

## Monthly Climate Statement – November 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).
- The current 'La Niña' climate pattern favours above-average rainfall in Queensland and is likely to persist through summer.

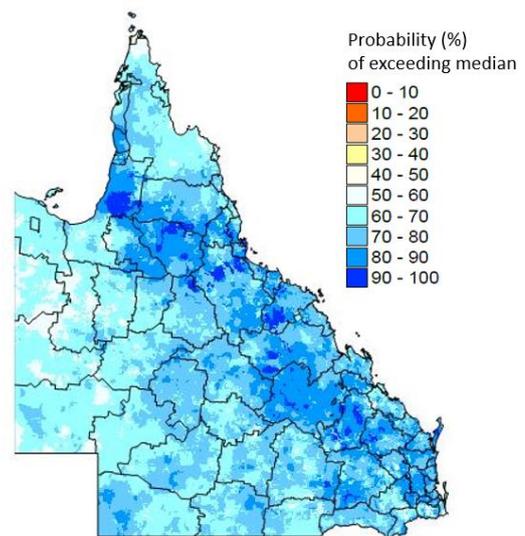
The Department of Environment and Science (DES) monitors sea-surface temperature (SST) anomalies in key regions of the Pacific Ocean over autumn, winter and spring, and provides objective outlooks for summer (November to March) rainfall on this basis. Based on the evolving SST pattern in the Pacific 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 central equatorial Pacific Ocean. SOI values, particularly at this time of year, are best smoothed over several months. The SST anomaly in the Niño 3.4 region of the central equatorial Pacific requires less smoothing, with monthly index values providing valuable information as to ENSO development. The most recent three-month average SOI value is now quite positive (+7.6 for August to October). SSTs in the Niño 3.4 region have continued to cool over the last three months, that is, from -0.6°C in August to -1.4°C in October. Climate models generally project further cooling of SSTs in the central equatorial Pacific over coming months.

A positive value of the SOI in spring, together with cool SST anomalies in the central equatorial Pacific, is indicative of a 'La Niña' climate pattern. This coupled ocean-atmosphere pattern tends to build over winter and spring, as we have seen this year. In late September, the Bureau of Meteorology changed the status of their 'ENSO outlook' from "La Niña Alert" to "La Niña Active". However, it should be appreciated that the actual declaration of a La Niña event does not suddenly 'flip a switch' in terms of rainfall probabilities. Rather, rainfall probabilities change according to the strength of the underlying oceanic and atmospheric conditions, both leading up to, and following, the declaration of a La Niña event.

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 guide to summer rainfall in Queensland, and indeed eastern Australia. 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 very 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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