Queensland Government

Department of the Environment, Tourism, Science and Innovation — August 2025 issue

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 8 August 2025

- **Rainfall over the last six- and twelve-month periods was above average to extremely high over much of Queensland although the last three-month period has been dry over parts of the southern and north-western Queensland and Cape York Peninsula.**

- **Twelve-month rainfall to the end of July 2025, averaged over the main grazing lands of Queensland, was 33 per cent above the long-term average (1890 to 2020).**

- **The El Nino-Southern Oscillation (ENSO) phenomenon, which is the major driver of spring and summer rainfall in Queensland, remains in an 'ENSO-neutral' state.**

- **As at 1 August 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 July 2025, averaged over the main grazing lands of Queensland, was 33 per cent above the long-term average (1890 to 2020). Queensland currently has no local government areas which are officially drought-declared.

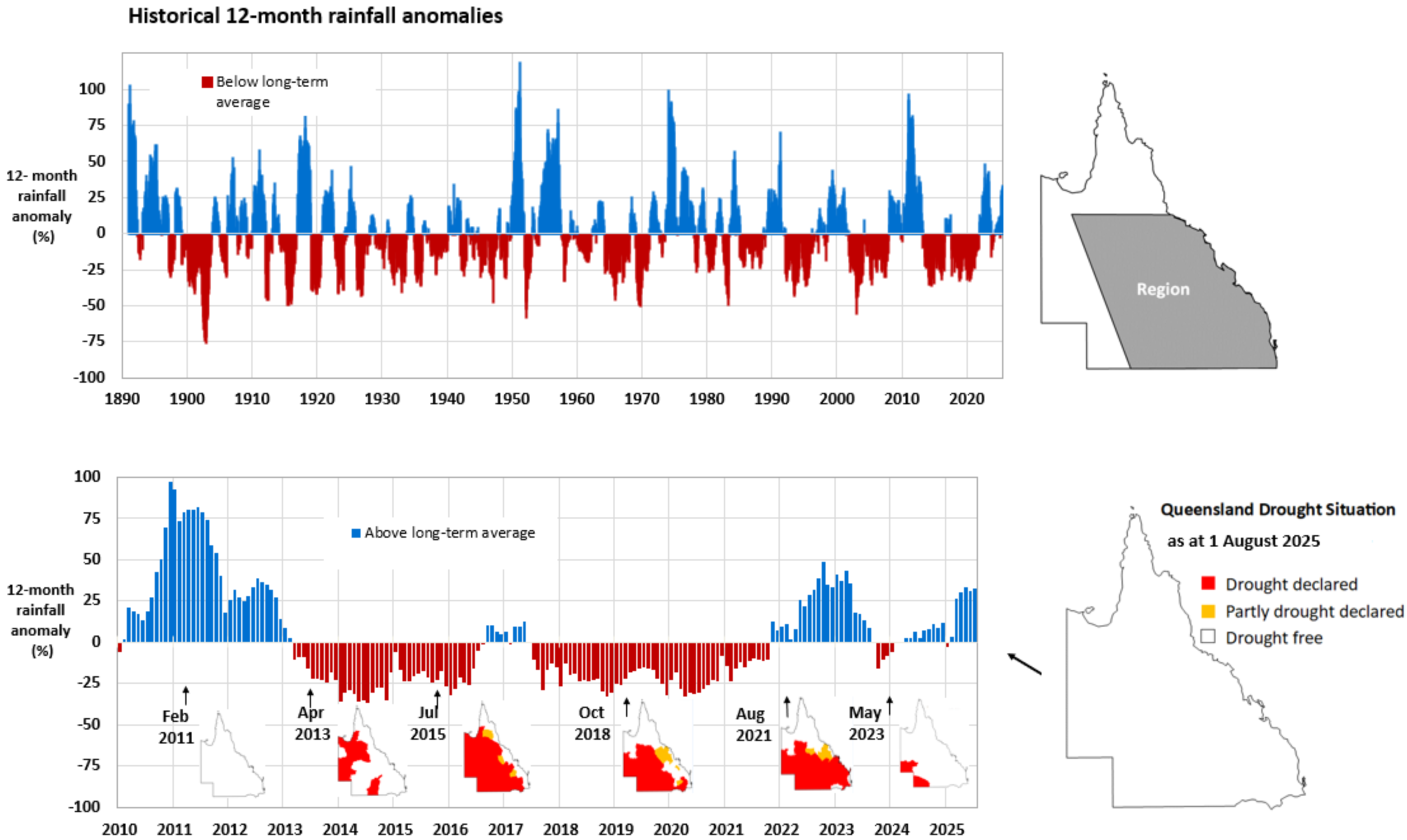


Fig.1: Historical 12-month rainfall anomalies
(Rainfall data source: https://www.longpaddock.qld.gov.au/silo/)

CURRENT CONDITIONS – RELATIVE TO HISTORICAL RECORDS

Rainfall and Pasture Growth Update

Figures 2 and 3 are products of the AussieGRASS Environmental Calculator (Carter et al. 2000). Figure 2 shows rainfall over the last three-, six- and 12-month periods (up to July 31, 2025) ranked against historical values. Rainfall percentiles over the last three-month period were below to well-below average over parts of the southern and north-western Queensland and Cape York Peninsula. Over the last six-, and 12-month periods rainfall percentiles were above average to extremely high over Queensland, except for parts of south-eastern Queensland and eastern Cape York Peninsula.

last 3 months	**last 6 months**	**last 12 months**
May to July 2025	February to July 2025	August 2024 to July 2025

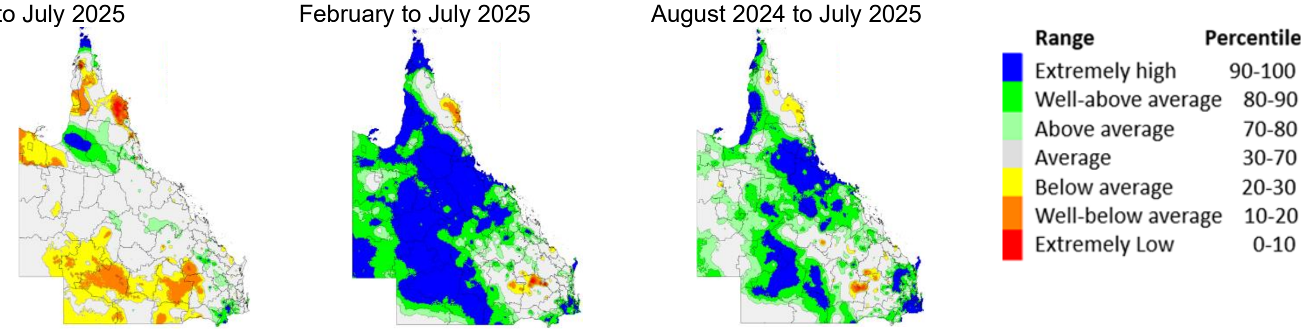


Fig. 2: Rainfall percentiles (base period 1890 to current)
(Source: https://www.longpaddock.qld.gov.au/aussiegrass/)

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.

last 3 months	**last 6 months**	**last 12 months**
May to July 2025	February to July 2025	August 2024 to July 2025

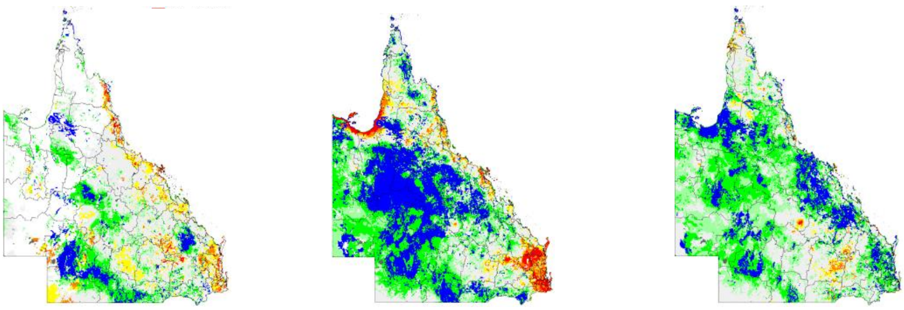


Fig. 3: Pasture growth percentiles (base period 1957 to current)
White shading indicates areas that normally have "seasonally low" pasture growth.
(Source: https://www.longpaddock.qld.gov.au/aussiegrass/)

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

Rainfall for 1 April to 31 July 2025 period, averaged across Queensland's major grazing lands region (grey region on the map in Fig.4), totalled 126 mm, and is above the long-term median for April to October period. The season is trending very close to the 70th percentile for all years.

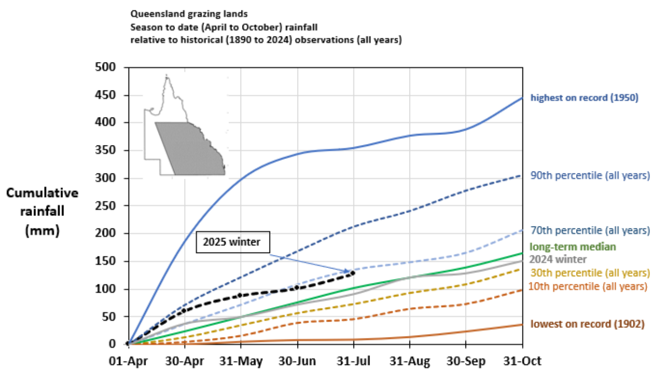


Fig. 4: April to October 2025 season accumulated rainfall as at 1 August 2025, compared to historical values.
Percentiles based on season-to-date rainfall at the end of each month since 1 April (based on data from 1890 to 2024).
Data source: https://www.longpaddock.qld.gov.au/silo/

CLIMATE DRIVERS

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, (+3.4 for May to July 2025, Fig. 5) lingers 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 (-0.02°C, Fig. 5) has remained in the near-average range with near-average SST anomalies now established across most of the central equatorial Pacific (Fig. 6). Coupling between oceanic and atmospheric conditions indicates that 'ENSO-neutral' conditions have now set in.

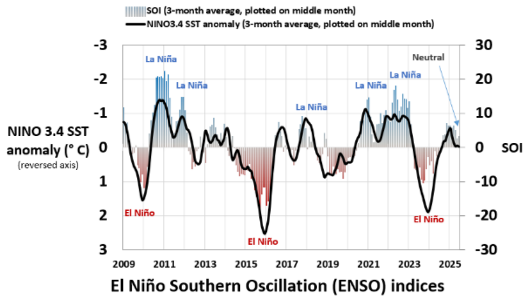


Fig. 5: El Niño Southern Oscillation (ENSO) Indices
SST source: www.cpc.ncep.noaa.gov/data/indices
(NINO3.4 SST, monthly OISST.v2.1 (1991 to 2020 base period)
SOI source: www.longpaddock.qld.gov.au/soi/soi-data-files
(monthly SOI 1887-1989 base period)

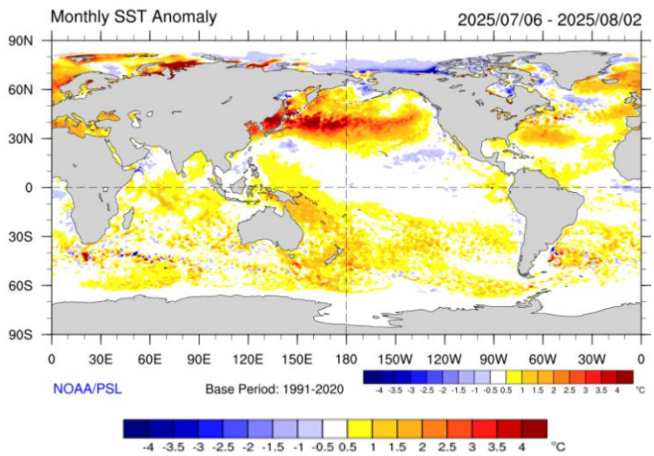


Fig. 6: **Pacific Ocean sea-surface temperature anomalies (°C)**
for 6 July to 2 August 2025 based on NOAA OISST.v3.1 SST data (1991 to 2020 based period)
Map source: https://psl.noaa.gov/map/clim/sst.shtml

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. A moderate to strong MJO is currently progressing across the Western Hemisphere and into the Indian Ocean though other international models suggest it will weaken as it progresses eastwards over the coming days.

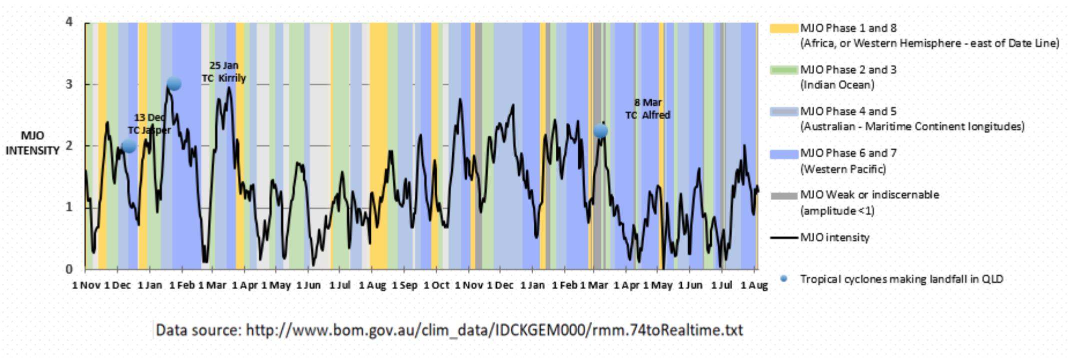


Fig. 7: Madden-Julian Oscillation intensity and phase-location

The graph shows the general location (coloured bars) and intensity (grey line) of the MJO from 1 November 2023 to 2 August 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 August, 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.

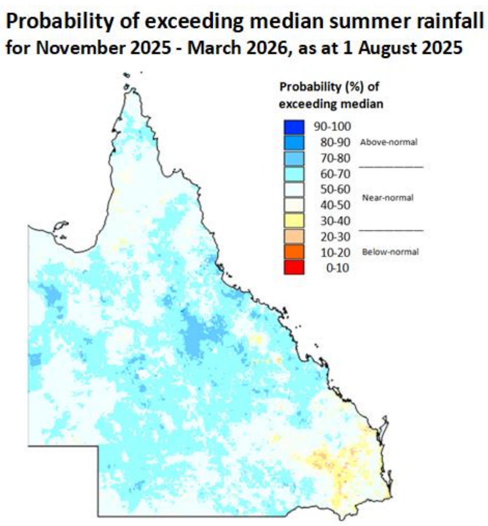


Fig. 8: Probability of exceeding median summer rainfall (for November 2025 to March 2026) as at 1 August 2025

Produced by the DETSI SPOTA-1 system.

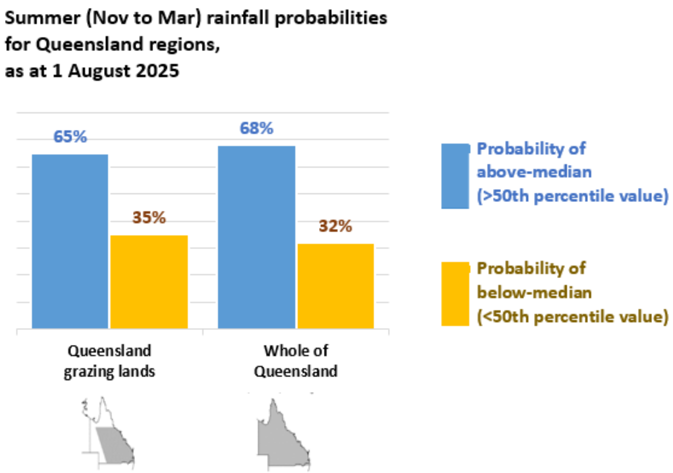


Fig. 9: Probabilities of above and below median summer rainfall (for November to March) as at 1 August 2025

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.

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 August to October 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 for most parts except south-eastern Queensland, that is wetter.

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)

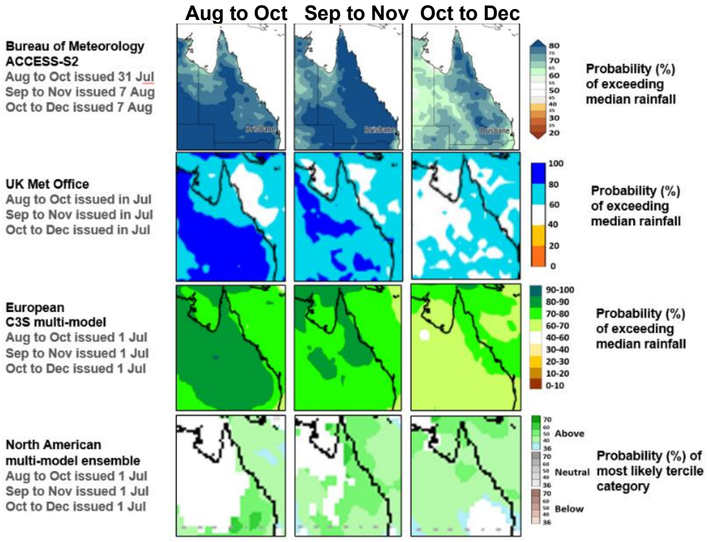


Fig. 10: Rainfall probabilities for August to December 2025, based on international dynamical models

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 Rapidly Rising 'phase' of the SOI at the end of July 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 (+0.6 for June and +6.3 for July 2025).

The map, which is based on 26 previous years (from 1889 to 2015) which had a 'Rapidly Rising' phase of the SOI at the end of July 2025, indicates a generally 50 to 70 per cent probability of exceeding median August to October 2025 rainfall across much of Queensland.

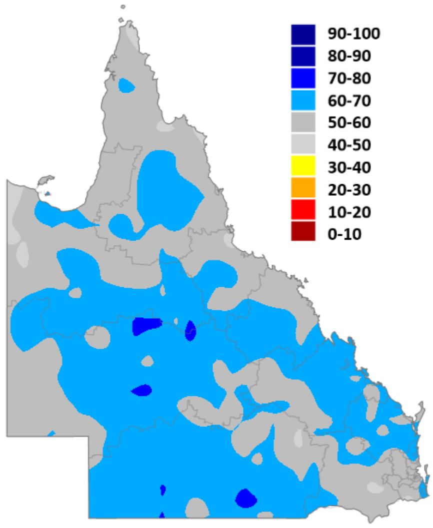
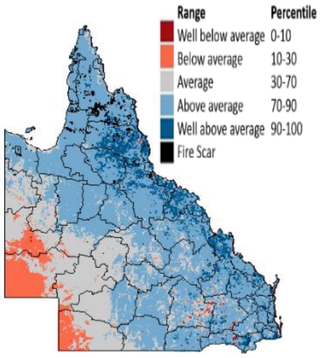
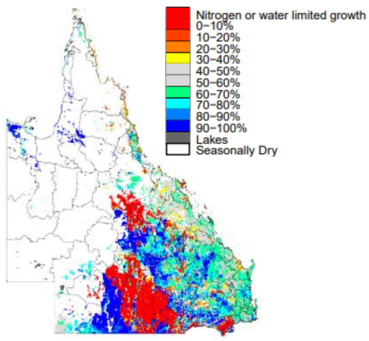


Fig. 11: Probability of exceeding median rainfall for August to October 2025 based on a 'Rapidly Rising' phase of the SOI at the end of July 2025.

Pasture Outlook

Figures 12 and 13 are products of the AussieGRASS Environmental Calculator. Calculated pasture ground cover at the end of July 2025 (Fig. 12) ranged from average to well-above average in most parts, except for south-western Queensland with below average ground cover. Figure 13 shows that the probability of exceeding median pasture growth over August to October 2025 is higher than normal for some parts of south-eastern half of Queensland. The probability of exceeding median pasture growth is lower than normal for the other parts of south-eastern Queensland probably due to nitrogen limitations. 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 31 July 2025.

Fig. 13:

Probability of exceeding median pasture growth for Aug to Oct 2025 based on a 'Rapidly Rising' 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.

Day, K.A. *et al.* (2001). 'Queensland summer rainfall in relation to sea-surface temperature in the previous autumn (March) and spring (October).' Seasonal Pacific Ocean Temperature Analysis - 1 (SPOTA-1), Report 7, 2001/2. Issued 09/11/2001 on http://www.LongPaddock.qld.gov.au. Queensland Department of Natural Resources and Mines, Brisbane.

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:

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