

# Monthly Climate Statement — December 2015

## Key messages

- Eighty six per cent of Queensland is drought declared.
- For most of Queensland there remains an increased probability of below median rainfall for summer (November to March).
- An increased probability of below median rainfall does not rule out the possibility of localised high rainfall events or mean that below median rainfall will occur across all of the state.

## Findings as at 15 December 2015

The Science Division of the Department of Science, Information Technology and Innovation (DSITI) considers that, **for most of Queensland, there remains an increased probability of below median rainfall for summer (November to March 2015/16).**

DSITI's seasonal outlooks for Queensland are based on the current and projected state of the El Niño–Southern Oscillation (ENSO) phenomenon and on factors which alter the impact of ENSO on Queensland rainfall (i.e. the more slowly changing extra-tropical sea surface temperature (SST) pattern in the Pacific Ocean).

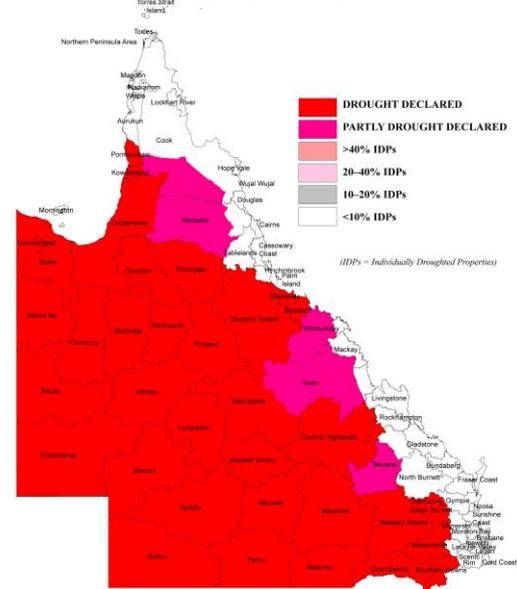
At this time of year, the prevailing ENSO pattern, as measured by indices such as the Southern Oscillation Index (SOI) or central equatorial Pacific Ocean SST anomalies, offers a useful basis for providing seasonal outlooks for summer.

Currently:

- The monthly value of the [SOI](#) was -3.2 in November, rising from the very negative values of -16.7 in September and -21.3 in October. The three-month (September to November) average of -13.7 remained very low.
- The monthly SST anomaly in the Niño 3.4 region of the central equatorial Pacific Ocean was +3.0 °C in November, having warmed considerably since September (+2.3 °C) and October (+2.5 °C). The three-month anomaly of +2.6 °C equals values recorded during the strong El Niño's of 1982/83 and 1997/98.
- Most [international global climate models](#) indicate that the current warming observed in the central equatorial [Pacific Ocean SSTs](#) should peak over summer.
- Associated with the current El Niño pattern, a strong SST gradient currently exists in the Pacific Ocean between eastern Australia and the central equatorial Pacific region. The October index of this SST gradient, related to ENSO and Queensland summer rainfall, is incorporated in DSITI's summer rainfall outlook (opposite page).

- Rainfall for November was close to average across much of Queensland. However, based on the strong SST gradient across the Pacific Ocean, there remains a high probability of below median rainfall for summer as a whole (November to March).
- Currently, [86 per cent of Queensland is drought declared](#) under state government processes – the shires of Burdekin, Kowanyama and Pormpuraaw and the remainder of Isaac and parts of Cook and Whitsunday being added as at 1 November. For some parts of Queensland, the high probability of the current El Niño event continuing further over summer poses a risk of current drought conditions becoming more protracted. This risk should be factored into decision making and allocation of resources. In this context, DSITI's outlook for summer rainfall (opposite page) should be taken into consideration.

## QUEENSLAND DROUGHT SITUATION as at 1st November 2015

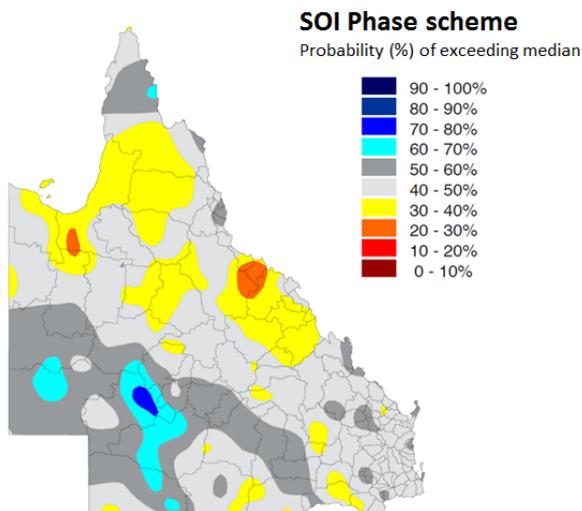


## Seasonal rainfall outlook (Dec-Feb 2015/16)

Based on previous years when the SOI has been in a 'Rapidly Rising' phase at the end of November, the probability of rainfall being above median for the next three-month period (December to February) is less than 50 per cent for most northern and eastern parts of Queensland (see map opposite page). For many western and some southern parts of the state the probability of above median December to February rainfall is higher (50 to 70 per cent).

## Probability of Exceeding Median Rainfall

for December to February  
based on a Rapidly Rising SOI phase  
during October / November



## Summer rainfall outlook (Nov-Mar 2015/16)

DSITI scientists have shown that extra-tropical SST anomalies, when measured in specific regions of the Pacific Ocean in March each year, provide a useful basis for long-lead forecasting of summer (November to March) rainfall in Queensland. The accuracy of this outlook increases as the evolving ENSO-related SST pattern is also taken into account from May through to October. This understanding has been incorporated in an experimental system known as [SPOTA-1 \(Seasonal Pacific Ocean Temperature Analysis version 1\)](#), which has been operationally evaluated by DSITI scientists for over a decade.

As at 1 November 2015, DSITI's final outlook for summer (November to March 2015/16) indicated a lower than normal probability of exceeding median rainfall for most of Queensland, based on the evolving sea surface temperature pattern across the Pacific.

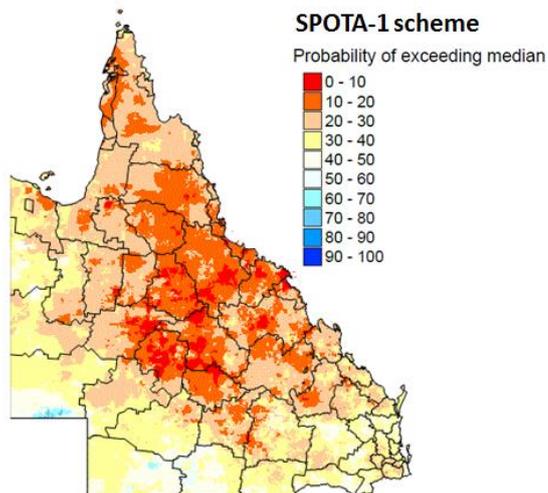
This final outlook for summer rainfall, which has been consistent since June this year, is closely related to the SST gradient measured across the South West Pacific Ocean in October, and is indicative of the current strong El Niño event.

In summary, it should be noted that:

- The current El Niño pattern is likely to persist over summer (November to March).
- An increased risk of below median rainfall for most of Queensland means that there is also a low probability of widespread drought-breaking rainfall. However, this does not rule out the possibility of localised high rainfall events or mean that below median rainfall will occur across all of the state (see [Australia's Variable Rainfall poster](#), or the department's [archive of historical rainfall maps](#)).
- Users should also be aware that seasonal outlooks are probabilistic, rather than deterministic, in nature. For example, if an outlook is described as having a 50 to 70 per cent probability of below median rainfall, there is also a 30 to 50 per cent probability of above median rainfall. Although outcomes with a high probability may be more likely, it does not mean that less probable events will not occur in any given year.
- The Bureau of Meteorology, which provides advice on the tropical cyclone season (November to April), has noted, in regard to eastern Australia, that El Niño shifts the odds toward both fewer cyclones and a later first cyclone crossing of the season.
- On average, two tropical cyclones make landfall in Queensland during the tropical cyclone season.

## Probability of Exceeding Median Summer Rainfall

November 2015 – March 2016  
based on the SPOTA-1 Index  
as at November 1, 2015



## Why is SPOTA-1 labelled “experimental”?

The SPOTA-1 system is currently labelled “experimental” and will continue to be labelled as such until the details of the system, including its operational track record, are published in the international peer reviewed scientific literature. Until then, further details on the current outlook and access to previous outlooks (since 2001) are currently provided on a password protected area of the Long Paddock website (see the link above to request password access).

For more information, please visit: [www.longpaddock.qld.gov.au/seasonalclimateoutlook](http://www.longpaddock.qld.gov.au/seasonalclimateoutlook)  
or contact Stuart Burgess at: [stuart.burgess@dsiti.qld.gov.au](mailto:stuart.burgess@dsiti.qld.gov.au)