impact of El Nino will vary depending on their strength, SA generally has Decile 3 or 4 rainfall but Decile 8 temperature when El Nino events occur. - Tends to affect eastern half of SA worse than western half of SA <p>La Nina – sea surface temperatures warmer around north eastern Australia and cooler in the tropical Pacific Ocean Usually develop in autumn or winter and finish the following autumn.</p> <ul style="list-style-type: none"> - These events can last for 6 to 9 months providing wetter and cooler conditions. - SA generally has Decile 7 rainfall and Decile 4 temperature when La Nina events occur - Impacts all of SA but stronger in the north east of the State.
<p>ENSO Wrap-Up http://www.bom.gov.au/climate/ens/o/#tabs=Outlooks</p>  <p>ENSO forecast from POAMA</p>	<p>Eight international models are used by POAMA to forecast sea surface temperature (SST) anomaly, which gives an indication of the development of either an El Nino (+0.8°C) or La Nina (-0.8°C) from normal</p>
<p>Climate Model Summary http://www.bom.gov.au/climate/mo-del-summary/#tabs=Overview</p>  <p>NINO3.4 values from a range of international models for September 2018</p>	<p>Provides an Overview, Outlooks for Pacific Ocean, Indian Ocean, and POAMA.</p> <p>Updated weekly with 3 and 5 month outlooks</p> <p>#NB: Model outlooks produced in autumn have a lower accuracy than other times of the year.</p>

WEBSITE

Indian Ocean Dipole (IOD)



Negative IOD brings wetter than average conditions to SA



Positive IOD brings drier than average winter spring in SA

CONTENTS/USES

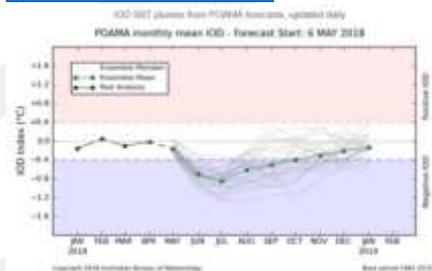
This can influence South Australian weather from June to October.

Negative Phase – warm sea surface temperatures northwest of Australia. Generally wetter and cooler in SA; Decile 8 rainfall and Decile 3 to 4 temperatures

Positive Phase – cool ocean in northwest of Australia. Tends to lead to drier and warmer conditions in SA; Decile 3 to 4 rainfall and Decile 8 temperatures.

IOD Outlook

<http://www.bom.gov.au/climate/ens/o/#tabs=Indian-Ocean>



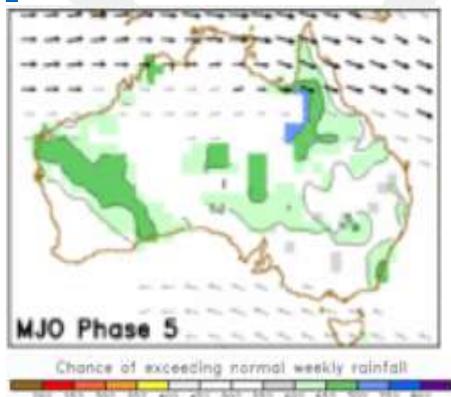
Indian Ocean Dipole forecast from POAMA

The Indian Ocean sea surface temperature plumes from POAMA are updated daily, giving a 9 month forecast of IOD conditions

#NB: Outlook skill during autumn is lower than at other times of the year.

Madden Julian Oscillation

<http://www.bom.gov.au/climate/mjo/>

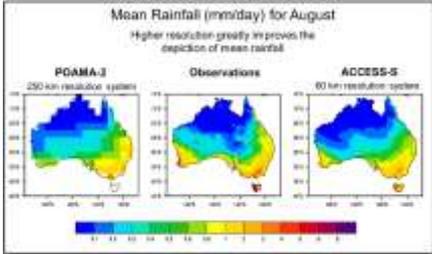


April to June average weekly rainfall probabilities of exceeding median in that MJO phase

Relatively new discovery of its influence on Australian weather. The Madden-Julian Oscillation (MJO) is the major fluctuation in tropical weather on weekly to monthly timescales. The MJO can be characterised as an eastward moving 'pulse' of cloud and rainfall near the equator that typically recurs every 30 to 60 days

There are 8 phases:

- Phase 1 to 3 – centred over Africa/Indian Ocean
- Phase 4 to 5 – centred over Northern Australia bring increased moisture in northern and central Australia
- Phase 6 to 8 – centred over the Pacific Ocean

WEBSITE	CONTENTS/USES
<p data-bbox="164 212 608 241"><i>ACCESS-S Seasonal Prediction Model</i></p>  <p data-bbox="164 499 608 557">Higher resolution with the ACCESS-S system compared to the current POAMA-2</p>	<p data-bbox="651 212 1407 728">ACCESS-S (Bureau of Meteorology) will replace the current low-resolution (250km) long range forecasting system POAMA-2. ACCESS-S (the seasonal prediction version of ACCESS) is a new seasonal forecasting system and will be phased in from mid-2018 and will operate at a 60 km resolution, compared to the 250 km resolution of POAMA-2, providing forecasts with more regional detail. The program will run on the Bureau's new supercomputer and brings POAMA and seasonal prediction into the national ACCESS modelling framework, which utilises the latest local and overseas developments. The new system will extend the forecasts out to at least 9 months. Increased resolution will also improve the representation of important large-scale climate drivers, like ENSO, potentially leading to better multi-week and seasonal forecast accuracy over Australia.</p>

How can Weather Forecasts assist in Decision Making?

It is one thing to get a forecast but it is another to be able to act on that information and make timely business decisions. Some producers seem to be very good at collecting relevant information and then using this to help them make informed management decisions. How can we learn from them?

As the accuracy of ENSO and IOD forecasts become more accurate there are significant opportunities to use these forecasts to help with management decisions such as agisting stock, buying or selling stock, buying feed etc. If these decisions can be made early it can result in either higher stock prices or lower costs.

In South Australia IOD is a strong indicator of seasonal conditions and when this is combined with ENSO the signal is even stronger. With a positive IOD and negative ENSO (El Nino) there is a strong chance of well below average rainfall and warmer temperatures, across most of South Australia and similarly with a negative IOD and positive ENSO (La Nina) the probability of above average rainfall and cooler conditions is much greater.

The BOM has developed an on-line education tool about the main drivers affecting Australia's climate and how they can affect the outlook maps as well as confidence in the outlook information. Case examples (for Wagga Wagga in eastern Australia and Merredin in western

Australia) provide a context for interpreting the different types of outlooks using past accuracy maps, climate driver information, and conditions to arrive at a decision based on the projections and overall confidence.

https://www.meted.ucar.edu/training_module.php?id=1247&tab=01#.WvJDn9IUnq4

This Information Sheet was developed from a webinar by Darren Ray, Senior Meteorologist/ Manager -South Australian Climate Section, Bureau of Meteorology by Michael Wurst (PIRSA).

This project is supported by Primary Industries and Regions SA, Sheep Industry Fund, the South Australian Arid Lands Natural Resources Management Board and the South Australian Murray-Darling Basin Natural Resources Management Board through funding from the Australian Government's National Landcare Program and the NRM Levies.



Government of South Australia