

Monthly Climate Statement — January 2015

Key messages

- Monthly sea surface temperature anomalies in the central equatorial Pacific have been warmer than average since April last year and remain close to El Niño thresholds.
- Monthly values of the Southern Oscillation Index have been negative since June last year and strongly negative since August.
- For most of Queensland, the probability of exceeding median rainfall over the remainder of summer (January to March) is below normal.

Findings for January 2015

The Science Division of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) considers that **the current borderline El Niño conditions and warm phase of the Inter-decadal Pacific Oscillation (IPO) increases the probability of below-median rainfall over most of Queensland for the remainder of this summer (January to March).**

DSITIA's rainfall 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).

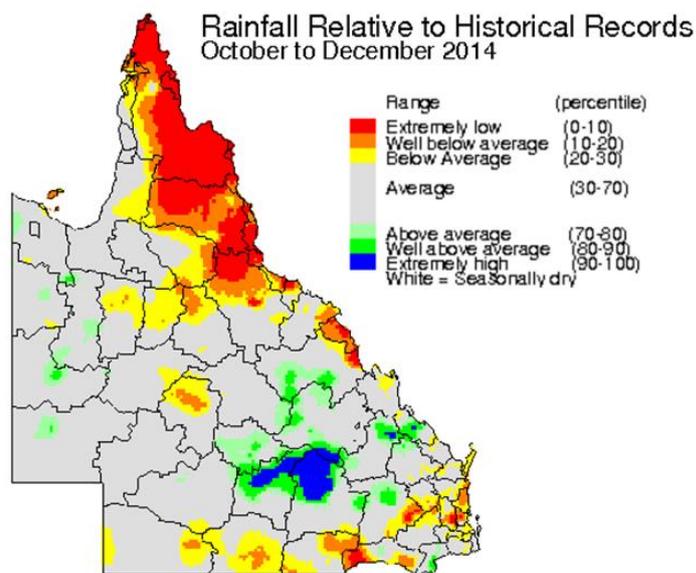
At this time of year the prevailing ENSO pattern (as measured by indices such as the [Southern Oscillation Index \(SOI\)](#) or central equatorial Pacific Ocean SST anomalies) offers a useful basis for providing seasonal outlooks for summer.

Monthly values of the SOI have been negative since June, averaging -7.4 for the last six-month period since July and -7.9 for the last three-month period since October. Monthly SST anomalies in the central equatorial Pacific have been warmer than average since April this year and remain close to El Niño thresholds. The six-month average SST anomaly since July was +0.5 °C and the three-month average since October was +0.7 °C.

Currently:

- In December the monthly SST anomaly in the Niño 3.4 region of the central equatorial Pacific Ocean was +0.8 °C and as at 10 January the latest weekly SST anomaly was +0.4 °C.

- The SOI was -7.6 in December and as at 12 January the 30-day mean value was -6.0.
- In its recent [National Climate and Water Briefing](#), the Bureau of Meteorology has noted 'El Niño-like' rainfall impacts across Australia during winter-spring (June to November) 2014.
- [More than 75 per cent of Queensland remains drought declared](#) under state government processes, including most inland regions and all of south-eastern Queensland.
- Although October and November rainfall was well-below average to extremely low in many drought affected parts of the state, high rainfall was recorded in parts of Central Queensland during December. Rainfall deciles for the full October to December period are shown in the map below.



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Borderline El Niño

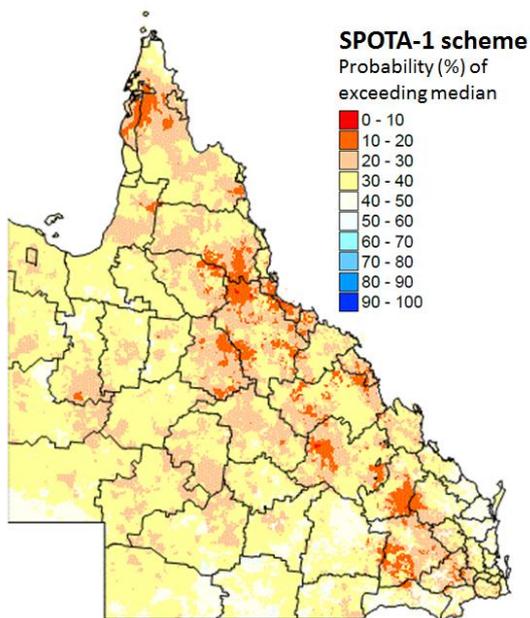
Although the definition of 'El Niño' varies between agencies, DSITIA considers current conditions to be bordering on El Niño. However it is immaterial to the rainfall outlooks presented on the following page, as to whether or not an 'El Niño event' is eventually declared by national and/or international agencies.

Outlook for summer rainfall

DSITIA 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 rainfall in Queensland. This outlook can be modified, with increasing accuracy, as the monthly ENSO-related SST pattern is also taken into account from June to November.

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 DSITIA scientists for over a decade. As at 1 November, DSITIA's final long-lead outlook for the whole of summer (November to March 2014/15) indicated a higher than normal probability of below-median to well below-median rainfall for most of Queensland and, conversely, a low probability of widespread drought-breaking rainfall (see map below). This outlook is strongly related to the extra-tropical SST pattern measured in March this year, which is indicative of a warm phase of the IPO.

Probability of Exceeding Median Summer Rainfall
November 2014 – March 2015 based on the SPOTA-1 Index
as at November 1, 2014



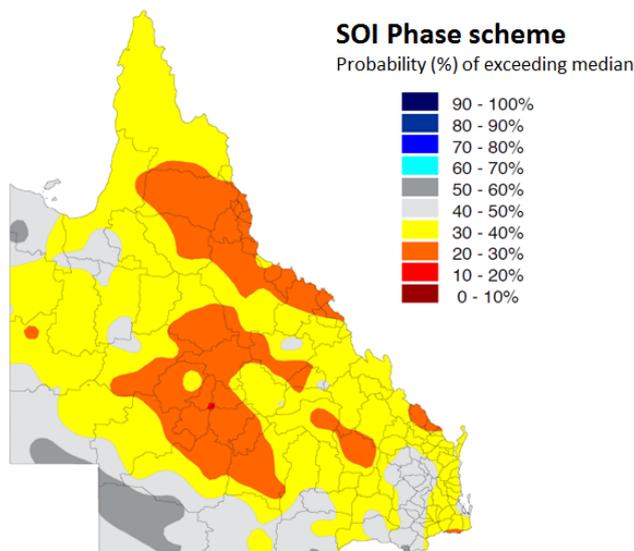
Furthermore, an analysis of rainfall probabilities as at 1 January based on the SOI being in a 'Consistently Negative' phase indicates that, for most of Queensland, the probability of exceeding median rainfall over the remainder of summer (January to March) is low (see map right).

In summary, it should be noted that:

- The current long-lead outlook for summer rainfall is based on both extra-tropical and central equatorial Pacific Ocean SST anomalies.
- Central equatorial Pacific Ocean SST anomalies over summer will define the state of ENSO ('El Niño', 'La Niña' or 'ENSO-neutral') for 2014/15.
- Should international agencies officially declare an El Niño event, it is most likely to be a weak event. However, both 'weak' and 'strong' El Niño events have an equal tendency to produce dry conditions in Queensland.
- For Queensland, the state of the extra-tropical Pacific Ocean determines whether an El Niño event (weak or strong) is most likely to result in a dry summer.
- A range of analyses (based on different approaches) support DSITIA's view that there is a low probability of widespread wet conditions across Queensland over summer (although this can't be totally ruled out).
- The Bureau of Meteorology have advised that 'near-average' tropical cyclone activity is likely for Queensland and the Coral Sea this cyclone season (November to April).
- On average, two tropical cyclones make landfall in Queensland during the tropical cyclone season.

Probability of exceeding Median Rainfall

for January to March
based on a Consistently Negative SOI phase
during November/December



For more information, please visit: www.longpaddock.qld.gov.au/seasonalclimateoutlook
or contact Stuart Burgess at: stuart.burgess@dsitia.qld.gov.au