

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

Key messages

- La Niña is likely to weaken during autumn
- High probability of above-median rainfall leading into autumn
- Tropical cyclone risk continues

Findings for February 2011

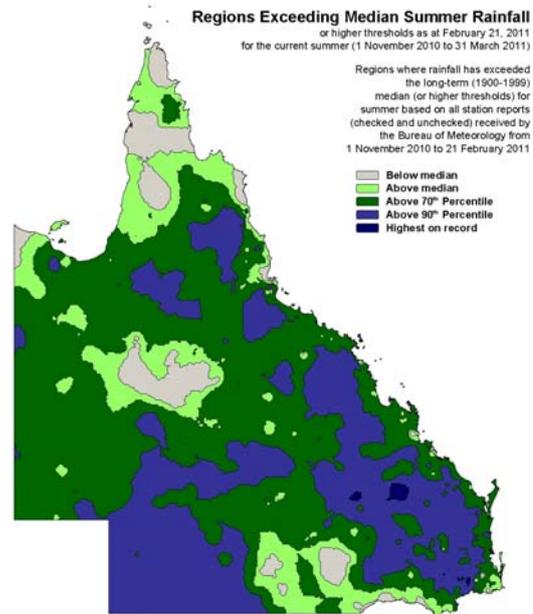
The Queensland Climate Change Centre of Excellence (the Centre) considers that there is **an increased probability of above-median rainfall over much of Queensland leading into autumn.**

The Centre's understanding is 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)).

As at 1 February 2011, the Centre notes that although one of the strongest La Niña events on record continues in the Pacific Ocean (see the latest Bureau of Meteorology '[ENSO Wrap-Up](#)'), this pattern is likely to weaken in coming months. Currently:

- The Southern Oscillation Index (SOI) remains very positive when averaged over the last month (January: +18.1), two months (December - January: +22.3), and three months (November - January: +20.3). [Higher values](#) for the three months ending in January have only been recorded in 1890 (+21.0) and 1974 (+22.5).
- Observed sea surface temperatures appear to have reached their minimum in the key [Niño 3.4](#) and [Niño 4 regions](#) but remain much cooler than normal.
- Associated with this La Niña pattern, the sea surface temperature gradient (west to east) across the [South Pacific Convergence Zone](#) (i.e. between eastern Australia and the Central Pacific) was extremely positive leading into summer (e.g. +1.9°C in October). According to the Centre's experimental [SPOTA-1 scheme](#), a positive sea surface temperature gradient across this region, particularly in October, tends to be associated with above-median rainfall in Queensland during the following November to March period.
- Historical evidence suggests that La Niña patterns tend to break down during autumn. The likelihood of the current La Niña pattern weakening as

autumn approaches is supported by most [global climate models](#), however, there is a possibility of it 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.

A cool phase of the PDO, coupled with La Niña conditions, is particularly favourable for November to March rainfall in Queensland (see the Centre's experimental [SPOTA-1 scheme](#) which incorporates a measure of both ENSO and the PDO). These conditions are also usually associated with enhanced tropical cyclone activity in the Coral Sea. Further information is available in the Bureau of Meteorology's [media release](#).

So far this summer, three tropical cyclones have made landfall in Queensland. These were Tasha (25 December 2010), Anthony (30 January 2011) and, by far the largest, Yasi (2 February 2011).

The three-month period from November 2010 to January 2011 has been extremely wet, with rainfall between the 90th and 100th percentile over much of Queensland (see the Centre's [Rainfall Relative to Historical Records](#) chart). Most of Queensland has already received rainfall totals exceeding the long-term median for the entire summer (November to March). Several regions have already received rainfall totals exceeding the 70th percentile, with some



southern and eastern regions exceeding the 90th percentile, for the entire summer.

Rainfall outlook

There are various approaches for developing probabilistic rainfall outlooks based on the information above. These approaches tend to differ in terms of which components of the climate system are considered and might convey a different outlook, particularly for specific locations.

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.

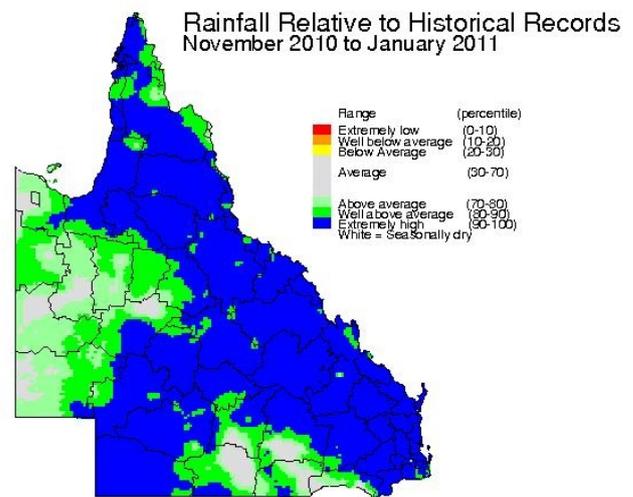
The Centre produces two statistical climate risk assessment schemes:

- The Centre's experimental [SPOTA-1 scheme](#) integrates the above sea-surface temperature information, including indices of ENSO and the PDO. The final SPOTA-1 outlook for this summer (November to March), issued in November 2010, indicated a high probability of exceeding median rainfall across the state. Given the extremely wet start to summer, in January the Centre issued a special SPOTA-1 analysis for the remainder of summer (January to March). This analysis indicated a high probability of exceeding median rainfall for the remainder of summer.
- The Centre's [SOI Phase scheme](#), which relies on the SOI, also indicates a higher than normal probability of exceeding median rainfall across much of the state from [February to April](#).

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 has 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 a historical archive of

[SPOTA-1 reports](#). 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](#)'.



www.LongPaddock.qld.gov.au

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, visit [Long Paddock](#) or contact QCCCE@climatechange.qld.gov.au

