

Queensland Climate Change Centre of Excellence

Monthly Climate Statement – April 2011

Key messages

- Historically high rainfall for Queensland in the 2010-11 wet season
- Wet summer consistent with pre-season assessment indicating a high probability of above-average summer rainfall
- A La Niña climate pattern persists but is likely to break down by winter
- By June – July the Centre will have a better understanding of the likely ENSO conditions for the coming summer season

Findings for April 2011

The Queensland Climate Change Centre of Excellence (the Centre) considers that, at this time of year, the Southern Oscillation Index (SOI) or other measures of the El Niño-Southern Oscillation (ENSO) are less reliable as indicators of rainfall for the autumn season. However, the Centre considers that **there remains an increased probability of above-median rainfall for Queensland while the current La Niña episode persists.** The current La Niña sea-surface temperature pattern continues to weaken although the SOI (an atmospheric measure of ENSO) remains high.

The Centre's understanding is 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). This time of year is known as the 'autumn predictability gap' when there tends to be less persistence in the ENSO signal and when El Niño or La Niña events tend to break down.

Back-to-back La Niña events

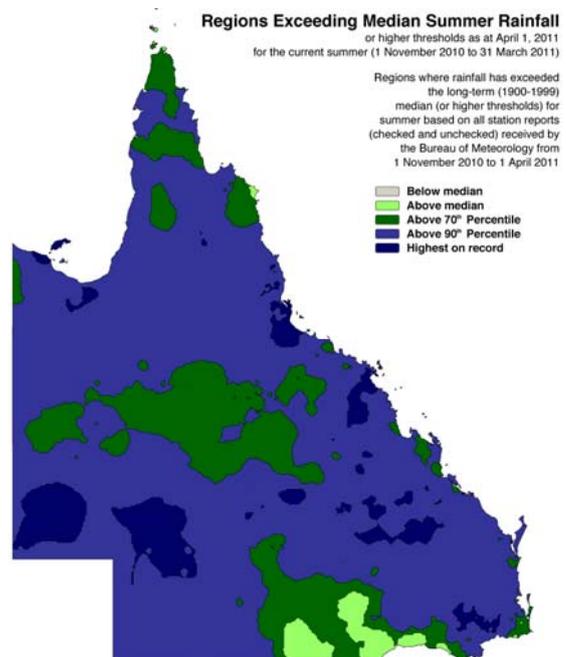
Although El Niño and La Niña events tend to break down in autumn, during a 'Cool Phase' of the Pacific Decadal Oscillation consecutive La Niña events are quite common (e.g. 1916/17 to 1917/18, 1955/56 to 1956/57, 1970/71 to 1971/72, 1973/74 to 1975/76). The Pacific Decadal Oscillation currently remains in a 'Cool Phase' and the Centre continues to monitor the current La Niña conditions.

As at 1 April 2011, the Centre notes that a La Niña pattern currently remains in the Pacific Ocean although there are signs of this pattern weakening. This pattern is likely to continue to weaken in coming months with a

return to ENSO-neutral conditions by winter (see the latest Bureau of Meteorology '[ENSO Wrap-Up](#)').

Currently:

- The SOI, a key atmospheric measure of ENSO, remains very positive when averaged over the last month (March: +17.5), two months (February - March: +20.1), and three months (January - March: +19.4).
- Observed sea surface temperatures in the key [Niño 3.4 and Niño 4 regions](#) have warmed during February and March but remain cooler than normal.
- Historical evidence suggests that La Niña patterns tend to break down during autumn. The likelihood of the current La Niña pattern weakening further over the coming months is supported by most [global climate models](#). However there still remains a possibility of La Niña conditions persisting through 2011.



The recent [sea-surface temperature pattern](#) in the North Pacific remains consistent with a 'Cool Phase' of the [PDO](#). The PDO modulates the impact of ENSO on summer rainfall in Queensland, particularly under La Niña conditions. The ENSO and PDO signals have historically had the strongest impact on rainfall in north-eastern Queensland and the weakest impact in south-eastern Queensland.



There are various approaches used to provide probabilistic rainfall outlooks based on the above information. These approaches tend to differ in terms of which components of the climate system are considered and, for this reason, each approach may convey a different outlook, particularly for specific locations.

Rainfall outlook

The Centre produces two statistical climate risk assessment schemes:

- The Centre's experimental [SPOTA-1 scheme](#) integrates the above sea-surface temperature information, including indices of ENSO and the PDO.
- The Centre's [SOI Phase scheme](#) relies solely on the SOI, an atmospheric measure of ENSO.

The Centre's 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. From mid-April 2010, the SPOTA-1 scheme indicated a high probability of exceeding above-median summer rainfall throughout Queensland. From August through to November 2010, the SPOTA-1 scheme also indicated a high probability of a wet summer (i.e. exceeding 70th percentile rainfall). The summer of 2010/11 was extremely wet in Queensland with rainfall exceeding median levels for the entire state and, for much of the state, exceeding 90th percentile values.

An initial outlook for summer 2011/12 based on the experimental SPOTA-1 scheme is now available (ref link). The SPOTA-1 scheme currently indicates a slightly higher than normal probability of above-median rainfall in parts of Queensland for the coming summer. This outlook is based on an index of March sea-surface temperature anomalies in both the South-West Pacific and the North Pacific which, in part, reflect the current 'cool' state of the PDO. This outlook will be modified when the SPOTA-1 scheme takes into account a monthly ENSO index from June through to November this year.

The Centre's [SOI Phase scheme commentary](#), which relies on the SOI, indicates a slightly higher than normal [probability of exceeding median rainfall](#) across much of the state for the three-month period from April to June.

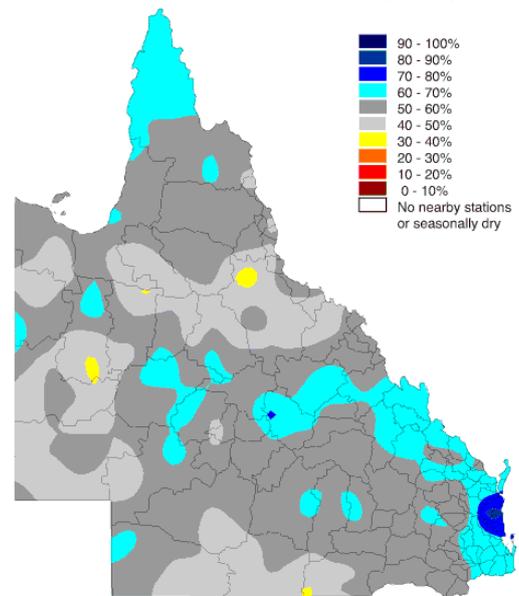
As the above schemes indicate rainfall probabilities based on historical relationships, it is important that the nature of seasonal outlooks are understood and long-term risk management is undertaken. For example, if an outlook indicates a 70 per cent probability of above-median rainfall, this also means there is a 30 per cent probability of below-median rainfall. Additionally, an increased risk of above or below-median rainfall in Queensland due to ENSO will not necessarily result in

above or below-median rainfall occurring throughout the state (see [Australia's Variable Rainfall poster](#) or the Centre's [archive of historical rainfall maps](#)).

The Centre understands that each of the schemes may have its own particular following. Although such schemes cannot provide outlooks with absolute certainty each year, 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. The Centre's Long Paddock website provides an historical archive of [SPOTA-1 reports](#) and past commentaries on the SOI Phase scheme. Users should also consider the wide range of information available each month describing the current state of the ocean/climate system, for example the '[ENSO Wrap-Up](#)'.

Probability of exceeding Median Rainfall

for April / June
based on consistently positive phase
during February / March



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 is also dependent on current pasture condition and soil water status. The Centre's AussieGRASS model takes these factors into account in producing pasture growth seasonal probabilities.

For further information, please visit www.LongPaddock.qld.gov.au or contact QCCCE@climatechange.qld.gov.au