

Monthly Climate Statement – December 2020

Key messages

- The Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is higher than normal across Queensland.
- This outlook for summer rainfall is based on sea-surface temperatures across the Pacific Ocean, including those regions related to the El Niño-Southern Oscillation (ENSO) phenomenon.
- The current 'La Niña' climate pattern is likely to persist through summer and favours above-average summer rainfall in Queensland.

The Department of Environment and Science (DES) monitors sea-surface temperature (SST) anomalies in key regions of the Pacific Ocean over autumn, winter and spring, and provides objective outlooks for summer (November to March) rainfall on this basis. Based on the evolving SST pattern in the Pacific Ocean, **the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is higher than normal across Queensland.**

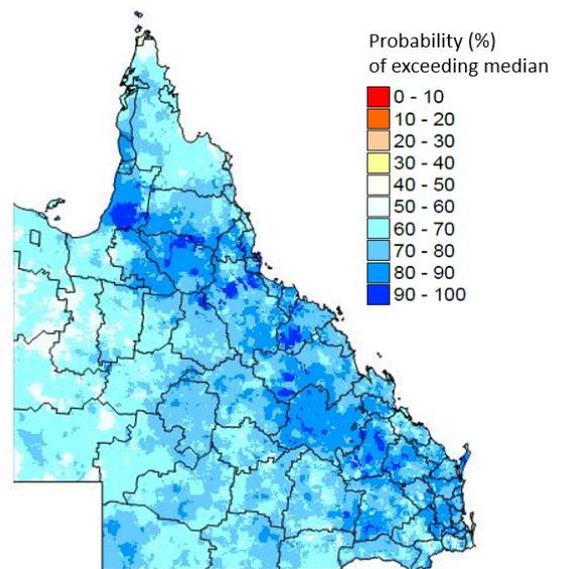
The most closely monitored driver of Queensland rainfall is the El Niño-Southern Oscillation (ENSO) phenomenon. Climate scientists monitor several ENSO indices, including the atmospheric Southern Oscillation Index (SOI) and SST anomalies in the Niño 3.4 region of the central equatorial Pacific Ocean.

Over the last three months (September to November) the SOI has remained quite positive (+7.9 on average) and SSTs in the Niño 3.4 region have been much cooler than average (-1.2°C on average). These conditions are indicative of a 'La Niña' climate pattern. This coupled ocean-atmosphere pattern tends to build over winter and spring and, once formed, tends to persist through summer, favouring above-average summer rainfall in Queensland.

La Niña conditions tend to weaken the SST gradient between the central Pacific and the south-western Pacific. This SST gradient, which crosses a region known as the 'South Pacific Convergence Zone' (SPCZ), is a particularly useful leading indicator of summer rainfall in Queensland, and is monitored monthly by DES.

The DES outlook for summer rainfall in Queensland (below) is based on an objective analysis of SST gradients across key regions of the Pacific Ocean, including the SPCZ. On this basis, the Science and Technology Division of DES considers that the probability of exceeding median summer (November to March) rainfall is higher than normal across Queensland. This outlook, whilst based on historical relationships, is also consistent with recent outlooks based on climate modelling conducted by the Bureau of Meteorology and international climate agencies.

Probability of exceeding median summer rainfall
for November 2020 – March 2021, as at 1 November 2020



As regular readers of this Monthly Climate Statement will appreciate, DES climate scientists calculate rainfall probabilities for the coming summer season on a continual basis from April through to November each year. With the summer season now having commenced, the above outlook is the final update of this information for 2020. As always, readers are cautioned that seasonal outlooks are expressed in terms of probabilities. Even though an outcome has a high probability of occurring based on historical records, a less likely outcome may still occur in any given year.

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