

# Monthly Climate Statement — September 2013

## Key messages

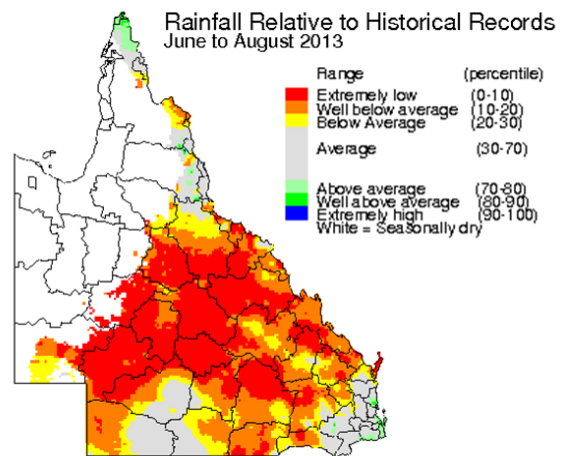
- More than half of Queensland is currently drought declared under State Government processes.
- For the next three-month period (September to November) there is an equal likelihood of rainfall being either above or below the long-term median.
- For the coming summer (November to March), the probability of dry conditions is lower than normal for most of the state.

Currently:

- The Southern Oscillation Index ([SOI](#)), a key atmospheric measure of ENSO, fell from a positive value (+7.4) in July to a near-zero (-0.2) value in August). The three-month mean, from June to August 2013, is +5.9.
- The observed [sea-surface temperature \(SST\) anomaly](#) (-0.3 °C) in the key Niño 3.4 region of the central equatorial Pacific, remained in the ENSO-neutral range in August.
- The majority of [international global climate models](#) surveyed by the International Research Institute for Climate and Society in the USA, and most models surveyed the Bureau of Meteorology 'ENSO Wrap-Up' (10 September), suggest that central equatorial Pacific SSTs will remain within the 'ENSO-neutral' range for the rest of 2013.
- Over the coming months, DSITIA will closely monitor ENSO indices including the SOI and the SST pattern in the Pacific Ocean.

August 2013 rainfall was low across much of the state. Extensive areas of inland Queensland, and some northern regions, have experienced extremely-low rainfall over the past three-month and twelve-month periods.

As at 1st August, over 50 per cent of Queensland was [drought declared](#) under State Government processes. Balonne and northern parts of Maranoa are the most recent regional council areas to be drought declared.



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## Findings for September 2013

The Science Delivery Division of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) notes that, **for the next three-month period (September to November) there is an equal likelihood of rainfall being either above or below the long-term median. For the coming summer (November to March), the probability of dry conditions is lower than normal for most of the state.**

Seasonal forecasts are based on the current and projected state of the ENSO phenomenon and on factors which alter the impact of ENSO on Queensland rainfall (e.g. the Pacific Decadal Oscillation (PDO)). The PDO modulates the impact of ENSO on summer rainfall in Queensland.

## The Pacific Decadal Oscillation

The Pacific Decadal Oscillation (PDO) is a long-lived Pacific Ocean sea-surface temperature pattern which, approximately every 10 to 30 years, 'flips' between what is known as its 'warm' and 'cool' phases. The sea-surface temperature pattern associated with 'warm' and 'cool' phases of the PDO resemble the familiar 'El Niño' (warm) and 'La Niña' (cool) sea-surface temperature patterns of the El Niño-Southern Oscillation (ENSO). However, unlike ENSO, the PDO sea-surface temperature pattern is most pronounced in the extra-tropics, particularly in the North Pacific. The PDO can either reinforce or lessen the impact of an El Niño or La Niña event. The strongest El Niño events tend to occur when the PDO is in its warm phase whereas the strongest La Niña events tend to occur when the PDO is in its cool phase.

## Rainfall Outlook

There are various approaches used to provide rainfall outlooks. These approaches tend to differ in terms of the components of the climate system that are considered. For this reason, each approach may convey a different outlook, particularly for specific locations.

DSITIA uses two statistical schemes to develop its forecasts of seasonal rainfall:

- the experimental long-lead [SPOTA-1 scheme](#), which integrates SST information, including indices of ENSO and the PDO; and
- the [SOI Phase scheme](#), which relies solely on the SOI, an atmospheric measure of ENSO.

The experimental SPOTA-1 scheme provides long-lead probabilities of summer (November to March) rainfall for Queensland from mid-April through to mid-November each year. An updated outlook for summer 2013/14 is now available. This outlook takes into account a monthly ENSO index, as well as an index of March SST anomalies which reflect the current 'cool' phase of the PDO. For the coming summer (November to March), the SPOTA-1 scheme currently indicates that the probability of dry conditions is lower than normal for most of the state. This outlook will continue to be revised each month until November this year.

DSITIA's SOI Phase scheme provides probabilities of rainfall for the coming three-month season based on SOI values over the previous two months. The SOI Phase scheme currently indicates that the [probability of above-median rainfall across most of Queensland](#) is 40 to 60 per cent for the next three-month period (September to November). This analysis is based on the SOI being in a 'Consistently Near-Zero' phase at the end of August, as discussed further in the [Commentary on Rainfall Based on 'Phases' of the SOI](#).

The SPOTA-1 and SOI Phase schemes indicate probabilities based on historical relationships. It is important that the probabilistic nature of seasonal outlooks is understood and long-term risk management is undertaken. For example, if an outlook indicates a 70 per cent probability of above-median rainfall, this also means there is a 30 per cent probability of below-median rainfall.

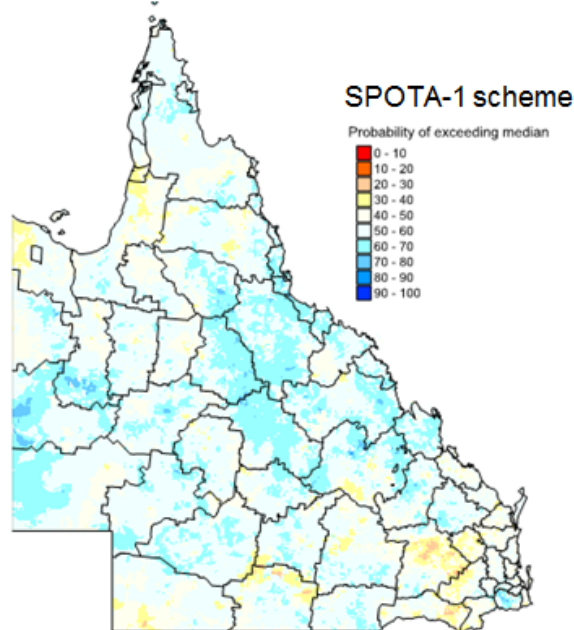
An increased risk of above- or below-median rainfall in Queensland will not necessarily result in above- or below-median rainfall occurring throughout all of the state (see [Australia's Variable Rainfall poster](#), or the Department's [archive of historical rainfall maps](#)).

Each climate outlook scheme may have its own particular following. Although such schemes cannot provide outlooks with absolute certainty, users of the information who follow a skilful scheme should benefit from doing so in the long-term. Users should consider the historical track record of any scheme, and such information is becoming increasingly available. DSITIA's Long Paddock website provides an archive of [SPOTA-1 reports](#) and [past commentaries](#) on the SOI Phase scheme.

Whilst DSITIA places emphasis on the SPOTA-1 and SOI-Phase analyses, a much wider range of information from national and international agencies is also considered. DSITIA pays particular attention to the Bureau of Meteorology's '[ENSO Wrap-Up](#)' which is updated fortnightly on the Bureau's website.

ENSO influences other climate variables apart from rainfall (e.g. temperature, pan evaporation and vapour pressure). This means that the impact of ENSO on crop or pasture growth can be stronger than on rainfall alone. The impact of ENSO on pasture growth, for example, is also dependent upon current pasture condition and soil water status. DSITIA's [AussieGRASS](#) model takes these factors into account in producing [seasonal pasture growth probabilities](#).

**Probability of Exceeding Median Summer Rainfall**  
November 2013 – March 2014 based on the SPOTA-1 Index  
as at September 1, 2013



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