

CUMULUS

SEASON 2023/2024

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11 April 2024



YOUNG PEOPLE SEE THE FUTURE

Differently



“THE FUTURE OF AGRICULTURE... A CERTAIN FUTURE”

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Summary

More rain over the interior

Following the widespread rain during the weekend and early this week, sunny and mild to cool weather now dominates. While minimum temperatures will be relatively low until the weekend, only light frost is expected in frost-prone locations such as the southern escarpment, especially over the Eastern Cape interior and areas along the Drakensberg. There is no current indication of widespread or severe frost during the next two weeks.

Isolated to scattered thundershowers will develop over the central to eastern parts from the weekend as a weak upper-air low develops over the southeastern parts and slowly makes its way northwards to the northeastern parts of the country by the middle of next week. Large parts of the summer-grain production region may receive between 30 and 75 mm of rain during the period, making this the second week in a row with above-normal rainfall over these areas. The winter rainfall region is expected to remain dry while the upper-air system is active in the east and there is an absence of frontal systems in the southwest.

Looking further ahead, current forecasts indicate a continuation of large-scale circulation patterns in the region that will support rainfall over the summer rainfall region, such as regular ridging of high-pressure systems around the country. There will be an associated tendency for more upper-air systems in the westerlies to move across the country, with more showers or thundershowers expected over the interior during the next few weeks. While such upper-air systems are associated with cold fronts, there are no indications currently of a severe cold event associated with these systems as frontal systems are not expected to make a significant onslaught over the winter rainfall region according to current outlooks.

The following is a summary of weather conditions during the next few days:

- It will be cooler than normal over the eastern parts while warmer than normal in the west.
- Minimum temperatures will be low for this time of the year until Friday, with light frost expected along southern to southeastern escarpment, including the southern to central Drakensberg and possibly southern to eastern high-lying areas of the summer-grain production region.
- There is no indication currently of widespread and severe frost over the summer-grain production region.
- Rainfall will be above normal for this time of the year over the central to eastern and southeastern parts, but below normal in the west and extreme northeast.
- Scattered thundershowers will occur over the central to eastern parts from Saturday until Monday, clearing from the southwest by Tuesday.
- With atmospheric temperatures lower by this time of the year, there will be an enhanced tendency for hail associated with the expected thundershowers over the interior. These should however remain small in most cases.
- The winter rainfall region is expected to remain dry.
- **The winter rainfall region** will be warm on most days, especially over the western to northern parts of the region, while the southern parts will be mild. It will be windy in the south, with strong south-easterly winds expected until Sunday. No rain is expected during the next few days.

- **The summer-grain production region** will receive above-normal rainfall during the next few days, with current forecasts indicating more than 25 mm over large parts of the region, with higher totals expected over the Free State and KZN. Scattered to widespread thundershowers will occur from Saturday until Monday over most of the region except in the northeast. Thundershowers are however expected to move into the northeastern parts of the region by early next week while it should clear from the southwest. Temperatures will be in the near normal to below normal range. The location and intensity of rainfall will be determined by the exact location of the upper-air low as it moves south-north over the eastern to central parts of the country.

Overview of expected conditions over the main agricultural production areas

With an upper-air low expected to develop in the south and then move northwards towards the northeastern interior during the period until the middle of next week, scattered thundershowers will occur over the summer rainfall region from the weekend until next week. Moisture will be contributed to the interior by a ridging high to the south, which will at first result in an influx of cooler air from the south over the interior. The ridging high will result in strong southeasterlies over the southwestern parts of the winter rainfall region and will also cause warm conditions over the western parts of the winter rainfall region.

Maize production region:

It will start out sunny and dry with cool conditions in the mornings, but thundershowers will occur over large parts of the region from Saturday continuing into early next week while minimum temperatures will be somewhat higher.

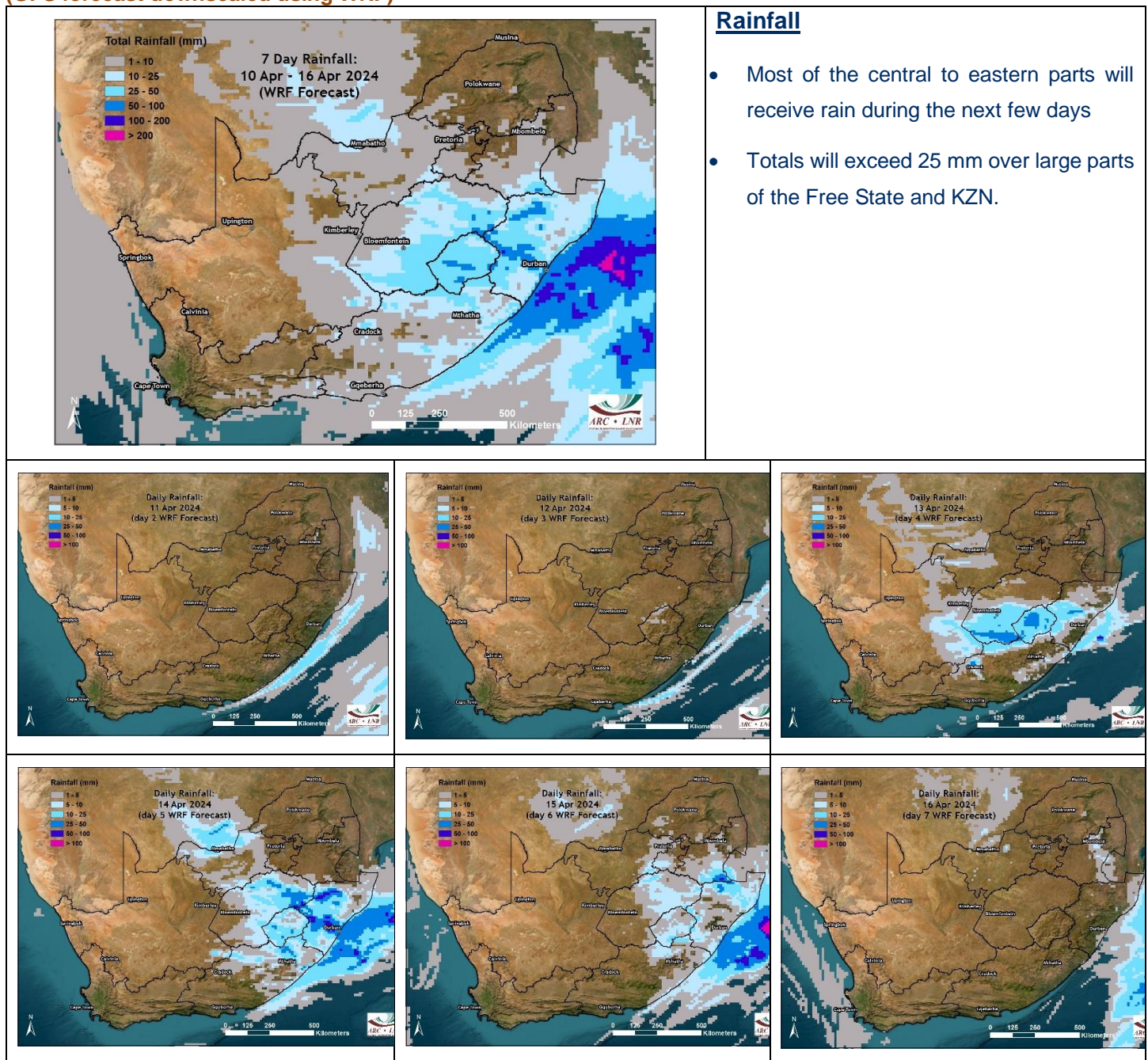
- Maximum temperatures over the western maize-production areas will range between 21 and 27°C. Minimum temperatures will be in the order of 5 – 10°C, with lowest temperatures on Friday morning and towards the south.
- Maximum temperatures over the eastern maize-production region will range between 16 and 23°C. Minimum temperatures will be in the order of 4 - 11°C, with lowest temperatures by Friday morning and mostly along the Drakensberg.
- **Thursday (11th):** Sunny and mild, but partly cloudy in the east. It will be cool in the morning.
- **Friday (12th):** Sunny and mild, but partly cloudy in the north. It will be cool to cold in the morning, with light frost possible over the southern to eastern high-lying areas of the region.
- **Saturday (13th):** Partly cloudy and mild with scattered thundershowers except in the northeast. It will be windy over the western to central parts.
- **Sunday (14th):** Partly cloudy and mild with scattered to widespread thundershowers, but isolated in the northeast. It will be windy over the western to central parts.
- **Monday (15th):** Partly cloudy and mild with scattered thundershowers. It will be windy over the western to central parts.
- **Tuesday to Wednesday (16th – 17th):** With the upper-air low expected to be located further north, current forecasts favour further thundershowers over the central to northern and eastern areas of the region while the western parts are expected to be sunny and mild during this period.

Cape Wine Lands and Ruens:

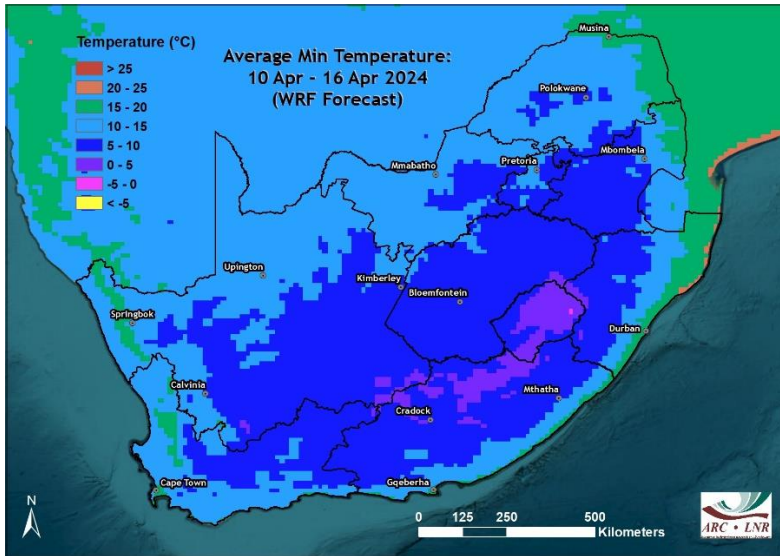
The region will be sunny and warm. With a lack of frontal activity while high-pressure systems ridge to the south, winds over the region will be southeasterly to easterly, resulting in relatively lower temperatures along the Garden Route while it will be warmer towards the west such as in the Swartland. Strong south-easterly winds are expected over the south-western parts until Sunday.

Daily summary of expected conditions

(GFS forecast downscaled using WRF)

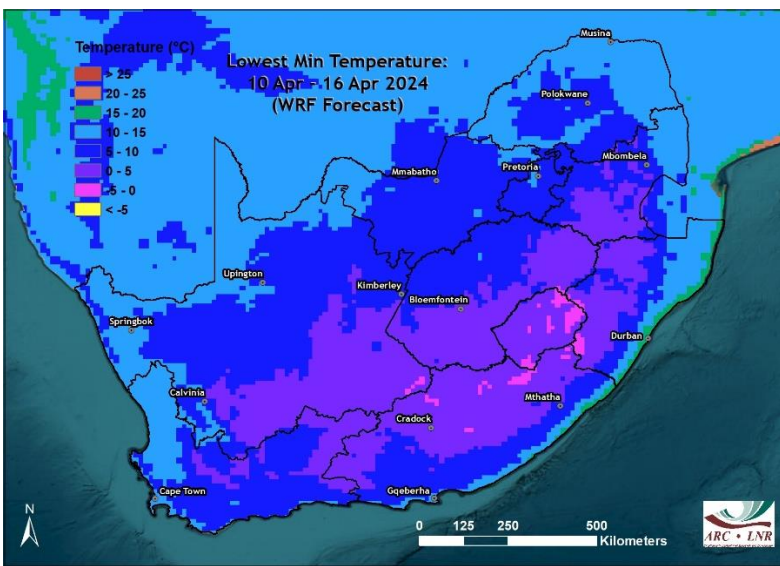


• It will be dry over the interior until the weekend while light showers will occur along the eastern seaboard.



Average minimum temperatures

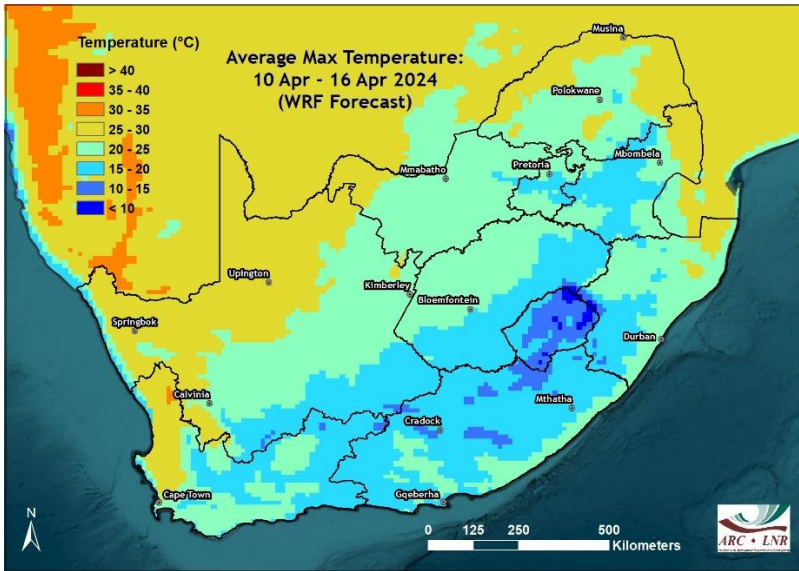
- Average minimum temperatures over the interior will range between 5 and 15°C.



Lowest minimum temperatures

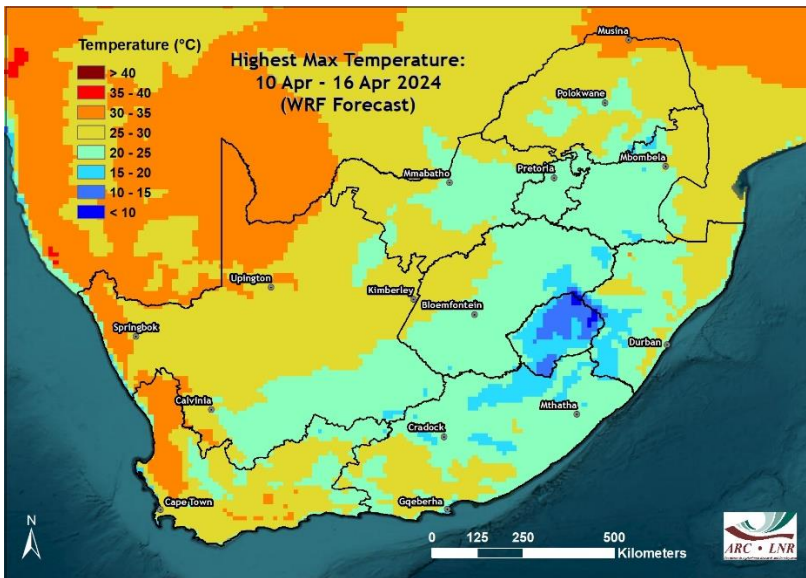
- Lowest minimum temperatures will remain above 0°C over the summer grain production region.
- Lowest minimum temperatures will be below 0°C over the southern to southeastern escarpment, including the southern to central Drakensberg.

- Isolated to scattered thundershowers will occur over the central to eastern and southeastern parts from Saturday until Monday, becoming more isolated by Tuesday.



Average maximum temperatures

- Average maximum temperatures will range between 15 and 25°C over most of the country.

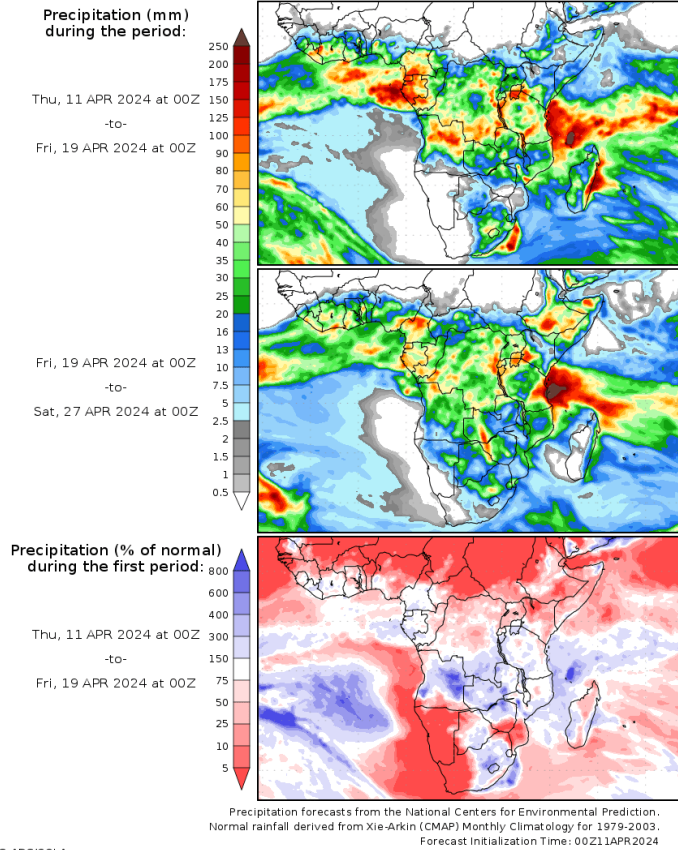


Highest maximum temperatures

- Highest temperatures during the next few days are not expected to exceed 35°C anywhere in the country.

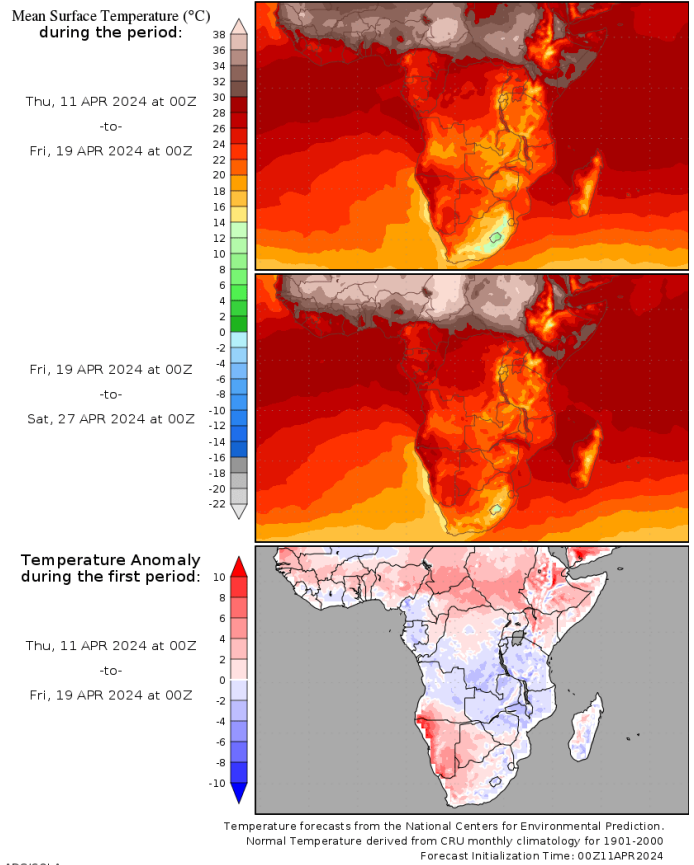
Medium term rainfall and temperature summary

Precipitation Forecasts

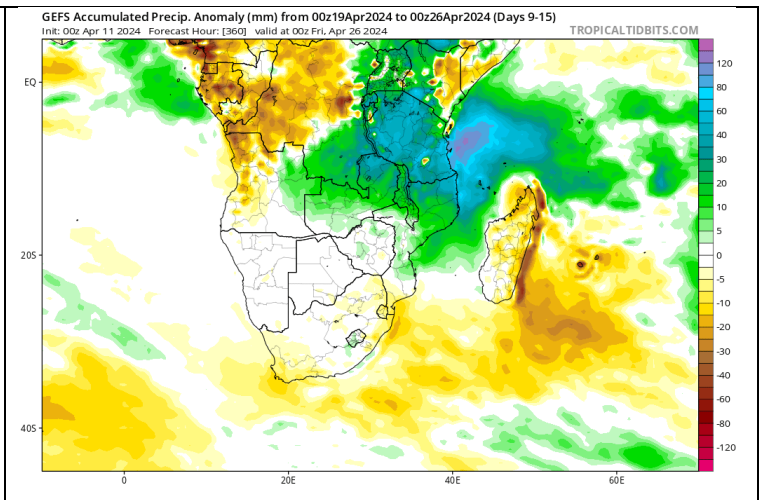
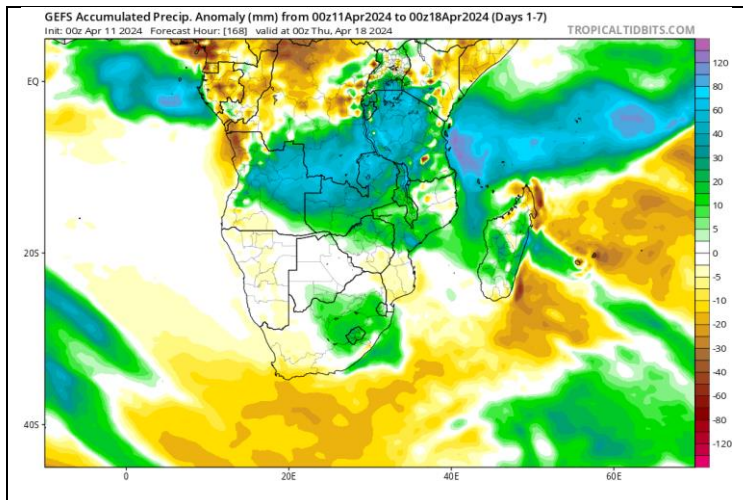


GRADS/COLA

Temperature Forecasts



GRADS/COLA



The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors above-normal rainfall over the summer-rainfall region with relatively dry conditions over the winter rainfall region until mid-April. Later in the month, current outlooks favor near-normal rainfall over the interior while the winter rainfall region is expected to remain dry for this time of the year (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 11 April) 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:

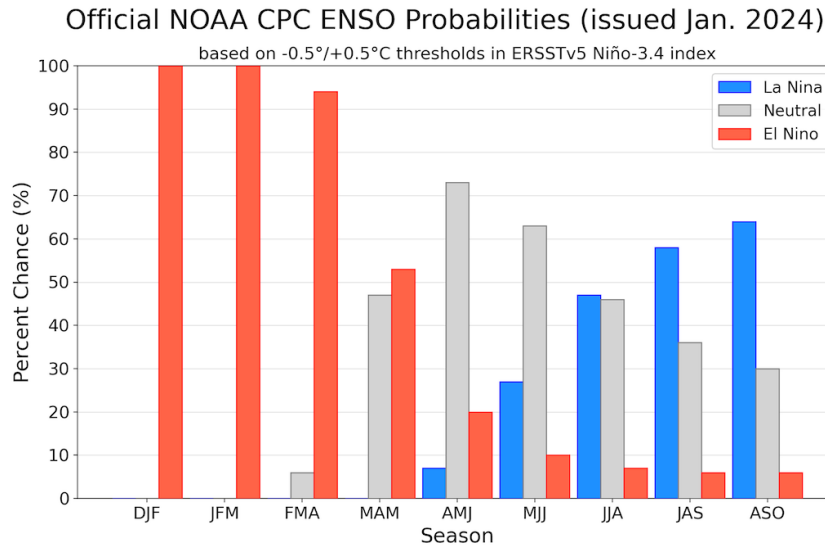
- **Widespread thundershowers with significant multi-day total rainfall, following earlier rain, may be disruptive to agricultural activities:**
 - KZN, Free State and southern North West: **Saturday to Tuesday (13th-16th).**
 - Eastern North West, Gauteng and western to southern Mpumalanga: **Sunday to Wednesday (14th-17th).**
- **Some thundershowers be associated with large amounts of small hail:**
 - Southern to eastern Free State and interior of the Eastern Cape: **Saturday (13th).**
 - Southern parts of North West, Free State (except southwestern parts) and interior of the Eastern Cape: **Sunday and Monday (14th – 15th).**
 - Eastern parts of North West, Gauteng, western Mpumalanga: **Monday and Tuesday (15th – 16th).**
- **Strong south-easterlies are expected:**
 - Southwestern parts of the Western Cape: **Thursday to Sunday (11th to 14th).**
- **Low minimum temperatures will occur with possible light frost:**
 - Southern escarpment and Drakensberg, adjacent parts of the summer-grain production region: **Friday (12th).**

Seasonal forecast

Current ENSO conditions:

The current El Niño has peaked and ENSO forecast models predict a weakening of the event so that the Sea Surface Temperature Anomaly patterns will resemble neutral conditions by autumn and winter. Some models lean towards La Niña conditions by our next summer, which will not be uncharacteristic based on historical observations of conditions following an El Niño summer. However, ENSO forecasts are usually only found to be reliable from July onwards, so there is still great uncertainty in the outlook.

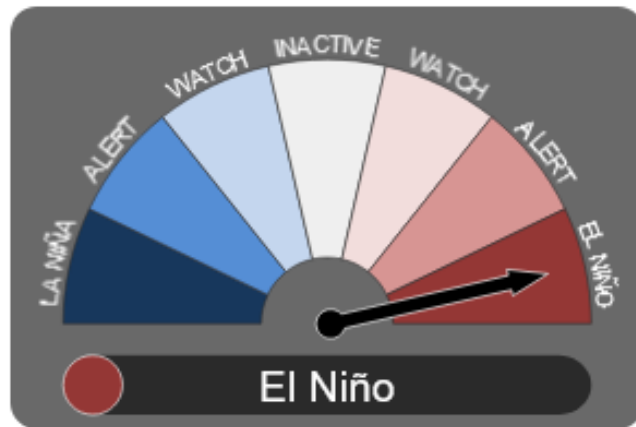
The International Research Institute for Climate and Society (IRI)'s latest ENSO forecast however maintains the expectation of a continuation of El Niño, at least in terms of Sea Surface Temperatures, into autumn:



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

Likewise, the Australian Bureau of Meteorology keeps their outlook to “El Niño”

El Niño persists



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

In their most recent update (issued 19 March), the IRI notes the “As of mid-March 2024, El Niño conditions persist in the central-eastern equatorial Pacific, with important oceanic and atmospheric indicators aligning with an ongoing El Niño event that is gradually diminishing. Almost all the models in the IRI ENSO prediction plume forecast a continuation of the El Niño event during boreal spring (SH autumn), which rapidly weakens thereafter. ENSO-neutral conditions become the most likely category in Apr-Jun, May-Jul, and Jun-Aug of 2024. La Niña becomes the most probable category in Jul-Sep 2024 through Nov-Jan 2025.”.... <https://iri.columbia.edu>

In their most recent update (2 April), the Australian Bureau of Meteorology states that “El Niño continues and is near its end. Climate models indicate sea surface temperatures in the central tropical Pacific are expected to return to ENSO-neutral later in autumn 2024.

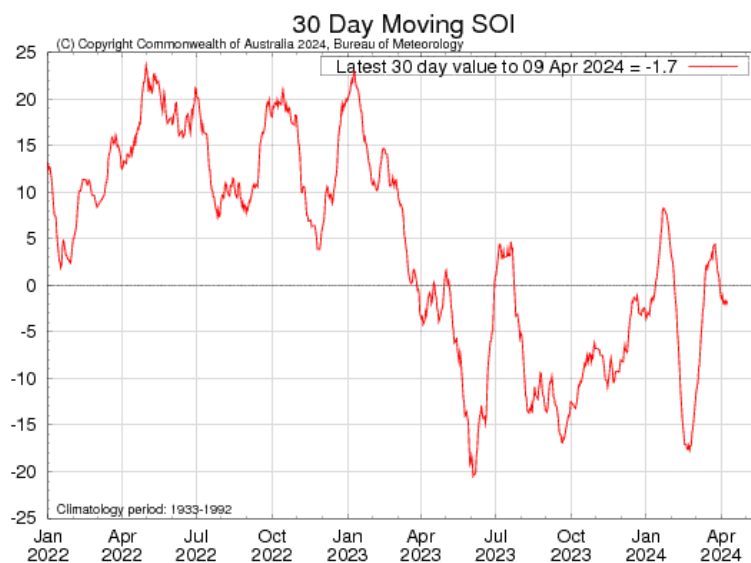
Oceanic indicators such as tropical Pacific sea surface temperatures have been steadily cooling since December but are still meeting El Niño thresholds. Atmospheric indicators are consistent with a decaying El Niño. Cloudiness near the equatorial Date Line is below average, opposite to that expected during an active El Niño. The 90-day Southern Oscillation Index (SOI) is currently -3.0 , indicative of ENSO-neutral conditions.

International climate models suggest the central tropical Pacific Ocean will continue to cool in the coming months, with four out of seven climate models indicating the central Pacific is likely to return to neutral El Niño–Southern Oscillation (ENSO) levels by the end of April (i.e., neither El Niño nor La Niña), and all models indicating neutral in May.

While four out of seven international models are predicting a La Niña by late winter, El Niño and La Niña predictions made in early autumn tend to have lower accuracy than predictions made at other times of the year. This means that current forecasts of the ENSO state beyond May should be used with caution. ENSO forecasts have historically had their lowest skill for forecasts issued in April, with skill increasing from May.

The oceans have been the warmest on record globally since April 2023. Sea surface temperatures continue to increase, with temperatures in February 2024 setting a record for that month, and March 2024 on track to be the warmest March on record (final data for March is not yet available). The global pattern of warmth is affecting the typical historical global pattern of sea surface temperatures associated with ENSO variability. As the current global ocean conditions have not been observed before, inferences of how ENSO may develop in 2024 that are based on past events may not be reliable.”... - <http://www.bom.gov.au>.

The 30-day Southern Oscillation Index (SOI) is currently -1.7 and therefore indicative of atmospheric pressure patterns in the Australia – Pacific region being in neutral mode. This is an indication of a weakening of the current El Niño.

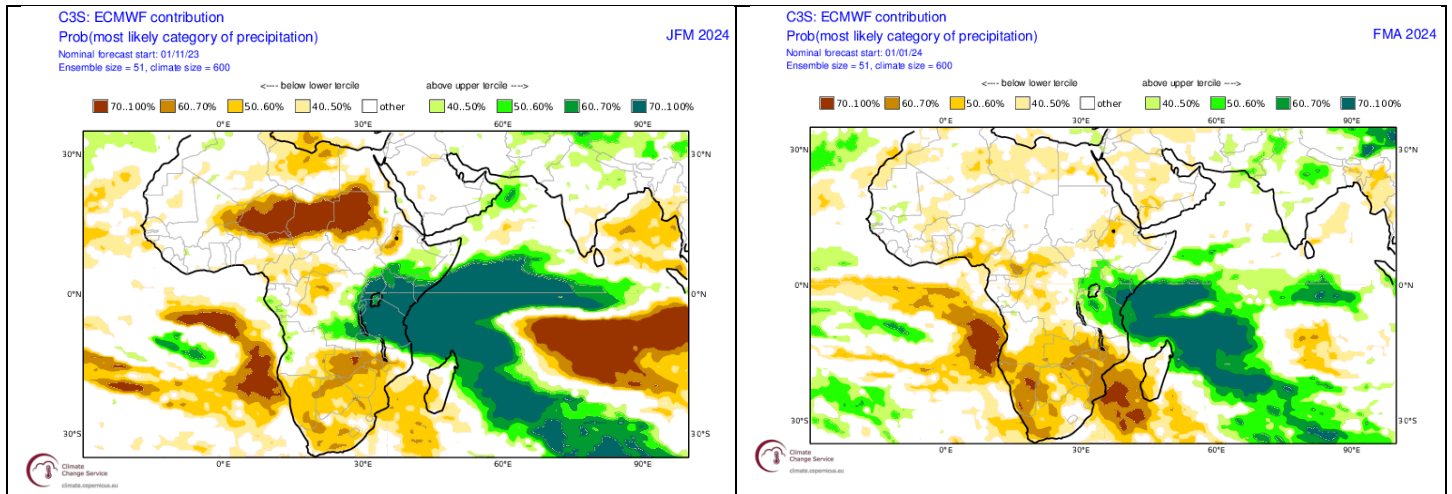


Australian Bureau of Meteorology - <http://www.bom.gov.au>

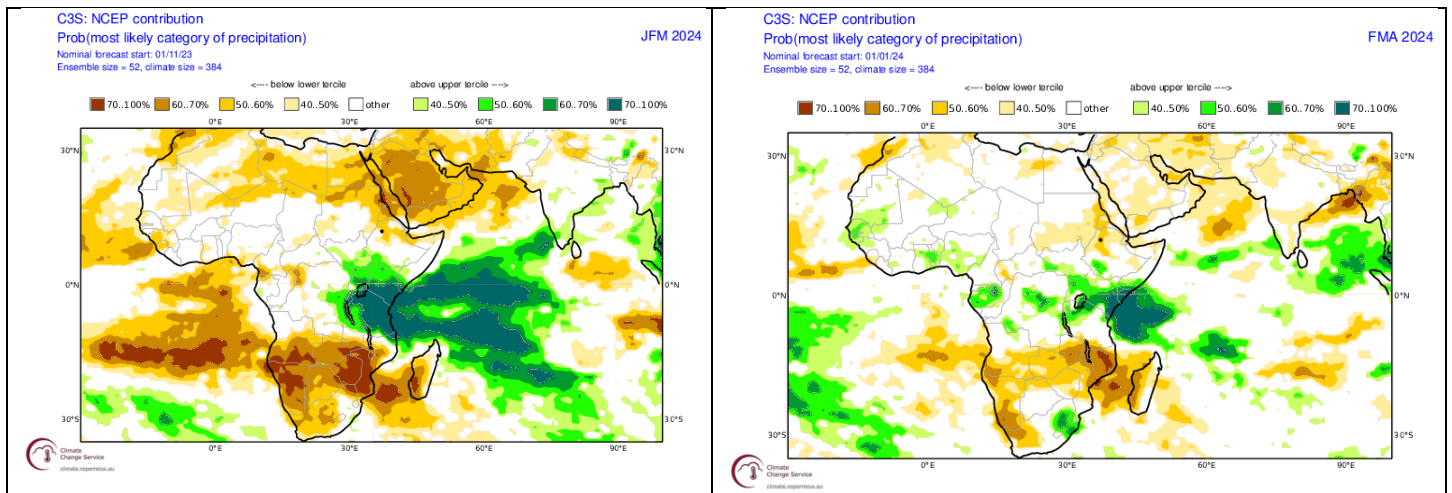
Seasonal forecasts issued by various international institutions

Seasonal forecasts (updated in January 2024) by various institutions, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) and by the IRI, still expect drier conditions for the remainder of summer.

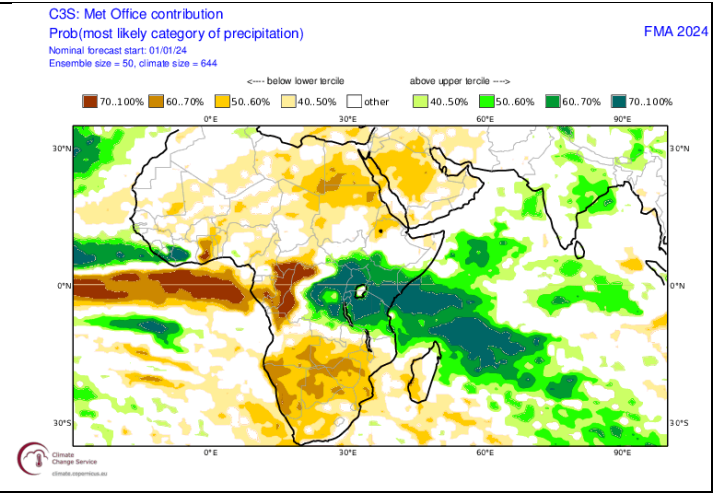
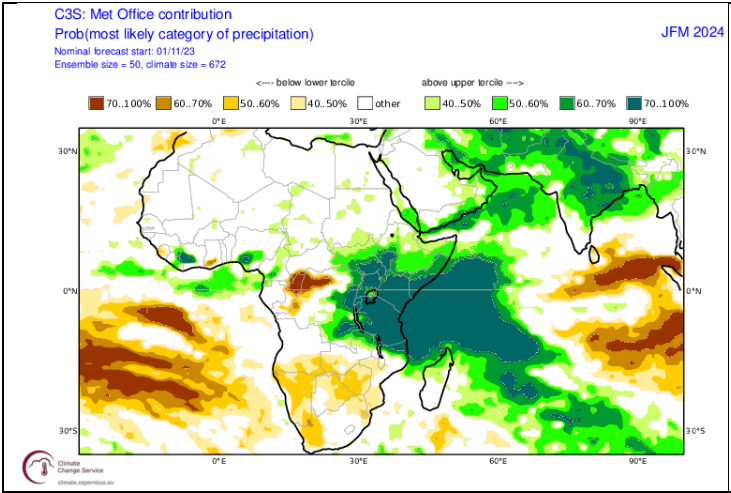
The drier pattern expected across most of southern Africa is to be expected with regard to seasonal forecasts given the current El Niño event. Forecasts still lean more strongly towards drier than normal conditions over the central to western parts of the country with the somewhat wetter or near normal signal over the eastern parts.



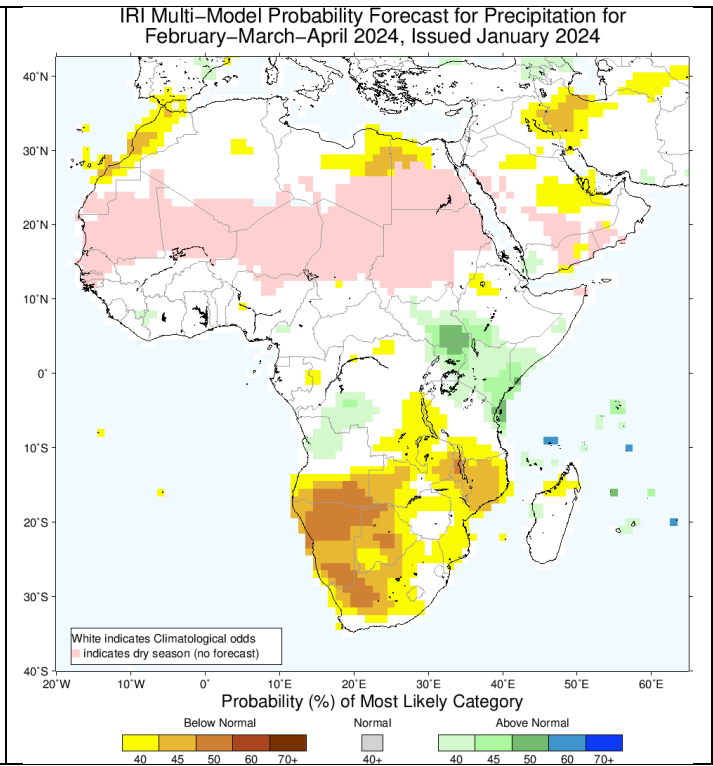
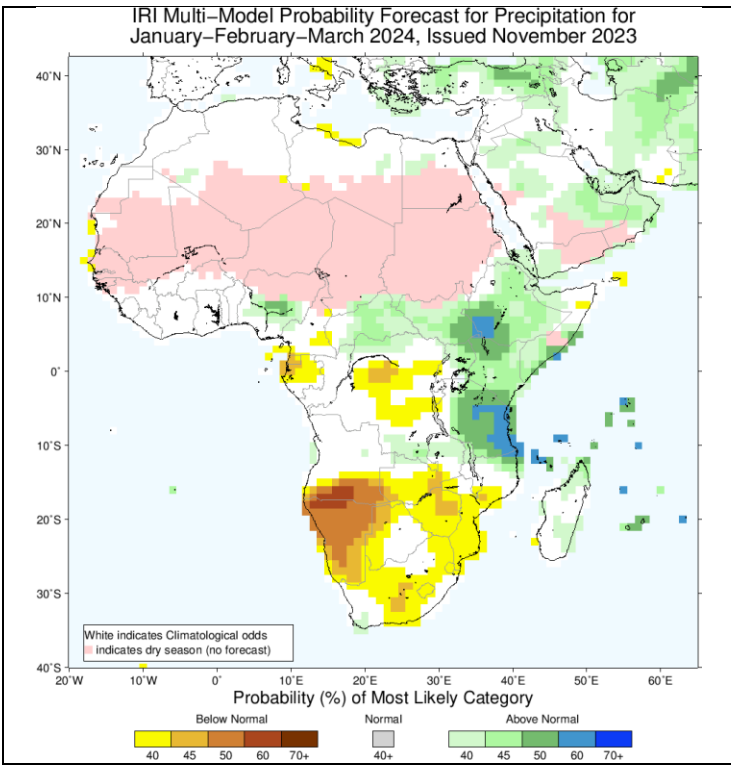
Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for mid-to-late summer (January-March 2024; left - Forecast issued in 2023-11; and for late summer (February to March 2024 right – Forecast issued in 2024-01).



Same as above, but forecasts issued by the National Centres for Environmental Prediction.



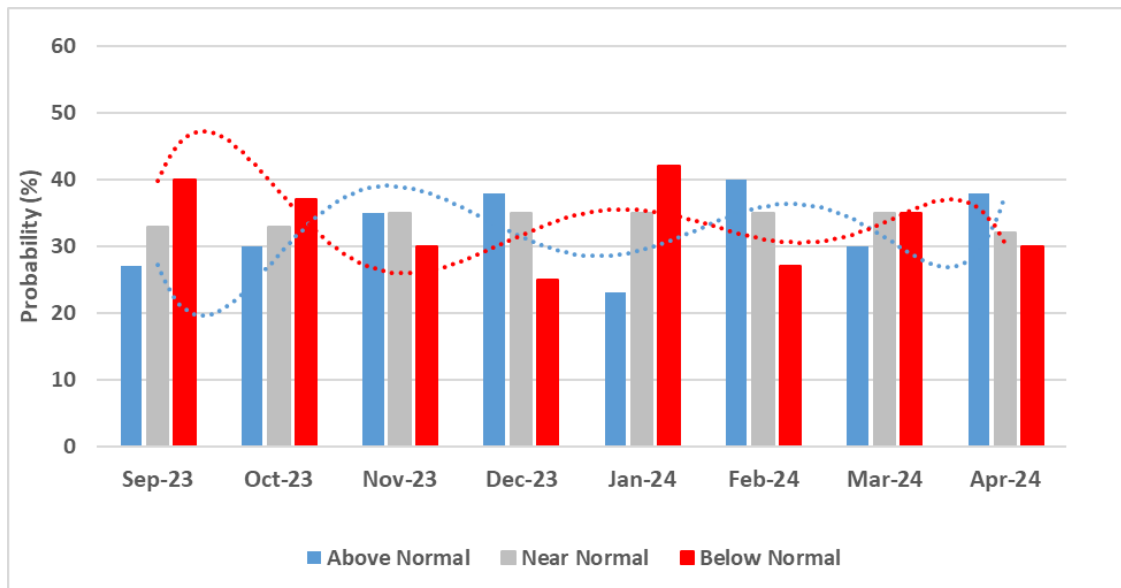
Same as above, but forecasts issued by the UK Met Office.



Probabilistic forecasts by the International Research Institute for Climate and Society (IRI) for rainfall for mid-to-late summer (January-March 2024; left - Forecast issued in 2023-11) and late summer (February to April, right - Forecast issued in 2024-01).

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), as associated with the cyclic variability of the global climate system. Summers that are similar to 2023/24 usually experience near normal to below normal rainfall in total, with alternating wet and dry periods throughout the summer rather than one half of the summer being dry while the other half is wet.



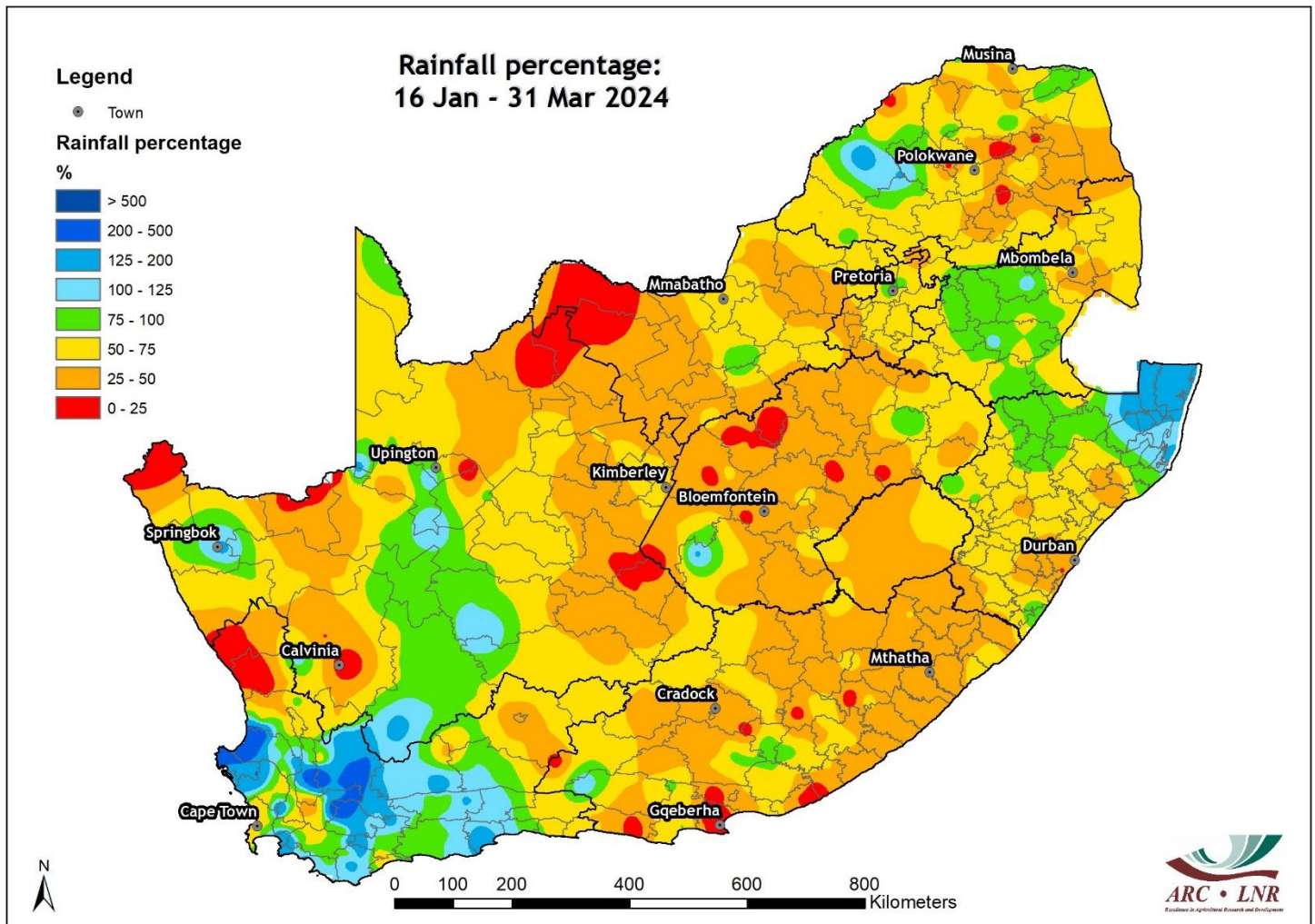
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2023 – April 2024 (Forecast issued in 2023-09).

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

- September – first half of October: Relatively dry conditions over the north-eastern half of the summer rainfall region
- Second half of October – early November: Near-normal rainfall over the north-eastern half of the summer rainfall region
- First half of November: Near-normal to below-normal rainfall over the north-eastern half of the summer rainfall region
- Late November and December to early January: Above-normal rainfall over the north-eastern half of the summer rainfall region
- Rest of January: Below-normal rainfall over the north-eastern half of the summer rainfall region
- February: Normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- Late February and early March: Below-normal rainfall over the north-eastern half of the summer rainfall region
- Late March into Early April: Normal to above-normal rainfall over the north-eastern half of the summer rainfall region

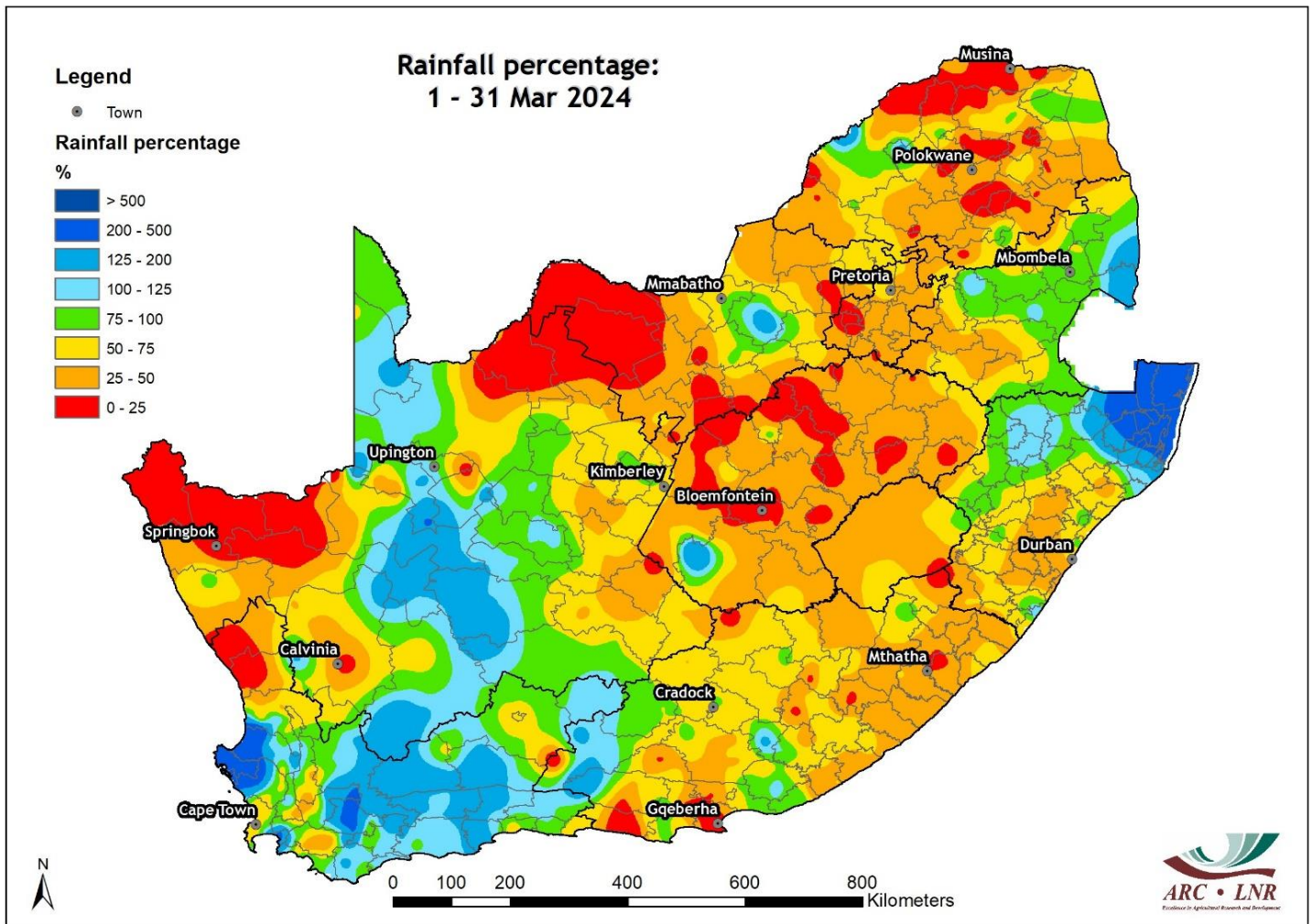
Observed conditions

Rainfall (% of long-term mean): 16 January – 31 March 2024



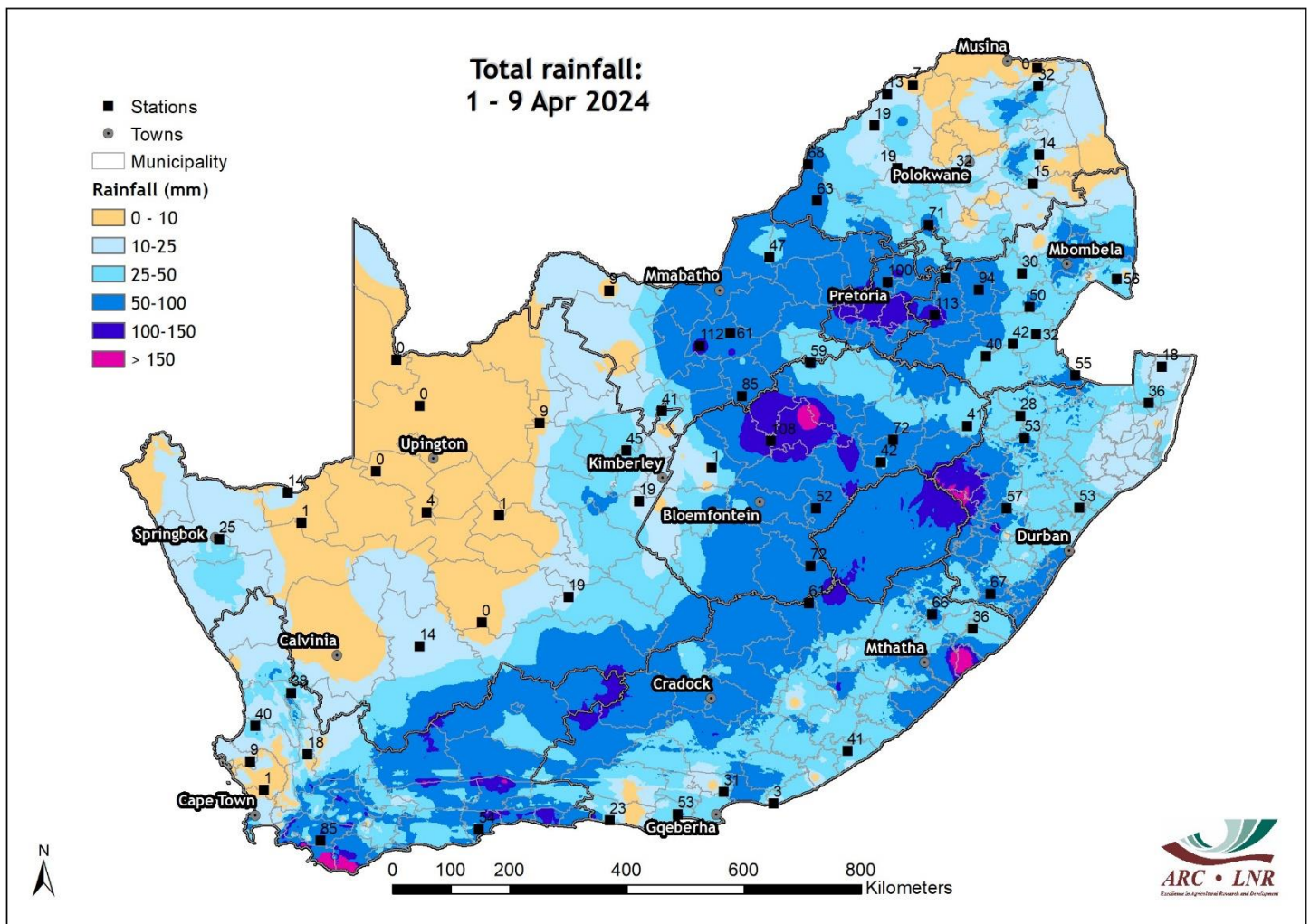
Most of the interior was relatively dry from 16 January until late March. Parts of the central to western Free State received less than 25% of the long-term average rainfall. Some areas in the northeast along with the southwestern parts of the country received near-average to above-average rainfall during the period.

Rainfall (% of long-term mean): March 2024



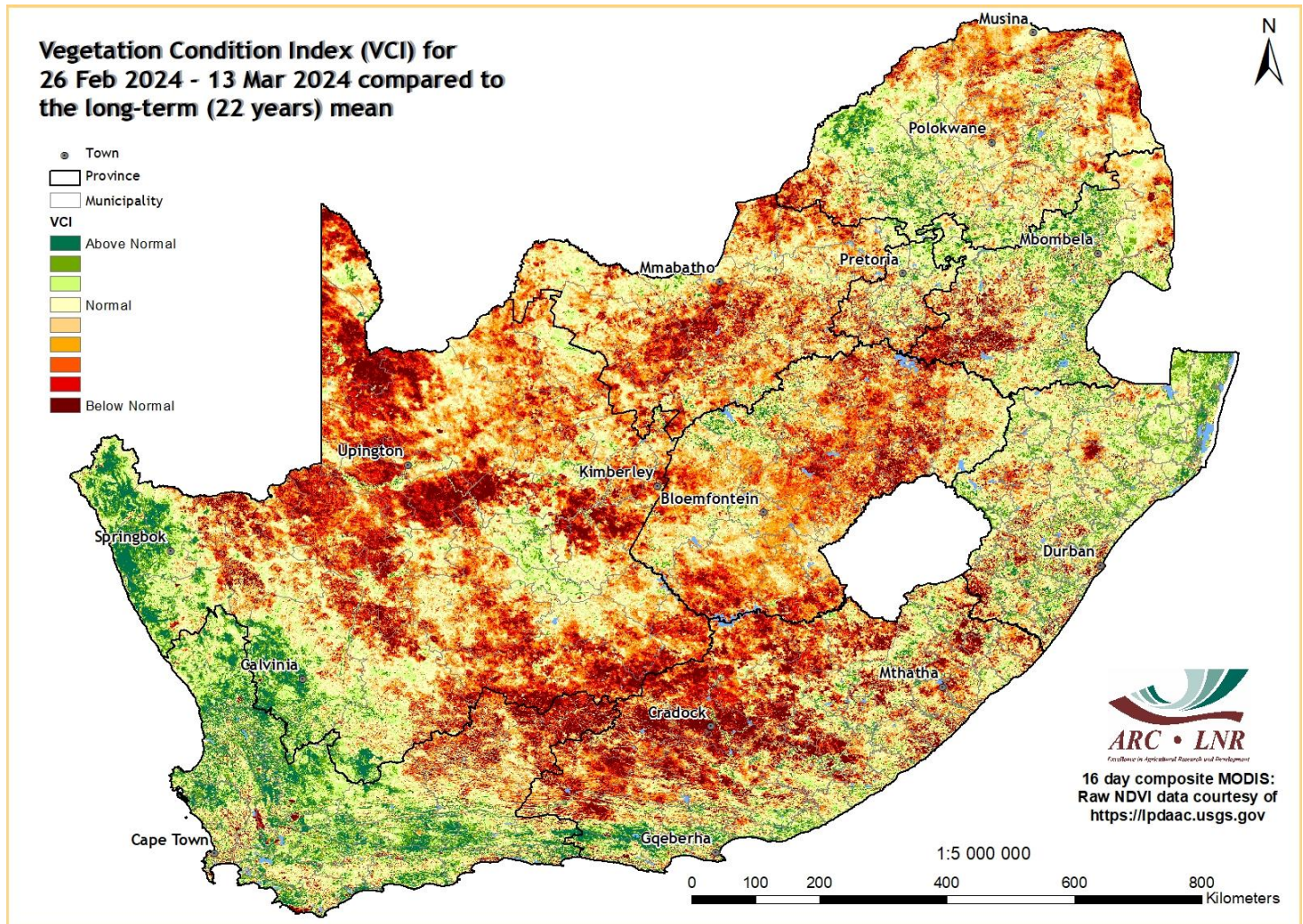
Rainfall was below average over the central to eastern interior, including much of the summer-grain production region, during March. Above-average rainfall occurred over the winter rainfall region and parts of the western interior. Above-average rainfall also occurred over the extreme eastern parts due to tropical storm Filipo.

Rainfall (mm): 1 – 9 April 2024



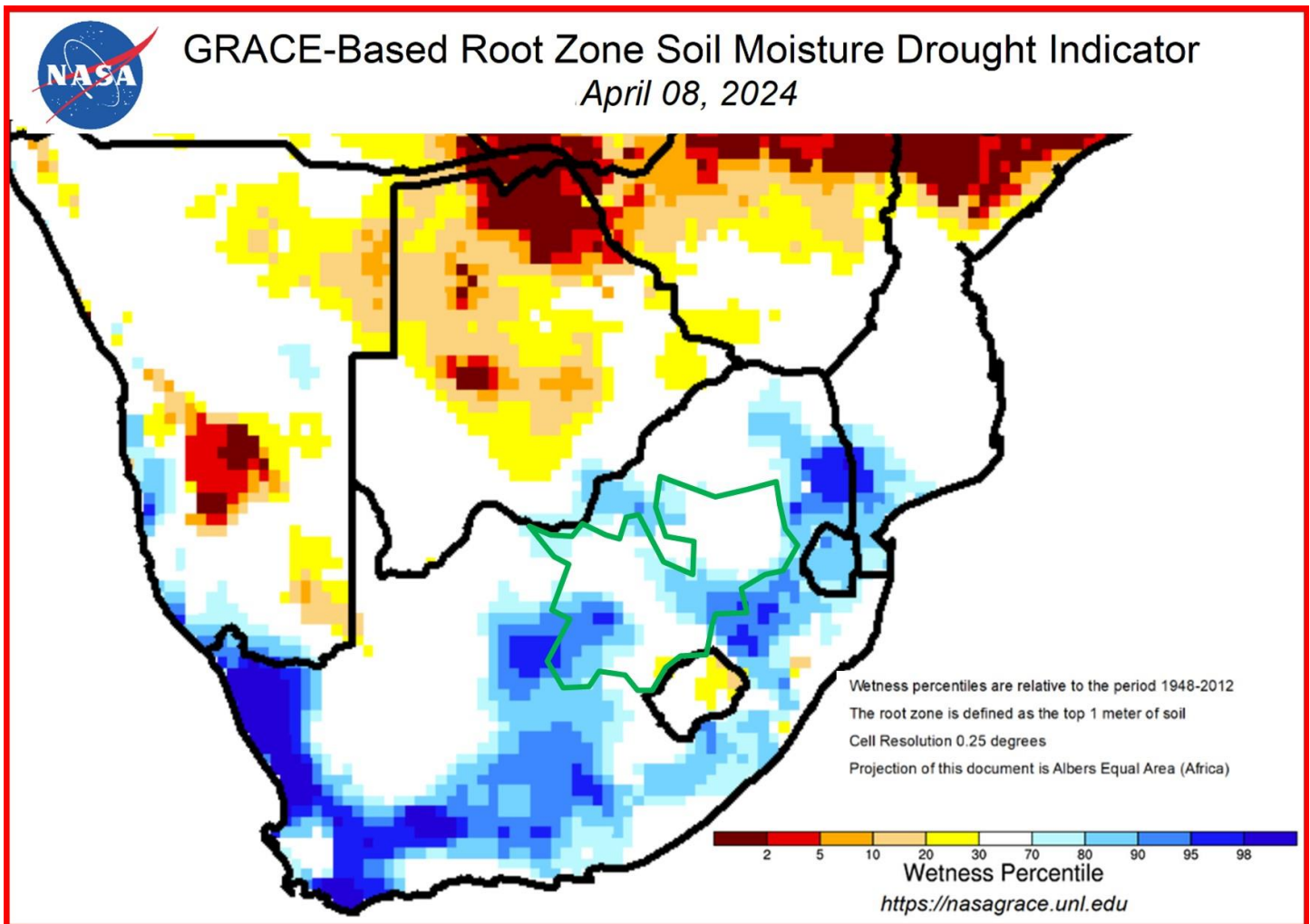
Large parts of the central to eastern interior received more than 50 mm of rain during the first few days of April. The entire winter rainfall region also received rain, with totals over the southern parts of the region as well as along the Garden Route receiving in excess of 50 mm.

Vegetation Condition Index: Mid-March 2024



By mid-March, the effect of hot and dry conditions since mid-January especially over the central to western interior, including the central to western summer-grain production region, was clearly visible as below-normal vegetation activity. Vegetation activity was above normal over parts of the eastern to northeastern interior where near-normal to above-normal rain occurred in early February. Vegetation activity was also above normal over the winter rainfall where unseasonal rainfall occurred in January and February.

Soil moisture conditions

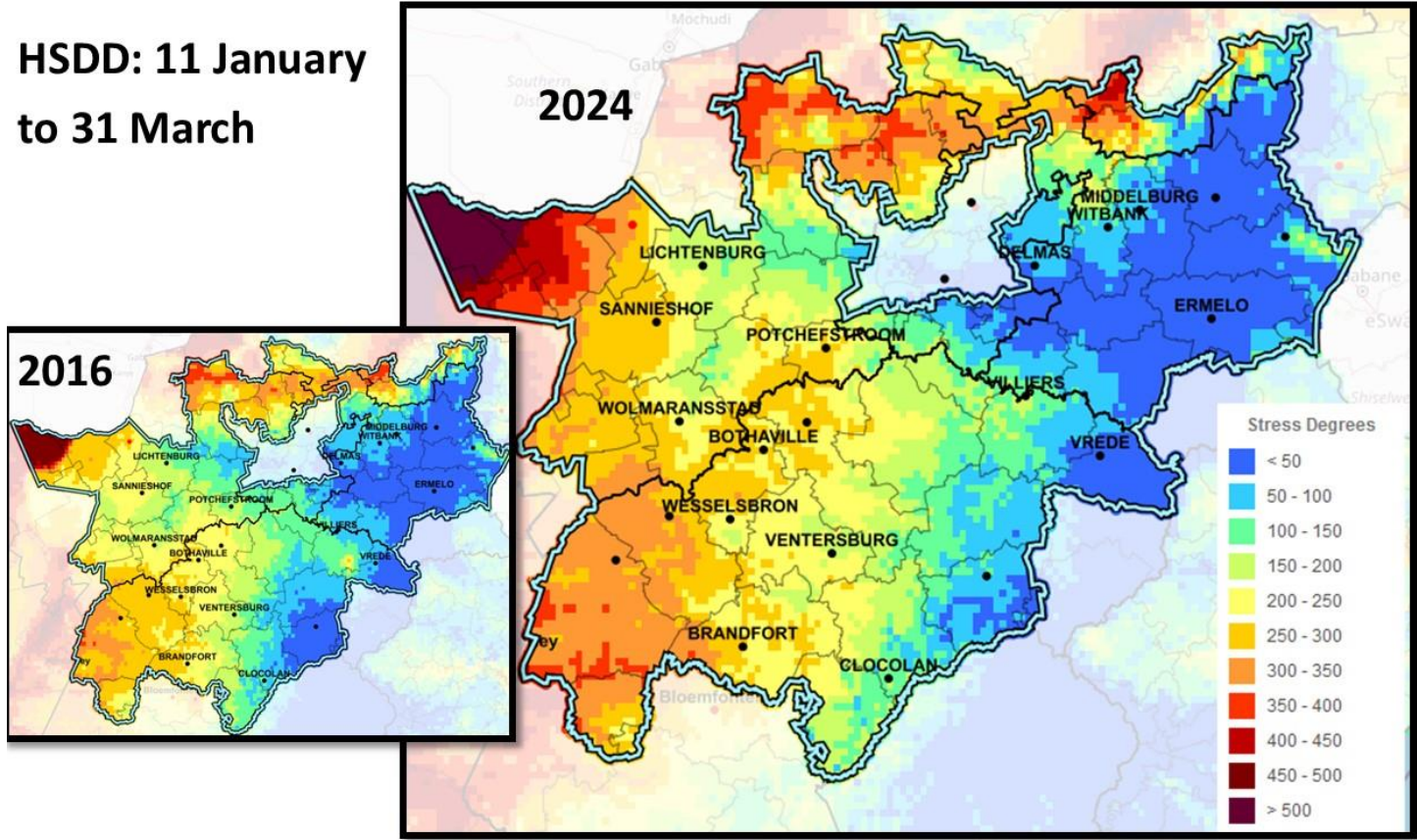


The Root Zone (top 1 meter) Drought Indicator shows that soil moisture levels have improved markedly during the last few days, associated with widespread rain in early April. Root-zone soil moisture levels are normal to above normal for this time of the year (by 8 April) over large parts of the summer-grain production region (indicated on the map).

Data / maps available at nasagrace.unl.edu through a partnership with the National Drought Mitigation Center.

Heat Stress Degrees accumulated: 11 January – 31 March 2024

HSDD: 11 January
to 31 March



Accumulated heat stress degrees days (HSDD) are in the order of 250 – 350 units over the western to northern parts of the summer crop-production region (region shown in the map). These exceed those of the 2015/16 summer (inlet) for the same period and are the highest for any summer since 2014. The index is calculated by considering the number in Degrees Celsius per day of the maximum temperature exceeding 30°C, a rough indication of the temperature beyond which additional warming is negative for maize production, accumulated since 10 January.

Data available at: <https://www.drought.agric.za>

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 downscalings 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>

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The way in which **young people see the future** speaks of a positive attitude – and of the choice to be relevant in a new era. AgriSeker shares this excitement about the future of agriculture in South Africa. Our motto is 'A certain future', after all.

AgriSeker is motivated to make a contribution to the future of our country with a dedicated focus on agriculture through knowledge, understanding and participation in this sector. Our focus is on producers and young people, because for agriculture to survive, we need you.

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