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30 JANUARY 2025
by J Malherbe, R Kuschke
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Contents

Summary

Drier pattern continues, thundershowers in the east

Drier conditions are expected to continue over most parts during the next few days. However, thundershowers will be somewhat more widespread, occurring over the eastern parts of the country, including the eastern parts of the summer-grain production region. While the central parts will be hot and dry most of the time, thundershowers are expected to spread westwards, including the western summer-grain production region, by next week. Hot conditions with afternoon westerlies will result in high evaporation rates over large parts of the interior. This will lead to a drying trend over the central parts in the light of only low rainfall totals expected (over the central parts) during the period.

The large-scale atmospheric circulation patterns in the region are still unfavorable for widespread rain over South Africa. With most of the activity taking place over the south-west Indian Ocean, the interior will be under the influence of an upper-air high-pressure system. Generally, over the Southern Hemisphere, the pressure anomalies along 40°S are negative. This means that there is a reduced tendency for high-pressure systems to ridge around South Africa and feed oceanic moisture into the subcontinent. This, together with more tropical activity in the south-west Indian Ocean, result in depleted atmospheric moisture and relatively dry conditions over the South African interior. Under such conditions, thundershowers will be isolated to scattered only and rainfall distribution will be uneven. Thundershowers will have an enhanced tendency to become severe given high temperatures and interaction with dry air.

Global convection patterns along the Equator are changing, with a trend towards less activity expected over the Indian Ocean. This will pave the way for more favorable conditions for rainfall over South Africa by the second week of February. More locally, the possible presence of a tropical cyclone towards the east over the south-west Indian ocean next week, may result in a delay in onset of wetter conditions. The system may be associated with a further suppression of rainfall over South Africa next week.

Despite a continuation of hot and dry conditions over especially the central parts, the forecasted redistribution of convection along the equator during early February still indicates a more favorable large-scale environment for a possible return of widespread rain over the interior during the first half of the month (February) especially once the expected tropical cyclone next week moves out of the region. Another large-scale change will be an expected increase in the pressure along 40°S from next week onwards. This is also an indication of a trend towards more favorable conditions towards the 2nd week of February. The pattern will be monitored and discussed further next week.

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

- Temperatures will on average be above normal, with largest positive deviations in temperatures over the central to western interior.
- It will be hot, with maximum temperatures exceeding 35°C over most of the central to northern and north-eastern interior as well as the eastern lower-lying areas on several days.
- Cold fronts will result in somewhat cooler conditions in the south-western interior and winter rainfall region on Friday and possibly by the middle of next week.
- Rainfall will be below normal, but near normal over the far-eastern parts of the summer rainfall region.

- Isolated thundershowers will occur over the eastern parts until the weekend. Thundershowers over the eastern parts may become scattered during the weekend. The band of thundershowers will shift into the central interior early next week.
- Thundershowers will be convective in nature. With relatively dry air in circulation, rainfall distribution will be uneven, and thundershowers will have an enhanced tendency to become severe, producing strong winds and hail.
- Rainfall totals are expected to be low (<10 mm during the period) over the central interior, including the central to western parts of the summer-grain production region.
- The summer-grain production region will be warm to hot and relatively dry. While isolated to scattered thundershowers will occur over the eastern parts most of the period, the western to central parts will see a continuation of hot and dry conditions until early next week when isolated thundershowers may spread further west and south. Maximum temperatures over the western parts are expected to remain high throughout the period. Evaporation rates will be high given sunny, hot and windy conditions over the western to central parts of the region.
- **The winter rainfall region** will be warm to mild. Two cold fronts will brush the region during the period resulting in somewhat cooler conditions, with light showers possible on Friday and towards the middle of next week. It will be hot over the interior of the region early next week.

Overview of expected conditions over the main agricultural production areas

With most of the large-scale moisture and convection still located to the northeast of South Africa over the south-west Indian Ocean, the summer-grain production region will experience relatively dry conditions. However, thundershowers are expected over the eastern to northern parts of the region initially, and these will shift south-westwards to cover the entire region by next week. Thundershowers are expected to be of the convective type typical to the highveld, resulting in an uneven distribution of rainfall. Hot and dry conditions will remain in place over the western parts of the region until early next week.

Over the winter rainfall region, cold fronts will at times result in cooler conditions. It will be partly cloudy to sunny and warm most of the time over this region.

Maize production region:

It will remain warm to hot, with hot conditions especially over the western to central parts where lower rainfall is expected in total. Isolated to scattered thundershowers will develop over the eastern parts initially while the western to central parts are expected to be sunny to partly cloudy and hot with moderate to fresh afternoon westerly winds. Thundershowers will gradually spread westwards and southwards during the period.

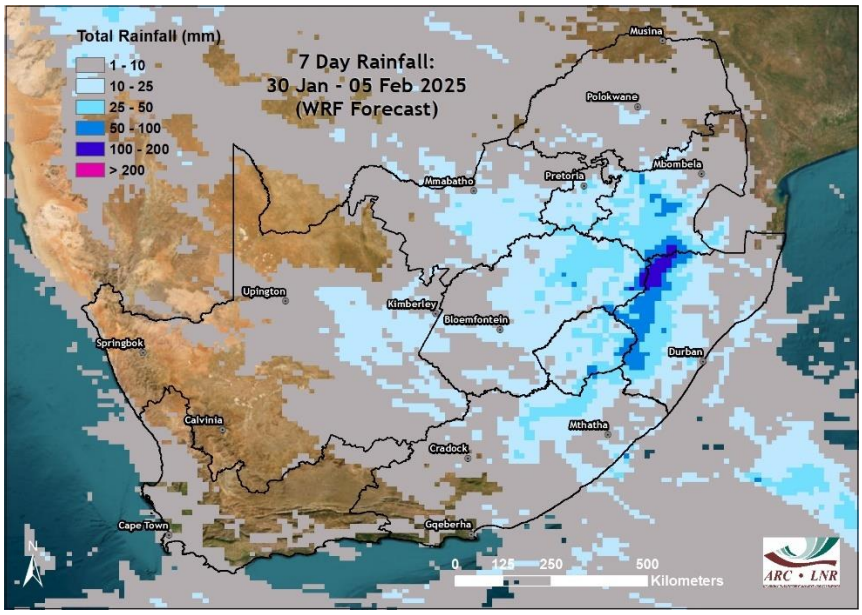
- Maximum temperatures over the eastern maize-production areas will range between 30°C and 33°C. Minimum temperatures will be in the order of 13°C to 17°C.
- Maximum temperatures over the western maize-production areas will range between 31°C and 38°C, with the higher temperatures further west. Minimum temperatures will be in the order of 17°C to 22°C.
- **Thursday (30th):** Partly cloudy and warm, but hot over the central to western parts. Isolated thundershowers are possible except in the north.

- **Friday (31st):** Partly cloudy and warm, but hot with moderate to fresh westerly winds over the western to central parts. Isolated thundershowers are possible, mostly in the east.
- **Saturday (1st):** Partly cloudy and warm, but hot with moderate to fresh westerly winds over the western to central parts. Isolated to scattered thundershowers are possible in the east.
- **Sunday (2nd):** Partly cloudy and warm, but hot with moderate to fresh westerly winds over the western to central parts. Isolated to scattered thundershowers are possible north of the Vaal and in the east.
- **Monday (3rd):** Partly cloudy and warm, but hot with moderate to fresh westerly winds over the western to southern parts. Isolated to scattered thundershowers are possible except in the southwest.
- **Tuesday to Wednesday (4th – 5th):** Current forecasts indicate a continuation of warm to hot conditions across the region. Isolated thundershowers are possible over the entire region, as the band of thundershowers in the northeast continues to shift westwards over the interior. Maximum temperatures over the western parts are expected to remain around the mid-thirties (°C).

Cape Wine Lands and Ruens: The region will be partly cloudy and warm for the most part. Winds will have a westerly component most of the time, keeping the far-western parts relatively mild. Light showers are expected on Friday and next week Wednesday when it will be cloudy at times. It will be hot over the interior on Monday and Tuesday.

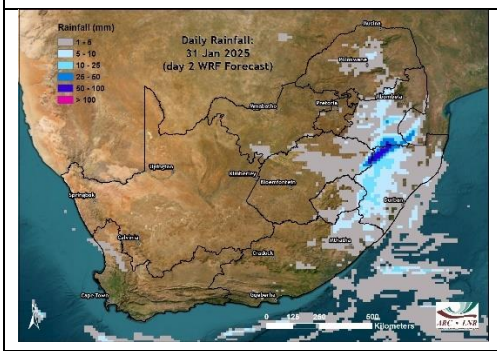
Daily summary of expected conditions (30 Jan – 5 Feb)

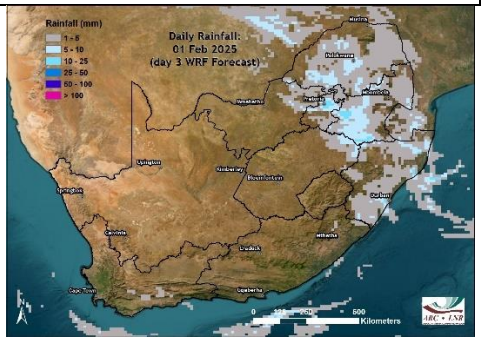
(GFS forecast downscaled using WRF)

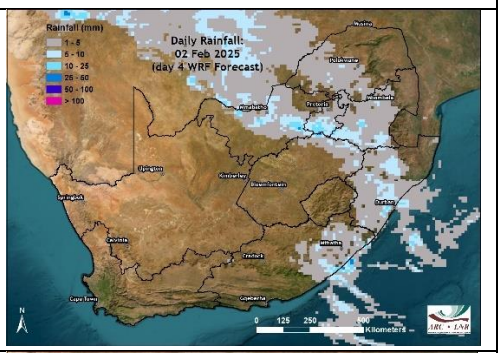


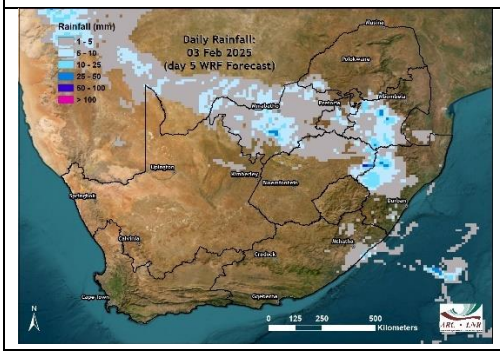
Rainfall

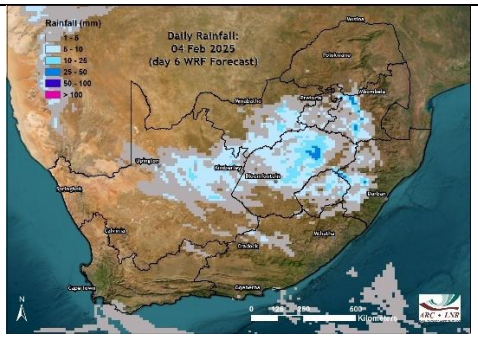
- Rain will be concentrated over the eastern parts during the next few days, with little to no rain expected over the western and north-eastern parts.
- Only limited areas are expected to receive more than 25 mm.
- Higher totals are expected along the Drakensberg.
- Totals over the winter rainfall region will be low.

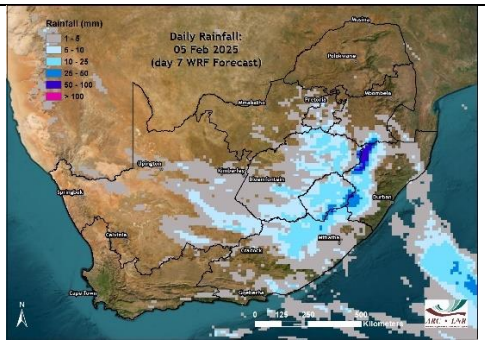




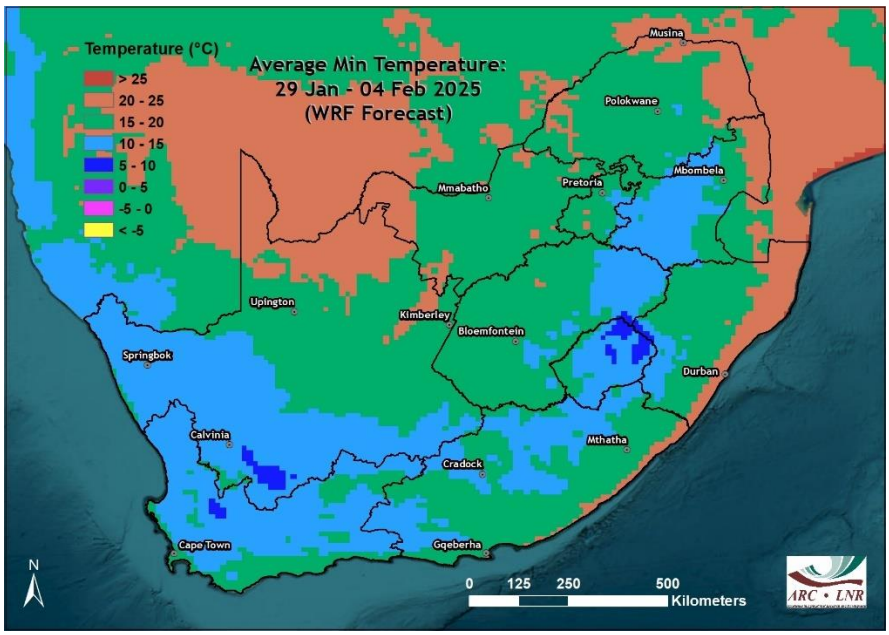






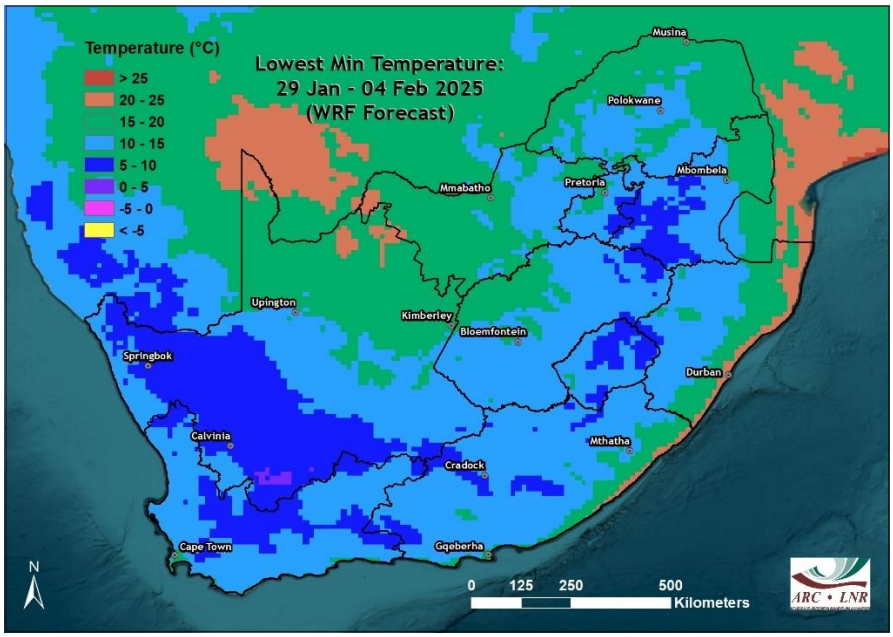


- Isolated thundershowers are expected over the eastern parts at first and during the weekend.
- Thundershowers will gradually shift westwards and southwards to the central to southern and south-eastern parts next week.



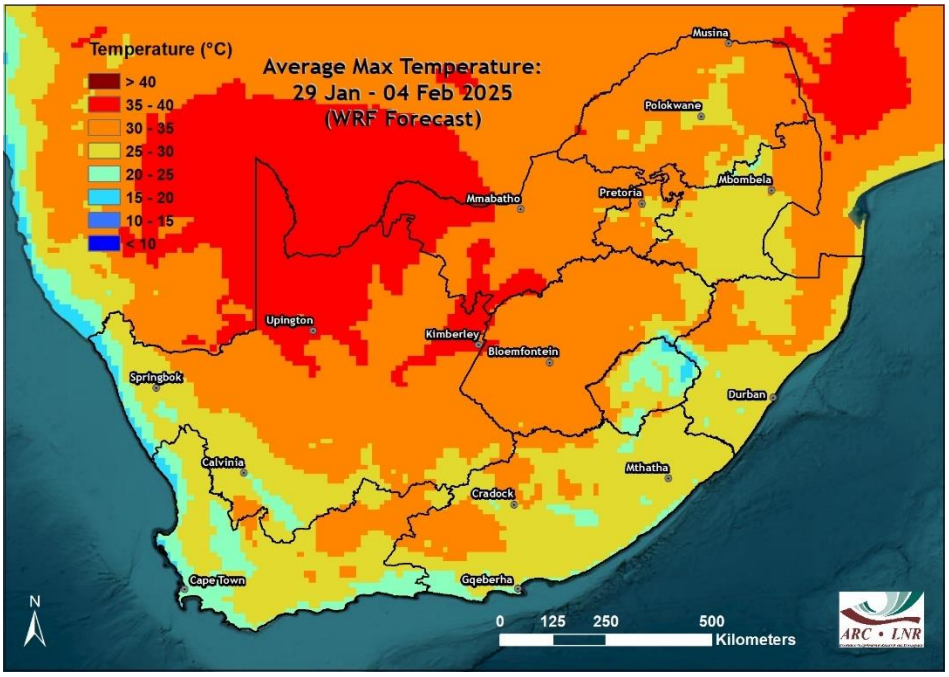
Average minimum temperatures

- Average minimum temperatures will range between 10 and 20°C over most of the country.



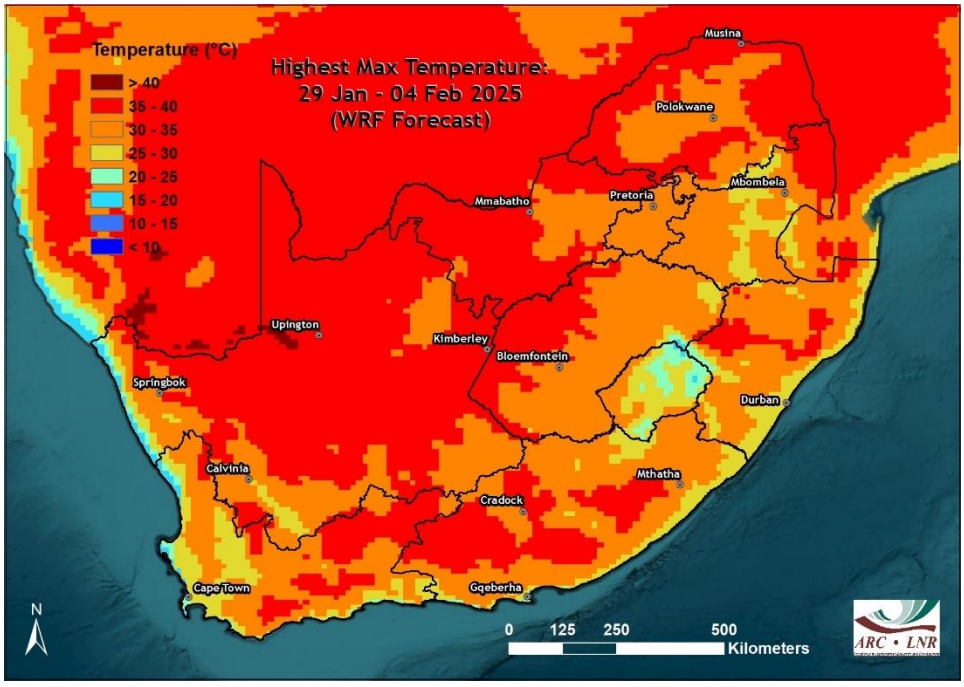
Lowest minimum temperatures

- Lowest minimum temperatures will remain above 5°C over the summer-grain production region.
- Lowest minimum temperatures over the southern to western interior will be in the order of 5 – 10°C, lower than during the previous few days and associated with frontal activity.



Average maximum temperatures

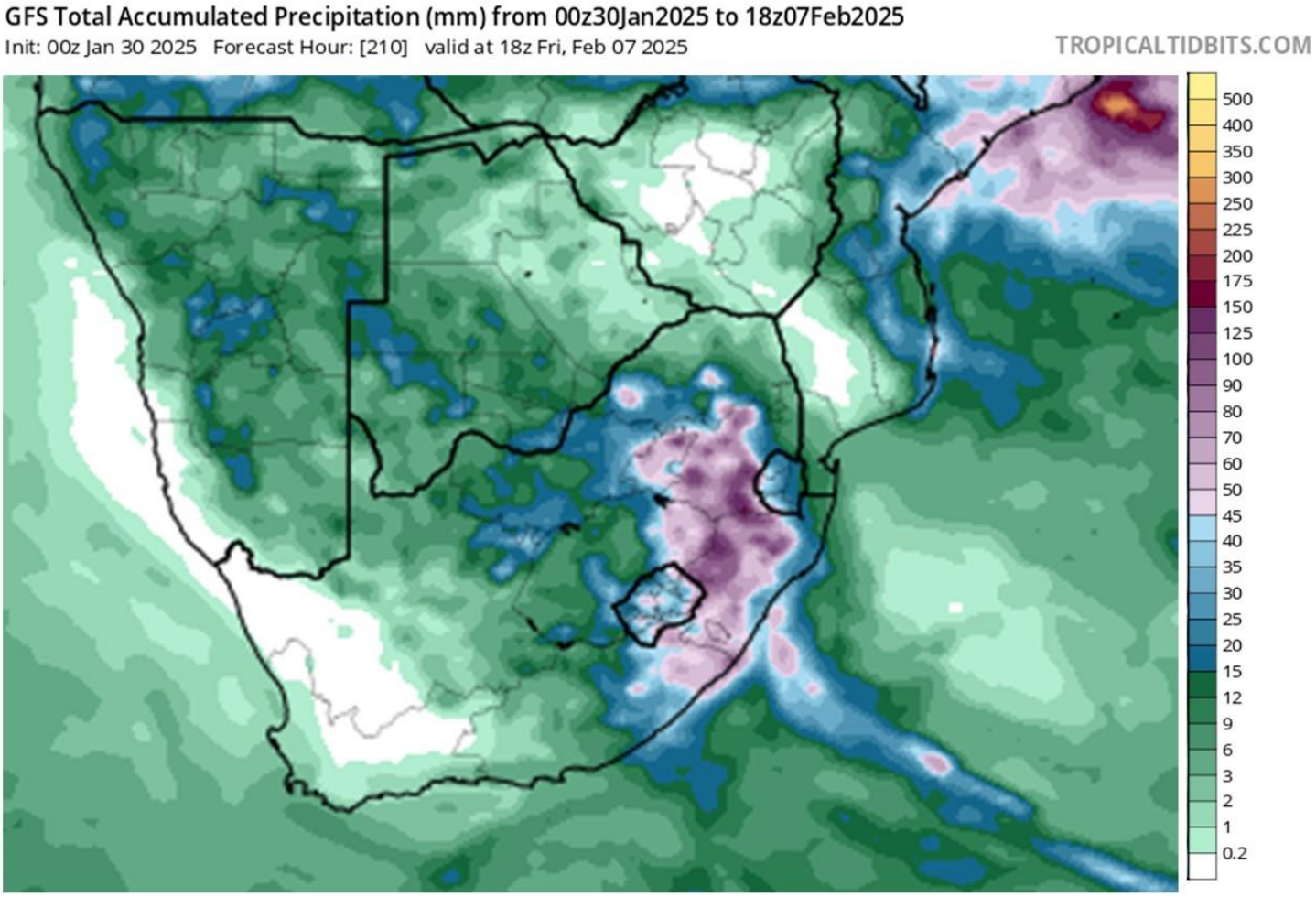
- Average maximum temperatures will be higher than during the previous few days, ranging between 30 and 35°C over most of the interior.
- Average maximum temperatures will range between 35 and 40°C over the northern half of the Northern Cape into the southern parts of North West and far north-western parts of the Free State.

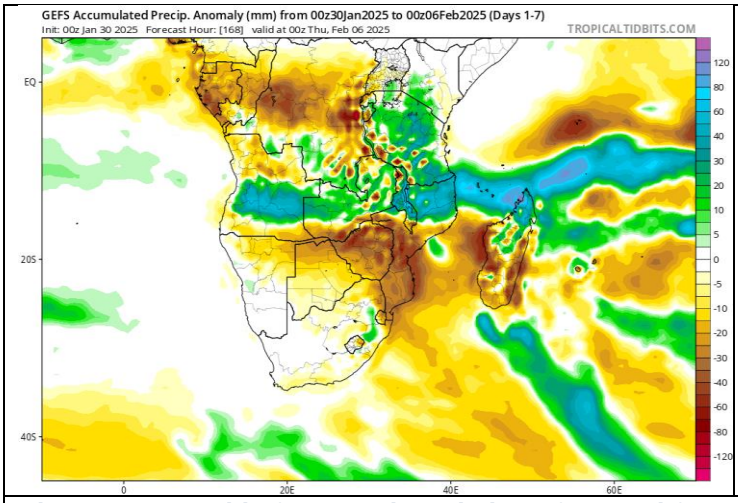


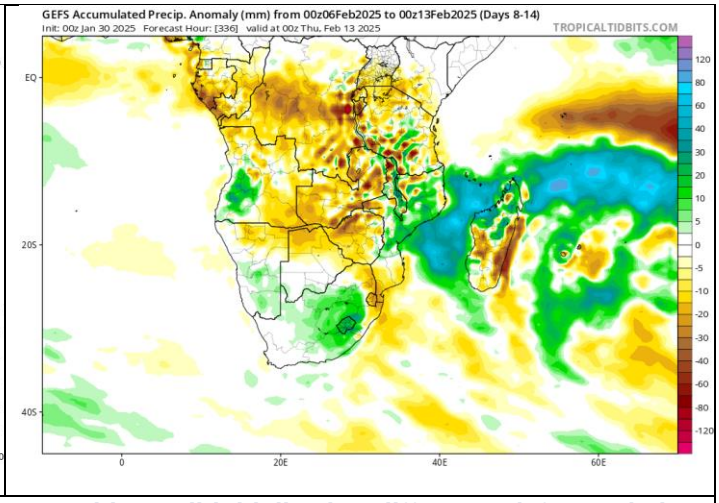
Highest maximum temperatures

- Highest temperatures during the next few days are expected to exceed 35°C over almost the entire country, except the Eastern Highveld, Escarpment and along the coast.

Medium term rainfall and temperature summary







The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors below average rainfall over most of South Africa while large-scale tropical activity remains to the east of the subcontinent in the Mozambique Channel (left) during the first week of February. Conditions are expected to improve by the second week of the month, but activity in the south-west Indian Ocean may diminish rainfall potential depending on the development of systems over that region or not (right).

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 30 January) 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:

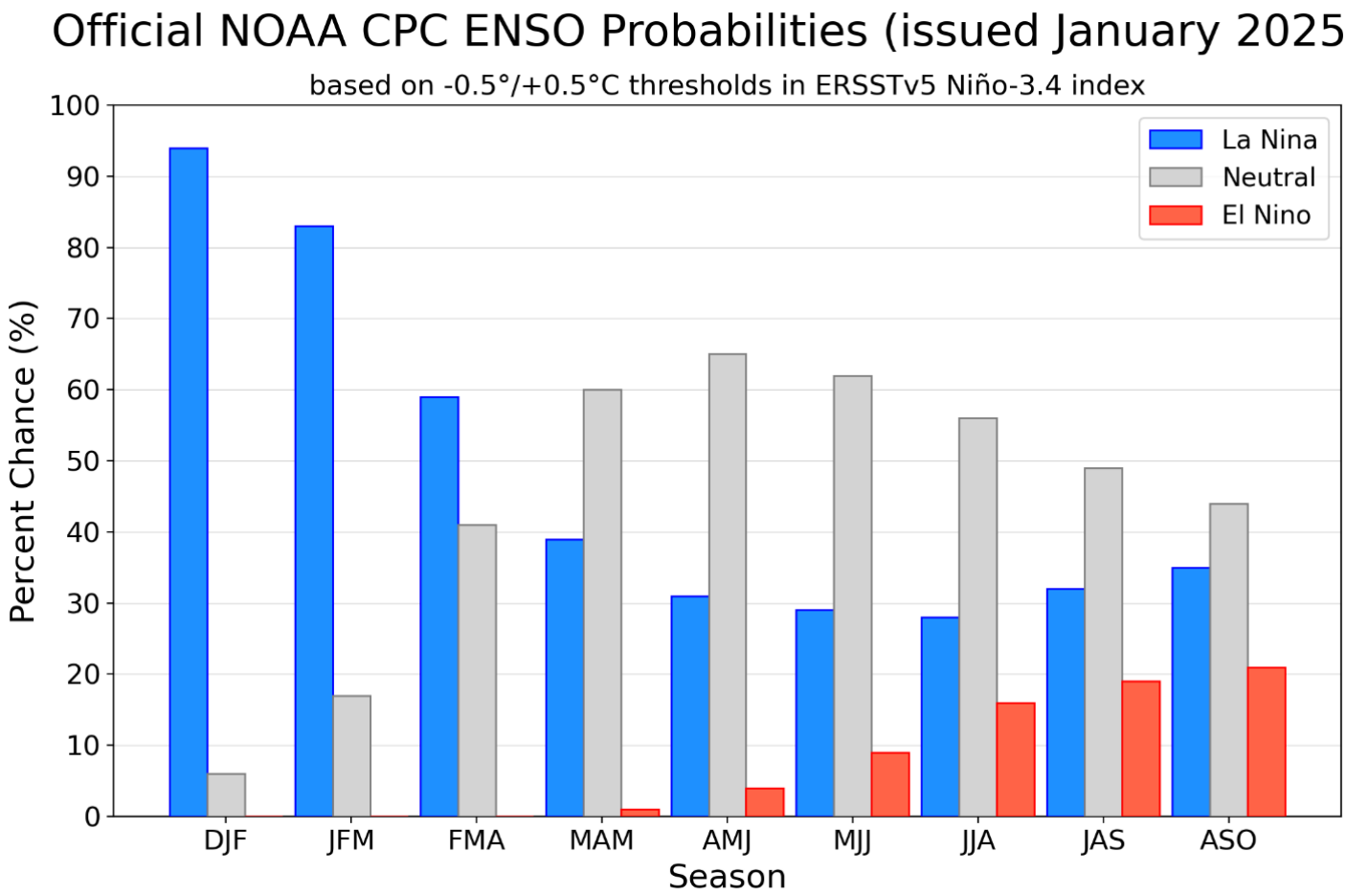
- **Hot, dry conditions can be conducive to stalk rot where maize is in the flowering and grain-filling stages:**
  - Maize production region, especially the central to western parts**.**
- **Dry, warm to hot and windy conditions at times will increase the fire hazard where vegetation is dry:**
  - Western to southern interior: **Thursday to Wednesday (30th – 5th).**
- **Some thundershowers will tend to become severe and produce strong wind gusts and hail:**
  - Interior of KZN: **Friday (31st).**
  - Northern interior of KZN, eastern to central Mpumalanga: Saturday and Sunday **(1st & 2nd).**
  - Southern to central Limpopo: Saturday and Sunday **(1st & 2nd).**
  - Southern Mpumalanga, northern to western KZN and north-eastern Free State: **Monday (3rd).**
- **It will be hot, with maximum temperatures exceeding 35°C:**
  - Interior of the Northern Cape: **Thursday to Wednesday (30th – 5th).**
  - The Karoo: **Thursday (30th) and Monday to Tuesday (3rd – 4th).**
  - Interior of the winter rainfall region, including the Swartland and Boland: **Monday to Tuesday (3rd – 4th).**
  - Eastern Cape interior: **Thursday (30th) and Tuesday (4th).**
  - Northern to eastern KZN: **Friday (31st), Sunday (2nd) and Tuesday (4th).**
  - Lowveld and Limpopo River Valley: **Thursday to Wednesday (30th – 5th).**
  - Western to central and northern Free State and North West: **Friday to Monday (31st – 3rd).**

Seasonal forecast

Current ENSO conditions:

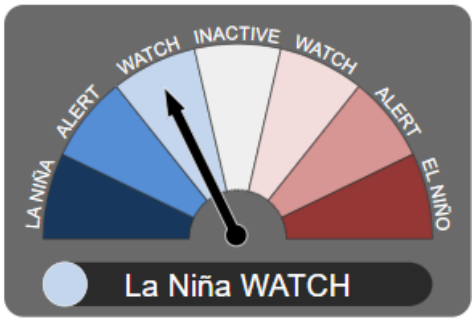
The ENSO state has finally been declared to be a weak La Niña by the NOAA Climate Prediction Centre. This is based on evidence from the Sea Surface Temperatures which remained below the La Niña thresholds during the last few weeks and with atmospheric indicators such as the Southern Oscillation Index (SOI) and the strength of the easterly winds over the equatorial central to eastern Pacific Ocean now more consistently remaining in La Niña territory. La Niña conditions are expected to persist through February-April 2025. Certain institutions, such as the Australian Bureau of Meteorology still classify this summer as ENSO Neutral (Neither El Niño nor La Niña).

The graph below shows the International Research Institute for Climate and Society (IRI) 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 9 January), the **IRI** notes that "As of mid-December 2024, ENSO-neutral conditions persist in the equatorial Pacific, and both oceanic and atmospheric indicators remain in an ENSO-neutral state. The IRI ENSO prediction plume forecasts slightly higher chances (59%) for ENSO-neutral conditions for Dec-Feb, 2025, with a continuation of ENSO-neutral conditions from Jan-Mar, 2025 to Jul-Sep, 2025. For Aug-Oct 2025, no specific ENSO category emerges as favored. In summary, ENSO-neutral conditions are expected to persist through the *austral summer, autumn, and winter* of 2025……According to the most recent official CPC ENSO Outlook (issued on December 12, 2024), the La Nina onset is forecasted in Nov-Jan 2024, with 59% chances; however, the objective IRI model-based ENSO outlook forecasts indicate the continuation of ENSO-neutral conditions for Dec-Feb, 2025.".

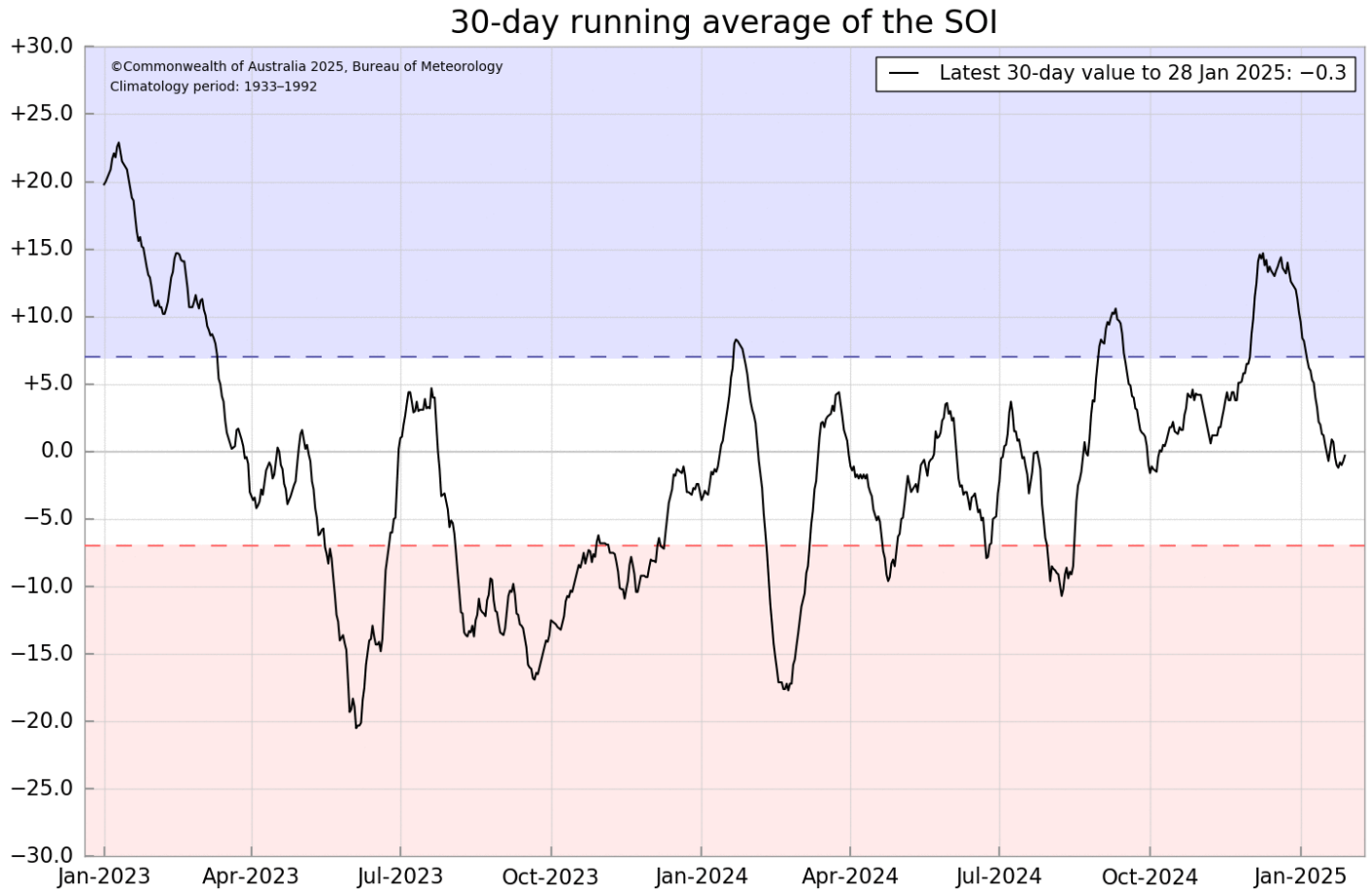
The **Australian Bureau of Meteorology** has stated that atmospheric indicators have recently remained more consistently within La Niña thresholds while SSTs are already at La Niña levels. This has increased the chance for a La Niña to be declared should the atmospheric indicators remain within La Niña thresholds. In their most recent update (21 January), the **Australian Bureau of Meteorology** states that "The El Niño Southern Oscillation (ENSO) in the tropical Pacific remains neutral. While many of the indicators have recently met the threshold for La Niña they have not been sustained for levels or duration sufficient to warrant La Niña status:

- The El Niño–Southern Oscillation (ENSO) has remained neutral for the past 6 months, despite changes in sea surface temperature patterns consistent with a developing La Niña.
- Since late December, conditions across the tropical Pacific have been more La Niña like, with both oceanic and atmospheric indicators beginning to align. However, until a sustained atmospheric and oceanic response is observed, the Bureau's ENSO status remains neutral.
- All surveyed international models have a neutral ENSO outlook from March until at least June.
- Historically, it is very late in the typical ENSO cycle for a La Niña event to develop, with La Niña also tending to have a weaker association with Australian temperature and rainfall patterns during summer compared to winter and spring.

http://www.bom.gov.au

The Southern Annular Mode (SAM) is currently neutral and is expected to trend negatively during the next few days. A negative SAM during mid-to late summer is associated with dry conditions generally across South Africa. The index is expected to return to neutral values later next week.

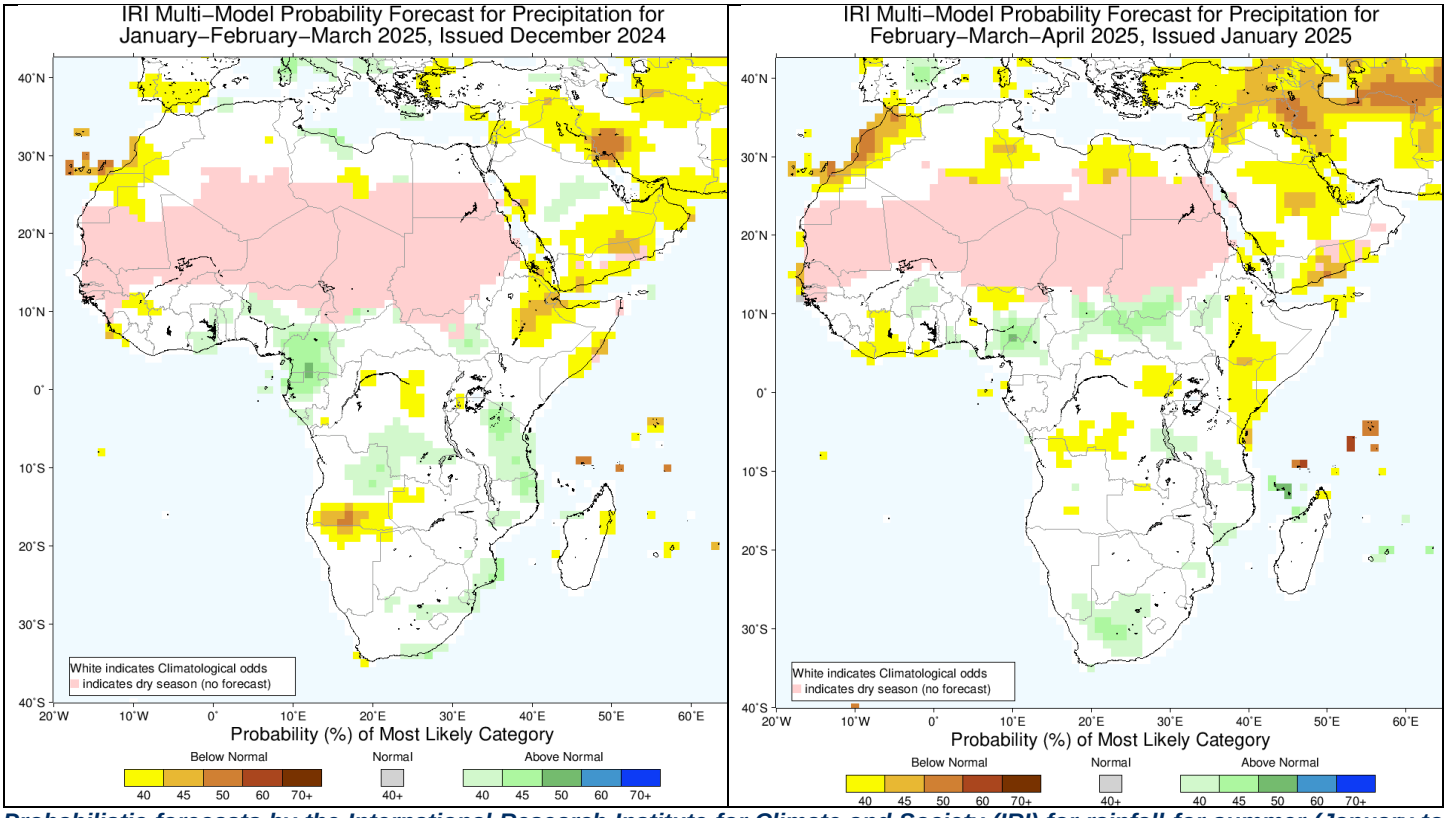
The 30-day Southern Oscillation Index (SOI) is currently -0.3 and therefore representing atmospheric pressure patterns in the Australia – Pacific region indicative of ENSO Neutral conditions. The SOI is still slowly trending positive.



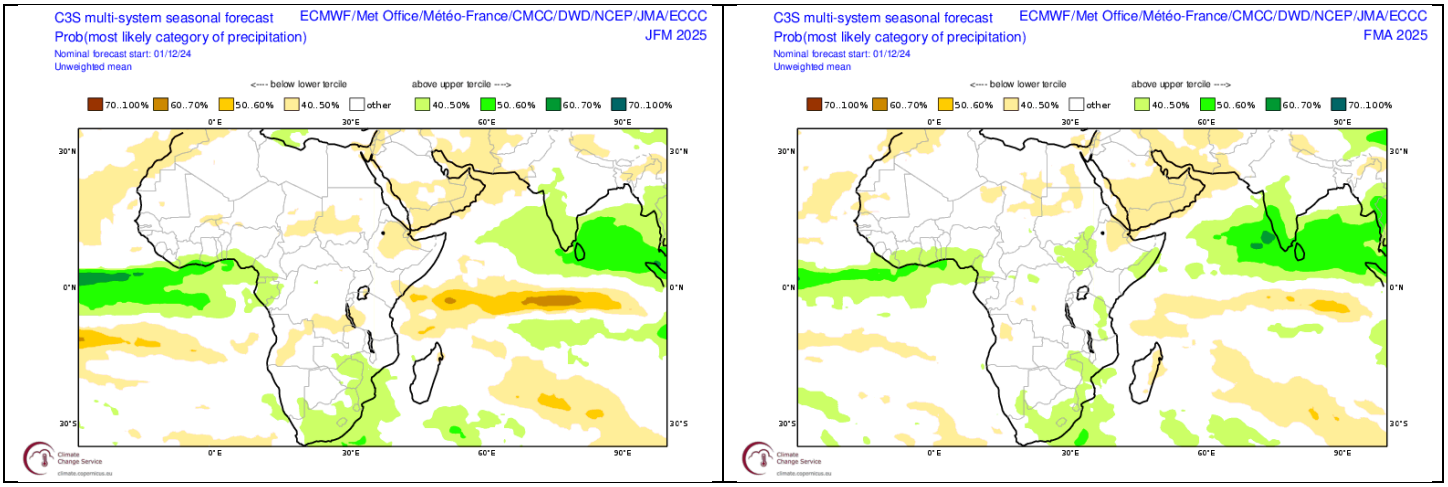
Australian Bureau of Meteorology - http://www.bom.gov.au

Seasonal forecasts issued by various international institutions

Seasonal forecasts (updated in December 2024 and January 2025) remain relatively neutral for summer given the weak signal from the Pacific Ocean but have trended slightly positive for rainfall over the summer rainfall region. The IRI seasonal forecast for the period January to April (first pair of maps) indicates an enhanced probability for relatively wet conditions over the central interior. The drier signal to the north, shown in earlier forecasts, has now disappeared due to the cooling trend in the equatorial Pacific. This is still very much an uncertain forecast due to the weak state of ENSO. The COPERNICUS multi-model assimilated forecast (second pair of maps) also shows the expectation of relatively wet conditions over large parts of the interior, but this is also a very conservative outlook, associated with the very late development of a weak La Niña.



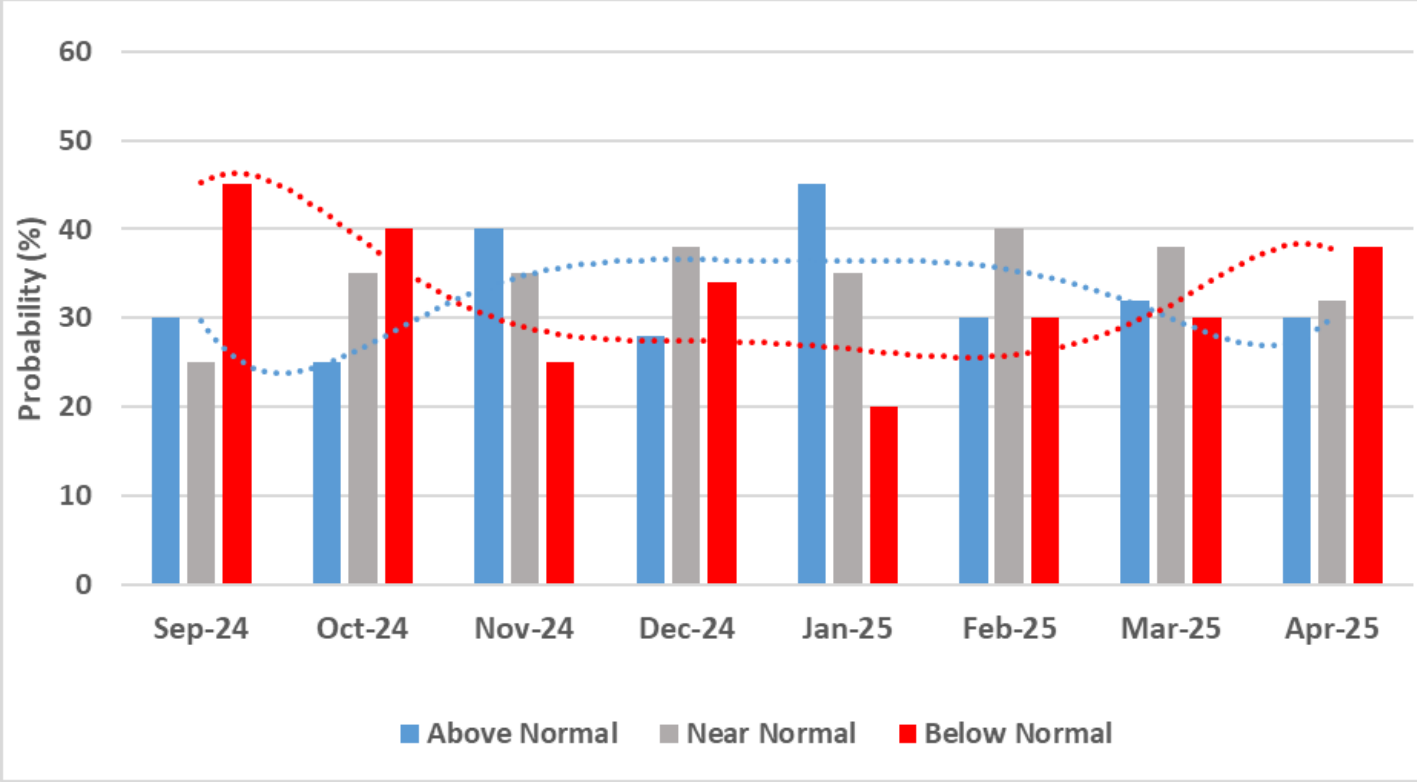
Probabilistic forecasts by the International Research Institute for Climate and Society (IRI) for rainfall for summer (January to March 2025; left - Forecast issued in 2024-12) and late summer/autumn (February to April 2025, right – Forecast issued in 2025-01).



Probabilistic multi-model forecasts by the ECMWF COPERNICUS Programme for rainfall for mid-to-late summer (January to March 2025; left - Forecast issued in 2024-12) and late summer (February to April 2025, right – Forecast issued in 2024-12).

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.



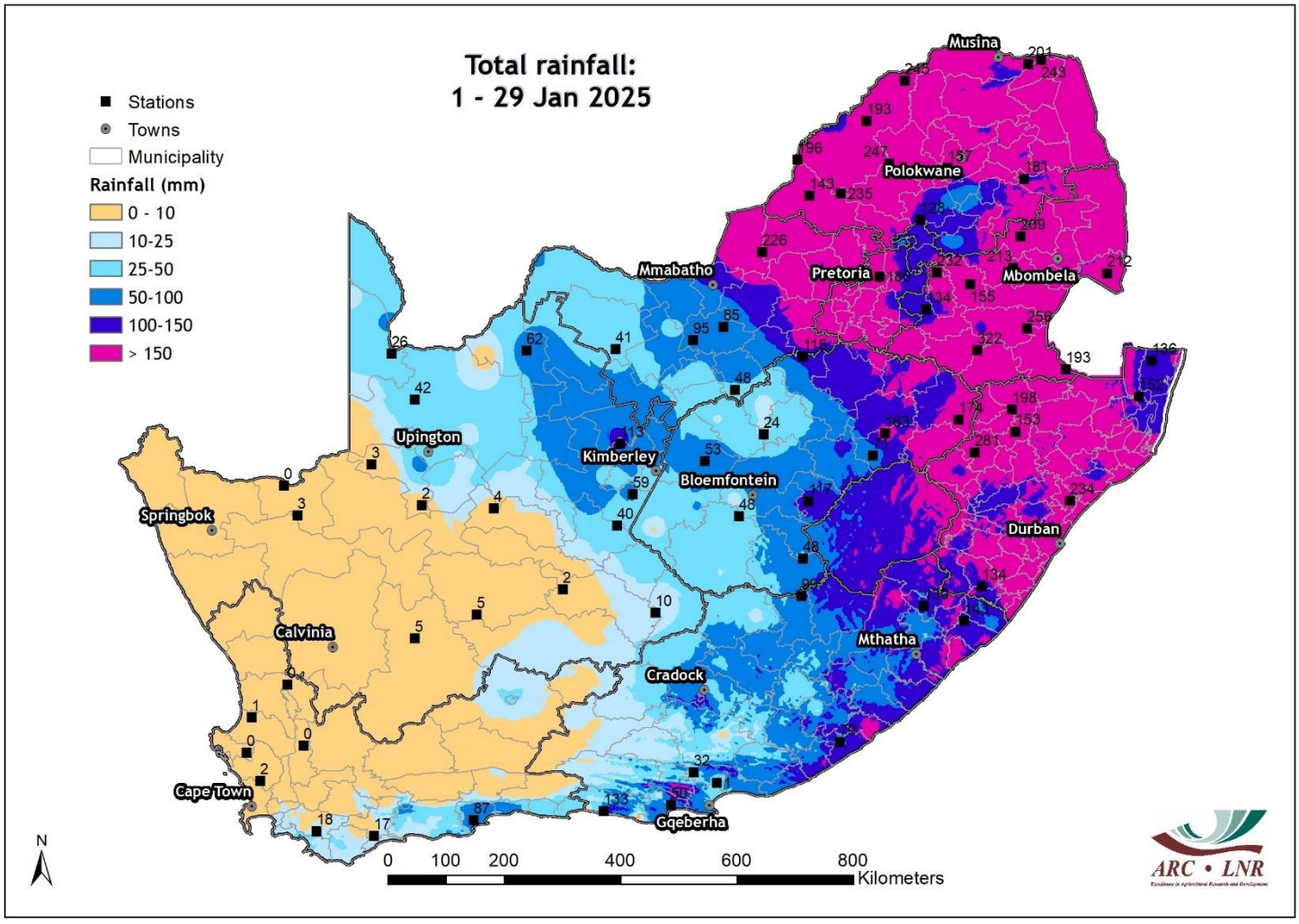
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2024 – April 2025 (Forecast issued in 2024-10).

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

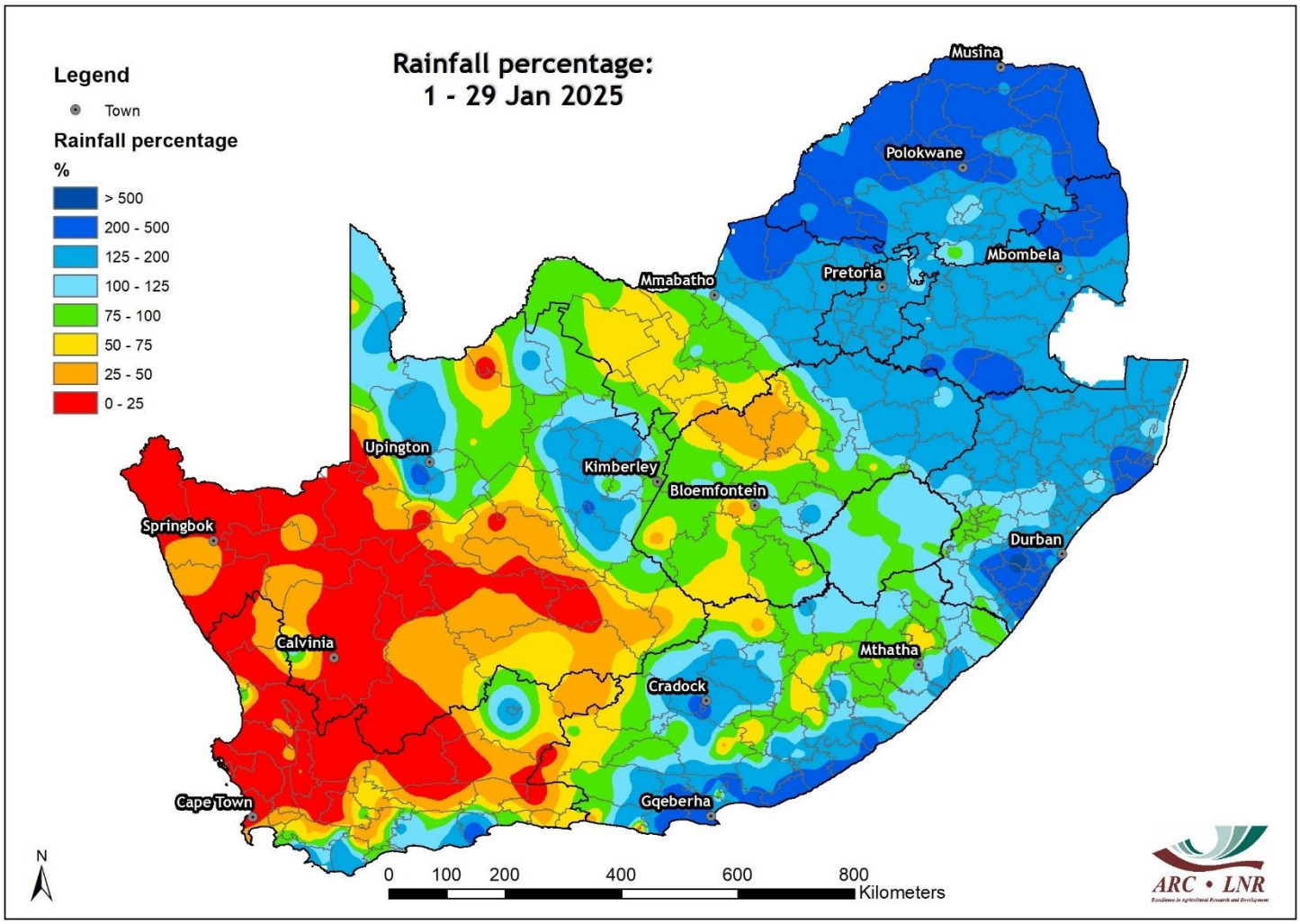
Observed conditions

Rainfall (mm): 1 - 29 Jan 2025



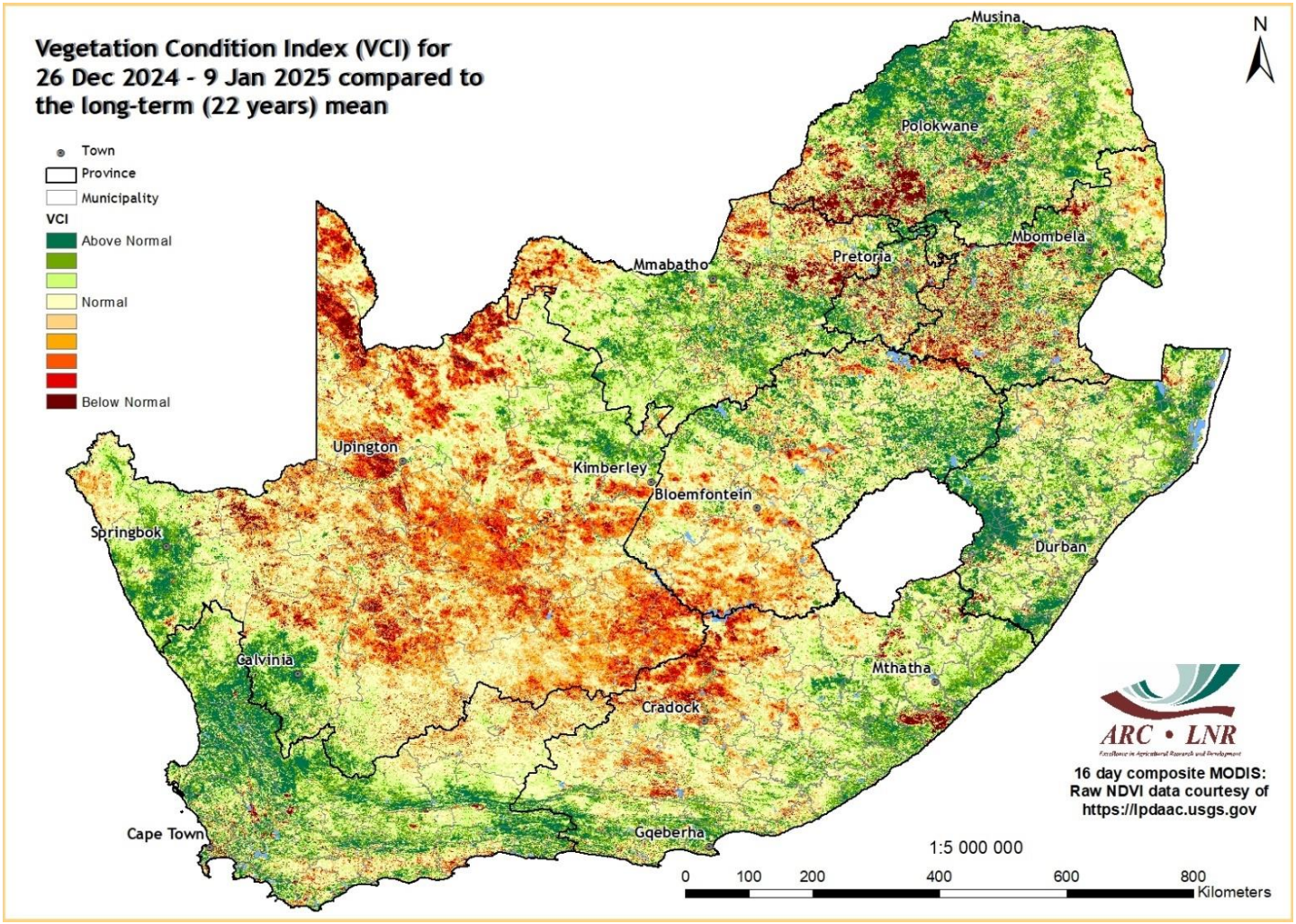
Most of the northeastern parts of the country received more than 150mm of rain during the first 29 days of January 2025. Much of the central parts of the country (including the western parts of the summer-grain-production region) received less than 50 mm of rain while it was dry in the west.

Rainfall (% of long-term mean): 1 - 29 Jan 2025



Most of the central to north-eastern parts received above-average rainfall so far in January. The south-western areas were dry for this time of the year. The western parts of the summer-grain production region received near-average to below-average rainfall.

Vegetation Condition Index: Early January 2025



By early January, vegetation activity recovered over the north-eastern parts due to widespread rain from mid-December onwards. Vegetation was stressed over most of the Northern Cape and south-western half of the Free State, associated with warm and dry conditions. Vegetation activity was 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***