Queensland Climate Change Centre of Excellence Monthly Climate Statement—January 2012

Key messages

- The Southern Oscillation Index strengthened in December.
- The current La Niña climate pattern is likely to persist for the remainder of summer.
- There remains a higher than normal probability of above-median rainfall for the remainder of summer for Queensland.
- The risk of land-falling tropical cyclones remains over the next few months.

Findings for January 2012

The Queensland Climate Change Centre of Excellence (the Centre) considers that the probability of above-median rainfall for the remainder of summer (from January to March 2012) is higher than normal for most of Queensland. The Centre's view, which is based on a comparison of historical rainfall records and climate indices, is also supported by a range of evidence provided by national and international climate agencies. Furthermore, the Centre notes that the Bureau of Meteorology has indicated that the tropical cyclone season (November to April) is likely to be more active than normal. The Queensland Regional Office of the Bureau of Meteorology is encouraging communities to be prepared for 'perhaps one or two' tropical cyclones making landfall in Queensland during the cyclone season.

Associated with the current La Niña climate pattern, most of Australia, including parts of western Queensland, has experienced a wetter than average summer to date. However, more generally across Queensland, rainfall so far this summer has been close to average. The now well established La Niña climate pattern is likely to persist for the remainder of summer and, with this, there remains a high probability of above-above median rainfall throughout Queensland for the remainder of summer (January to March).

As at 1 January 2012 the Centre notes that Niño 3.4 region sea-surface temperature anomalies in the central equatorial Pacific, a key indicator of the El Niño-Southern Oscillation (ENSO) phenomenon, exceed La Niña thresholds. The Southern Oscillation Index (SOI), an atmospheric measure of ENSO, has averaged +14.0 over the last 90 days (to 11 January) and was very positive (+ 22.2) during December. However, these indicators are weaker than at the same time in 2010. The Bureau of Meteorology, in their latest 'ENSO Wrap-Up' (PDF)* (issued 4 January 2012), notes that the majority of climate models surveyed by the Bureau indicate that the current La Niña event is likely to have peaked with a gradual decline expected over the remainder of summer and early autumn.

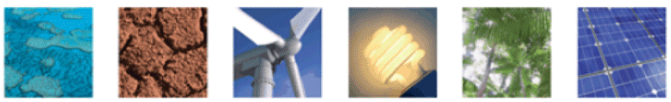
The Centre has closely monitored sea-surface temperatures in specific regions of the Pacific Ocean since April last year to provide long-lead rainfall probabilities for the current summer. These long-lead outlooks are based on the Centre's experimental Seasonal Pacific Ocean Temperature Analysis (SPOTA-1) scheme. SPOTA-1 takes into account both ENSO and a more persistent, but related, coupled ocean-atmosphere phenomenon known as the Pacific Decadal Oscillation (PDO). The final SPOTA-1 update for Queensland prior to this summer (as at 1 November 2011) indicated a higher than normal probability of above-median summer rainfall (November to March), including any three-month period falling within summer (i.e. November to January, December to February and January to March). Although these probabilities won't be revised, the Centre will continue to monitor the SOI and sea-surface temperatures and provide commentary on this basis.

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 and, for this reason, each approach may convey a different outlook, particularly for specific locations.

The Centre produces two statistical climate risk assessment schemes. They are:

- the experimental SPOTA-1 scheme, which integrates sea-surface temperature 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 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 sea-surface temperature gradient (west to east) across the South Pacific



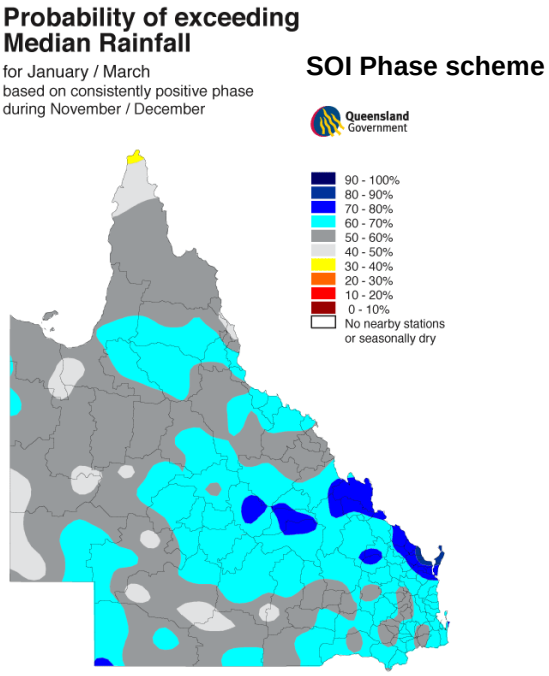
Convergence Zone (i.e. between eastern Australia and the central Pacific) remained positive (+1.37 ºC) in October. According to the Centre's experimental SPOTA-1 scheme, a positive sea-surface temperature gradient across this region is favourable for summer rainfall in Queensland. The final SPOTA-1 scheme, issued in November, indicated a higher-than-normal (60 to 80 per cent) probability of above-median summer rainfall throughout Queensland.

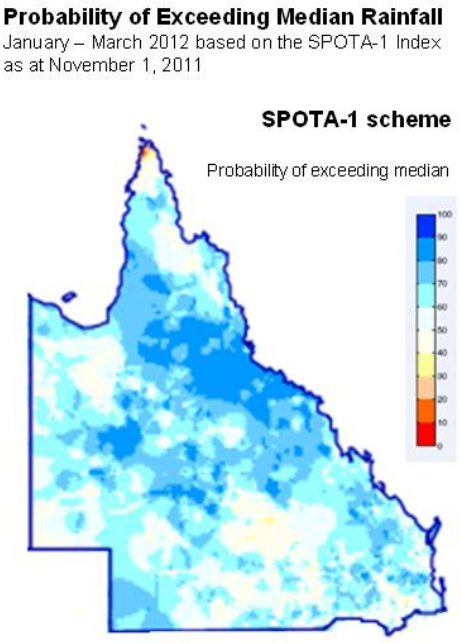
The Centre's SOI phase scheme provides probabilities of rainfall for the coming three-month season based on SOI values over the previous two months. The SOI phase scheme currently indicates that the probability of exceeding median rainfall across most of Queensland is 50 to 70 per cent, which is higher than normal (50 per cent) for the next three-month period (January to March). This analysis is based on the fact that the SOI has remained consistently positive from November to December as discussed further in the Centre's 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.

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 above schemes may have their 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 historical information is becoming increasingly available. The Centre's Long Paddock website provides the 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'. 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 upon current pasture condition and soil water status. The Centre's AussieGRASS model takes these factors into account in producing seasonal pasture growth probabilities.





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