

Queensland Climate Change Centre of Excellence Monthly Climate Statement – May 2011

Key messages

- Above-average rainfall for much of Queensland over the last three months consistent with pre-season assessment
- 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
- Autumn predictability gap evident

Findings for May 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. Given a strong likelihood of the current La Niña pattern breaking down by winter (May to July), the Centre considers that **the probability of above- or below-median rainfall for the next three-month period (May to July) is normal (40-60 per cent) for most of Queensland**. The Centre's experimental SPOTA-1 scheme currently indicates **a slightly higher than normal probability of above-median rainfall for the coming summer (November to March)**.

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.

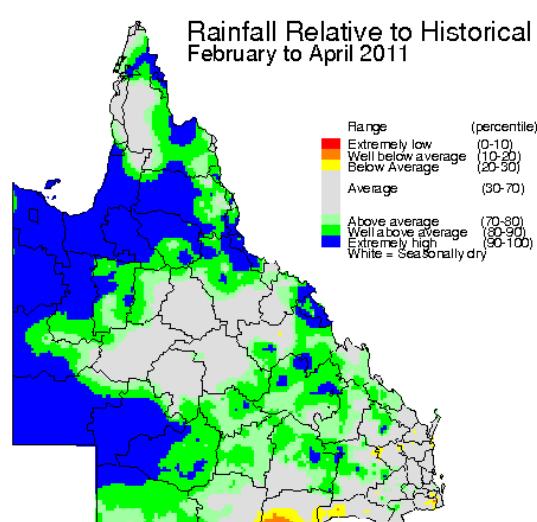
Autumn predictability gap evident

The March 2011 Climate Statement discussed the 'autumn predictability gap', a period when seasonal climate outlooks are least reliable. This 'predictability gap' is now clearly evident. At any other time of the year, extremely positive SOI values as seen in recent months, would indicate a high probability of wet conditions for the season ahead. However, the map overleaf shows that high SOI values over March and April have little bearing on rainfall probabilities for the following three-month period (May to July). This map is based on an historical analysis of Queensland rainfall and the SOI. History also shows that it is far more important to watch the SOI and other measures of the ENSO over coming months.

As at 1 May 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 strong likelihood of 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 (April: +23.9), two months (March - April: +20.7), and three months (February - April: +21.3).
- Observed sea surface temperatures in the key [Niño 3.4 and Niño 4 regions](#) have warmed over autumn but still remain cooler than normal.
- Although a La Niña pattern currently remains in the Central Pacific, the observed warming of equatorial sea-surface temperatures during autumn has been consistent with an historical tendency for La Niña patterns to break down at this time.
- The likelihood of the current La Niña pattern weakening further over the coming months is supported by most [global climate models](#).
- From next month, the Centre will closely monitor the sea-surface temperature pattern in the South-West Pacific which has most relevance for summer rainfall in the Queensland region.



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.

Rainfall over the last three-month period (February to April) has been above-average for much of Queensland. This is consistent with the continuation of the La Niña pattern through this period as discussed in previous climate statements.

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. The initial outlook for summer 2011/12 based on the experimental SPOTA-1 scheme is now available. 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 monthly from June onwards 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 that the [probability of exceeding median rainfall](#) (or below median rainfall) across most of Queensland is normal (40-60 per cent) for the next three-month period (May to July).

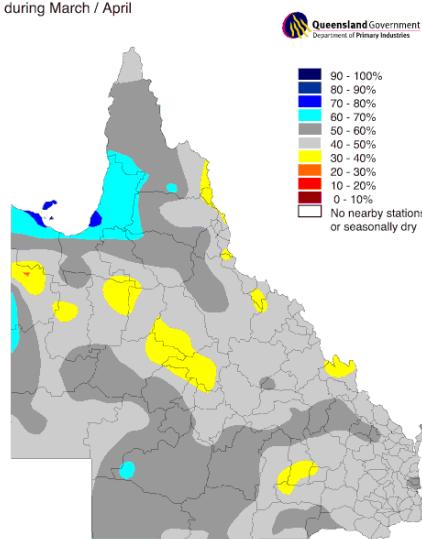
As the above schemes indicate rainfall probabilities based on historical relationships, it is important that the nature of seasonal outlooks are understood and long-term risk management is undertaken. For example, if an outlook indicates a 70 per cent probability of above-

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 all of 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 May / July
based on consistently positive phase
during March / April



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/climatestatement or
contact QCCCE@climatechange.qld.gov.au