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 January 2016.
**ENSO**

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

The Pacific Ocean remains in a strong El Niño event. However, sea surface and sub-surface temperatures have begun to decline over the last month. These and other indicators suggest the event may have peaked. The decline may be slowed by the recent movement of the Madden-Julian Oscillation into the western Pacific. The El Niño event is likely to persist into late autumn/early winter 2016. It is most likely to be followed by neutral conditions, or possibly by a La Niña event. A continuation of the El Niño event is a low probability, based on current model predictions. The Bureau of Meteorology’s ENSO tracker status remains at ‘El Niño’.

The Bureau of Meteorology’s latest POAMA outlook (as at 3 January) suggests that the decline in sea surface temperatures in the NINO3.4 region will continue, reaching neutral levels in autumn. This is also shown on the CPC/IRI consensus ENSO forecast probabilities.

Eight climate models surveyed by the Bureau (as at 16 December) indicate NINO3.4 sea surface temperatures are likely to remain above the Bureau’s El Niño threshold during January to March. Five of the eight suggest a return to neutral conditions by May, and one of the eight suggests sea surface temperatures of slightly above neutral in May.

**Monthly Sea Surface Temperatures**

(Source: NOAA & Bureau of Meteorology)

Warm sea surface temperatures anomalies extend across the central and eastern equatorial Pacific, but have weakened over the month. Temperatures are near-normal west of the International Date Line. The most recent monthly temperature anomaly value in the key NINO3.4 region is +2.39°C, a decrease from +2.96°C for December. The weekly value to 3 January is +2.20°C, down from a peak of +2.48°C on 22 November.
Southern Oscillation Index (SOI)
(Source: Bureau of Meteorology & Queensland DSIIT)
The Southern Oscillation Index (SOI) has been variable and is currently weakly to moderately negative after rising to be neutral in late November. On 5 January, the 30-day SOI value was -10.3. Fluctuations in the SOI are likely at this time of year due to the influence of the monsoon season.

Values between -8 and +8 indicate neutral conditions, sustained values above +8 may indicate a La Niña event, and sustained values below -8 may indicate an El Niño event.

Indian Ocean Dipole (IOD)
(Source: Bureau of Meteorology)
The Indian Ocean Dipole (IOD) returned to neutral during November. The current value is -0.36 for the week to 3 January. The IOD has little influence on the climate between December and May. However, the warm sea surface temperatures across the Indian Ocean are likely to influence the climate over summer, providing sources of moisture.

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 and equator remained high during most of December, but remained low across Indonesia and Papua New Guinea, consistent with an El Niño event. Cloud was increased over NSW, reflecting the rainfall events in mid-late December and early January.

Trade winds were reversed (westerly) across western to eastern-central areas the equatorial Pacific during December, consistent with an El Niño event. The anomalies in the west are consistent with the passage of the Madden-Julian oscillation into the western Pacific, which may act to slow the decline of the El Niño in the short term.

Southern Annular Mode (SAM)
(Source: NOAA)
The experimental Southern Annular Mode or Antarctic Oscillation (AAO) index is currently weakly to moderately positive as at 7 January. The outlook suggests it will range from neutral to weakly positive during mid-late January.

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.
Conditions during December

Rainfall
(Source: Queensland DSITI)

Rainfall across NSW ranged from 0.4-394 mm during December, with most of the state receiving 10-50 mm. Relative to historical records, rainfall was near-average across much NSW. It was below average over areas of the far south west, south east, southern tablelands, north west and northern central west. Above average rainfall occurred across areas the far west, northern tablelands, mid-north coast, Hunter valley and across the northern areas of the central tablelands and the Sydney basin.

Soil moisture
(Source: CSIRO)

Modelled topsoil moisture declined across most of the state during December, particularly in the north west, west, southern and central areas. Levels were stable in the north east. Relative to historical records, it was average across most of NSW, but below average across the far south west, south east and areas of the north west. It was above average in areas of the north east and some areas of the far west.

Modelled subsoil moisture levels declined slightly in most areas. Levels remained moderate to high across most of the coast and south east and remained moderate across most of the tablelands and slopes.

Pasture growth
(Source: Queensland DSITI)

During December relative growth and was below average to average across most of NSW. Below average growth occurred across areas of the north west, far south west, the northern central west and the south east. Above average growth occurred in areas of the far west, Hunter valley, far north coast, and areas of the northern and central tablelands. Other pasture growth models suggested a similar pattern.