

CUMULUS

26 April 2023

by J Malherbe, R Kuschke



WE GET
AGRICULTURE'S *heartbeat*

Contents

| | |
|--|-----------|
| Summary..... | 3 |
| Warm with some thundershowers in places..... | 3 |
| Overview of expected conditions over the main agricultural production areas..... | 4 |
| Daily summary of expected conditions..... | 5 |
| Medium term rainfall and temperature summary..... | 7 |
| Possible extreme conditions - relevant to agriculture..... | 8 |
| Seasonal forecast..... | 9 |
| Seasonal forecasts issued by various international institutions..... | 10 |
| CUMULUS seasonal outlook..... | 12 |
| Observed conditions..... | 13 |
| Rainfall (% of long-term mean): March 2023..... | 13 |
| Rainfall (mm): 1 – 24 April 2023..... | 14 |
| Vegetation Condition Index: March 2023..... | 15 |
| Heat units since 1 November 2022..... | 16 |
| Sources of information..... | 17 |



Photo credit: Stefni Kuschke

Summary

Warm with some thundershowers in places

It will be relatively warm during the next few days with isolated to scattered thundershowers on a daily basis over the summer rainfall region, favoring large parts of the grain production region. Rainfall totals are not expected to be high and should not negatively impact access to fields, especially given recent drier conditions. With rainfall in the form of thundershowers and with temperatures expected to be above normal, it is likely that the rainfall will not have a significant negative impact on ripening and on harvest activities. In general, conditions will mostly be favorable given the state of the summer grain growing season.

Some thundershowers over the interior may produce hail, mainly due to atmospheric temperatures being relatively low by this time of the year. However, there are no indications of widespread severe weather according to current forecasts and hail occurrence should not exceed what is typical for this time of the year.

While some cold fronts are expected to influence the winter rainfall region, current forecasts don't indicate significant rainfall, with the totals expected to be on the lower side and below normal for this time of the year. The interior is expected to remain relatively warm, without any severe cold intrusion according to current forecasts. Minimum temperatures will be higher than earlier this month and frost occurrence will be limited to isolated areas where early frost is typical.

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

General:

- Temperatures will on average be above normal for this time of the year over the interior, but below normal over the winter rainfall region.
- Little to no frost is expected except over the climatologically cold high-lying parts of the southern escarpment and into the Drakensberg.
- It will be warm to hot over the Limpopo River Valley, Lowveld and the northern to northwestern parts of the Northern Cape on several days.
- Rainfall should on average be below normal, but normal to above normal over the central to eastern parts.
- Isolated to scattered thundershowers are expected over the central to eastern parts, especially favoring the Eastern Highveld.
- Thundershowers may be a daily feature over most of the summer grain production region, but totals are not expected to be high and field work should not be significantly disrupted.
- Cold fronts will result in showers over the western to southern parts of the winter rainfall region on Wednesday to Thursday and possibly again by Friday night.
- The summer-grain production region will experience warm conditions during most of the period, with somewhat cooler weather possibly setting in in the east by early next week. There is little to no indication of frost over the region. Thundershowers are expected on most days, but there is no indication that these will be anomalously severe nor associated with heavy falls:
 - Maximum temperatures over the eastern maize-production areas will be in the order of 22 – 28°C. Minimum temperatures will be in the order of 11 – 16°C.
 - Maximum temperatures over the western maize-production region will range between 27 and 30°C, with highest temperatures in the far west. Minimums will be in the order of 14 - 17°C.

Overview of expected conditions over the main agricultural production areas

Upper-air perturbations moving across the interior in a broad trough will support isolated to scattered thundershower development during the next few days over the central to eastern summer rainfall region. Thundershowers will be somewhat more widespread over the eastern parts early next week as a high pressure system ridges around the country and moisture is fed into the eastern parts. Ridging will also result in cloudy conditions with showers along the eastern seaboard during the weekend.

Cold fronts will brush the southern parts early in the period and will also result in cooler conditions over the southwestern to southern interior.

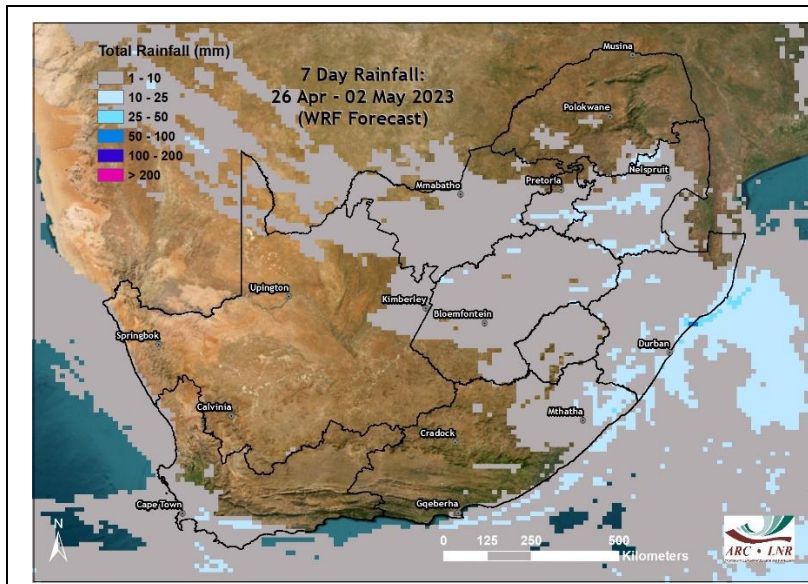
Maize production region: The region is expected to experience pleasant autumn conditions with isolated to scattered afternoon and evening thundershowers on several days. Temperatures are expected to be remarkably stable, but it will become somewhat cooler in the east by early next week. It will be warmer than earlier this month:

- Maximum temperatures over the eastern maize-production areas will be in the order of 22 – 28°C. Minimum temperatures will be in the order of 11 – 16°C.
 - Maximum temperatures over the western maize-production region will range between 27 and 30°C, with highest temperatures in the far west. Minimums will be in the order of 14 - 17°C.
-
- **Wednesday (26th):** Partly cloudy and warm.
 - **Thursday (27th):** Partly cloudy and warm with isolated afternoon and evening thundershowers, but scattered over the central to south-eastern parts.
 - **Friday (28th):** Partly cloudy and warm with isolated afternoon and evening thundershowers, but scattered in the far-east.
 - **Saturday (29th):** Partly cloudy and warm with isolated afternoon and evening thundershowers, but scattered in the far-east.
 - **Sunday (30th):** Partly cloudy and warm with isolated afternoon and evening thundershowers in the north, but sunny over the southern parts.
 - **Monday (1st):** Partly cloudy and warm, but mild to cool in the east where it will be cloudy at times. Scattered thundershowers are possible. Moderate to fresh north-westerly winds are possible in the west.
 - **Tuesday (2nd):** Partly cloudy and warm with isolated thundershowers. Moderate to fresh north-westerly winds are possible in the west.

Cape Wine Lands and Ruens: Two cold fronts will influence the region initially, but the rest of the period is expected to be dry. It will be cool with moderate to fresh northwesterly to westerly winds and showers initially as the first cold front moves through, clearing later on Thursday. More light showers are possible in the south and southwest during Friday night/Saturday morning as the second cold front may influence the region. The rest of the period is expected to be partly cloudy and mild according to current forecasts.

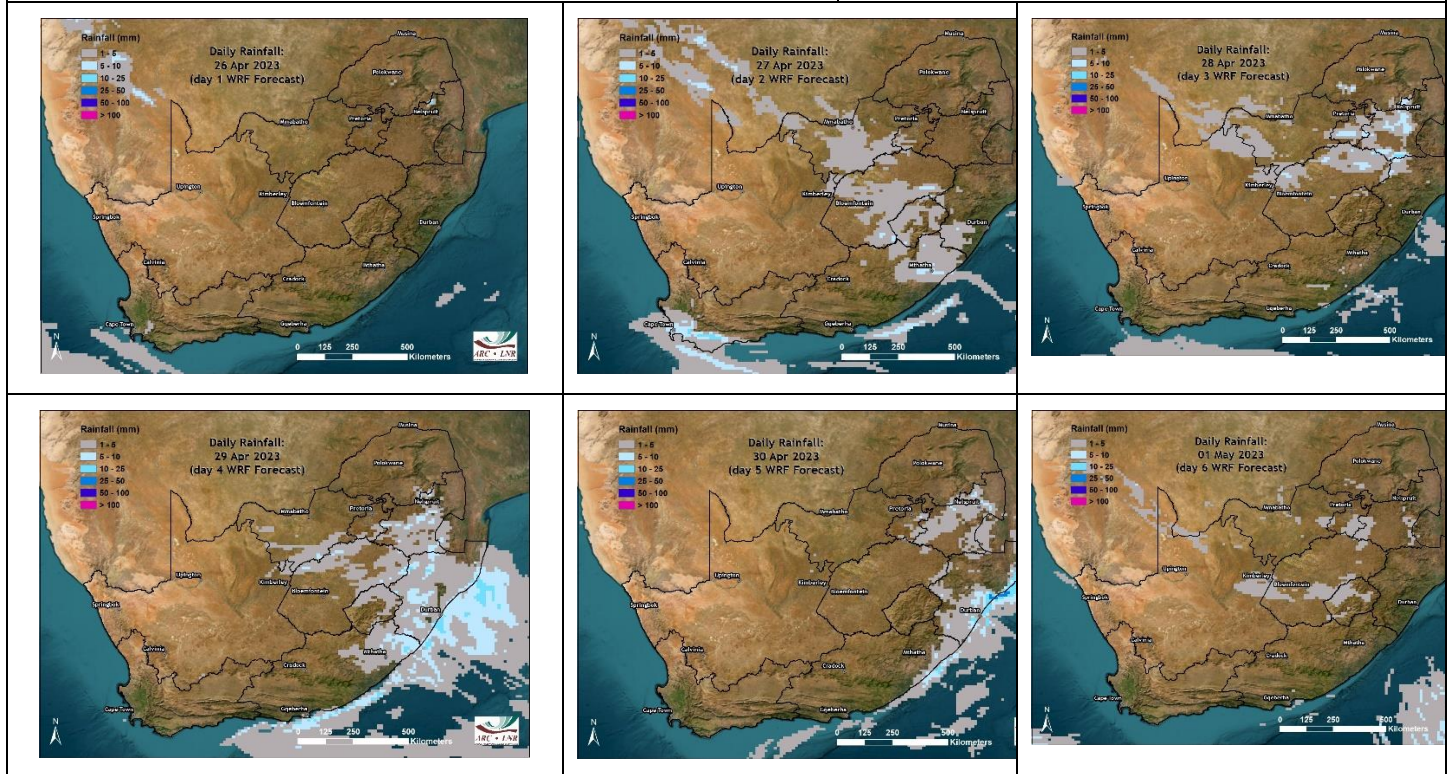
Daily summary of expected conditions

(GFS forecast downscaled using WRF)

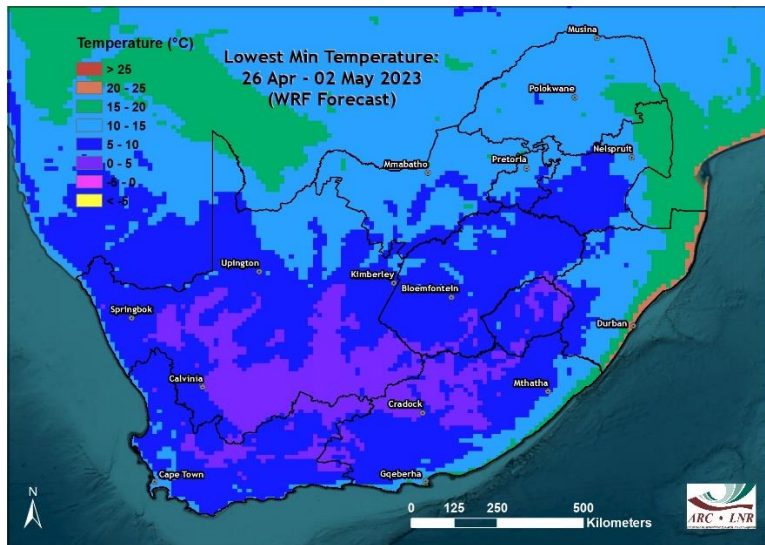


Rainfall

- Thundershowers will occur over the central to eastern parts but rainfall totals should not exceed 10 mm over most parts. Higher totals are possible over especially parts of the eastern Highveld.
- Somewhat higher totals are also possible over the eastern parts of KZN, including the coastal belt, where it will be cloudy with showers on certain days.
- Rainfall totals over the winter rainfall region will in most cases also not exceed 10 mm, but higher totals are possible especially over the mountainous areas in the southwest.

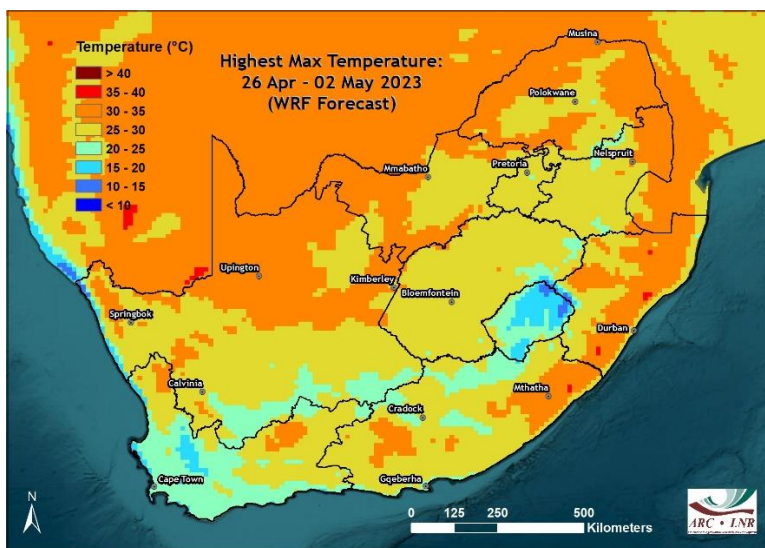


- Thundershowers are possible over the central to eastern parts from the 27th onwards.
- Thundershowers will mostly be isolated in nature, but scattered thundershowers are possible especially on the Eastern Highveld on certain days.
- It will be cloudy with showers along the southeastern to eastern seaboard during the weekend (29th and 30th).
- Cold fronts will result in showers over the southwestern parts WRF on the 26th and 27th as well as possibly during the night of the 28th.



Lowest minimum temperatures

- The lowest minimum temperatures, reaching values below 5°C, will occur over the southern interior and Drakensberg.
- Minimum temperatures will be high over most of the country for this time of the year.
- The colder mornings over the southern high-lying interior will be on the 28th to the 30th.
- Minimum temperatures over the summer-grain production region will remain above 5°C.

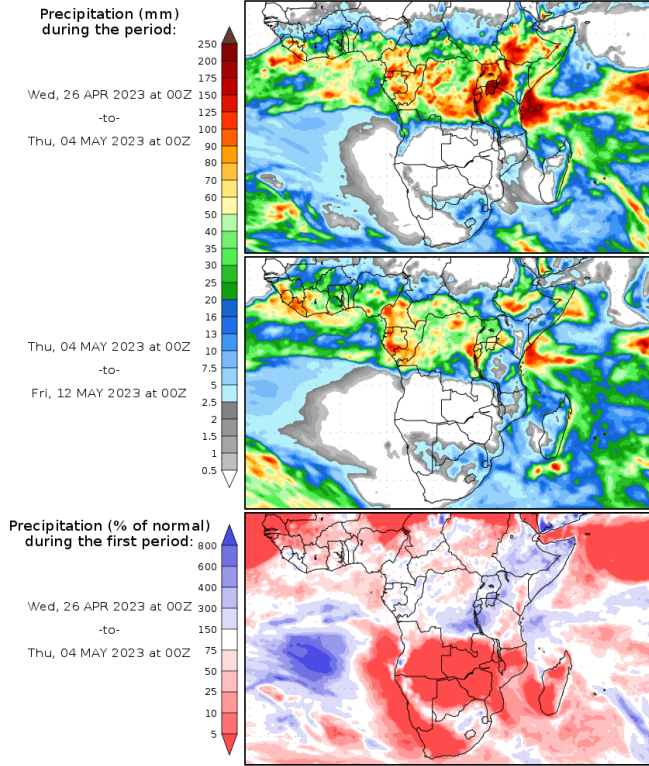


Highest maximum temperatures

- Day-time temperatures will be relatively high for this time of the year.
- Lowest temperatures are expected over the southern high-lying areas and winter rainfall region, where maximum temperatures will be in the upper teens or lower twenties from the 28th to the 30th.
- Hot conditions (>35°C) along the eastern seaboard will occur on the 27th.
- Over the Lower Orange River Valley, hot conditions (>35°C) are expected on the 26th.
- Maximum temperatures over the Limpopo River Valley and Lowveld will exceed 30°C from the 26th to the 30th.

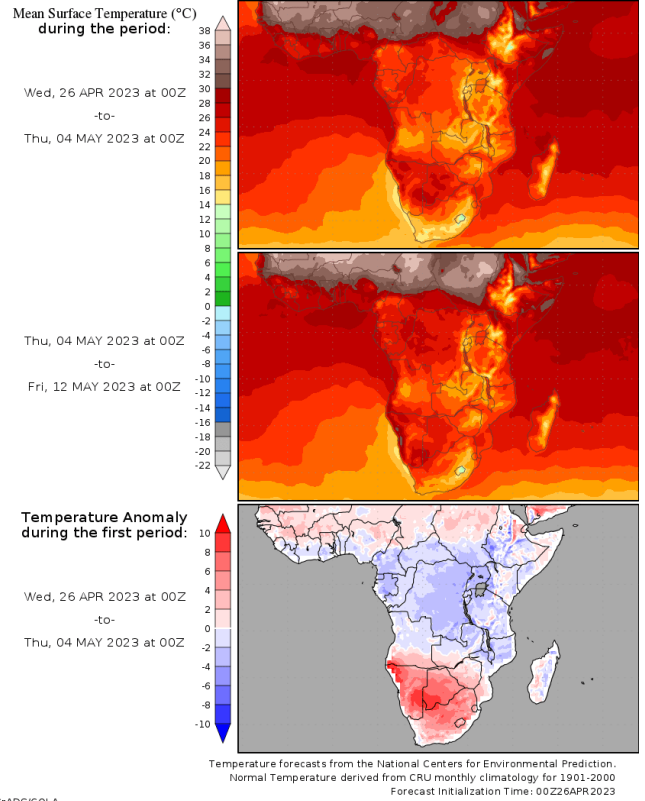
Medium term rainfall and temperature summary

Precipitation Forecasts



GRADS/COLA

Temperature Forecasts



GRADS/COLA

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 26 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:**
 - Orange River Valley: **Wednesday (26th) and Monday to Tuesday (1st, 2nd).**
 - Over the Lowveld and Limpopo River Valley: **Thursday to Saturday (27th – 29th).**
 - KZN coastal belt and adjacent interior: **Thursday (27th).**
- **It will be windy, enhancing the fire hazard where vegetation is dry:**
 - Western to southern interior (north-westerly to westerly winds): **Wednesday to Friday (26th- 28th).**
 - Central to southeastern interior (north-westerly winds): **Monday to Tuesday (1st – 2nd).**

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 Equatorial Pacific continues to warm

(Updated 26 April): 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. However, there are signs El Niño may form during winter. Therefore, the ENSO Outlook is at El Niño WATCH. This means there is approximately a 50% chance of El Niño in 2023.

International climate models suggest neutral ENSO conditions are most likely to persist through autumn. From July, all but one of the models indicate El Niño thresholds will be met or exceeded, with all models meeting El Niño thresholds by August. Current ENSO outlooks extending beyond autumn should be viewed with some caution as they typically have lower forecast accuracy than forecasts made during other times of the year.

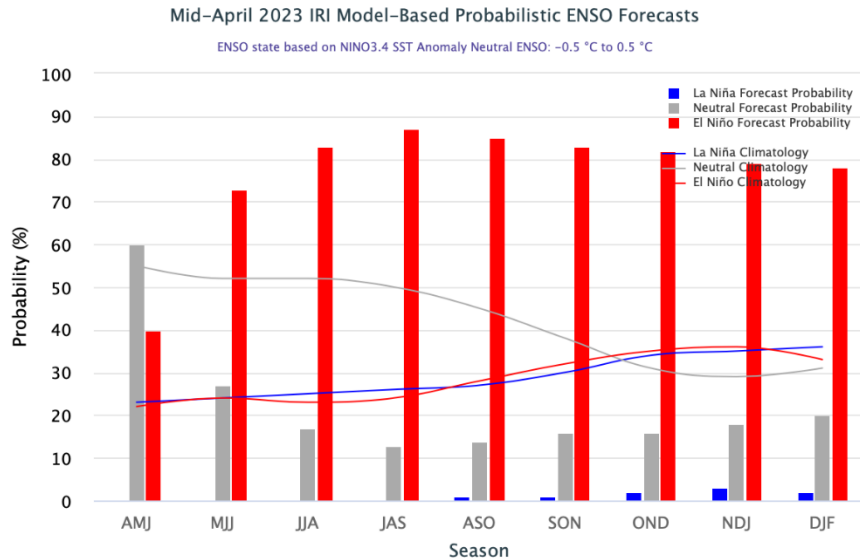
The Madden-Julian Oscillation (MJO) is expected to weaken in the coming days before possibly strengthening over the Maritime Continent in early May.

The Southern Annular Mode (SAM) index is currently neutral and is expected to remain mostly neutral over the coming 3 weeks. A neutral SAM has little influence on the Australian climate.... *Australian Bureau of Meteorology* - <http://www.bom.gov.au>

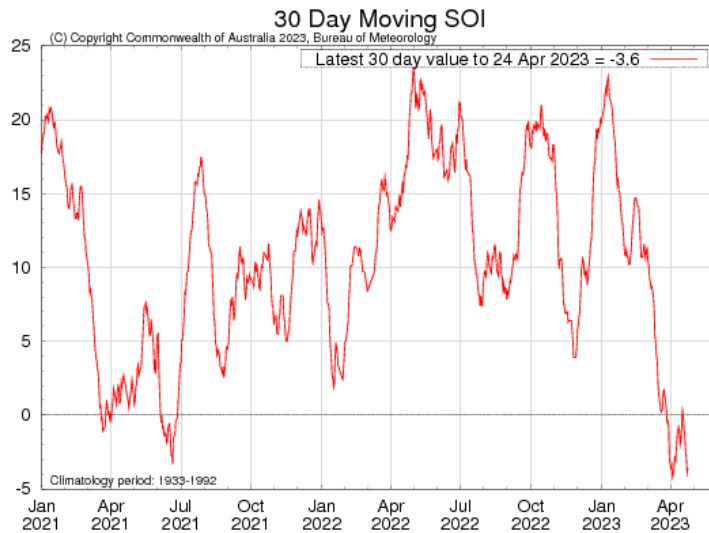
With ENSO neutral conditions present, there is little to no strong indication for either wet or dry conditions over the summer rainfall region, especially given the time of the year. ENSO Neutral conditions are expected to remain in place at least until the winter. The Southern Annular Mode (SAM) is 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 19 April): In mid-April 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 12 April 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 an El Niño watch in April 2023, signaling the start of the warm phase of the ENSO. Most models in the IRI ENSO prediction plume forecast SSTs in the El Niño starting from May-Jul, 2023 (73% chance), while the likelihood of the ENSO-neutral state remains low (27% chance). Going forward the El Niño becomes the dominant category during the entire forecast period with probabilities in the 78-87%. ENSO-neutral is the next most-likely category, with probabilities remaining in the range of 13-20%.....*International Research Institute for Climate and Society*-
<http://iri.columbia.edu/>



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

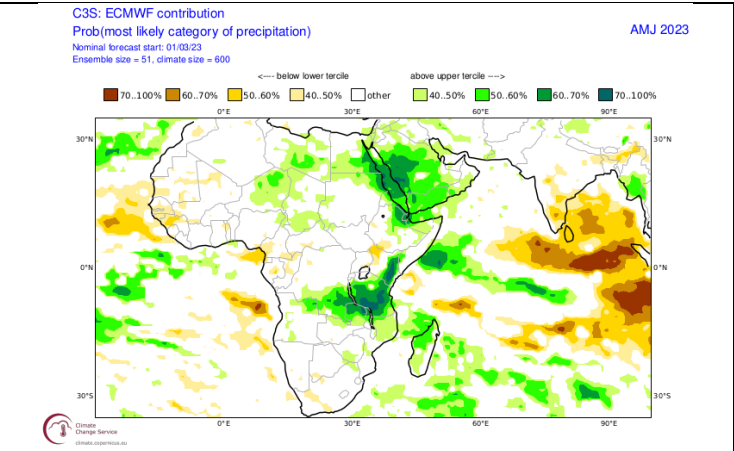
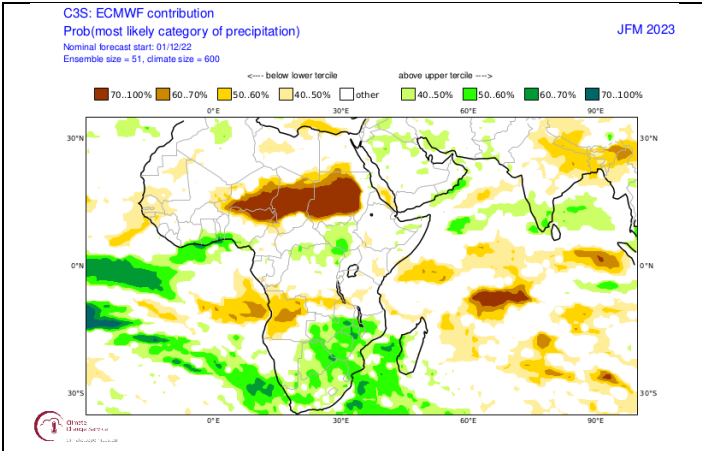


Australian Bureau of Meteorology - <http://www.bom.gov.au>

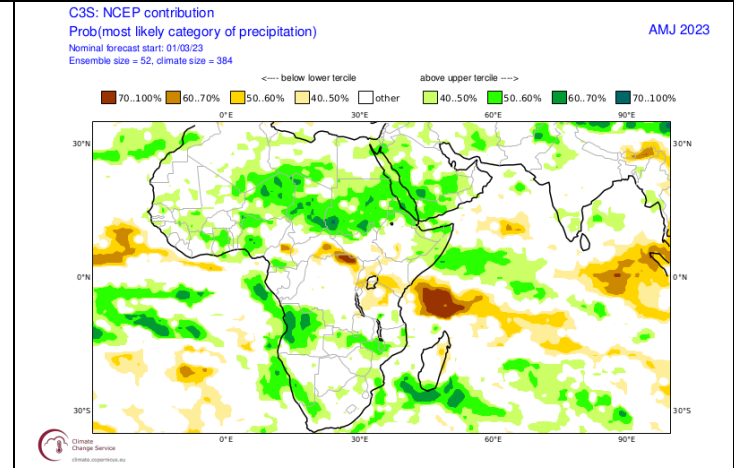
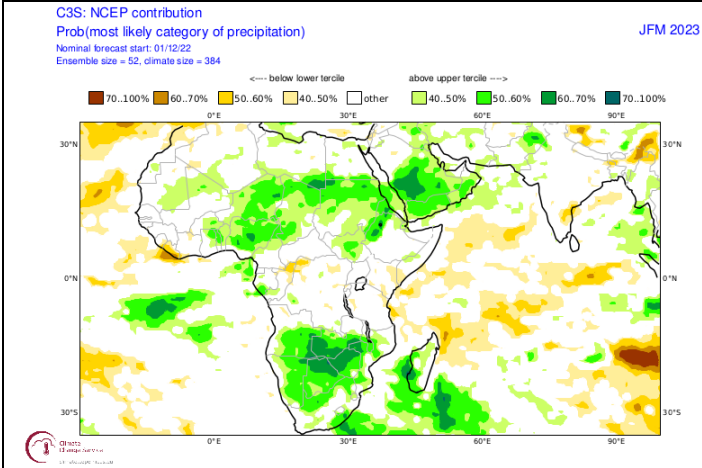
The Southern Oscillation Index is in neutral territory (-3.6). This is indicative of atmospheric circulation patterns not being associated with La Niña conditions anymore.

Seasonal forecasts issued by various international institutions

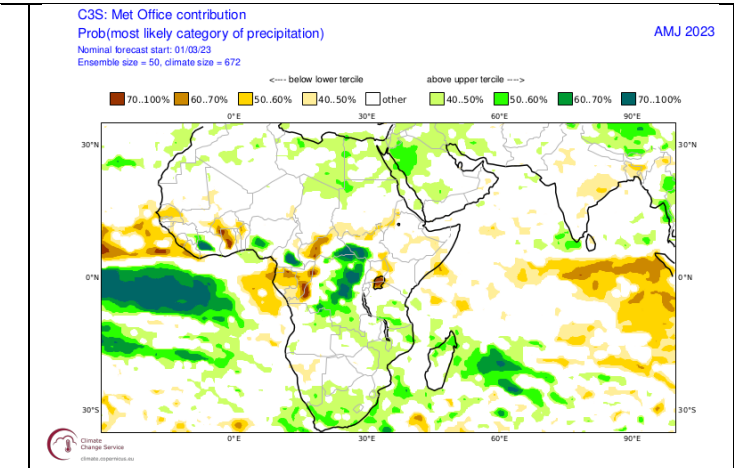
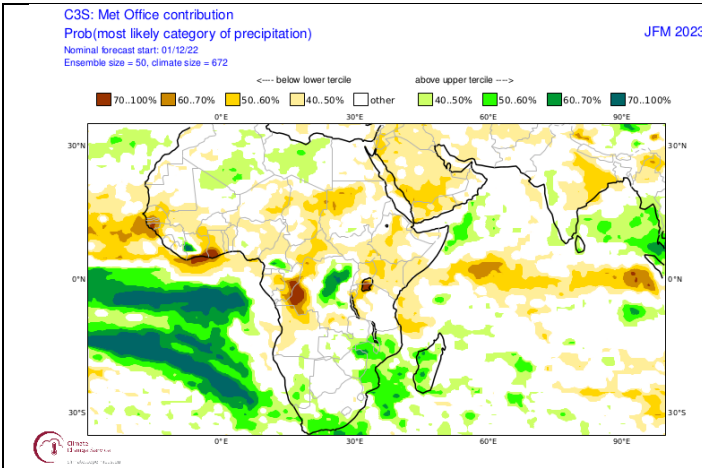
Seasonal forecasts (updated in October 2022) by these institutions, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) for autumn to early winter, reflect weak signals with regard to rainfall anomalies over both the interior and the winter rainfall region, as 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).



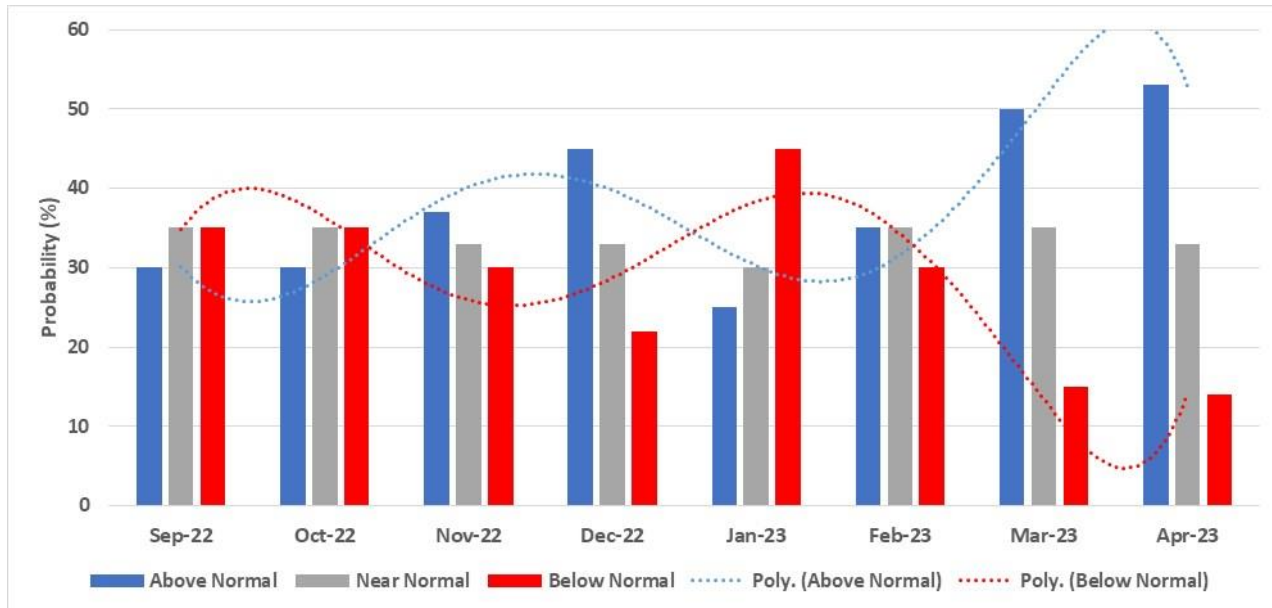
Same as above, but forecasts issued by the National Centres for Environmental Prediction.



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:



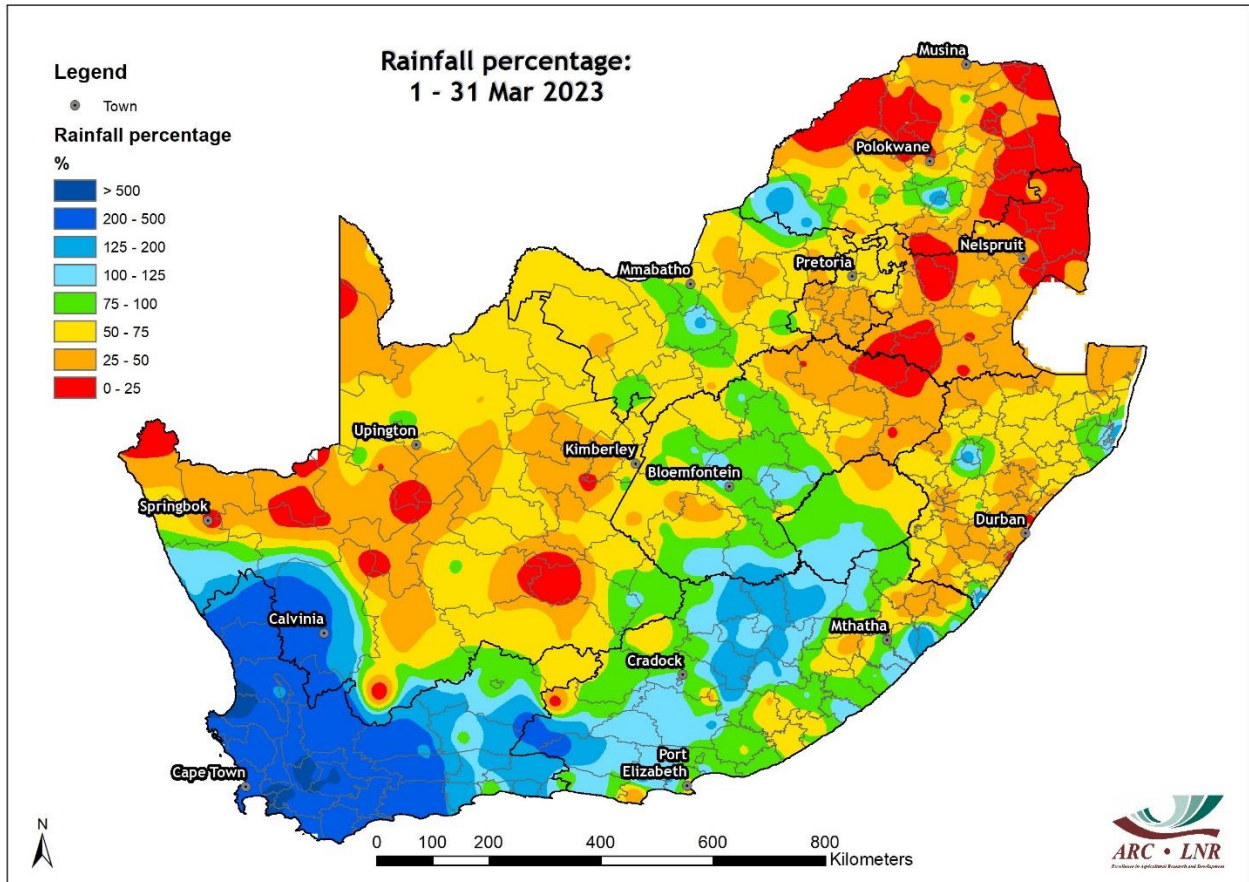
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2022 – April 2023 (Forecast issued in 2022-10).

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

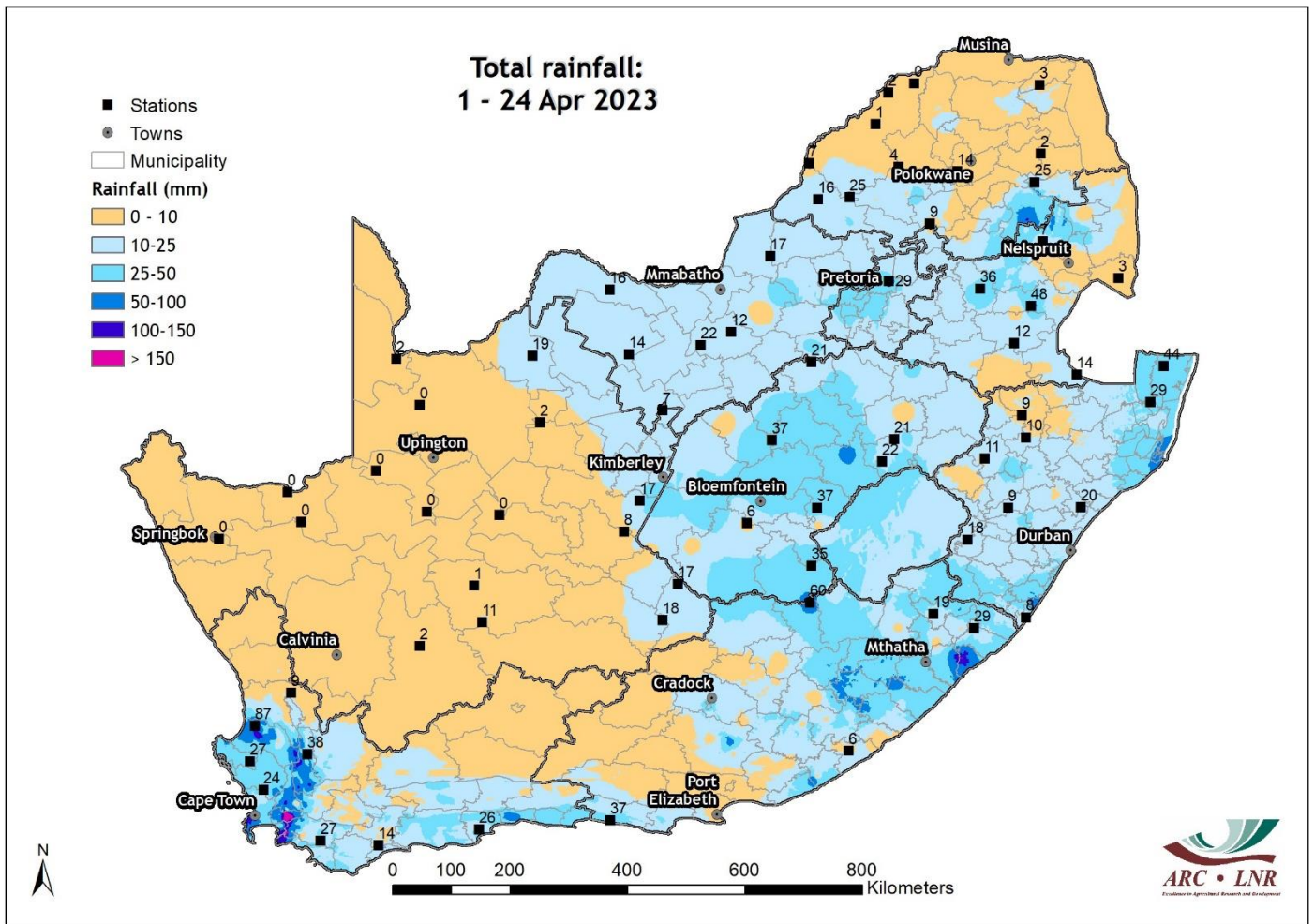
Observed conditions

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



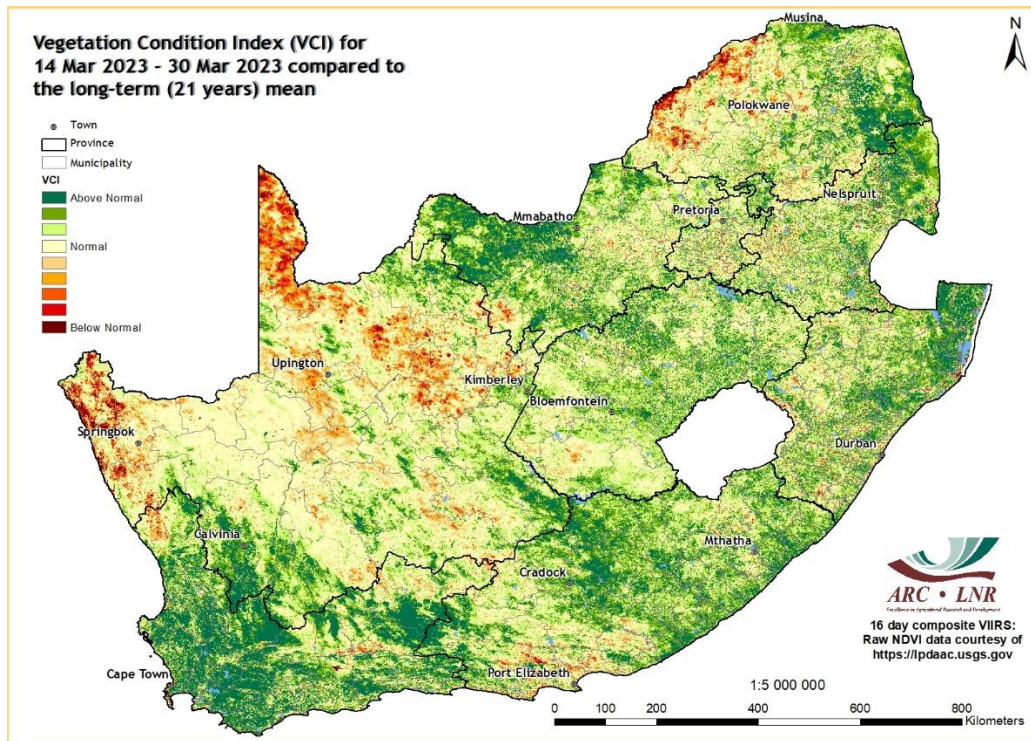
While the northern parts of the country received below-average rainfall during March, rainfall over the southern to southwestern parts, including the winter rainfall region, was above average.

Rainfall (mm): 1 – 24 April 2023



Large parts of the summer rainfall region received at least some rain during the first 24 days of April, with totals exceeding 25 mm over several areas, including large parts of the Free State and eastern half of the Eastern Cape. Totals also exceed 25mm over large parts of the winter rainfall region, with higher totals in the mountainous areas.

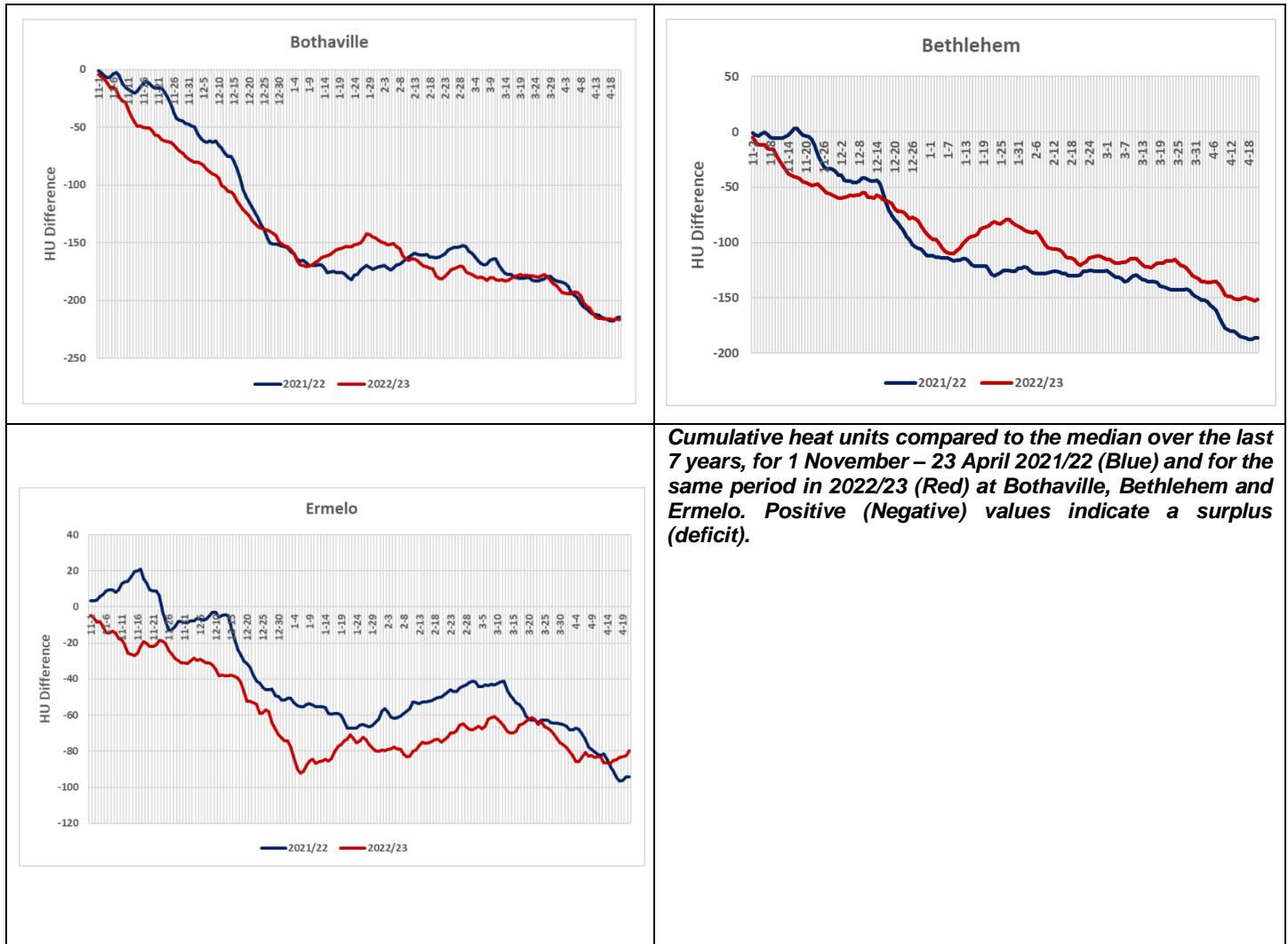
Vegetation Condition Index: March 2023



By mid- to late-March, vegetation activity still reflected widespread above-normal rainfall since mid-October over most of the interior. The winter rainfall region and large areas in the south benefitted from above-normal rain since December. Due to drier conditions setting in, vegetation activity over the Northern Cape western parts of Limpopo was below normal.

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 since 1 November still lag the 7-year median and are in line with the figure for 2021/22. Deficits are smaller than during 2021/22 over the eastern locations.

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



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