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INSURANCE (SOC) LIMITED
AgriSeker fa( )
'n Seker Toekoms
CUMULUS
28 NOVEMBER 2024
by J Malherbe, R Kuschke
1 FUTURE 2 FOCUS 3 AGRICULTURE
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Summary
Dry weather ahead

Following scattered thundershowers over the interior earlier this week, a period of sunny and warm to hot conditions lies ahead for most of the interior. Thundershowers are expected to return to the eastern to northeastern parts of the country, but the central parts, including a large part of the summer-grain production region, will see little to no rain. These drier conditions are typical when cold fronts move inland during mid-summer and introduce dry Atlantic air into the subcontinent.

Looking further ahead, circulation patterns will be unfavorable for widespread rain during early December. This pattern may persist broadly also in the second week of the month, but thundershowers will become more frequent over the interior. There isn't an indication of widespread significant rainfall over the interior up to the middle of December. There is no indication currently of a pattern which will favor a deep tropical system to the north, and which will introduce large amounts of tropical moisture to the interior. Precipitation towards the middle of the month over the interior will therefore be in the form of convective thundershowers and there will be an enhanced tendency for thundershowers to become severe. The pattern through December will be monitored and any significant changes will be reported here.

The following is a summary of weather conditions during the next few days (until early next week):

- Temperatures will on average be above normal for this time of the year, but below normal over the southern parts of the country.
- It will be mild initially with cool mornings over the central to southern and western parts together with the high-lying areas around the Drakensberg.
- It will become progressively warmer over the interior during the next few days into next week.
- It will be hot over the central to northeastern parts by next week.
- Rainfall will be below normal, but some areas in the north-east will receive near-normal rainfall in total for this time of the year. The central to western interior is expected to remain mostly dry.
- Isolated to scattered thundershowers will occur over the north-eastern parts by next week, but most areas will be dry through the weekend.
- The winter rainfall region will be dry apart from light showers that may occur at times over the southern parts and further east along the Garden Route. Total rainfall over these areas will however be low and is expected to be below the long-term average for this time of the year.

- **The winter rainfall region** will be partly cloudy to sunny and warm, but mild in the south. It will be hot at times over the northern to northwestern interior of the region. Little to no rain is expected, but light showers may at times occur in the south as cold fronts move past the region to the south.

- **The summer-grain production region** will be warm dan dry, becoming hot over the western to central parts. Isolated thundershowers will develop over the northeastern and possibly central parts of the region by next week.

Overview of expected conditions over the main agricultural production areas

With an upper-air high-pressure system dominating, the period will be characterised by sunny to partly cloudy and warm to hot conditions over the interior. Thundershowers are possible over the northeastern parts of the country next week when there will be a weak influx of moisture from the east and northeast over the region.

Maize production region:

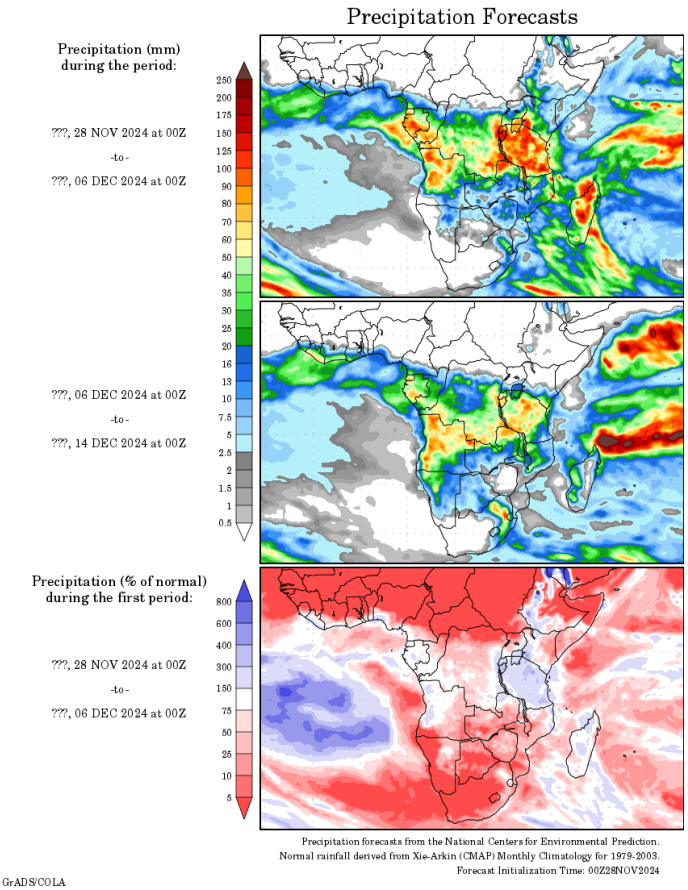
While initially mild with cool mornings, especially over the southern to western parts, temperatures will trend upwards and it will become warm to hot over most of the region by next week. It will be dry at first, but isolated thundershowers will likely develop over the central to eastern and northern parts next week.

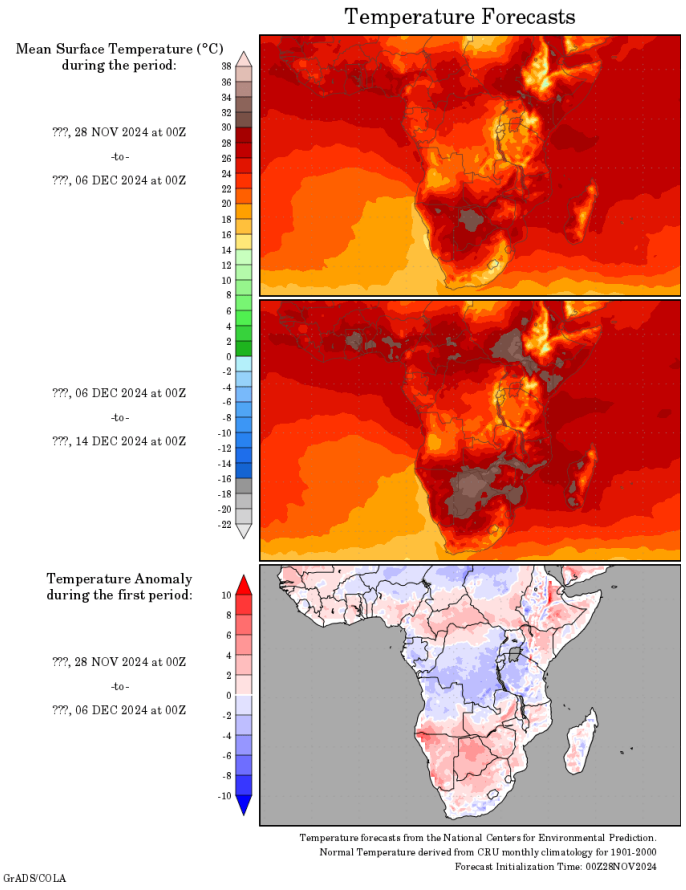
- Maximum temperatures over the eastern maize-production areas will range between 27°C and 35°C. Minimum temperatures will be in the order of 6°C to 14°C, with lowest temperatures early in the period and towards the Drakensberg.
- Maximum temperatures over the western maize-production areas will range between 29°C and 38°C, with higher temperatures expected further west and from Sunday onwards. Minimum temperatures will be in the order of 13°C to 20°C.
- **Thursday to Sunday (28th – 1st):** Sunny to partly cloudy and warm, but mild initially. Mornings will be cool initially over the eastern high-lying areas. It will become warmer during this period and will become hot in the north and west.
- **Monday to Wednesday (2nd – 4th):** It will be partly cloudy and warm, but hot over the western to central and northern parts. Isolated thundershowers will occur over the central to eastern and north-eastern parts according to current forecasts.

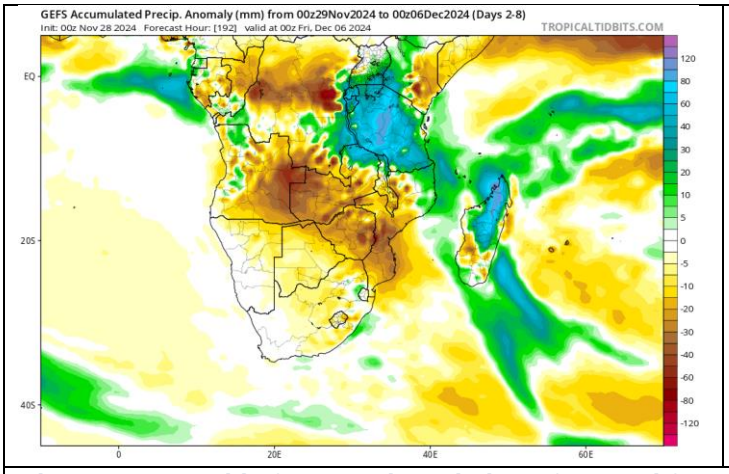
Cape Wine Lands and Ruens:

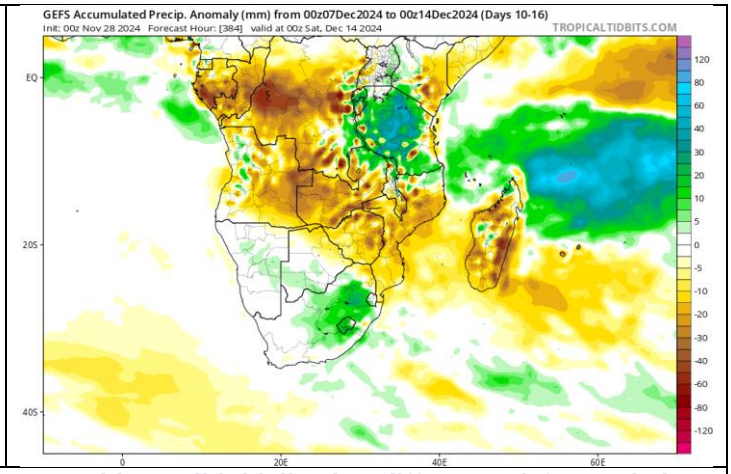
The region will be partly cloudy to sunny and warm, but mild in the south as the wind will have a southerly component most of the time. It will be hot over the northern to northwestern interior of the region. Little to no rain is expected, but light showers may at times occur in the south as cold fronts move past the region to the south. The period will not be characterized by strong south-easterlies, unlike what is typically the case in mid-summer.

Medium term rainfall and temperature summary









The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors below-average rainfall during the first week of December (left). The pattern is expected to remain broadly similar into December (right) but isolated to scattered thundershowers may return to the interior.

Possible extreme conditions - relevant to agriculture

The South African Weather Service issues warnings for any severe weather that may develop, based on much more information (and in near-real time) than the output of only 2 weather model (GFS and the ECMWF model) considered here in the beginning of a week-long (starting 28th November) period. It is therefore advised to keep track of warnings that may be issued by the SAWS (www.weathersa.co.za) as the week progresses.

According to current model projections (GFS / ECMWF models) of weather conditions during the coming week, the following may negatively affect agricultural activities and production:

- **Thundershowers may become severe, with hail and strong winds:**
  - Central Mpumalanga, central to northern KZN: **Monday (2nd).**

- **Hot and windy conditions will increase the fire hazard where vegetation is dry:**
  - Western to central interior: **Sunday to Wednesday (1st – 4th).**

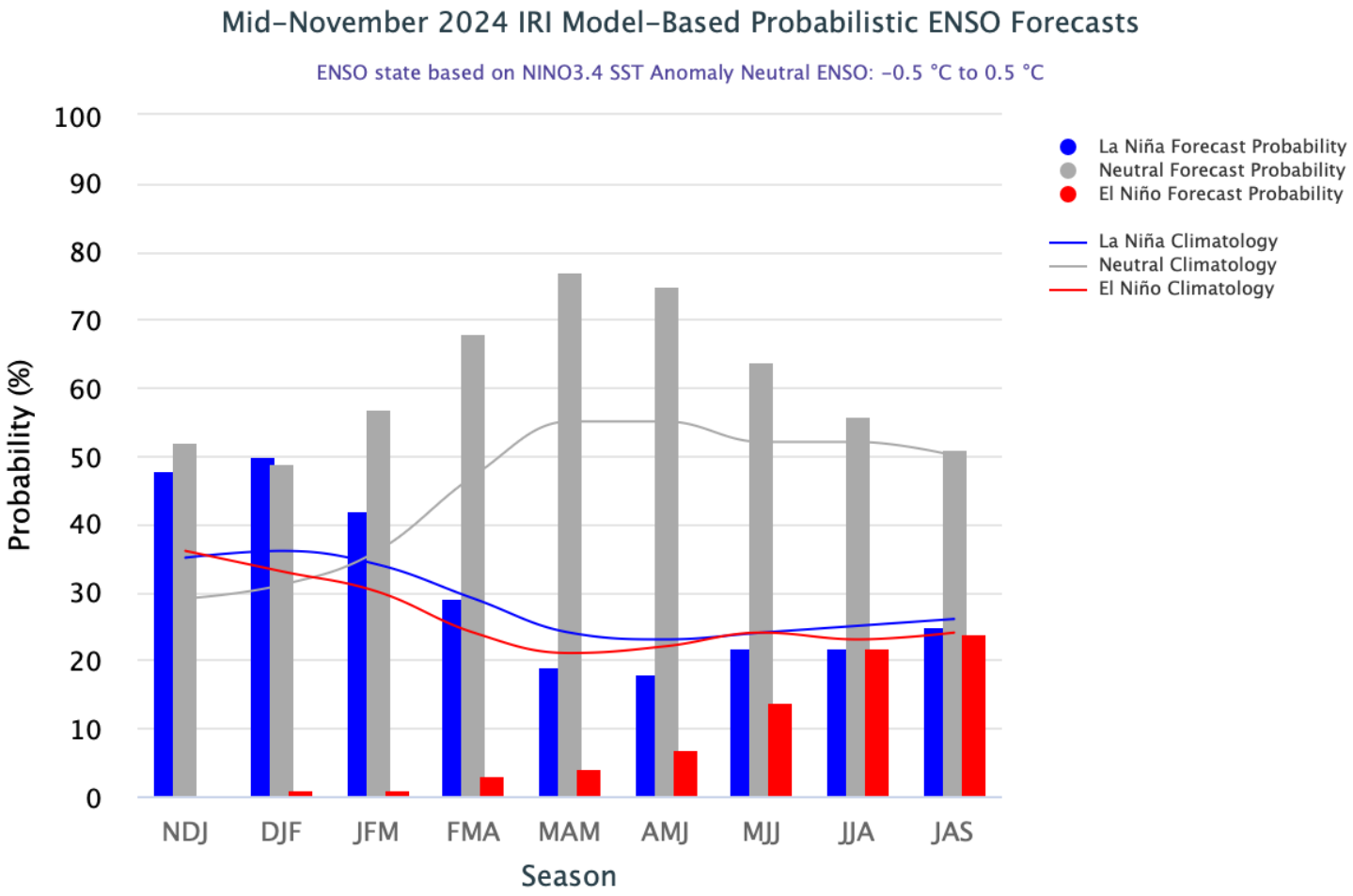
- **It will be hot, with maximum temperatures exceeding 35°C:**
  - Interior of the Northern Cape: **Saturday to Wednesday (30th – 4th).**
  - The Swartland: **Friday (29th).**
  - The Karoo: **Tuesday to Wednesday (3rd – 4th).**
  - Northern KZN: **Tuesday to Wednesday (3rd – 4th).**
  - Lowveld: **Sunday to Wednesday (1st – 4th).**
  - Limpopo River Valley: **Sunday to Wednesday (1st – 4th).**
  - Western to central and northern Free State, North West: **Sunday to Wednesday (1st – 4th).**

Seasonal forecast

Current ENSO conditions:

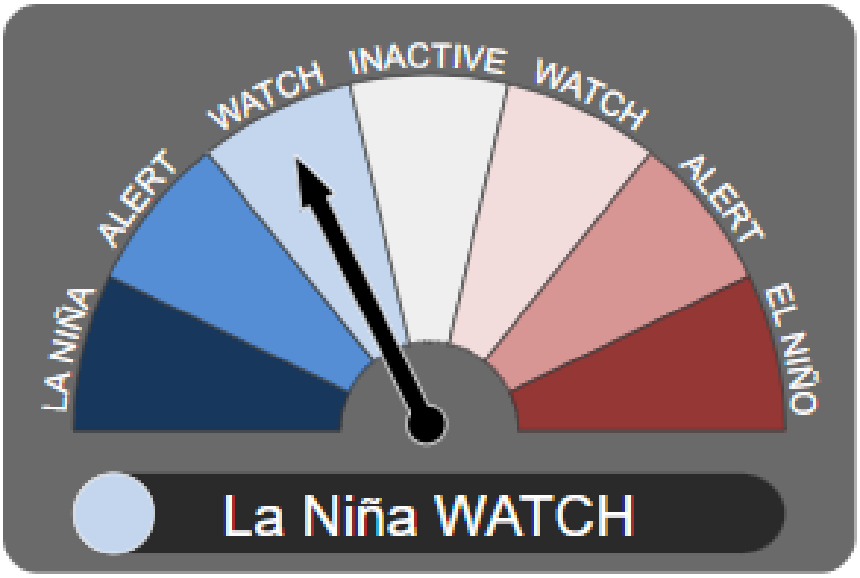
ENSO is in neutral state. There is still a slight chance that a La Niña will develop during the next few months but the likelihood of SSTs reaching the La Niña threshold during the next few months has diminished. The atmospheric indicators, such as trade winds along the equator and cloud patterns, have at times been indicative of a developing La Niña, but not consistently. The IRI forecast now is more like the Australian Bureau of Meteorology model data which are more indicative of ENSO neutral conditions this coming summer than a La Niña event.

The graph below shows the International Research Institute for Climate and Society (IRI)'s latest ENSO forecast which maintains the expectation of borderline La Niña or neutral conditions by mid-summer:



International Research Institute for Climate and Society- **http://iri.columbia.edu/**

Likewise, the Australian Bureau of Meteorology keeps their outlook to "La Niña Watch" ……



Australian Bureau of Meteorology - http://www.bom.gov.au

In their most recent update (issued 19 November), the **IRI** notes that "As of mid-November 2024, ENSO-neutral conditions persist in the equatorial Pacific, and both oceanic and atmospheric indicators remain in an ENSO-neutral state. In September, October, and early November, 2024, observations showed a sustained weakening of the trade winds tending to hamper the ongoing development of La Nina conditions. The IRI ENSO prediction plume forecasts slightly higher chances (52%) for ENSO-neutral conditions for Nov-Dec, 2025. Borderline La Niña conditions are forecasted during Dec-Feb (50% chances) just for one three-month season, with a return to ENSO-neutral conditions from Jan-Mar, 2025 to end of the forecasts period in Jul-Sep, 2025. In summary, ENSO-neutral conditions are likely to continue during the boreal winter, spring and summer of the 2025.

According to the most recent official CPC ENSO Outlook (issued on November 14, 2024), the La Nina onset is forecasted in Oct-Dec 2024, with 57% chance; however, the objective IRI model-based ENSO outlook forecasts indicate the continuation of ENSO-neutral conditions for Nov-Jan, 2025..".... https://iri.columbia.edu

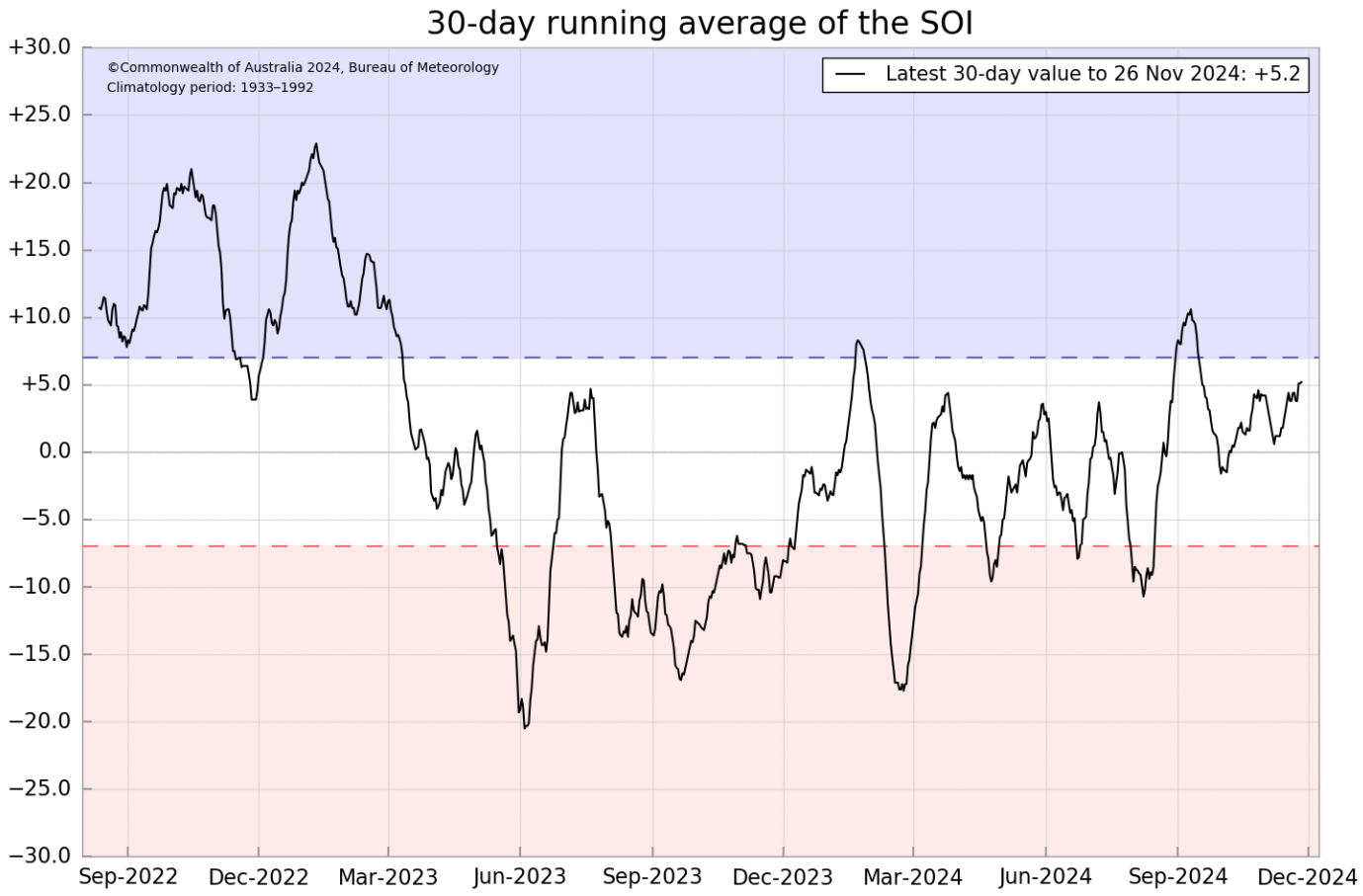
In their most recent update (26 November), the **Australian Bureau of Meteorology** states that "The El Niño–Southern Oscillation (ENSO) remains neutral, with sea surface temperatures (SSTs) in the central equatorial Pacific Ocean at ENSO-neutral levels. Atmospheric indices, such as those related to patterns of surface pressure, cloud and trade winds, are broadly consistent with an ENSO-neutral state. While some have displayed La Niña-like signals over recent months, a consistent and sustained shift in the atmosphere has not been observed. Ocean temperatures in the central equatorial Pacific have started to warm in recent weeks, away from the La Niña threshold, although they are still cooler than the historical average.

The Bureau's model suggests SSTs are likely to remain within the ENSO-neutral thresholds (−0.8 °C to +0.8 °C) throughout the forecast period to February 2025. Of the 6 other climate models surveyed, 2 models suggest SSTs in the tropical Pacific are likely to exceed the La Niña threshold (below −0.8 °C) throughout December to February, which is sufficient time to be

classified as a La Niña event, though this would be considered a very short-lived event compared to the historical record. All models forecast neutral ENSO values by March.

The Southern Annular Mode (SAM) index is neutral as at 23 November, having been positive for most of November. It is forecast to become positive again in the coming fortnight. SAM is also forecast to have a greater than usual chance of being in the positive phase during December.....” - http://www.bom.gov.au. ***A positive SAM is associated with above-average rainfall over the summer rainfall region of South Africa.***

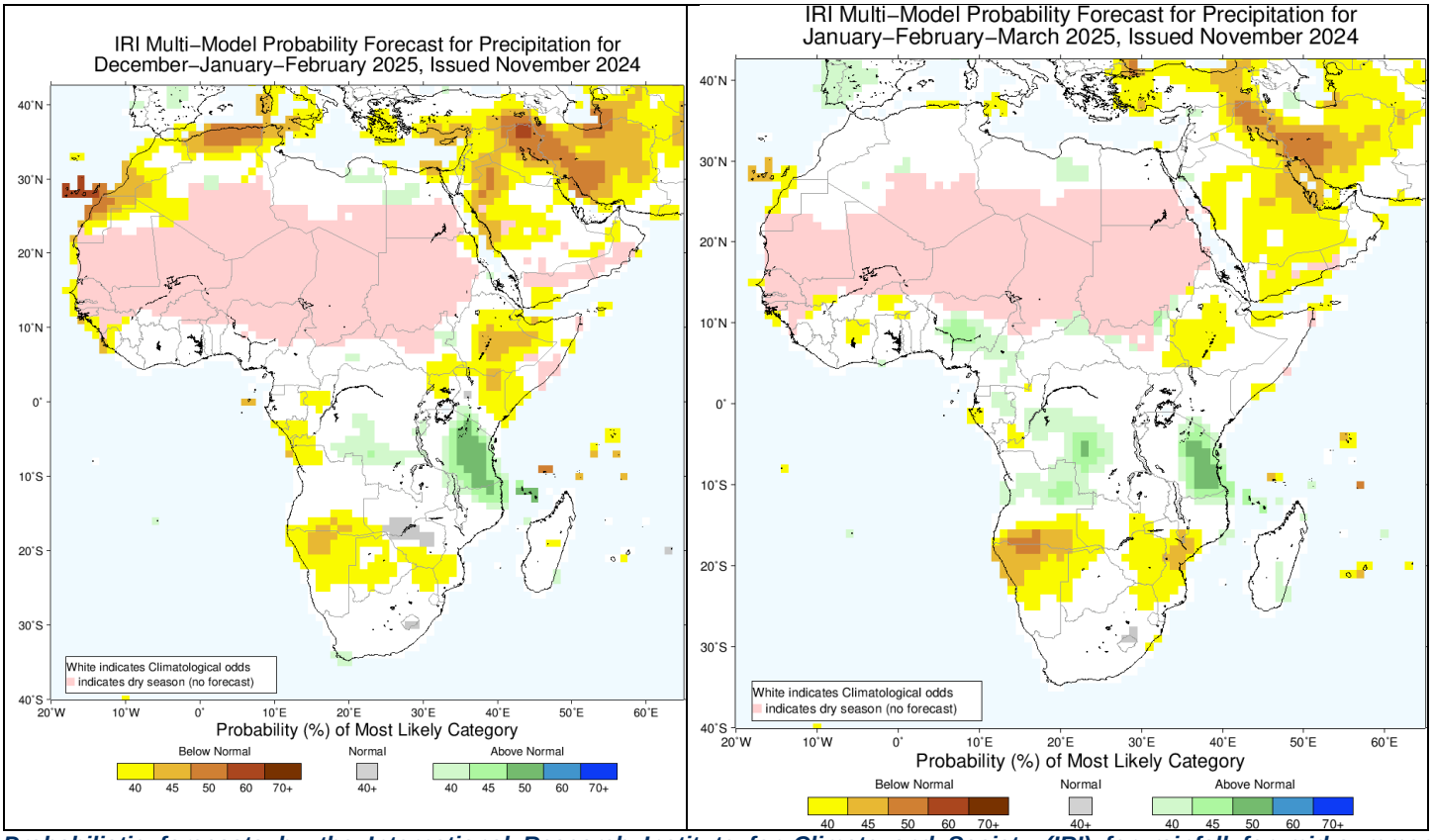
The 30-day Southern Oscillation Index (SOI) is currently +5.2 and therefore representing atmospheric pressure patterns in the Australia – Pacific region indicative of ENSO Neutral conditions. The SOI is however slowly trending positive.



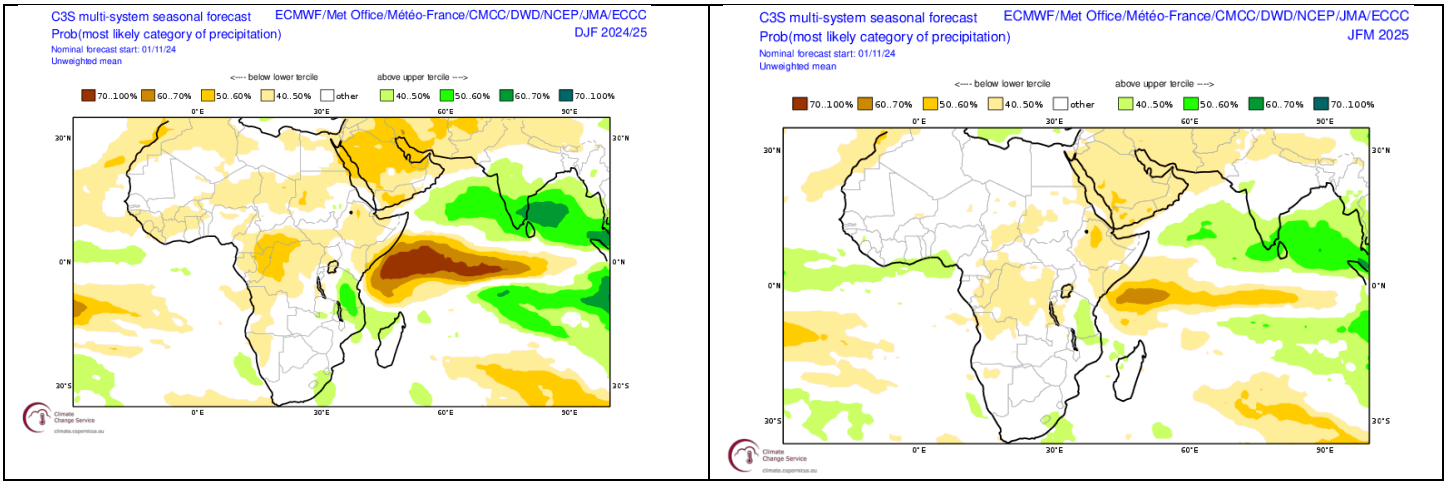
***Australian Bureau of Meteorology* - http://www.bom.gov.au**

Seasonal forecasts issued by various international institutions

Seasonal forecasts (updated in November 2024) remain relatively neutral for summer given the weak signal from the Pacific Ocean. The IRI seasonal forecast for the period November to March (first pair of maps) indicates enhanced probabilities for relatively dry conditions over the northern parts of South Africa and into the neighboring countries to the north, but no clear signal over most of South Affrica. The overall signal over the subcontinent, with a dry bias over northern Botswana and Namibia, is associated with what would be more likely during weak El Niño conditions. With the uncertainty regarding further development of a La Niña, these forecasts will likely be adjusted later. The COPERNICUS multi-model assimilated forecast (second pair of maps) doesn't show any strong wet or dry signal over the summer rainfall region and reflects the uncertainty related to fairly neutral conditions with possible La Niña development in the Pacific.



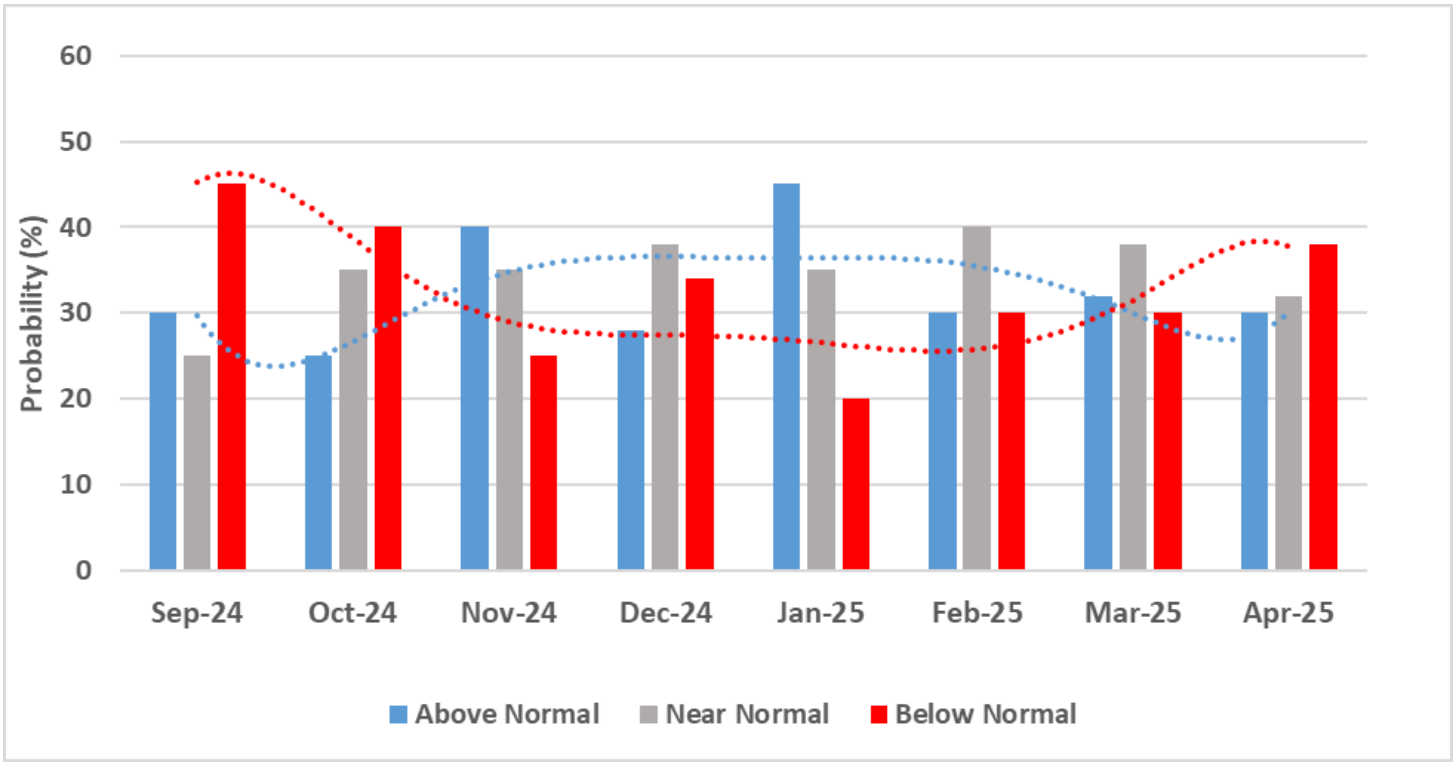
Probabilistic forecasts by the International Research Institute for Climate and Society (IRI) for rainfall for mid-summer (December-February 2024/25; left - Forecast issued in 2024-11) and late summer (January to March 2025, right – Forecast issued in 2024-11).



Probabilistic multi-model forecasts by the ECMWF COPERNICUS Programme for rainfall for mid-summer (December-February 2024/25; left - Forecast issued in 2024-11) and late summer (January to March 2025, right – Forecast issued in 2024-11).

CUMULUS seasonal outlook

This outlook is based on the typical observed rainfall patterns over the ***north-eastern half*** of the country (including most of the summer grain production region), associated with the cyclic variability of the global climate system. Summers that are similar to 2024/25 usually experience near normal rainfall in total, with a delayed start and a wetter signal during November and again by January/February.



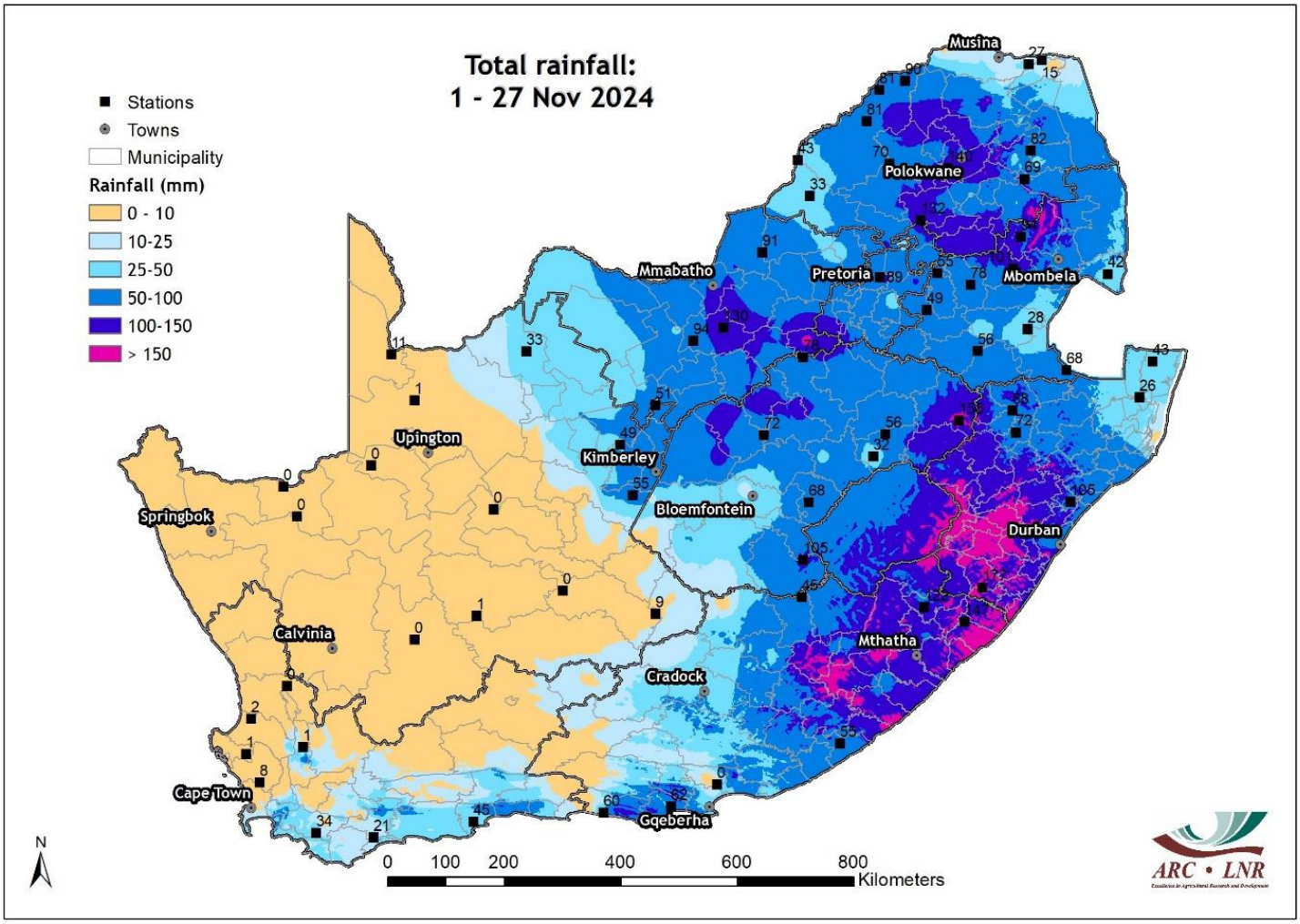
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2024 – April 2025 (Forecast issued in 2024-10).

Typical patterns during similar summers, over the north-eastern half of the summer rainfall region, are:

- September – October: Relatively dry conditions over the north-eastern half of the summer rainfall region
- November: Near-normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- December: Near normal to below-normal rainfall over the north-eastern half of the summer rainfall region
- January: Above-normal rainfall over the north-eastern half of the summer rainfall region
- February-March: Near-normal rainfall over the north-eastern half of the summer rainfall region
- April: Below-normal rainfall over the north-eastern half of the summer rainfall region

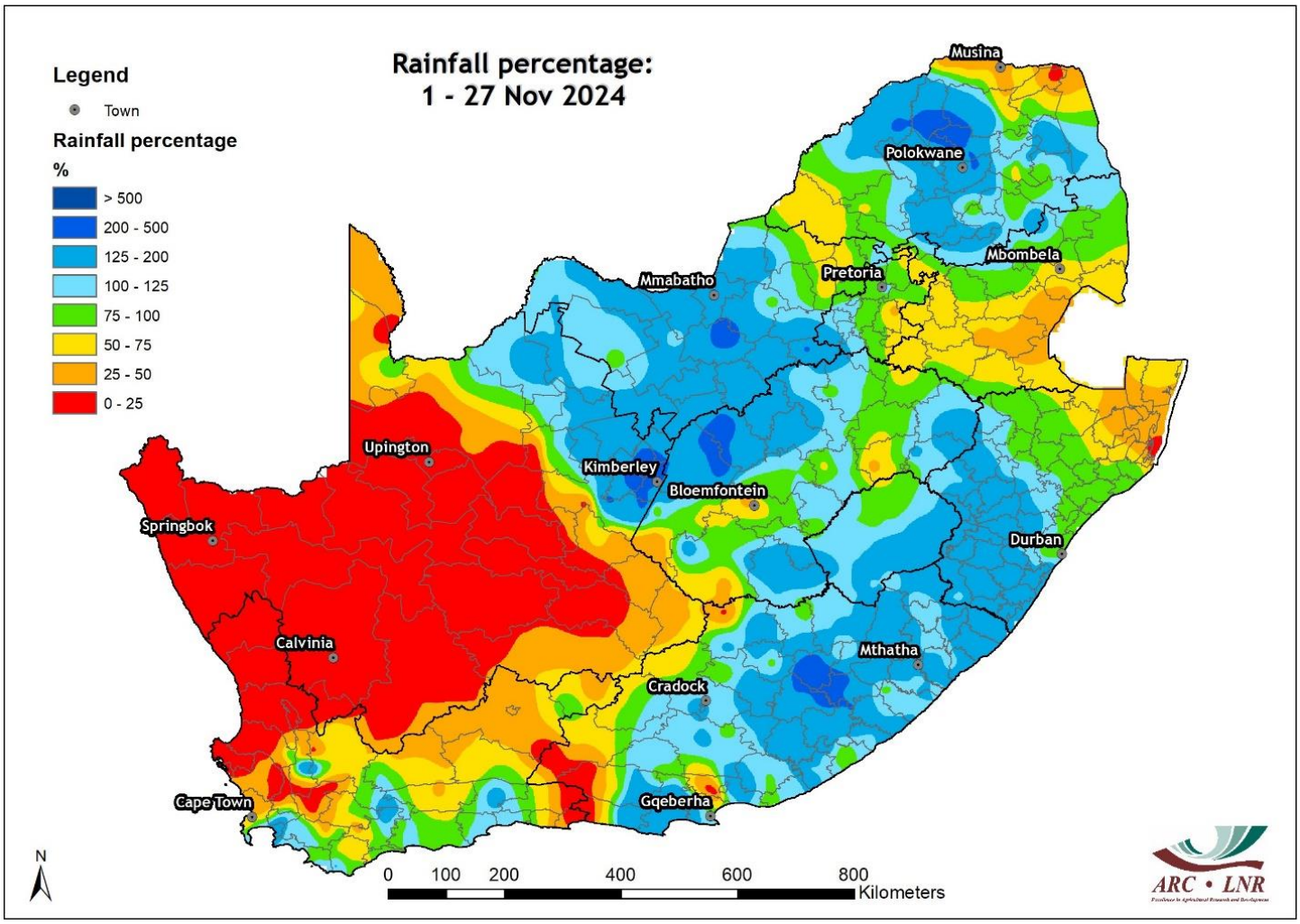
Observed conditions

Rainfall (mm): 1 – 27 Nov



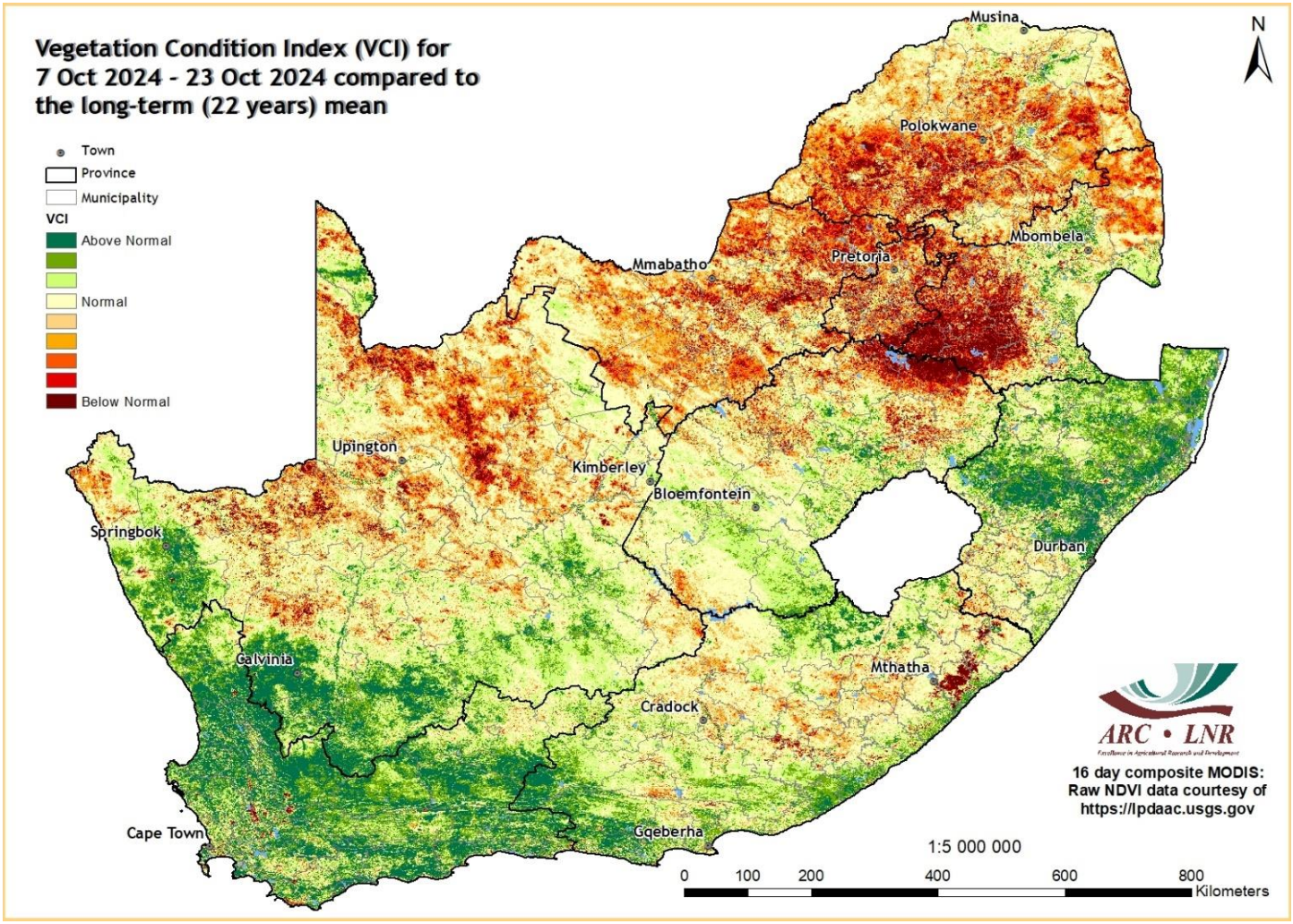
Large parts of the central to eastern summer rainfall region, including most of the summer-grain production region, received more than 50 mm so far during November. Parts of Mpumalanga however received less. Parts of the North West and parts of the western to northern Free State and Limpopo received more than 100 mm of rain in total. The wettest areas were central to southern KZN and the eastern parts of the Eastern Cape where some areas received more than 150 mm.

Rainfall (% of long-term mean): 1 – 27 Nov 2024



Most of the central to eastern and northeastern summer rainfall region received above-average rainfall during November so far. An exception is the southern half of Mpumalanga and north-eastern KZN where totals are below average for this time of the year.

Vegetation Condition Index: October 2024



By late October, vegetation activity was clearly below normal over the northern parts of the Free State and most of the maize region in Mpumalanga, Gauteng and North West. These are some of the areas where the planting window is relatively early. Vegetation activity is above normal over the western to southern Free State and KZN, where spring rainfall was more favourable. Vegetation activity is also above normal over the winter rainfall region following above-normal rainfall during winter.

Sources of information

Seasonal forecasts: Published by the COPERNICUS Programme (***https://climate.copernicus.eu/seasonal-forecasts***)

Rainfall, temperature and wind maps over South Africa for the past week:
Agricultural Research Council - Institute for Soil, Climate and Water (ISCW) – Climate Data Bank. Data recorded by the automatic weather station network of the ARC-ISCW.

Vegetation condition maps: Copernicus Global Land service, distributed by VITO.

Information related to: ENSO, IOD and SOI:
Australian Bureau of Meteorology - http://www.bom.gov.au
Climate Prediction Center - http://www.cpc.ncep.noaa.gov
International Research Institute for Climate and Society- http://iri.columbia.edu/

Information related to the SAM:
The Annular Mode Website - http://www.atmos.colostate.edu/ao/index.html

SST map:
NOAA Climate Prediction Center - http://www.cpc.ncep.noaa.gov

Daily conditions over South Africa:
WRF model downscaling of GFS forecasts.

Fires:
MODIS data, distributed by the Land Processes Distributed Active Data Center (LP DAAC), located at the US Geological Survey's EROS Data Center

Soil moisture:
https://nasagrace.unl.edu/

Precipitation and temperature outlooks for the coming week:
Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES) – http://Wxmaps.org