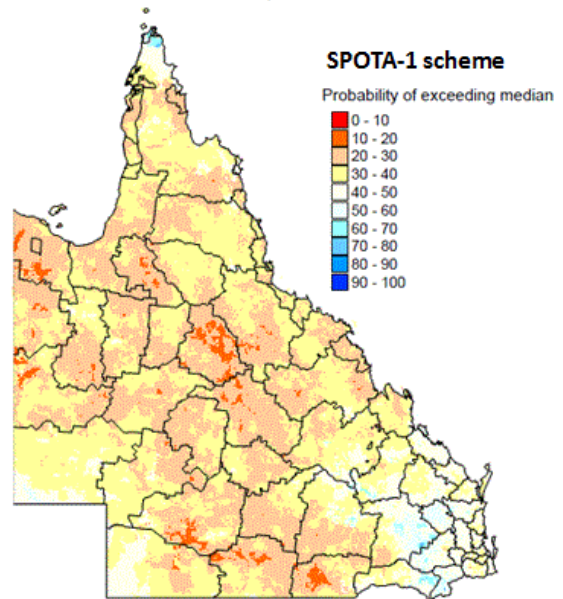


Monthly Climate Statement — April 2014

Key messages

- The current 'Rapidly Falling' phase of the Southern Oscillation Index (SOI) indicates, although with low confidence, a slightly lower than normal probability of exceeding median rainfall over the next three-month period (April to June) for most of Queensland.
- Furthermore, and with higher confidence, the probability of widespread wet conditions over Queensland next summer (November to March 2104/15) is very low based on DSITIA's analysis of the current extra-tropical Pacific Ocean sea surface temperature (SST) pattern.
- This long-lead outlook does not yet factor in central equatorial Pacific Ocean SST anomalies which will define the state of the El Niño-Southern Oscillation (ENSO) phenomenon in coming months.

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



Findings for April 2014

The Science Division of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) considers that **there is a slightly lower than normal probability of exceeding median rainfall over the next three-month period (April to June) for most of Queensland. This view is based on DSITIA's analysis of the historical relationship between Queensland rainfall and the Southern Oscillation Index (SOI) which, at this time of year, is quite weak. Furthermore, and with higher confidence, the probability of a wet summer (November to March 2014/15) is very low based on DSITIA's analysis of the current extra-tropical Pacific Ocean sea surface temperature (SST) pattern.**

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 SST pattern in the Pacific Ocean).

About this long-lead rainfall outlook

At this time of year (known as the 'autumn predictability gap'), the ENSO pattern tends to change very rapidly. Although the change in the ENSO pattern over autumn may provide a guide as to the likely development of an El Niño or La Niña event, it is not until late autumn (May) that the prevailing ENSO pattern (as measured by indices such as the SOI or central equatorial Pacific Ocean SST anomalies) provides a useful basis for seasonal forecasting (i.e. for providing rainfall outlooks for winter, spring or summer).

However, DSITIA scientists have shown that extra-tropical SST anomalies, when measured in specific regions of the Pacific Ocean at this time of year, **do** provide a useful basis for long-lead forecasting of summer rainfall in Queensland. This information 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.

Why was SPOTA-1 developed?

The SPOTA-1 system was developed specifically with Queensland pastoralists in mind. At this time of year, when ENSO indices are least reliable, critical livestock and pasture management decisions are made leading into the winter 'dry' season. An indication of rainfall probabilities for the coming summer 'wet' season (November to March) would therefore have greatest utility if available from April onward. SPOTA-1 meets this need in Queensland's pastoral industry for long-lead outlooks of summer rainfall. However, because the summer season (November to March) is generally when Queensland receives most of its annual rainfall, SPOTA-1 long-lead outlooks have also proven useful to other sectors (e.g. water management and summer cropping).

The El Niño - Southern Oscillation (ENSO)

It is not until late autumn (May) that the prevailing ENSO pattern (as measured by indices such as the SOI or central equatorial Pacific Ocean SST anomalies) provides a useful basis for seasonal forecasting i.e. for providing rainfall outlooks for winter, spring or summer. However it is useful to monitor the change in ENSO indices over this time of year as a guide as to whether an El Niño or La Niña pattern may develop. Global climate models also provide a more formal means of assessing this likelihood.

Currently:

- The [SOI](#), a key-atmospheric measure of ENSO, fell sharply from -1.7 in February to -12.0 in March. The three-month mean SOI value from January to March was -0.8, remaining in the ENSO-neutral range.
- Observed SST anomalies in the key Niño 3.4 region of the central equatorial Pacific Ocean warmed by 0.4 °C from February (-0.6 °C) to March (-0.2 °C). As at 5 April, the latest weekly SST anomaly (+0.3 °C) was slightly above average.
- Most [international global climate models](#) currently indicate that central equatorial Pacific Ocean SSTs should continue to warm in the coming months, with a higher than normal probability of El Niño conditions developing over winter.

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).

What if an El Niño develops this year?

Currently, close to 80 per cent of Queensland remains drought declared under State Government processes. While patchy rainfall during February and March has brought relief to some drought affected regions, the possibility of an El Niño event developing later this year, and with it the threat of another dry summer for some regions, 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, it should be noted that:

- The current long-lead outlook is based solely on extra-tropical Pacific Ocean SST anomalies and does not yet factor in central equatorial Pacific Ocean SST anomalies which, in coming months, will define the state of ENSO ('El Niño', 'La Niña' or 'ENSO-neutral') for 2014/15.
- Central equatorial Pacific Ocean SST anomalies currently remain 'ENSO-neutral', but there is a growing body of evidence pointing to the likely development of an El Niño pattern over winter and spring.
- Should an El Niño event occur, this coupled oceanic and atmospheric pattern would likely persist over the coming summer (November to March).
- An El Niño pattern in the central equatorial Pacific Ocean, coupled with the current extra-tropical Pacific Ocean SST pattern, would support a weak atmospheric Walker Circulation, leading to a high probability of dry conditions (< decile 3 rainfall) for much of Queensland over the coming summer.
- Irrespective of how ENSO develops, the probability of wet conditions (> decile 7 rainfall) for much of Queensland will remain low over the coming summer.
- DSITIA's long-lead outlook for summer rainfall will be reassessed in June, and then updated monthly until November, by factoring in the most recent ENSO conditions.
- Updates to the summer rainfall outlook will be reported in future Monthly Climate Statements.

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