

QUEENSLAND CLIMATE ASSESSMENT REPORT

Current climate and seasonal outlook information to support sustainable grazing land, water, catchment and environmental management in Queensland.

SEASONAL CONDITIONS SUMMARY

FINDINGS AS AT 14 July 2025

- Rainfall over the last three-, six- and twelve-month periods was above average to extremely high over much of Queensland.
- Twelve-month rainfall to the end of June 2025, averaged over the main grazing lands of Queensland, was 31 per cent above the long-term average (1890 to 2020).
- The El Niño-Southern Oscillation (ENSO) phenomenon, which is the major driver of spring and summer rainfall in Queensland, is now clearly in an 'ENSO-neutral' state.
- As at 1 July 2025 the Science Division of DETSI considers that the probability of exceeding median summer (November 2025 to March 2026) rainfall for much of Queensland currently remains within the near-normal range (30 to 70 per cent).

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Historical Rainfall Variability and Drought Situation

Figure 1 shows 12-month rainfall averaged over the region of Queensland shown on the grey map (top right). This region carries over 80 per cent of the State's cattle and sheep herd and covers only 60 per cent of Queensland's land area. In each graph, rainfall is expressed as a percentage difference from the long-term (1890 to 2020) average. The upper graph shows the running 12-month rainfall anomaly since 1890, indicating the long-term history of wet and dry periods over this region. The lower graph focuses on changes since 2010 and shows, at selected times, those parts of Queensland drought-declared under State Government processes. Twelve-month rainfall to the end of June 2025, averaged over the main grazing lands of Queensland, was 31 per cent above the long-term average (1890 to 2020). Queensland currently has [no local government areas which are officially drought-declared](#).

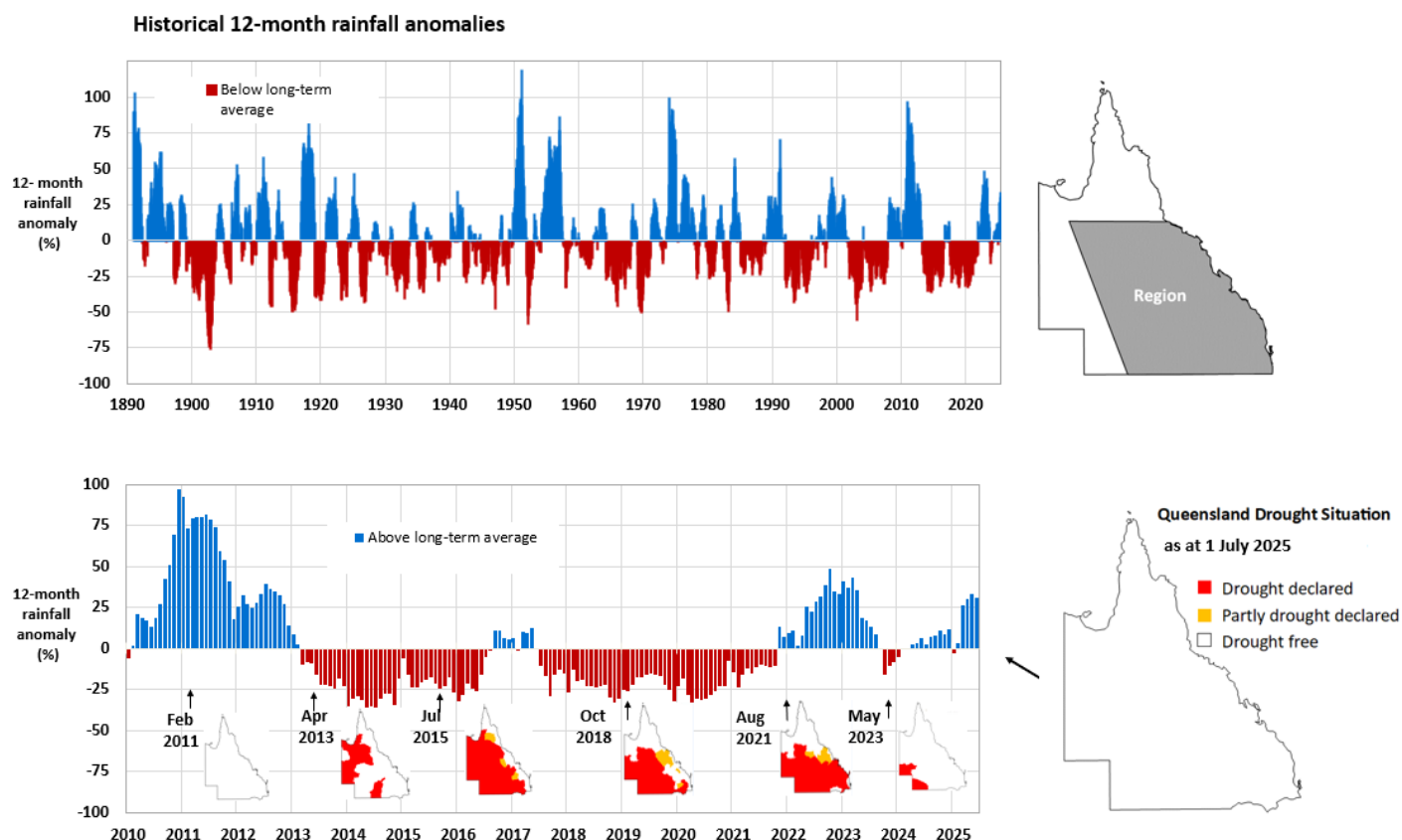


Fig.1: Historical 12-month rainfall anomalies

(Rainfall data source: <https://www.longpaddock.qld.gov.au/silo/>)

Rainfall and Pasture Growth Update

Figures 2 and 3 are products of the [AussieGRASS Environmental Calculator](https://www.longpaddock.qld.gov.au/aussiegrass/) (Carter et al. 2000). Figure 2 shows rainfall over the last three-, six- and 12-month periods (up to April 30, 2025) ranked against historical values. Rainfall percentiles over the last three-, six-, and 12-month periods were above average to extremely high over much of Queensland, the main exceptions being parts of southern and south-western Queensland and eastern Cape York Peninsula which have received below to extremely low rainfall totals in some cases.

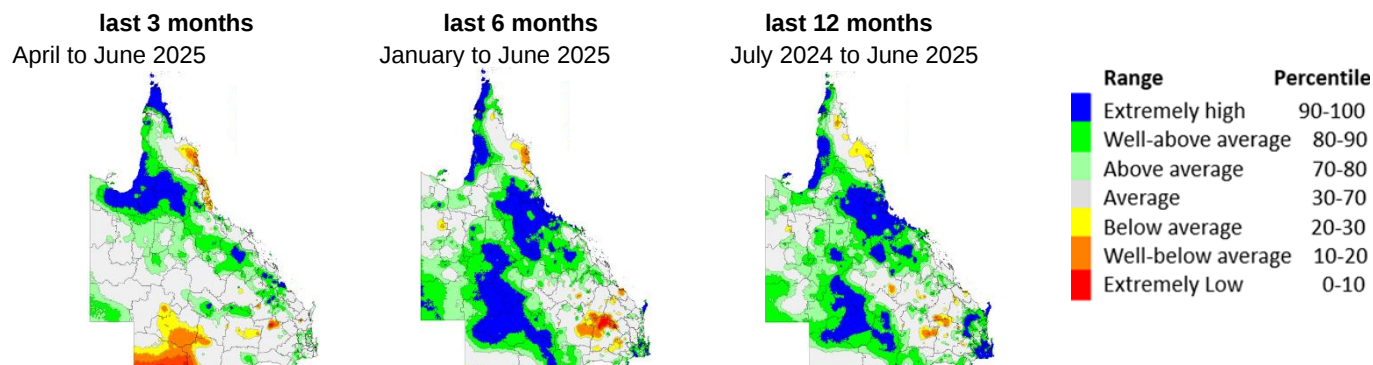


Fig. 2: Rainfall percentiles (base period 1890 to current)
(Source: <https://www.longpaddock.qld.gov.au/aussiegrass/>)

Figure 3 shows calculated pasture growth percentiles over the last three-, six-, and 12-month periods. The pattern of calculated pasture growth percentiles over the last three-, six-, and 12-month periods has broad similarities for much of the state to that of rainfall percentiles (above), ranging from extremely low to extremely high depending on region and length of period considered.

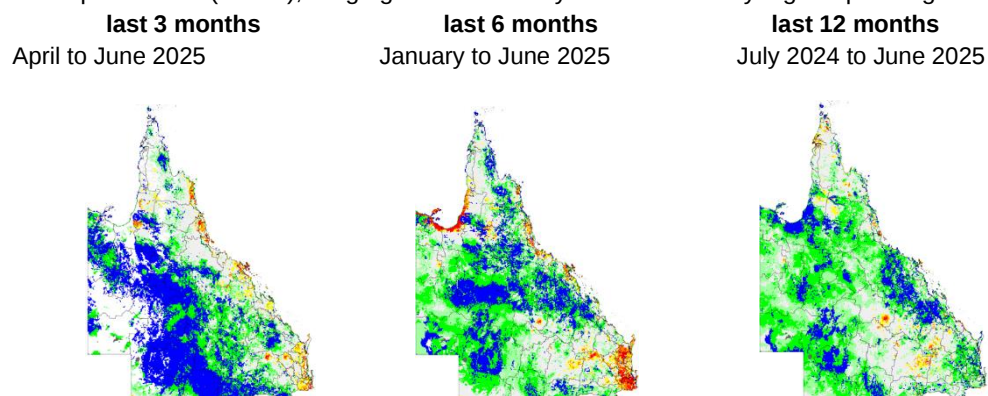


Fig. 3: Pasture growth percentiles (base period 1957 to current)
White shading indicates areas that normally have "seasonally low" pasture growth.
(Source: <https://www.longpaddock.qld.gov.au/aussiegrass/>)

Season-to-Date Rainfall versus April to October historical records

Rainfall for 1 April to 30 June 2025 period, averaged across Queensland's major grazing lands region (grey region on the map in Fig.4), totalled 100 mm, and is above the long-term median for April to October period. The season is wetter than the same period last year 1 April to 30 June 2024.

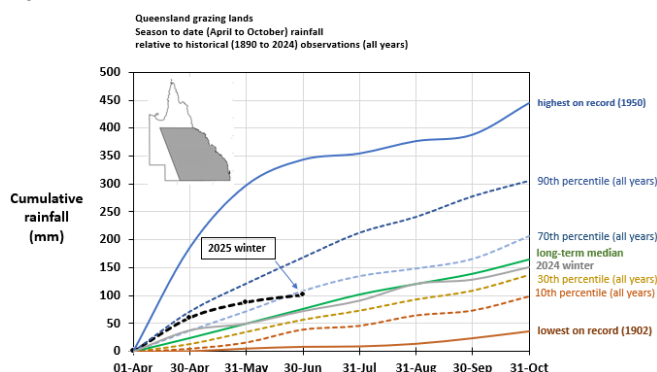


Fig. 4: April to October 2025 season accumulated rainfall as at 1 July 2025, compared to historical values.
Percentiles based on season-to-date rainfall at the end of each month since 1 April (based on data from 1890 to 2024).
Data source: <https://www.longpaddock.qld.gov.au/silo/>

El Niño-Southern Oscillation (ENSO)

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 sea-surface temperature (SST) anomalies in the central equatorial Pacific Ocean.

The most recent three-month average value of the SOI, (+2.7 for April to June 2025, Fig. 5) now falls within the 'ENSO-neutral' range (-5 to +5; fig 5). Over the corresponding period, the SST anomaly in the Niño 3.4 region of the central equatorial Pacific has remained in the near-average (-0.05°C, Fig. 5) with near-average SST anomalies now extending across most of the central equatorial Pacific (Fig. 6). Together, these and other indices clearly show that the oceanic and atmospheric conditions are now 'ENSO-neutral'.

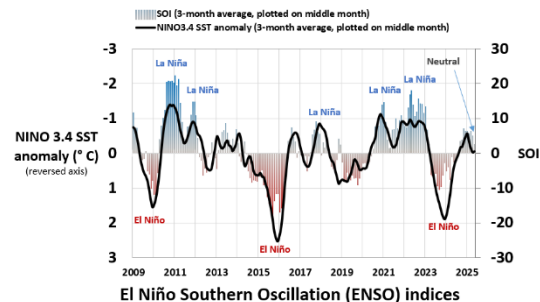


Fig. 5: El Niño Southern Oscillation (ENSO) Indices

SST source: www.cpc.ncep.noaa.gov/data/indices
(NINO3.4 SST, monthly OISST.v2.1 (1991 to 2020 base period))
SOI source: www.longpaddock.qld.gov.au/soi/soi-data-files
(monthly SOI 1887-1989 base period)

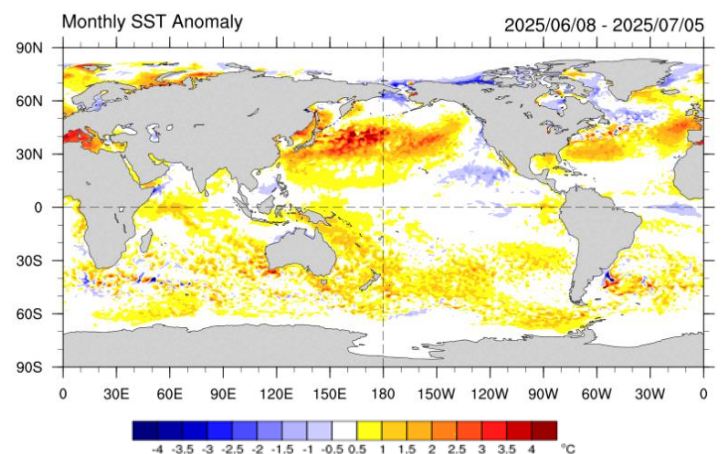


Fig. 6: Pacific Ocean sea-surface temperature anomalies (°C)
for 8 June to 5 July 2025 based on NOAA OISST.v3.1 SST data (1991 to 2020 based period)
Map source: <https://psl.noaa.gov/map/clim/sst.shtml>

Madden-Julian Oscillation (MJO)

The [Madden-Julian Oscillation \(MJO\)](#) is a broad area of tropical convection (cloud and rainfall) which tracks east from the western Indian Ocean toward the eastern Pacific Ocean. This MJO cycle tends to recur on average every 30 to 60 days (intraseasonal), distinct from El Niño and La Niña events which typically persist for three to nine months. In Queensland, the MJO has its greatest influence on rainfall during the tropical cyclone season (November to April), particularly in northern parts of the State, as its passage can enhance the strength of the northern Australian monsoon and increase the chance of tropical cyclones. For example, two tropical cyclones made landfall in Queensland during the 2023-24 season ('Jasper' on 13 December and 'Kirrily' on 25 January), both occurred when the MJO was active in Australian-Western Pacific longitudes, unlike tropical cyclone Alfred which made landfall on 8 March 2025. The MJO has been weak or indiscernible for the fortnight up to 27 June and a weak MJO has minimal influence on Australian rainfall.

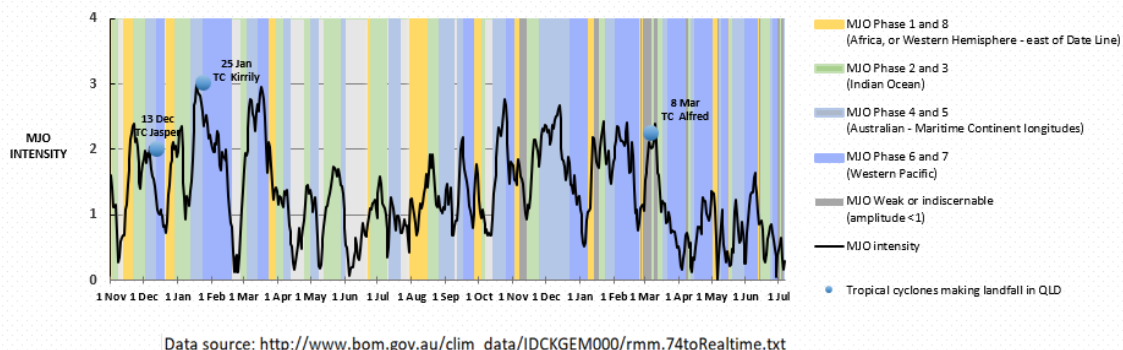


Fig. 7: Madden-Julian Oscillation intensity and phase-location

The graph shows the general location (coloured bars) and intensity (grey line) of the MJO from 1 November 2023 to 6 July 2025.
Data source: http://www.bom.gov.au/clim_data/IDCKGEM000/rmm.74toRealtime.txt

Long-lead Summer Rainfall Outlook

(produced on 10 June, based on SPOTA-1)

The Department of the Environment, Tourism, Science and Innovation (DETSI) monitors 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.

The current DETSI outlook for summer rainfall in Queensland is an objective analysis of historical conditions using an index based on SST anomalies measured in March in key regions of the extra-tropical Pacific Ocean, which factors-in the evolving ENSO-related SST pattern in the central and southwest Pacific. The SSTs have been related to rainfall over much of Queensland in the following summer. On this basis, as at 1 July, the Science Division of DETSI considered that the probability of exceeding median summer (November to March) rainfall currently remains within the near-normal range (30 to 70 per cent) for much of Queensland (Figs. 8 and 9).

Further updates will follow each month up to November 2025.

Three-month Rainfall Outlooks

based on international dynamical models

The maps in Figure 10 show rainfall probabilities for upcoming three-month periods, based on dynamical climate modelling, sourced from a range of international climate agencies. Rainfall probabilities differ for each model, on both a spatial and temporal basis, due to the different methodologies used.

For July to September period, three quarters of the models are generally indicating wetter than average probability in most parts of Queensland, while a quarter of the models mostly predict drier than average conditions.

Dynamical model outlook sources:

Australian Bureau of Meteorology <http://www.bom.gov.au/jsp/sco/archive/>

UK Met Office: <http://www.metoffice.gov.uk/research/climate/seasonal-to-decadal/gpc-outlooks/glob-seas-prob>

European C3S (Copernicus Climate Change Service) multi-model: https://climate.copernicus.eu/charts/c3s_seasonal/ (C3S multi-system (7))

NOAA North American Multi-model Ensemble - USA: <https://www.cpc.ncep.noaa.gov/products/NMME/seasanom.shtml> (Global prate)

Probability of exceeding median summer rainfall for November 2025 - March 2026, as at 1 July 2025

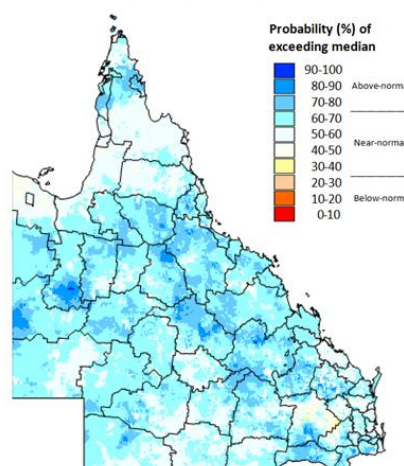


Fig. 8: Probability of exceeding median summer rainfall (for November 2025 to March 2026) as at 1 July 2025

Produced by the DETSI SPOTA-1 system.

Summer (Nov to Mar) rainfall probabilities for Queensland regions, as at 1 July 2025

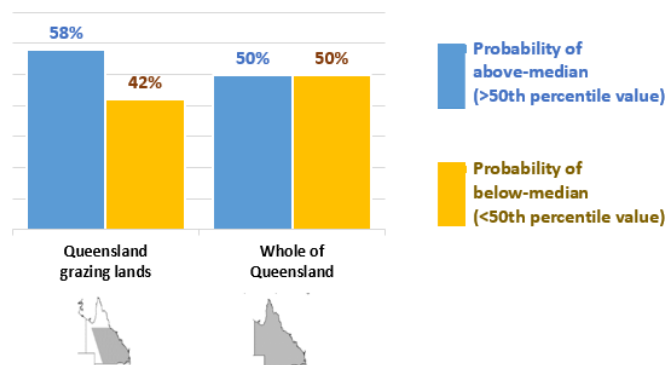


Fig. 9: Probabilities of above and below median summer rainfall (for November to March) as at 1 July 2025

For the Queensland's major grazing region and the State as a whole, based on historical analogue year output from the DETSI SPOTA-1 system.

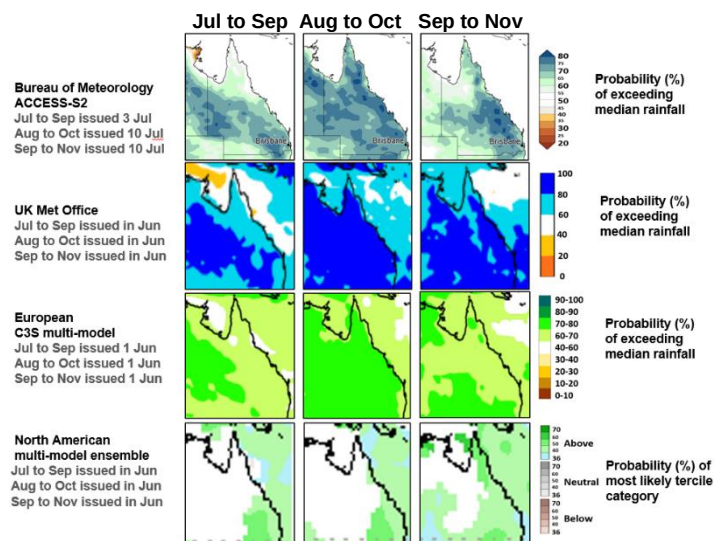


Fig. 10: Rainfall probabilities for July to November 2025, based on international dynamical models

Three-month Rainfall Outlook

based on the SOI Phase system

The map in Figure 11 shows rainfall probabilities for the coming three-month period, based solely on a Consistently Near Zero 'phase' of the SOI at the end of May 2025, as determined by the SOI Phase system. The current phase of the SOI ([click for more detail](#)) is based on the most recent values of the SOI (+4.1 for April and +3.3 for May 2025).

The map, which is based on 34 previous years (from 1889 to 2015) which had a 'Consistently Near Zero' phase of the SOI at the end of June 2025, indicates a generally 30 to 60 per cent probability of exceeding median July to September 2025 rainfall across much of Queensland.

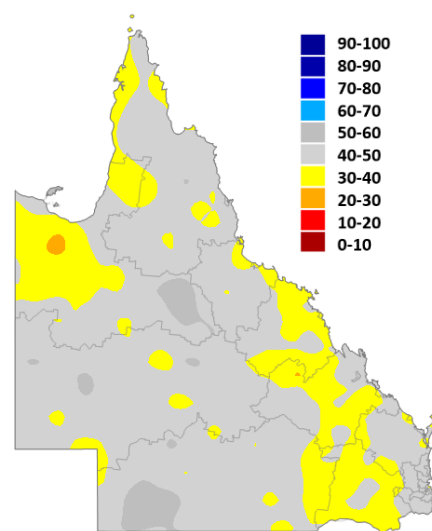
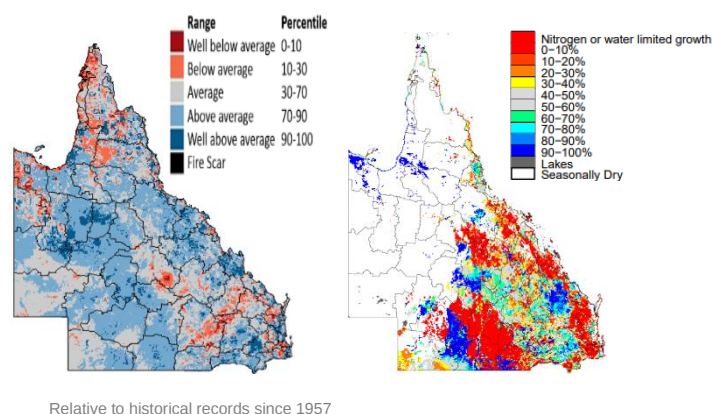


Fig. 11: Probability of exceeding median rainfall for July to September 2025 based on a 'Consistently Near Zero' phase of the SOI at the end of June 2025.

Pasture Outlook

Figures 12 and 13 are products of the [AussieGRASS Environmental Calculator](#). Calculated pasture ground cover at the end of June 2025 (Fig. 12) ranged from average to well-above average in most parts, with exceptions in parts of far north, central-eastern and south-eastern Queensland. Figure 13 shows that the probability of exceeding median pasture growth over July to September 2025 is higher than normal for some parts of northwest and south-eastern half of Queensland. The probability of exceeding median pasture growth is lower than normal for some parts of south-eastern Queensland. This calculation takes into account both current conditions (e.g., soil water content) and rainfall probabilities for the next three-month period) based on [SOI Phase analogue years](#).



Relative to historical records since 1957

Fig. 12:
Calculated pasture cover at 30 June 2025.

Fig. 13:
Probability of exceeding median pasture growth for Jul to Sep 2025 based on a 'Consistently Near Zero' phase of the SOI at the end of June 2025.

REFERENCES AND RESOURCES

References:

- Carter, J.O. *et al.* (2000). Aussie GRASS: Australian Grassland and Rangeland Assessment by Spatial Simulation. In 'Applications of seasonal climate forecasting in agricultural and natural ecosystems - the Australian experience.' (Eds. G. Hammer, N. Nicholls and C. Mitchell). Kluwer Academic Press, Netherlands, pp. 329-349.
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- Day, K.A. and McKeon, G.M. (2018). An Index of Summer Rainfall for Queensland's Grazing Lands. *Journal of Applied Meteorology and Climatology*, **57**, 1623-41. <https://doi.org/10.1175/JAMC-D-17-0148.1>
- McKeon, G. *et al.* (2004). 'Pasture Degradation and Recovery in Australia's Rangelands: Learning from History.' Queensland Department of Natural Resources, Mines, and Energy, Brisbane, Australia.
- Stone, R. and Auliciems, A. (1992), SOI phase relationships with rainfall in eastern Australia. *Int. J. Climatol.*, **12**: 625-636. <https://doi.org/10.1002/joc.3370120608>
- Stone, R., Hammer, G. & Marcussen, T. Prediction of global rainfall probabilities using phases of the Southern Oscillation Index. *Nature* **384**, 252–255 (1996). <https://doi.org/10.1038/384252a0>

Additional resources:

For further information on AussieGRASS, seasonal climate outlooks (including the SOI Phase scheme and the SPOTA-1 scheme) and Queensland drought declarations, visit the Long Paddock website, <https://www.longpaddock.qld.gov.au>.

MJO description: <https://www.climate.gov/news-features/blogs/enso/what-mjo-and-why-do-we-care>

General Disclaimer:

Information contained in this report is provided as general advice and the maps are designed to provide information relevant at a regional (shire) scale. More detailed information is required when making specific property scale management decisions. The State of Queensland, as represented by the Department of the Environment, Tourism, Science and Innovation, gives no warranty in relation to the data including without limitation, accuracy, reliability, completeness or fitness for a particular purpose.

It should be noted that seasonal outlooks are probabilistic and not deterministic in nature. For example, if an outlook indicates that there is an 80 per cent probability of exceeding median rainfall, should be interpreted as also meaning that there is a 20 per cent probability of rainfall being below the long-term median. In cases where outcomes with a high probability may be more likely, this does not mean that less probable events will not occur in any given year. Users should also consider sourcing information related to the historical track record of any outlook scheme, and such information is becoming increasingly available.

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