

Monthly Climate Statement — December 2013

Key messages

- Oceanic indicators of ENSO are neutral and are likely to remain so over summer.
- The average value (+4.1) of the Southern Oscillation Index (SOI) over the last three months remained in the neutral range although the November value was quite high (+10.1).
- DSITIA's analysis of Pacific Ocean sea-surface temperatures indicates a higher than normal probability of 'near-average' to 'above-average' rainfall for much of Queensland over summer (November to March).
- Near-average tropical cyclone activity is likely in Queensland this cyclone season (November to April).
- So far this summer (November), rainfall over much of the state has been near-average to above-average, with one tropical cyclone having tracked into the Gulf of Carpentaria.

Currently:

- The [SOI](#), a key atmospheric measure of ENSO, rose from a negative value (-2.1) in October to a positive value (+10.1) in November. The three-month mean SOI value from September to November 2013 was +4.1, remaining in the ENSO-neutral range.
- The observed [sea-surface temperature \(SST\) anomaly](#) (0.0 °C) in the key Niño 3.4 region of the central equatorial Pacific remained in the ENSO-neutral range in November.
- Most [international global climate models](#) indicate that central equatorial Pacific SSTs should remain within the 'ENSO-neutral' range for the rest of summer. Some models indicate an increased potential for warmer than normal central Pacific SSTs in mid-2014.

As at 29 October, over 60 per cent of Queensland was [drought declared](#) under state government processes.

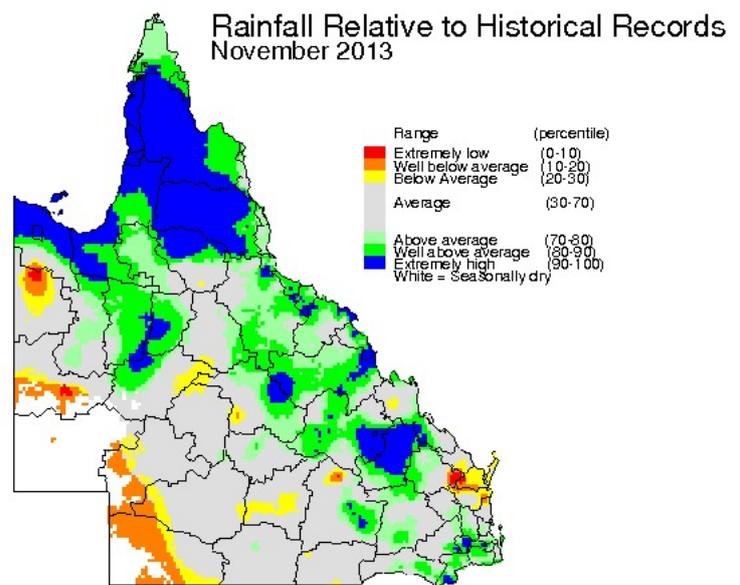
In November, rainfall was extremely-high in northern Queensland, partly due to a southward movement of the monsoon trough and a tropical cyclone (Alessia) which entered the Gulf of Carpentaria during the last week of November.

Findings for December 2013

The Science Delivery Division of the Department of Science, Information Technology, Innovation and the Arts (DSITIA) considers that, **for the summer as a whole (November 2013 to March 2014), and for the remainder of summer (December 2013 to March 2014), there is a higher than normal probability of 'near-average' to 'above-average' rainfall for much of Queensland. This view is based on DSITIA's analysis of Pacific Ocean sea-surface temperatures and their historical relationship with Queensland summer rainfall.**

Furthermore, the Bureau of Meteorology has indicated, in its ['Tropical Cyclone Seasonal Outlook for the Coral Sea'](#), that a 'typical' tropical cyclone season (November to April) is expected for Queensland and the Coral Sea.

Seasonal forecasts 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 (e.g. the Pacific Decadal Oscillation (PDO)).



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Rainfall Outlook

There are various approaches used to provide rainfall outlooks. These approaches tend to differ in terms of methodology and, for this reason, each approach may convey a different outlook, particularly for specific locations.

DSITIA places emphasis on two statistical schemes:

- the experimental long-lead [SPOTA-1 scheme](#), which integrates SST information, including indices of ENSO and the PDO
- 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. 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. As at 1 November 2013, the final SPOTA-1 assessment for this summer (November to March), indicated that there is a higher than normal probability of 'near-average' to 'above-average' rainfall for much of Queensland.

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 for the next three-month period](#) (December to February) is 40 to 60 per cent for most of Queensland. However, probabilities are lower for parts of the north and east of the state and higher for parts of the south-west of the state. This analysis is based on the SOI being in a 'Rapidly Rising' phase at the end of November, 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 to understand the probabilistic nature of seasonal outlooks and to ensure that 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.

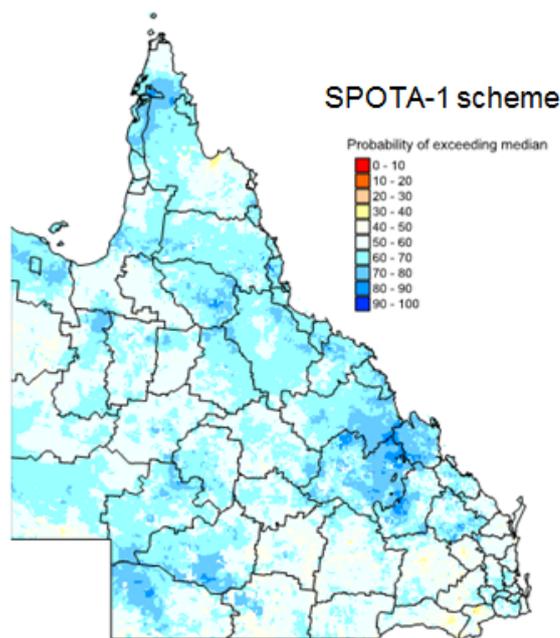
An increased risk of above- or below-median rainfall in Queensland will not necessarily result in above- or below-median rainfall occurring throughout all of the state (see [Australia's Variable Rainfall poster](#), or the department's [archive of historical rainfall maps](#)).

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 November 1, 2013



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