

# NSW Climate Summary - July 2016

## Summary

Seasonal Outlook	Current outlook
Rainfall (quarter)	Wetter
Max Temperature (quarter)	Cooler
Min Temperature (quarter)	Cooler (areas of the far west, north west, central west, northern tablelands, central to north coast, lower Hunter valley, south coast & southern tablelands)
	Near neutral (far south, Riverina, central tablelands, areas of the north west, central west & southern tablelands)
	Warmer (far south east)

ENSO	Current outlook
ENSO (overall)	Neutral La Niña possible in winter/spring
ENSO Outlook Status	La Niña watch
SOI	Neutral (borderline positive, slowly trending to positive)
Pacific Ocean (NINO3.4)	Neutral (trending to cool)
Indian Ocean (IOD)	IOD negative Warm Indian Ocean sea surface temperatures & trade wind reversal
Southern Annular Mode (SAM/AAO)	Weakly to moderately positive (trending to neutral-weakly positive)

Source: Derived from information provided by the [Australian Bureau of Meteorology](#) and the [US National Oceanic & Atmospheric Administration](#).

## Seasonal outlook

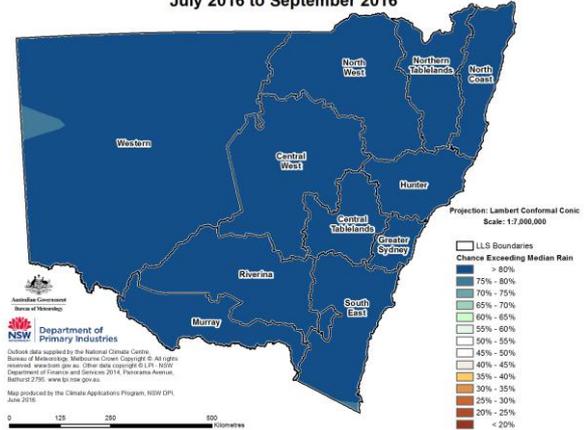
(Source: [Bureau of Meteorology](#))

Between July and September, wetter than normal conditions are likely across NSW with cooler than normal daytime temperatures.

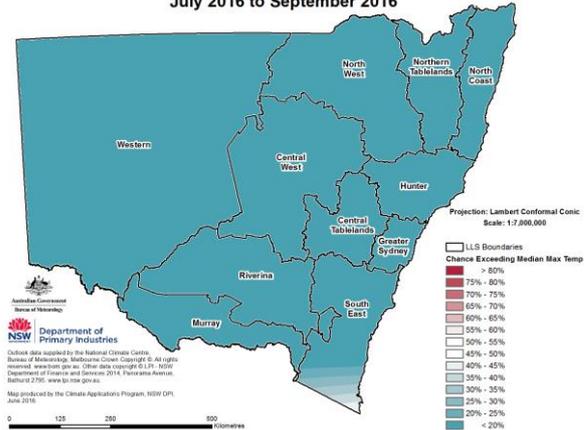
Cooler than normal overnight temperatures are likely for areas of the far west, north west, central west, northern tablelands, lower Hunter valley, central to north coast the south coast and southern tablelands. Warmer than normal overnight temperatures are likely in the far south east. There is a near-equal chance of cooler or warmer than normal daytime temperatures across the remainder of NSW.

*The seasonal outlooks presented in this report are obtained from the Australian Bureau of Meteorology & other sources. These outlooks are general statements about the likelihood (chance) of (for example) exceeding the median rainfall or minimum or maximum temperatures. Such probability outlooks should not be used as categorical or definitive forecasts, but should be regarded as tools to assist in risk management & decision making. Changes in seasonal outlooks may have occurred since this report was released. Outlook information was up to date as at 8 July 2016.*

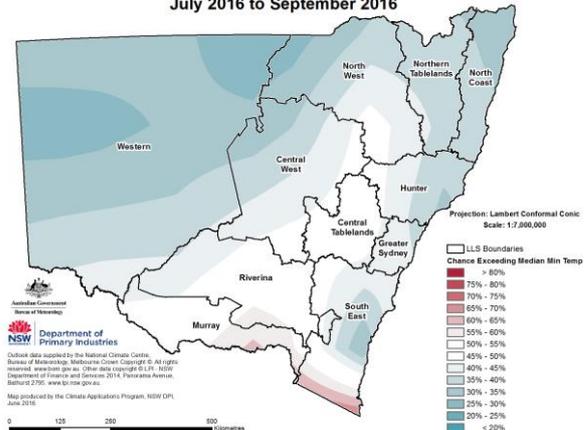
Chance of Exceeding Median Rainfall July 2016 to September 2016



Chance of Exceeding the Median Maximum Temperature July 2016 to September 2016



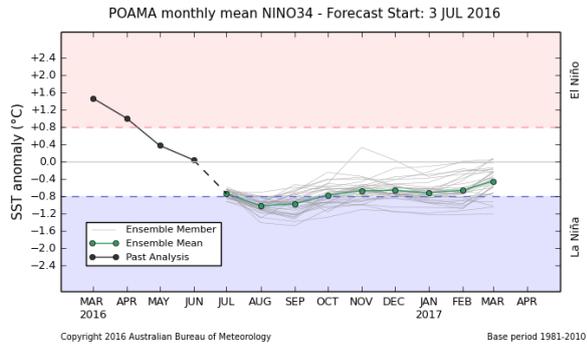
Chance of Exceeding the Median Minimum Temperature July 2016 to September 2016



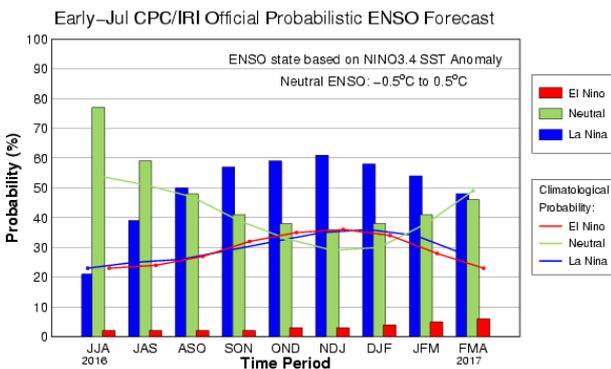
## ENSO

(Source: Bureau of Meteorology & International Research Institute for Climate and Society)

The Pacific Ocean is in an ENSO-neutral state. Sea surface temperatures in the central equatorial Pacific are at near-normal levels. A strong negative Indian Ocean Dipole (IOD) event is occurring. A La Niña event remains possible in winter and spring. The ENSO outlook status from both the Bureau of Meteorology and the CPC/IRI remains at 'La Niña watch'.



The Bureau of Meteorology's POAMA outlook (as at 3 July) suggests that the sea surface temperatures in the NINO3.4 region will reach weak La Niña levels during July and remain at borderline levels through winter and into spring. The current CPC/IRI ENSO forecast suggests a borderline to weak La Niña event is likely in late winter or early spring, extending into summer. The probability for a La Niña event declined from 75% last month to 55-60%. Many dynamical models suggest it occurring by the end of winter, but statistical models suggest an onset in mid-spring after neutral conditions in winter. Note that CPC/IRI uses different thresholds for El Niño or La Niña events than the Bureau of Meteorology.



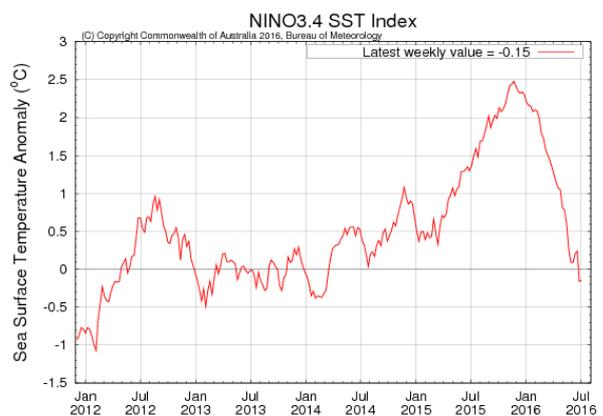
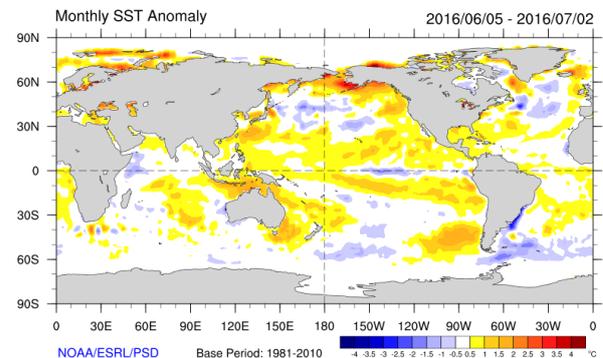
Of the eight climate models surveyed by the Bureau (as at 16 June), one to two indicate NINO3.4 sea surface temperatures are likely to reach borderline La Niña levels in July, and four to five during September to November.

## Sea Surface Temperatures

(Source: NOAA & Bureau of Meteorology)

Sea surface temperatures were near-average across the central equatorial Pacific during June, near-average to below average in the east and above average in the west. A line of cooler than normal water is snaking

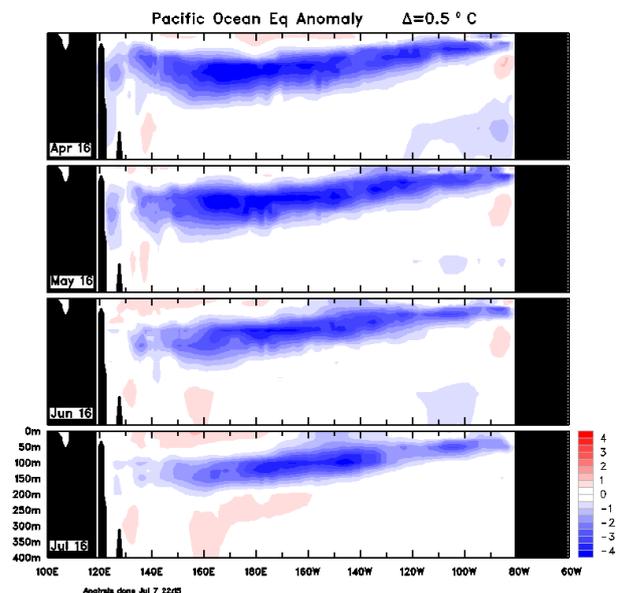
across the equator from Ecuador towards the International Date Line. The most recent weekly temperature anomaly value in the key NINO3.4 region was  $-0.15^{\circ}\text{C}$  in the week to 3 July, down from  $+0.09^{\circ}\text{C}$  in the week to 5 June.



## Monthly Sub-surface Temperatures

(Source: Bureau of Meteorology)

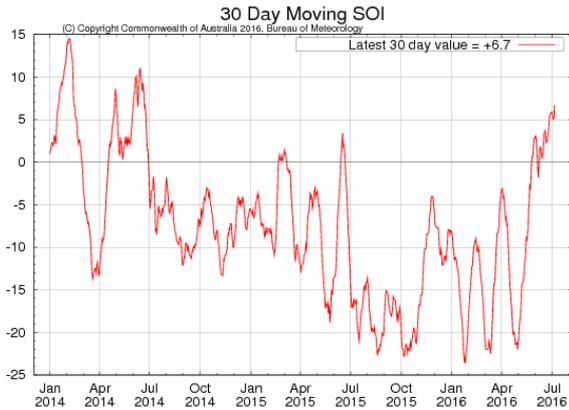
The sub-surface sea temperatures show the cool anomaly extends from 100-150 m in depth to the surface or near the surface across the eastern to central Pacific. It has weakened during the last month. The warming of areas of the western equatorial Pacific to a depth of 50 m is also evident.



### Southern Oscillation Index (SOI)

(Source: Bureau of Meteorology & Queensland DSITI)

The Southern Oscillation Index (SOI) is currently neutral-borderline positive. On 6 July, the 30-day SOI value was +6.7 (Bureau of Meteorology) and the 90-day SOI was -3.39 (QDSITI).



Values between -7 and +7 indicate neutral conditions, sustained values above +7 may indicate a La Niña event, and sustained values below -7 may indicate an El Niño event.

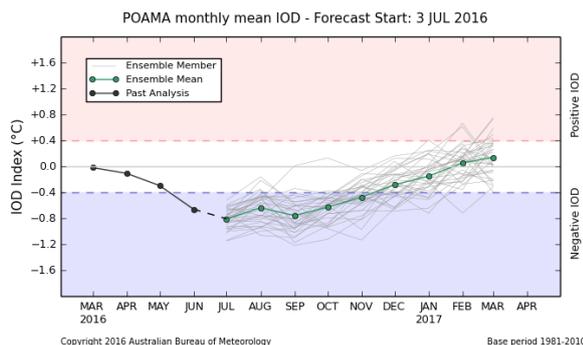
### Indian Ocean Dipole (IOD)

(Source: Bureau of Meteorology)

The Indian Ocean Dipole (IOD) is in a negative event, with the Dipole Mode Index (DMI) being negative for six weeks. The DMI value was strongly negative at -1.1 for the week to 3 July. A negative IOD together with the warm sea surface temperatures across much of the eastern Indian Ocean are likely to provide sources of moisture for eastern Australia.

The Bureau of Meteorology's outlook suggests the event is likely to continue through winter and spring. All four climate models surveyed by the Bureau of Meteorology on 16 June indicated the likelihood of a negative IOD event continuing till September, with three of the four indicating it is likely to continue till November.

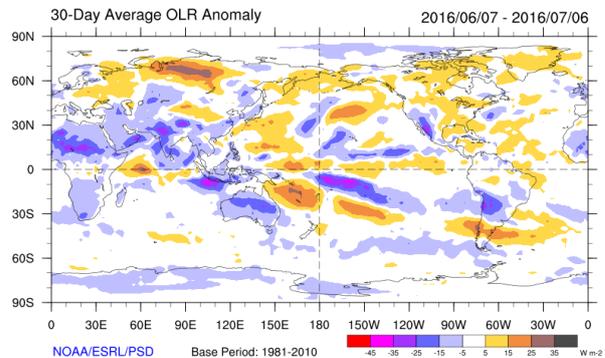
A positive IOD increases the chances of below normal rainfall and may exacerbate the effect of an El Niño event over south eastern Australia. A negative IOD increases the chances of above normal winter and spring rainfall across southern and much of western and central NSW.



### Cloudiness and trade winds

(Source: Bureau of Meteorology & NOAA)

Levels of cloud at the junction of the International Date Line (IDL) were near normal to slightly less than normal during June. Cloud levels were high to the south east of the IDL and also high over western Indonesia and Australia.



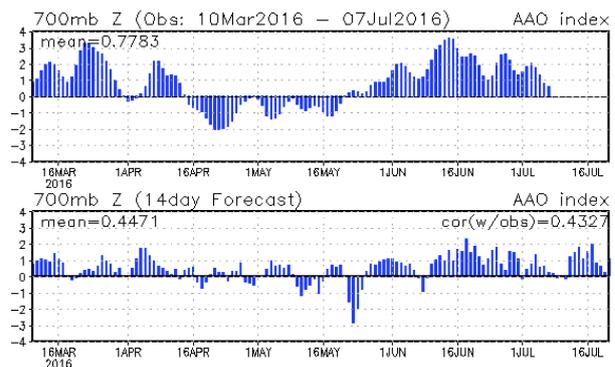
Trade winds were near-normal across the equatorial Pacific during June, but were reversed across the equatorial Indian Ocean (consistent with a negative IOD event and funnelling moisture towards north western Australia).

### Southern Annular Mode (SAM)

(Source: NOAA)

The experimental Southern Annular Mode or Antarctic Oscillation (AAO) index was weakly to moderately positive at 7 July, after being generally moderately to strongly positive through June. The outlook is for a neutral-weakly positive SAM during mid-July.

#### AAO: Observed & GFS forecasts



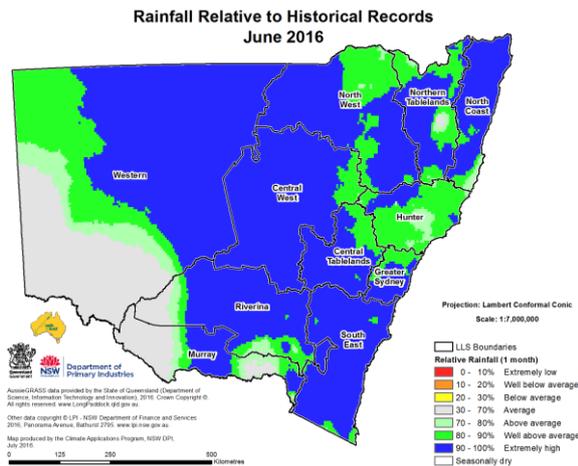
A negative SAM indicates expansion of the belt of strong westerly winds towards the equator, resulting in more or stronger low pressure systems across southern Australia and potentially increased rainfall. A positive SAM indicates the contraction of the belt of westerly winds towards Antarctica and higher pressures over southern Australia, and can result in stable, drier conditions. A strongly positive SAM in spring-summer can mean southern Australia is influenced by the northern half of high pressure systems, leading to a slightly higher likelihood of increased rainfall over south eastern and central NSW.

## Conditions during June

### Rainfall

(Source: Queensland DSITI)

Rainfall across NSW ranged from 10-694 mm during June. Most of the state received 50-200 mm, with higher falls along most of the coast. Relative to historical records, 88 per cent of the state received above average rainfall. Near average rainfall occurred across the far south west. Relative rainfall across the rest of the state was mostly well above average to extremely high. Most of NSW had rainfall in excess of 200 per cent of average.



### Soil moisture

(Source: CSIRO)

Topsoil moisture was at high levels across most of NSW during June, as a result of the wet conditions. The east and north of NSW showed the greatest increases over May. Relative to historical records, it was generally well above average to extremely high across NSW. Subsoil moisture levels improved during June, particularly in areas of western, southern and south eastern NSW. Relative to historical records, subsoil moisture in these areas was well above average to extremely high. Levels across the remainder of NSW were generally average.

### More information

For more information, contact the NSW Department of Primary Industries on 02 6391 3100 or Local Land Services on 1300 795 299. Additional and more detailed information on seasonal conditions can be found in the NSW Seasonal Conditions Summary and Report, available at <http://www.dpi.nsw.gov.au/agriculture/emergency/seasonal-conditions/regional-seasonal-conditions-reports>, and the LLS On-ground Seasonal Conditions Reports available at <http://www.lls.nsw.gov.au/agriculture/seasonal-conditions>.

### Acknowledgements

Information used in this report was sourced from the Australian Bureau of Meteorology, CSIRO, Queensland Department of Science, Information Technology and Innovation, the US National Oceanic and Atmospheric Administration, the International Research Institute for Climate and Society (Columbia University) and NSW Department of Primary Industries.

### Warning

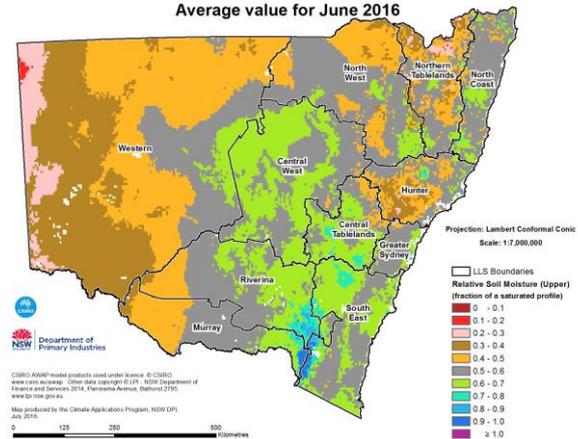
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Relative Soil Moisture (Upper Layer)  
Average value for June 2016



### Pasture growth

(Source: Queensland DSITI)

During June relative pasture growth was above average across most of the far west, central west and southern NSW. It was average to above average across areas of the tablelands and the north west, and generally average across the coast. Other pasture growth models indicated well above average to extremely high growth across most of the state.

Pasture Growth Relative to Historical Records from 1957  
June 2016

