CUMULUS

5 April 2023

by J Malherbe, R Kuschke

WE GET
AGRICULTURE'S *heartbeat*

AgriSeker Onderskrywingsbestuurder (Pty) Ltd. Reg No: 2014/235270/07 is an Authorised Financial Service Provider FSP no:45767
22 Steenbok St, La Provance, P.O. Box 1479, Bethlehem, 9700
Underwritten by Land Bank Insurance (SOC) Ltd. Reg No: 2012/115426/30

Contents

Photo credit: Stefni Kuschke

Summary

Wet conditions during Easter over the summer rainfall region

More showers and thundershowers are expected over the central to eastern parts during the next few days, particularly during the Easter Weekend and into early next week. Such wetter conditions during autumn are associated with periods of extensive cloud cover and significantly lower maximum temperatures during the rainfall event and shortly thereafter. The system responsible for the rainfall will be a sharp upper-air trough, expected to traverse the country starting over the west coast by Saturday and exiting in the northeast by late Tuesday next week according to current forecasts. The system will result in a band of precipitation developing over the central to southeastern parts at first and then it is expected to move northeastwards. Where thundershowers occur with the system, the lower atmospheric temperatures and upper-air dynamics may result in the occurrence of hail.

The winter rainfall region and most of the southern to western interior are once again expected to be mostly dry. Apart from the lower temperatures expected with the rain-causing system during the weekend, most areas will experience mild to warm conditions for this time of the year.

While forecasts may change, there is no indication currently of widespread severe frost during the next few days. Light frost may occur by early next week over the higher-lying areas such as the southern escarpment and Drakensberg with a very small chance for the areas further north according to current forecasts.

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

General:

- Temperatures will on average be near normal for this time of the year, but above normal over the western interior and below normal over the far-eastern parts.
- It will initially be warm over the western to southern parts, but a cold front will bring cooler conditions to these areas from Saturday onwards.
- Rainfall is expected to be near normal to above normal over the northeastern parts, but below normal over the winter rainfall region and most of the southern to western interior.
- Scattered showers and thundershowers are expected over the central to southeastern parts during the weekend, shifting towards the northeast by early next week according to current forecasts.
- Cold fronts will result in showers over the western to southern parts of the winter rainfall region on Friday and possibly again by Sunday//Monday.
- The summer-grain production region will again see some showers and thundershowers, mostly during the weekend and into early next week. It will be cooler on average than the previous week, with temperatures remaining within acceptable range for the late stages of production:
  - Maximum temperatures over the eastern maize-production areas will be in the order of 16 – 26°C. Minimum temperatures will be in the order of 5 – 14°C.
  - Maximum temperatures over the western maize-production region will range between 23 and 30°C. Minimums will be in the order of 11 - 17°C.

Overview of expected conditions over the main agricultural production areas

An upper-air trough moving across the country will result in normal to above-normal rainfall over the central to northeastern parts. A cold front, associated with the upper-air system, will result in cooling over the western to southern parts of the country.

Maize production region: The region is expected to receive more thundershowers during the next few days. There may be some cloudy and cool conditions at times, especially over the eastern parts. Given the cloud cover and precipitation, it will generally be mild over the central to eastern parts of the region:

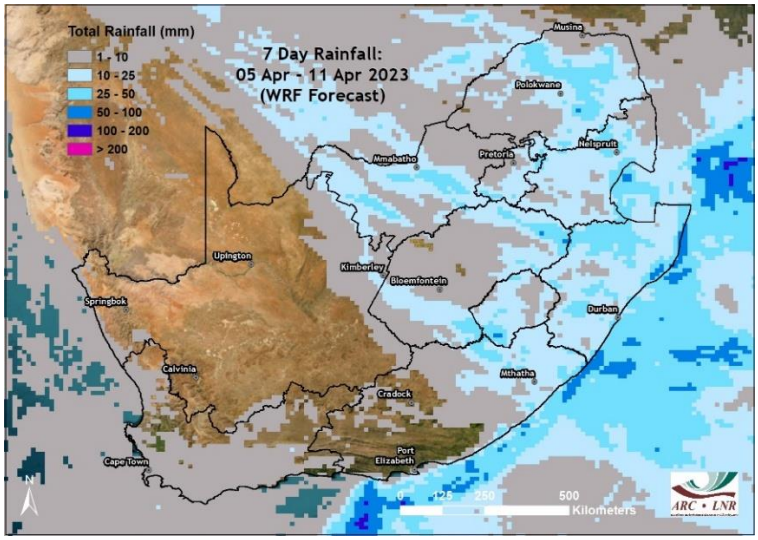
- Maximum temperatures over the eastern maize-production areas will be in the order of 16 – 26°C. Minimum temperatures will be in the order of 7 – 14°C.
- Maximum temperatures over the western maize-production region will range between 23 and 30°C. Minimums will be in the order of 11 - 17°C.

- **Wednesday (5th):** Sunny to partly cloudy and warm, but mild in the east where it will be cool in the morning.
- **Thursday (6th):** Partly cloudy and warm, but mild in the east where it will be cool in the morning.
- **Friday (7th):** Partly cloudy and warm. Isolated afternoon thundershowers are possible. Moderate westerly to north-westerly winds are expected over the central to western parts.
- **Saturday (8th):** Partly cloudy and warm with scattered thundershowers over the central to south-eastern parts, but isolated falls over the rest of the region.
- **Sunday (9th):** Partly cloudy to cloudy and warm with scattered showers and thundershowers. It will become cool over the eastern areas.
- **Monday (10th):** Cloudy over the central to eastern parts with widespread showers or thundershowers. It will become sunny in the west.
- **Tuesday (11th):** Cloudy and cool with scattered showers over the eastern parts, clearing, but partly cloudy to sunny and mild in the west.

Cape Wine Lands and Ruens: The region will experience sunny to partly cloudy and warm, prefrontal conditions initially while a cold front approaches from the west. It will become partly cloudy to cloudy and windy on Friday as the front makes landfall. Showers are expected over the western to southern parts as the system moves through on Friday. Following the passage of the frontal system, it will remain generally partly cloudy and cool to mild due to an on-shore flow during the remainder of the period. However, current forecasts aren't indicative of further precipitation over the region except possibly on Sunday or Monday as weaker frontal activity occurs in the wider region, mostly further south.

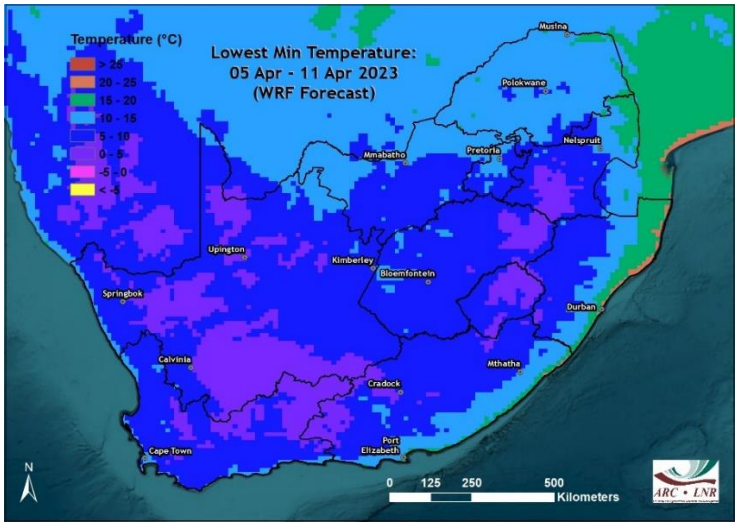
Daily summary of expected conditions

(GFS forecast downscaled using WRF)



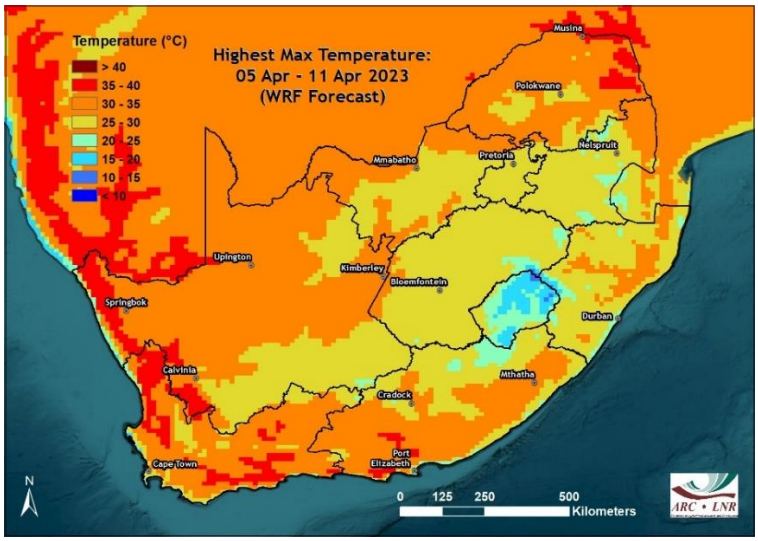
7-Day total rainfall:

- Most of the northeastern half of the country should receive rain during the next few days
- While most areas should receive some rain, areas receiving in excess of 25 mm will be relatively limited according to current forecasts.
- The southern to western parts of the winter rainfall region will also receive some rain due to frontal activity. Totals, for the most part, are not expected to exceed 10 mm. Most of the western interior should remain dry.



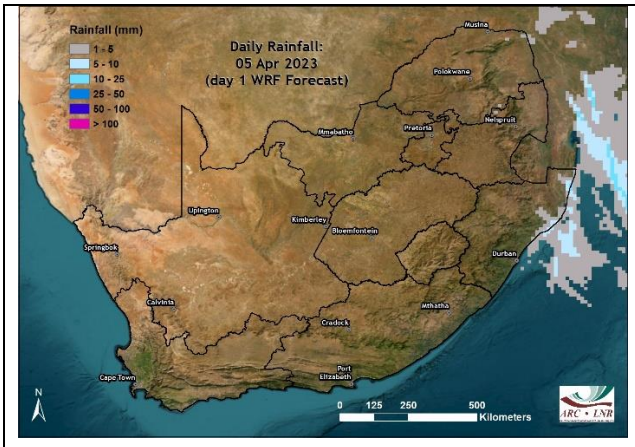
Lowest minimum temperatures

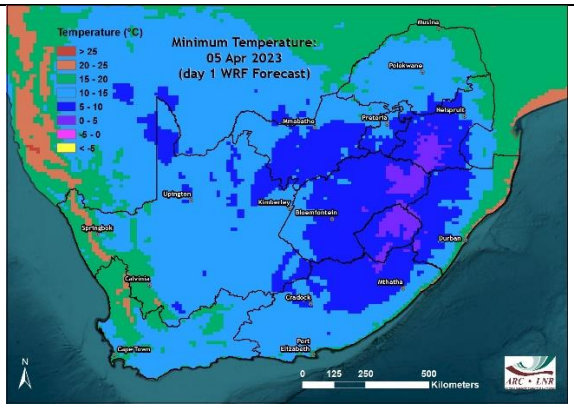
- The lowest minimum temperatures, reaching values below 5°C, will occur over over the Drakensberg and parts of the Eastern Highveld initially and over the western interior early next week.
- Lowest minimum temperatures will range between 5 and 10°C in most of the summer-grain production region.



Highest maximum temperatures

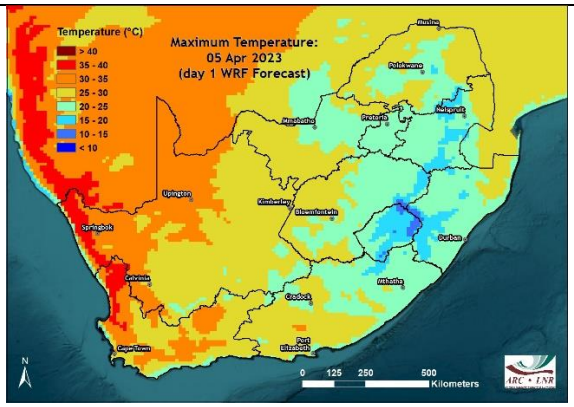
- The highest maximum temperatures, exceeding 35°C, will be confined to the western to southern interior and also parts of the Limpopo river Valley, including the northern parts of the Lowveld.
- Highest temperatures over the summer-grain production region will be in the order of 25 – 30°C.
- Hot conditions in the southwest are expected early in the period.
- Hot conditions in the far northeast will occur during the weekend.

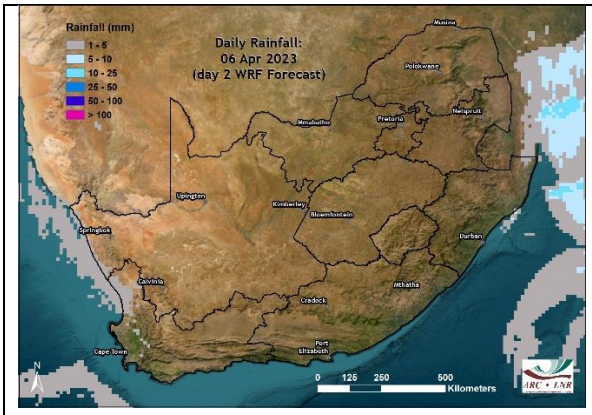


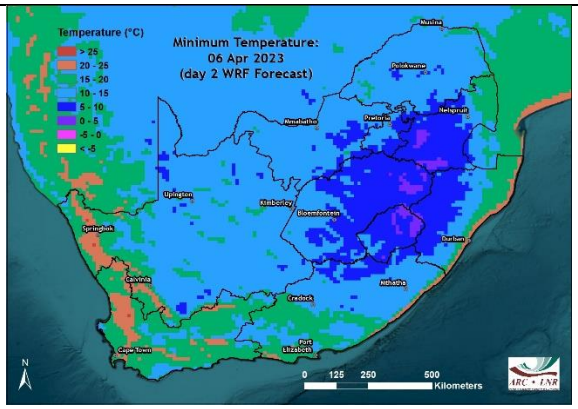


Wednesday 5 April

- Dry over most of the country
- Light showers on the KZN coast.
- Relatively low minimum temperatures over parts of the eastern Highveld.
- It will become hot along the west coast and the western interior.
- It will remain cool over the eastern Highveld.

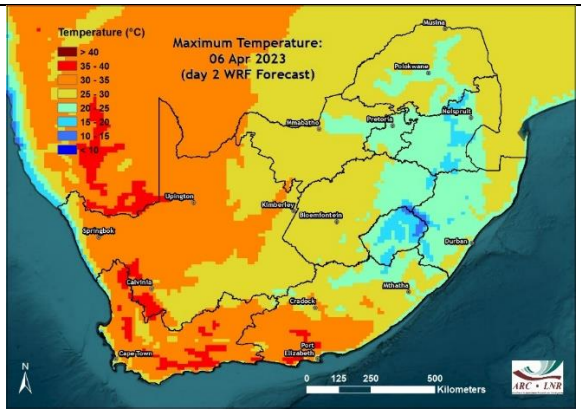


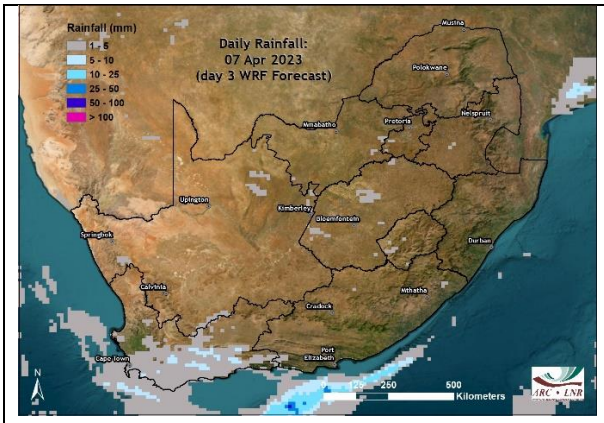


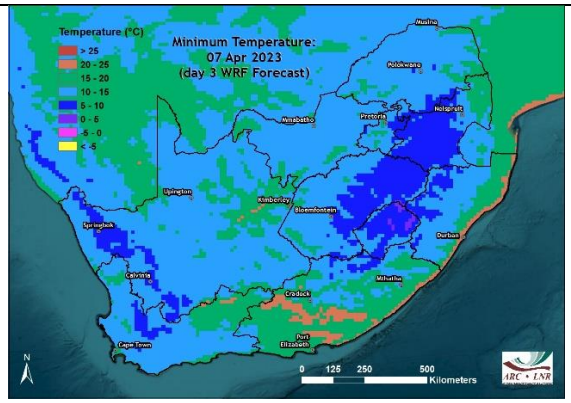


Thursday 6 April

- Still dry over the country
- Relatively low minimum temperatures over parts of the eastern Highveld.
- Hot conditions in the west will expend to the southern interior.
- It will remain cool over the eastern Highveld.
- Moderate to fresh northwesterly winds in the southwestern interior.

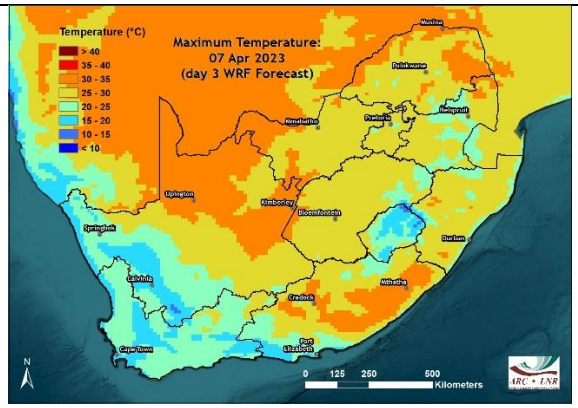


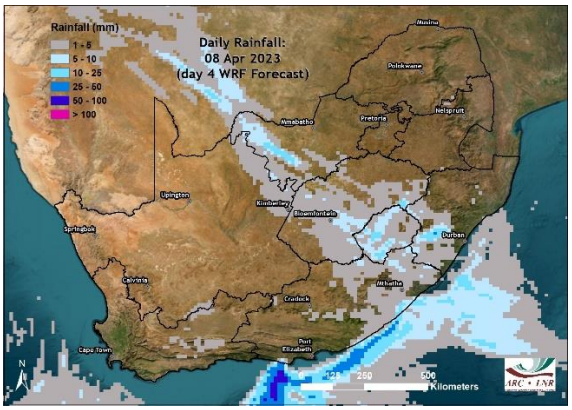


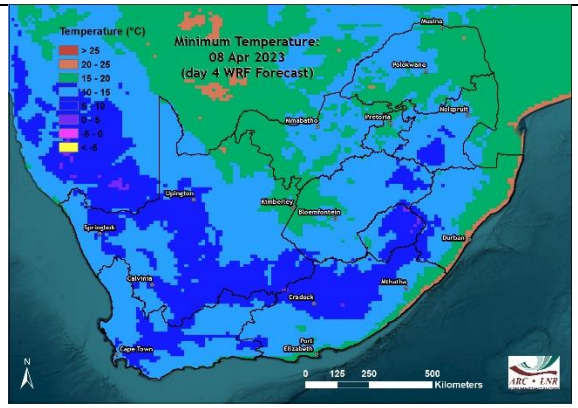


Friday 7 April

- Cold front cause some showers in the southwest and cool air invades the southwestern parts.
- Isolated afternoon thundershowers over the central to eastern interior.
- Morning temperatures somewhat higher in the east.
- Cooler over the western to southern parts.
- Windy (westerly to northwesterly winds) over the western to southern and central parts.

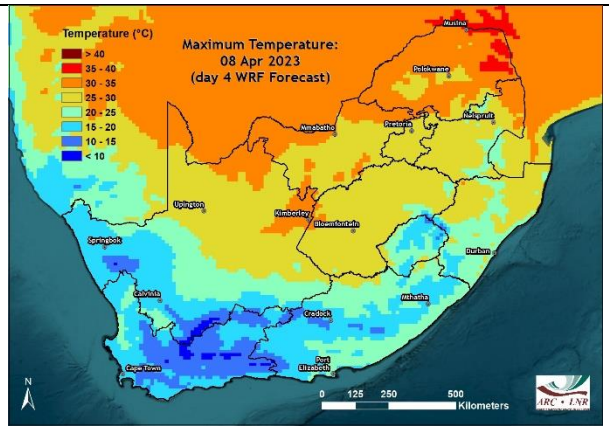






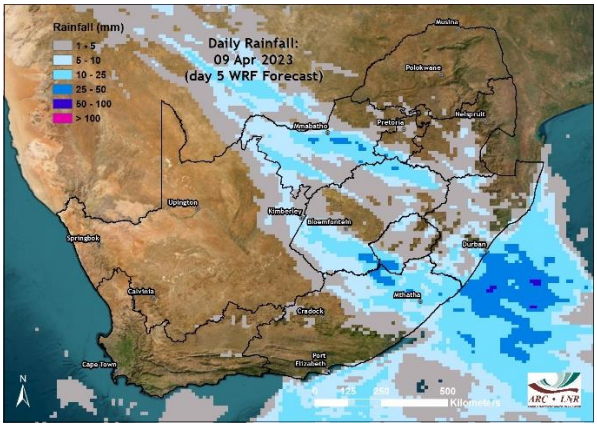
Saturday 8 April

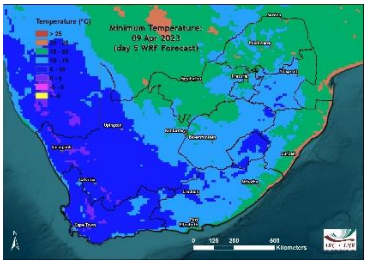
- A band of isolated to scattered showers and thundershowers will develop over the central to southeastern parts.
- Widespread showers are possible along the southern to southeastern coastal area.
- Cool over the southern to western parts.
- Hot over the northern Lowveld, Limpopo River Valley.
- Moderate to fresh westerly to northwesterly winds over the western, southern and central parts.

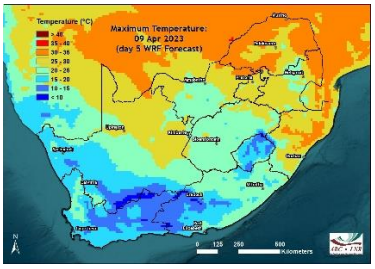


Sunday 9 April

- Scattered showers and thundershowers over the central to southeastern parts.
- Chilly in the morning over the western escarpment
- Warm in the northeast.
- Windy over the western to central parts (westerly to northwesterly winds).
- Cool over the western to southern parts during the day.

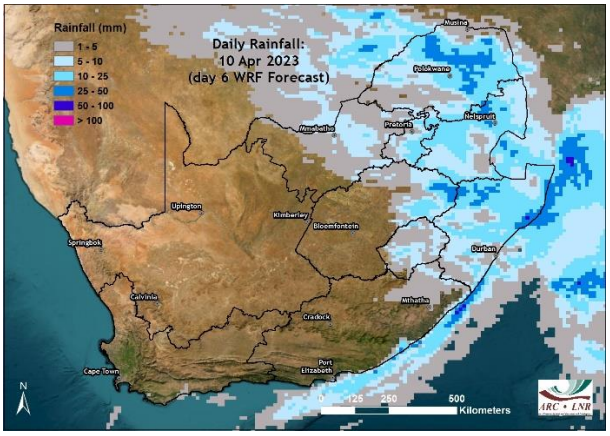


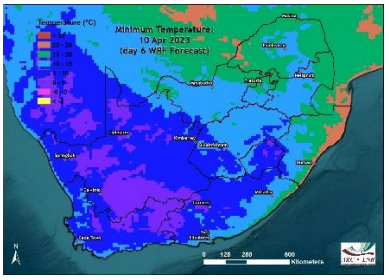


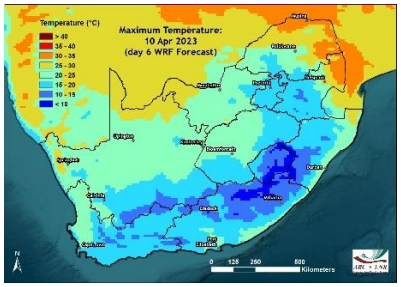


Monday 10 April

- Cloudy and cool over the eastern to northeastern parts with scattered to widespread showers and thundershowers.
- Sunny, mild and dry over the western parts
- Chilly in the morning over the western to southern parts.
- Cool over the southern to eastern parts during the day.
- Moderate to fresh southerly to westerly winds over the western, central and southern parts.
- Windy with showers along the southeastern coastal belt.

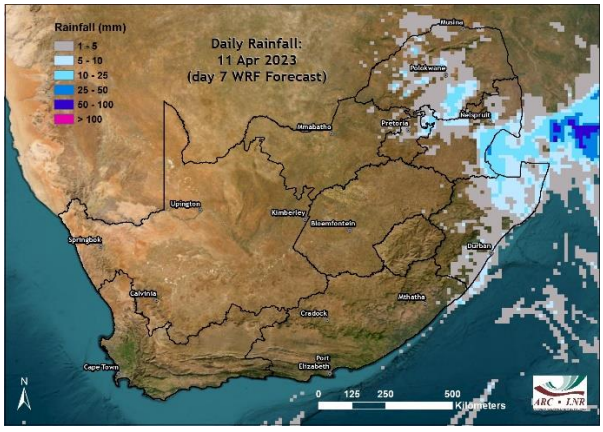


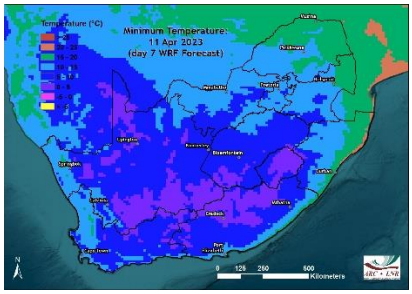


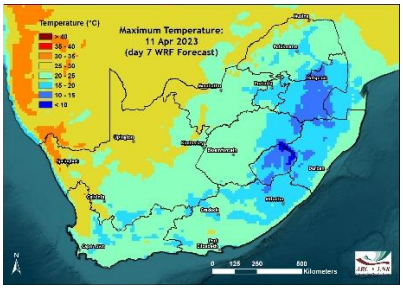


Tuesday 11 April

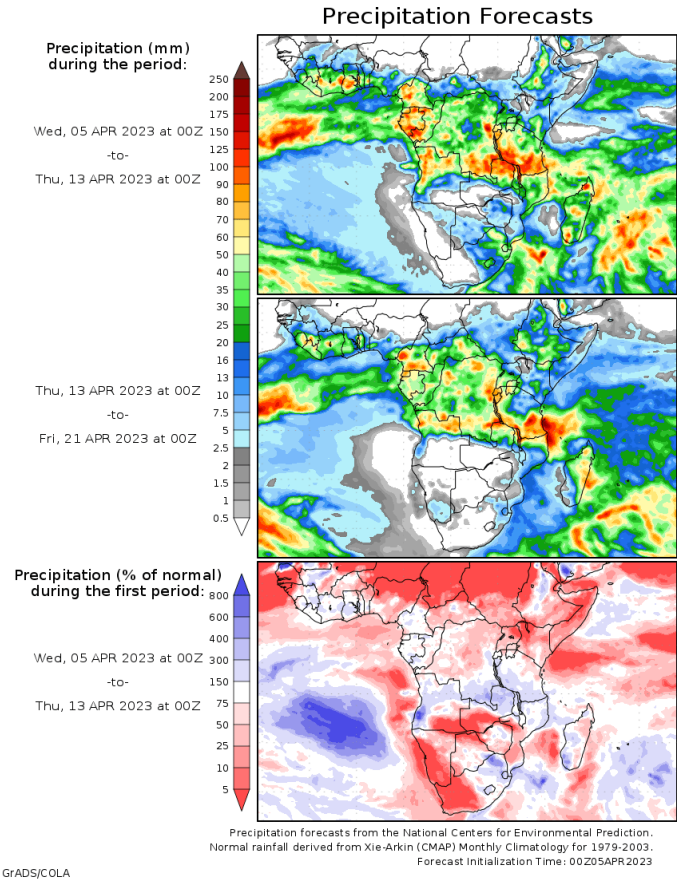
- Rain clearing – cloudy conditions with showers confined to northeastern and far eastern parts, clearing.
- Cool over the eastern parts during the day.
- Sunny, mild and dry over the rest of the country.
- Chilly in the morning over the western to southern parts.
- Becoming warm over the west coast and western escarpment during the day.
- Fresh north-easterlies over the Limpopo River Valley.

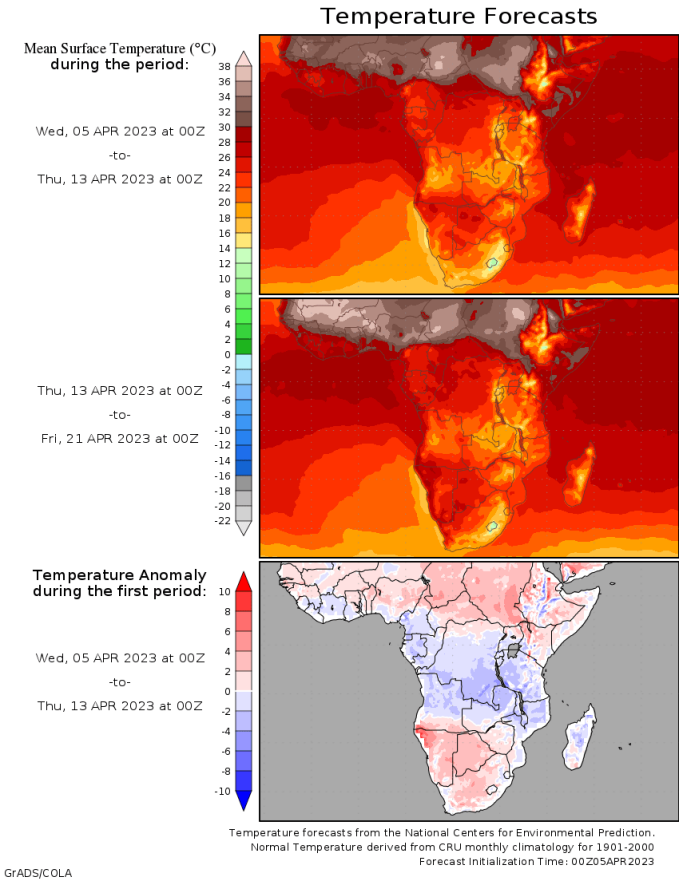






Medium term rainfall and temperature summary





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 5 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 be deduced:

- **It will be hot and windy:**
  - Over the western to northwestern parts of the Northern Cape, southern interior including the Karoo, Swartland: **Wednesday to Thursday (5th – 6th).**
  - Eastern to northern parts of Limpopo: **Saturday to Sunday (8th – 9th).**
- **It will be hot:**
  - Eastern to northern parts of Limpopo: **Saturday to Sunday (8th – 9th).**
- **It will be windy, enhancing the fire hazard where vegetation is dry:**
  - Western to southern and central interior (north-westerly to westerly winds): **Thursday to Monday (6th– 10th).**
- **Cool to cold and windy conditions may pose a hazard to small stock:**
  - Western to southern interior: **Saturday to Monday (8th– 10th).**
- **Thundershowers may become severe and produce large amounts of hail (mostly small):**
  - Central to eastern and southern Free State, Lesotho and eastern parts of the Eastern Cape: **Sunday (9th).**

- **Light frost is possible in isolated areas:**
  - High-lying parts of the southern interior: **Monday and Tuesday morning (10th – 11th).**
  - High-lying parts of the southeastern interior and Lesotho: **Tuesday morning (11th).**

- **Moderate to fresh southeasterly winds are expected:**
  - Over the southwestern parts of the Western Cape: **Friday to Saturday (7th – 8th).**

Seasonal forecast

Seasonal forecasts for autumn over South Africa are less indicative of wet conditions than earlier, reflecting global atmospheric circulation patterns now neutral and out of the La Niña state that has been present for much of the last few years.

ENSO observations and forecasts indicate that the 2022/23 La Niña has come to an end. ENSO neutral conditions are present. Over the Western Equatorial Pacific Ocean, westerly wind anomalies are present, indicating atmospheric circulation over this region favoring the development of warmer surface water anomalies and El Niño. Moreover, eastern Equatorial Pacific surface water temperatures have been rising recently, also indicating a potential trend towards El Niño conditions later.

The Australian Bureau of Meteorology points out that the La Niña in the Tropical Pacific has come to an end

(Updated 14 March): The El Niño–Southern Oscillation (ENSO) is currently neutral (neither La Niña nor El Niño). Oceanic and atmospheric indicators for the tropical Pacific Ocean are at neutral ENSO levels.

International climate models suggest neutral ENSO conditions are likely to persist through the southern hemisphere autumn. Long-range forecasts of ENSO conditions made in early autumn have lower accuracy than those made at other times of the year. However, there are some signs that El Niño may form later in the year. Hence the Bureau has issued an El Niño WATCH. This means there is a 50% chance of El Niño in 2023.

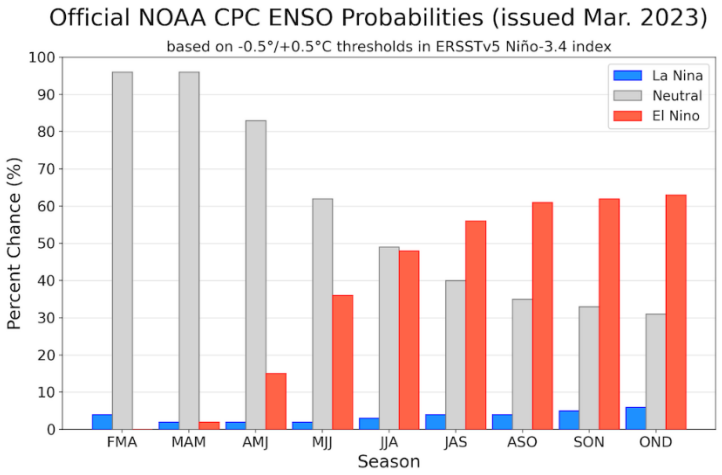
The Madden–Julian Oscillation (MJO) has recently weakened and is expected to be indiscernible for most of the coming week. Most models indicate the MJO will re-strengthen over the Western Pacific region in early April.

The Southern Annular Mode (SAM) index is currently neutral, and is expected to remain neutral over the coming weeks…….*Australian Bureau of Meteorology* - http://www.bom.gov.au

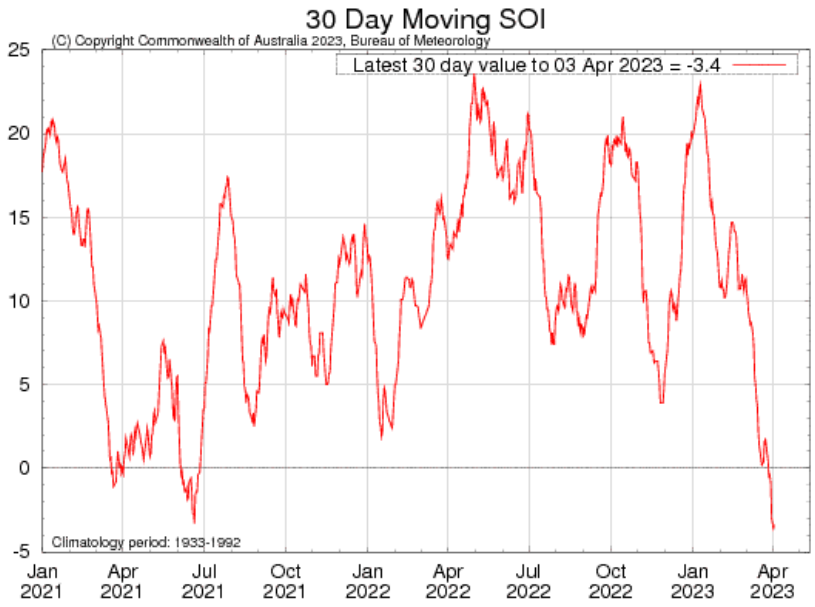
With ENSO neutral conditions present, there is little to no strong indication for either wet or dry conditions over the summer rainfall region, especially given the time of the year. ENSO Neutral conditions are expected to remain in place at least until the winter. The Southern Annular Mode (SAM) is neutral, and its association with rainfall over the summer rainfall region during this time of the year is weak. Current seasonal forecasts lean towards drier conditions during the winter over the winter rainfall region.

The International Research Institute for Climate and Society (IRI) also indicate that ENSO is in neutral state

According to the IRI (Updated 20 March): In mid-March 2023, the previous negative sea surface temperature anomalies in the central-eastern equatorial Pacific weakened further, and the basin is now in an ENSO-neutral state (as of 15 March 2023, the last observed value in the NINO3.4 region was 0.1 °C). Key oceanic and atmospheric variables are now consistent with ENSO-neutral conditions. CPC issued a Final La Niña Advisory in March 2023, signaling the end of the event. Most models in the IRI ENSO prediction plume forecast SSTs in the ENSO-neutral state during Apr-Jun, and May-Jul, 2023. The likelihood of El Niño remains low during Apr-Jun (21%), increasing to 49% in May-Jul, and then becomes the dominant category from Jun-Aug onward with probabilities in the 60-67%. ENSO-neutral is the next most-likely category, with probabilities remaining in the range of 31-35%.……*International Research Institute for Climate and Society*- http://iri.columbia.edu/



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

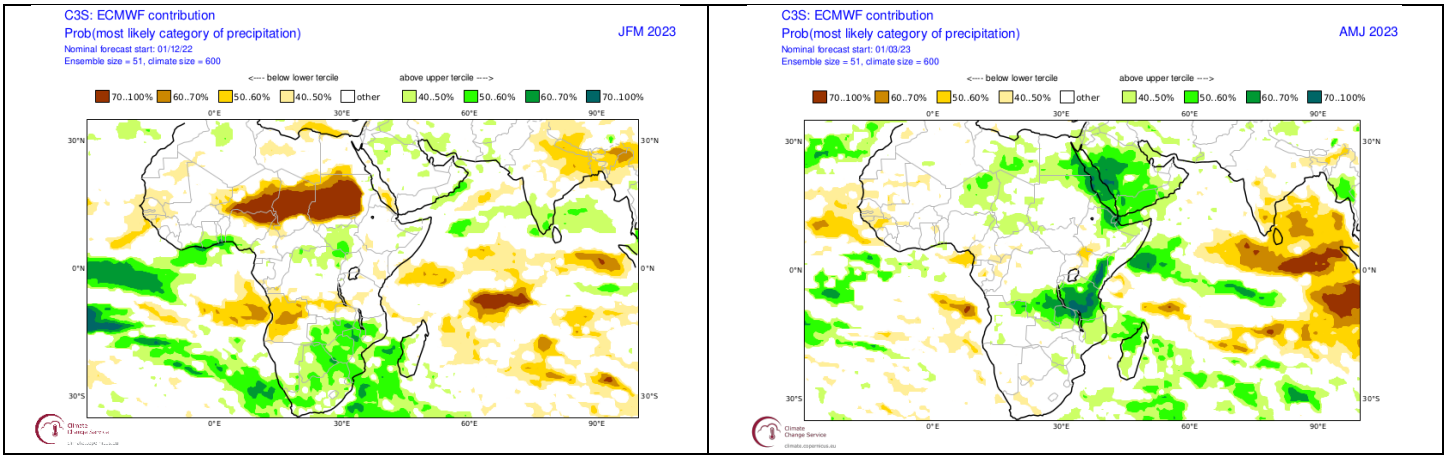


Australian Bureau of Meteorology - http://www.bom.gov.au

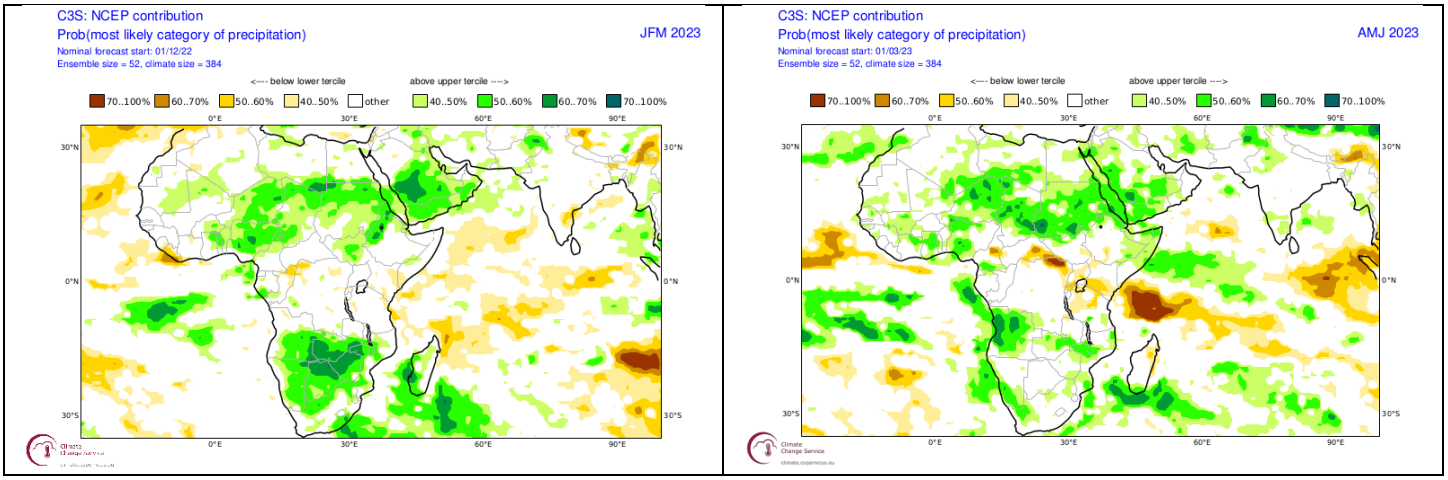
The Southern Oscillation Index is in neutral territory (-3.4). This is indicative of atmospheric circulation patterns not being associated with La Niña conditions anymore.

Seasonal forecasts issued by various international institutions

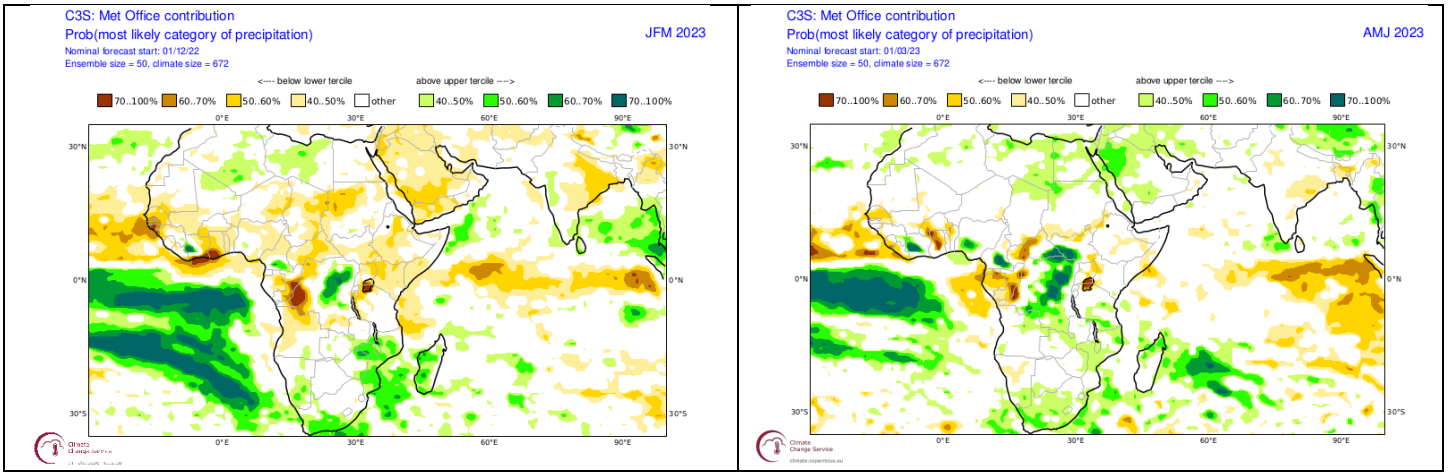
Seasonal forecasts (updated in October 2022) by these institutions, as published by the COPERNICUS Programme (***https://climate.copernicus.eu/seasonal-forecasts***) for autumn to early winter, reflect weak signals with regard to rainfall anomalies over both the interior and the winter rainfall region, as opposed to the late summer forecast that was dominated by the 2022/23 La Niña event that has come to an end.



Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for late-summer (January-March 2023; left – Forecast issued 2022-12) and autumn to early winter (April-June 2023; right - Forecast issued in 2023-03).



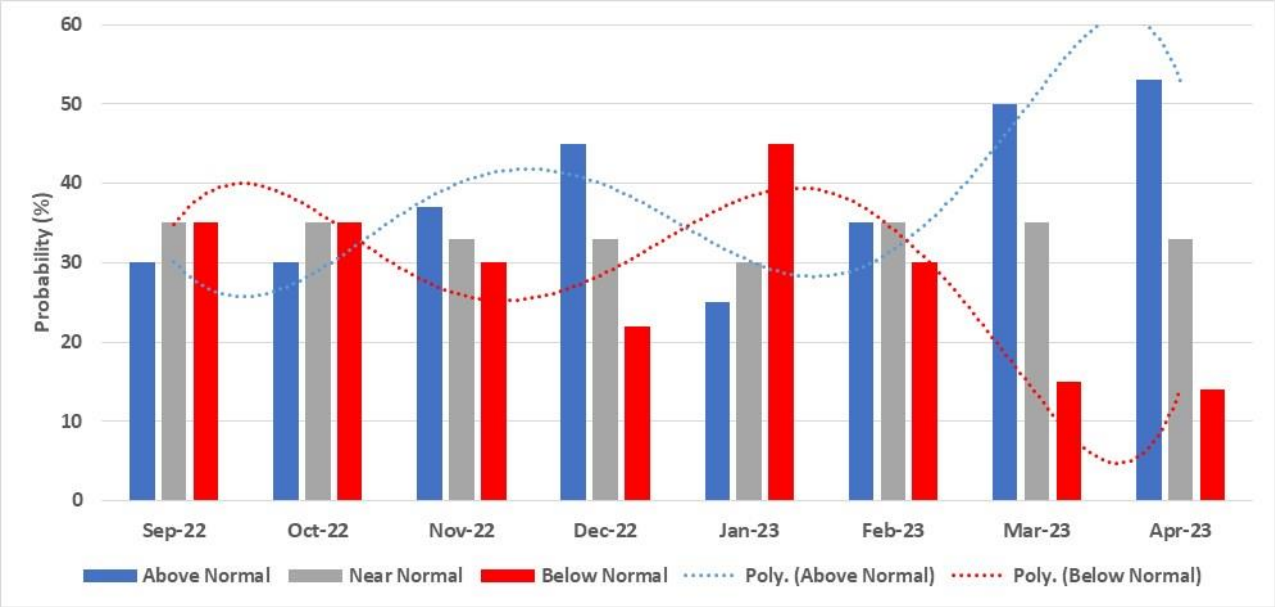
Same as above, but forecasts issued by the National Centres for Environmental Prediction.



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

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 2022/23 more often experience a seasonal rainfall curve that compares to normal conditions as indicated in the bar graph below, with wetter conditions focussing on November to December and again from mid-February to April while drier than normal conditions focus on October and January to mid-February:



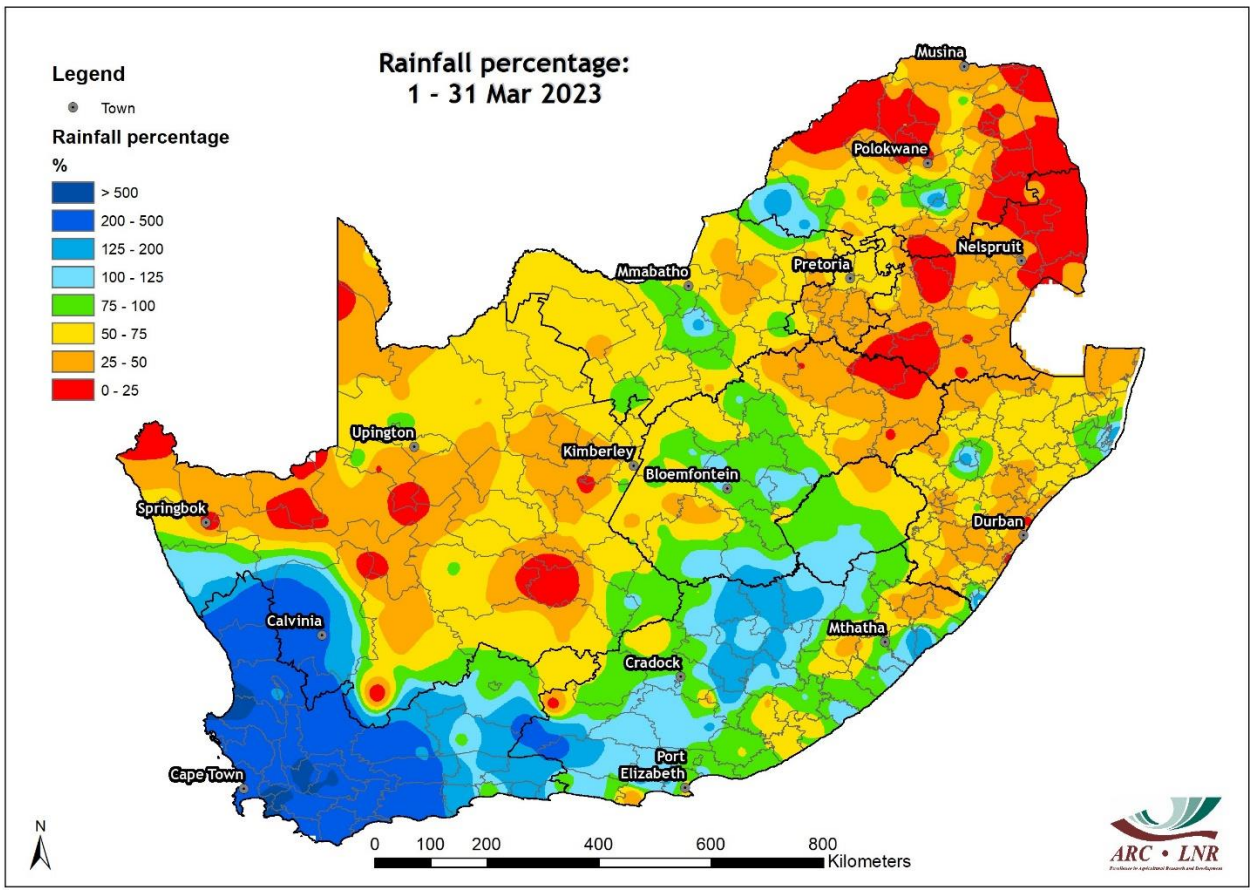
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2022 – April 2023 (Forecast issued in 2022-10).

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

- September – 9 October: Relatively dry conditions over the north-eastern half of the summer rainfall region
- 10 October – 10 November: Near-normal rainfall over the north-eastern half of the summer rainfall region
- 10 November – end of December: Near-normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- January – mid-February: Below-normal rainfall over the north-eastern half of the summer rainfall region
- Mid-February - April: Above-normal rainfall over the north-eastern half of the summer rainfall region

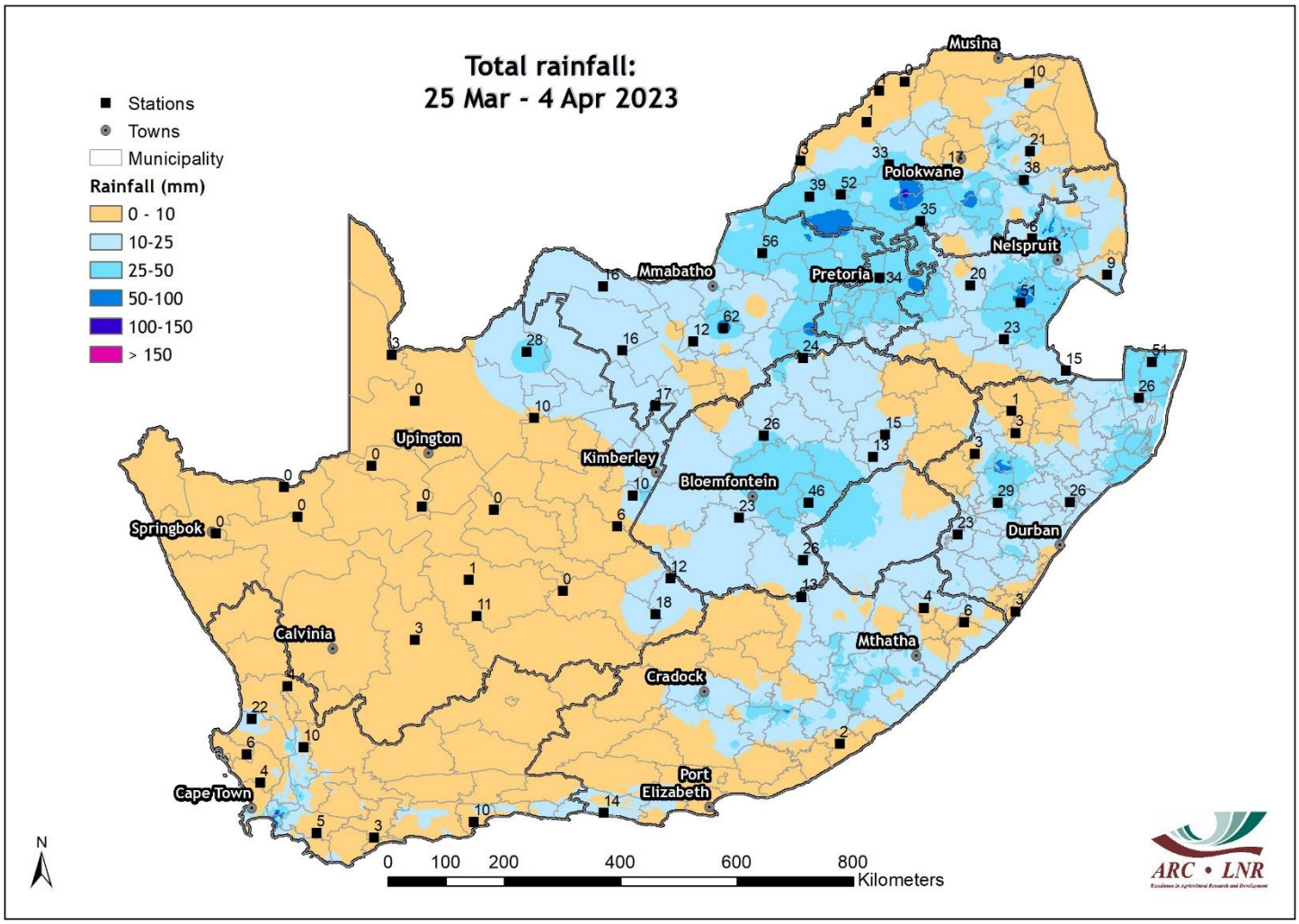
Observed conditions

Rainfall (% of long-term mean): March 2023



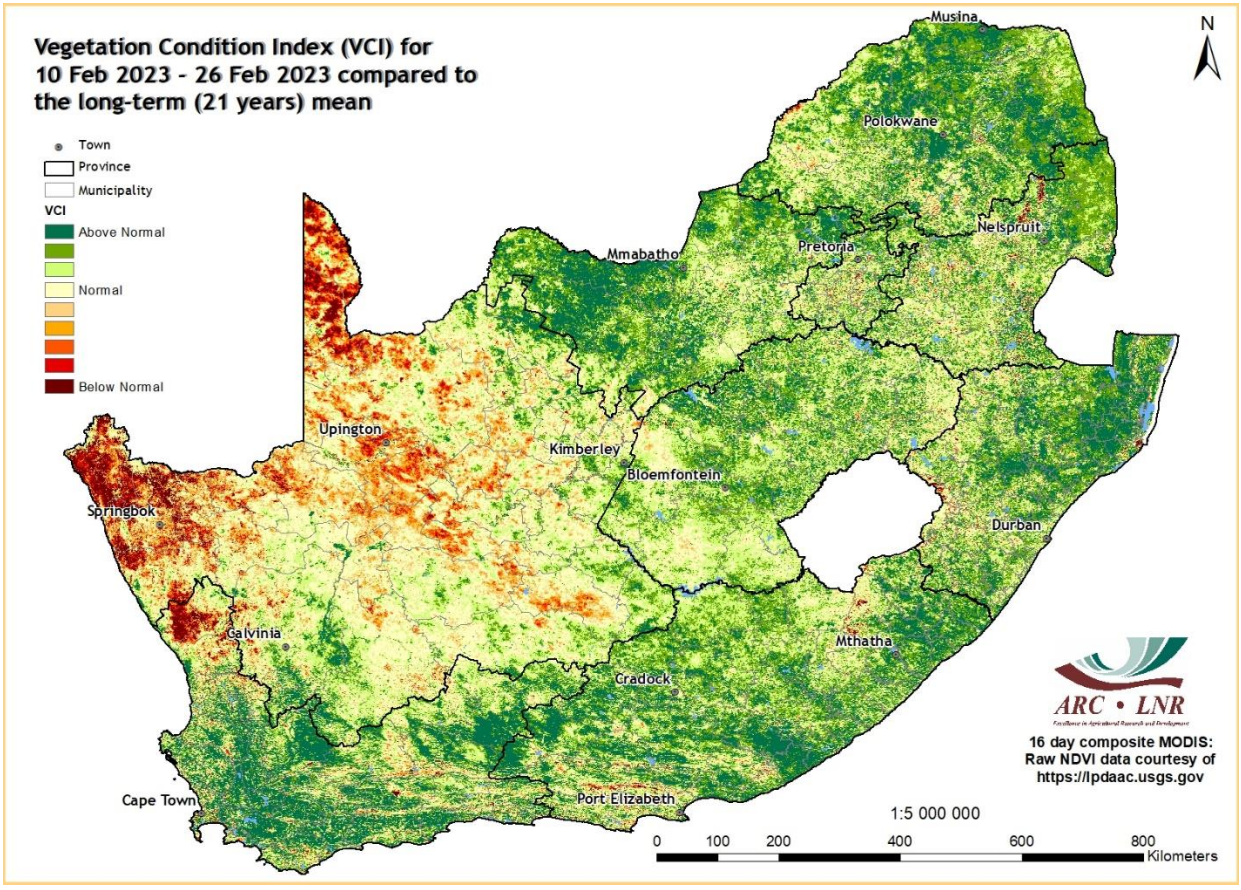
While the northern parts of the country received below-average rainfall during March, rainfall over the southern to southwestern parts, including the winter rainfall region, was above average.

Rainfall (mm): 25 March – 4 April 2023



Most of the country, except for the western to northwestern interior, received some rain during this period. The northern parts of the summer-grain production region received in excess of 25 mm.

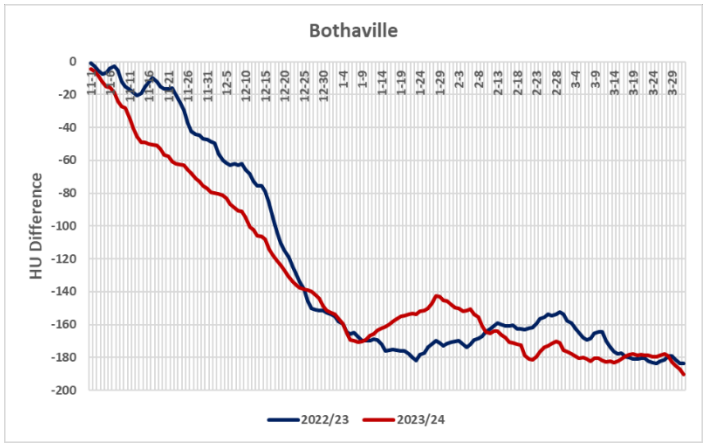
Vegetation Condition Index: February 2023

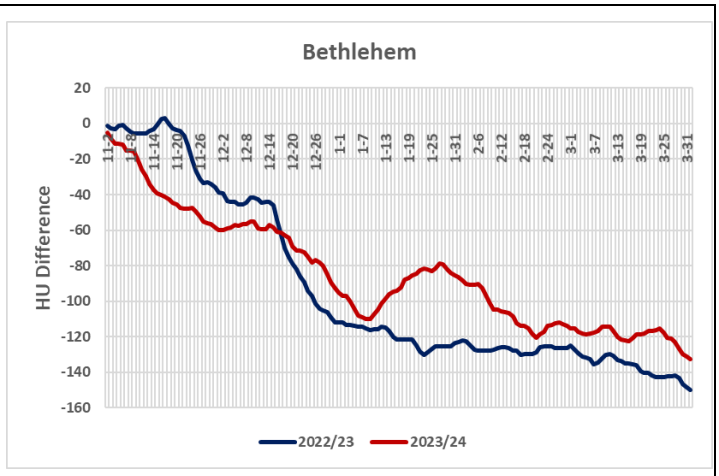


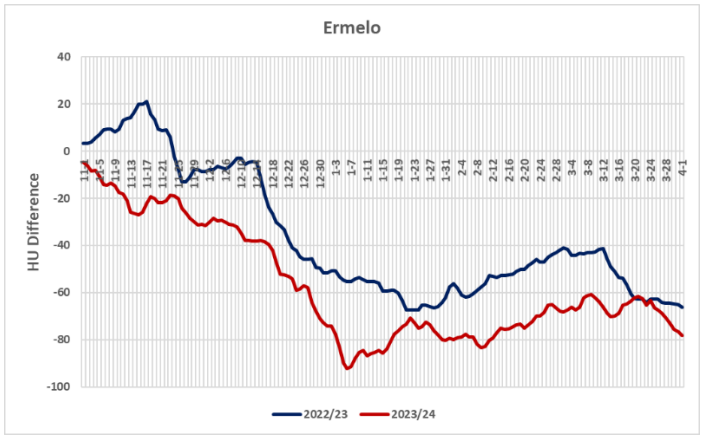
By late February, vegetation activity still reflected widespread above-normal rainfall since mid-October over most of the interior. Isolated areas over the far northeastern Free State, Mpumalanga and northwestern KZN however experienced below-normal vegetation activity associated with relatively dry conditions during January. Below-normal vegetation activity was also more observed over the western to northwestern parts of the Northern Cape.

Heat units since 1 November 2022

Due to cool, rainy conditions during extended periods in the 2022/23 summer, heat units are behind the median value calculated over the last seven years over the summer-grain production region.







Cumulative heat units compared to the median over the last 7 years, for 1 November – 2 April 2021/22 (Blue) and for the same period in 2022/23 (Red) at Bothaville, Bethlehem and Ermelo. Positive (Negative) values indicate a surplus (deficit).

Cumulative heat units since 1 November still lag the 7-year median and are in line with the figure for 2021/22. Deficits have increased somewhat recently. With near-normal temperatures expected during the next few days, the current deficits should remain in place.

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:
Accumulations of GFS 6-hourly rainfall fields, done in Google Earth Engine

Tropical cyclone/hurricane/typhoon information:
Weather Underground - http://www.wunderground.com
Cooperative Institute for Meteorological Satellite Studies (CIMMS) - Tropical Cyclone Group -http://tropic.ssec.wisc.edu/
Tropical Cyclone Centre La Reunion -http://www.meteo.fr/temps/domtom/La_Reunion/webcmrs9.0/anglais/index.html

Information on drought conditions over the USA:
NOAA National Weather Service - http://www.weather.gov
United States Drought Monitor - http://droughtmonitor.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
"COLA and IGES make no guarantees about and bear no responsibility or liability concerning the accuracy or timeliness of the images being published on these web pages. All images are generated by COLA and do not represent the actual forecasts issued by the National Weather Service. These products are not a substitute for official forecasts and are not guaranteed to be complete or timely. The underlying data are the direct product of the various operational forecast models.

YOUNG PEOPLE SEE THE FUTURE *Differently*

AgriSeker

fa( )

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.

Ask your insurance broker or find us online at *agriseker.co.za*