

CUMULUS

SEASON 2023/2024

by J Malherbe, R Kuschke

19 October 2023



YOUNG PEOPLE

SEE THE FUTURE

Differently

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



Contents

Summary	3
Mostly dry over the interior, more rain in the south	3
Overview of expected conditions over the main agricultural production areas	3
Daily summary of expected conditions	5
Medium term rainfall and temperature summary	8
Possible extreme conditions - relevant to agriculture	9
Seasonal forecast	10
Current ENSO conditions:.....	10
Seasonal forecasts issued by various international institutions	12
CUMULUS seasonal outlook	14
Observed conditions	15
Rainfall (% of long-term mean): September 2023	15
Rainfall (mm): 1 – 17 October 2023	16
Vegetation Condition Index: September 2023	17
Sources of information	18

Summary

Mostly dry over the interior, more rain in the south

Following a period with thundershowers over large parts of the summer rainfall region, dry weather now dominates the interior. The dry conditions are expected to continue for the most part, but isolated thundershowers will occur over the central to eastern and northeastern parts during the weekend. These thundershowers are not expected to bring widespread or significant rainfall to the interior. The thundershowers over the interior are expected during the weekend as yet another upper-air low brings stormy and wet conditions to the southern to southeastern parts of the country, while the northern parts receive little to no precipitation. This is by now a fairly familiar pattern this spring, and as mentioned previously, typical of the atmospheric circulation patterns when the interior is relatively dry. Widespread rainfall is however again expected along the Garden Route and into the southern to southeastern interior, with significant rainfall expected over the eastern parts of the Eastern Cape and southern KZN.

Ample upper-air dynamic support (due to the low-pressure system causing widespread rain in the south) will result in isolated thundershowers during the weekend over the central to northern and northeastern interior despite low atmospheric moisture levels. Due to the relatively dry atmospheric conditions, it can be expected that rainfall totals will be low over the interior. Where thundershowers occur over these parts, it is likely to be associated with frequent lightning, strong winds and little to no rainfall. In areas where vegetation is still dry, this may lead to the development of wild fires.

The first widespread rain over the interior could occur by the very end of October and early November. It is likely that an upper-air system will bring rainfall to large parts of the interior during that period, but the exact location and intensity of the rainfall is still very uncertain. Current ensemble (multiple member) forecasts favor the northeastern half of the interior for rainfall at that time. Prior to that period, forecasts are not indicative of widespread rainfall over the interior due to unfavorable large-scale circulation patterns that depletes atmospheric moisture across the interior. The potential development of the system during late October/early November will be closely monitored and will be discussed in the next newsletter.

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

General:

- Temperatures will on average be above normal over the interior, but normal to below normal over the southern to southeastern and far eastern parts.
- Hot conditions are expected initially over the western to southern and central parts, shifting to the northeast during the weekend and moving back to the western and northern to central parts by early next week.
- Rainfall will on average be below normal over the interior, but above-normal over the southern parts and coastal areas in the south and east.
- It will be cool, cloudy and windy with widespread showers or thundershowers over the southern parts of the country during the weekend, spreading into KZN through Saturday and clearing from the west on Sunday.
- Isolated thundershowers will develop over the central interior on Saturday and over the northeastern parts on Sunday.
- There is no indication of frost over the summer grain production areas, but temperatures may fall to single digits in some of the eastern high-lying areas of the region Monday morning due to the influx of cool air from the east/southeast.

Overview of expected conditions over the main agricultural production areas

An upper-air low moving across the southern parts of the country together with a strong high-pressure system to the south will result in wet, windy and cool weather over the southern parts while some thundershowers are possible on Saturday over the central parts, locating in the east and northeast by Sunday as the system tracks east and weakens. This will be followed, according to current forecasts, by drier conditions.

Maize production region: Except for isolated thundershowers on Saturday, the region is expected to be relatively warm and dry:

- Maximum temperatures over the western maize-production areas will be in the order of 28 – 35°C, with the hottest conditions expected on Saturday. Minimum temperatures will be in the order of 13 – 19°C.
- Maximum temperatures over the eastern maize-production region will range between 24 and 31°C. Minimum temperatures will be in the order of 10 - 17°C and perhaps somewhat lower over the eastern high-lying areas early next week.
- **Thursday (19th):** Partly cloudy and warm, but cool in the morning over the eastern high-lying areas.
- **Friday (20th):** Partly cloudy and warm, becoming hot with moderate to fresh north-westerly winds over the central to western parts.
- **Saturday (21st):** Partly cloudy and warm, but hot and windy (north-westerly winds) over the central to western parts. Isolated thundershowers are expected in the west by the afternoon, moving east over the rest of the region and becoming scattered over the eastern parts during the evening.
- **Sunday (22nd):** Partly cloudy and mild to warm, but hot in the northeast. It will be windy over the western to northern parts.
- **Monday (23rd):** Sunny and warm, but cool in the east in the morning.
- **Tuesday (24th):** Sunny and warm with moderate westerly winds.
- **Wednesday (25th):** Partly cloudy and warm.

Cape Wine Lands and Ruens: It will be partly cloudy and warm to hot initially. It will become cloudy and windy with showers by Friday, continuing into Saturday and clearing by Saturday evening. Showers will be more widespread along the Garden Route. Gale-force south-easterlies are expected in the southwest on these two days also. The rest of the period should be partly cloudy and mild to warm across the region, with showers possible especially in the south again by Tuesday as another frontal system may influence the region.

Daily summary of expected conditions

(GFS forecast downscaled using WRF)

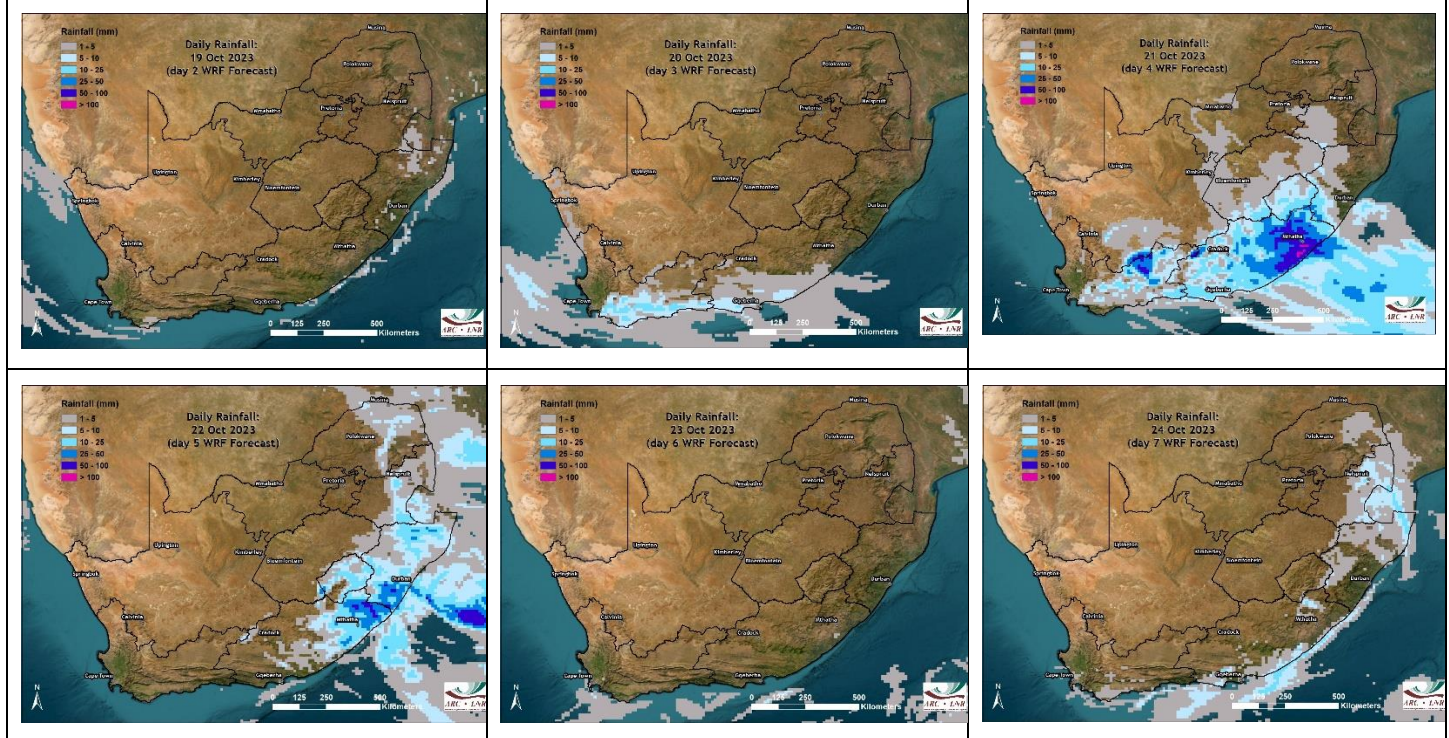
Total Rainfall (mm)

- 1 - 10
- 10 - 25
- 25 - 50
- 50 - 100
- 100 - 200
- > 200

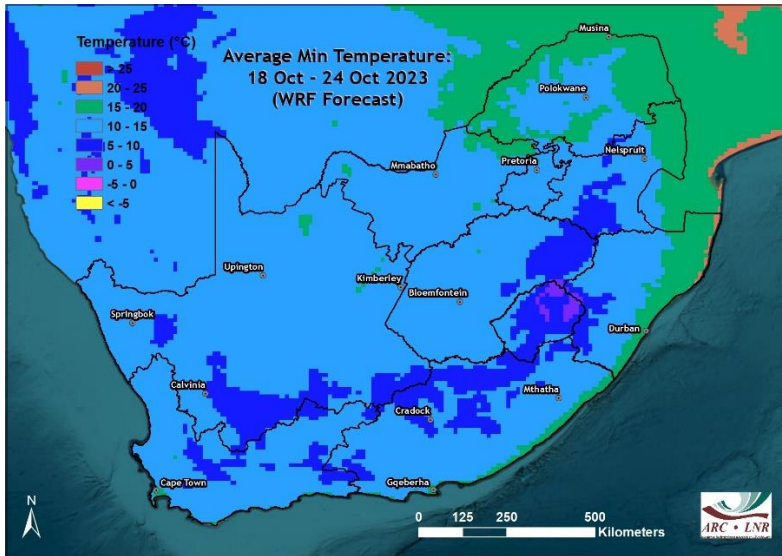
7 Day Rainfall:
18 Oct - 24 Oct 2023
(WRF Forecast)

Rainfall

- Rainfall will focus on the southern to southeastern and far eastern parts.
- Totals may exceed 50 mm over large parts of the eastern half of the Eastern Cape and southern parts of KZN.
- Only isolated and light falls are expected over the central to northern and western interior.
- Most of the central to northern and western interior should see little to no rain.

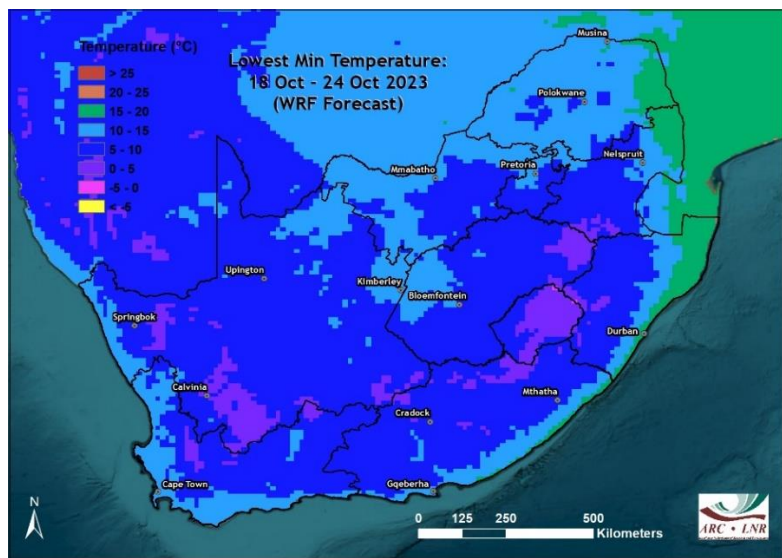


- It will be dry initially apart from light showers along the eastern escarpment and northeastern KZN.
- Showers are expected along the Garden route and into the Karoo on Friday while the interior remains dry.
- Showers will become widespread in the south, with heavy falls possible over the eastern parts of the Eastern Cape by Saturday. Isolated thundershowers will move across the central to eastern interior from the afternoon.
- Widespread showers and thundershowers will continue over the eastern parts of the Eastern Cape and also KZN on Sunday while it clears from the west. The band of thundershowers to the north will locate further east, over the far eastern to northeastern parts. Dry over most of the interior.
- Monday should be dry across the country.
- Showers are possible again by Tuesday, starting in the west and moving along the Garden Route through the day, up the east coast and into the northeastern escarpment and Lowveld by the evening, according to current forecasts. It will be dry over the interior.



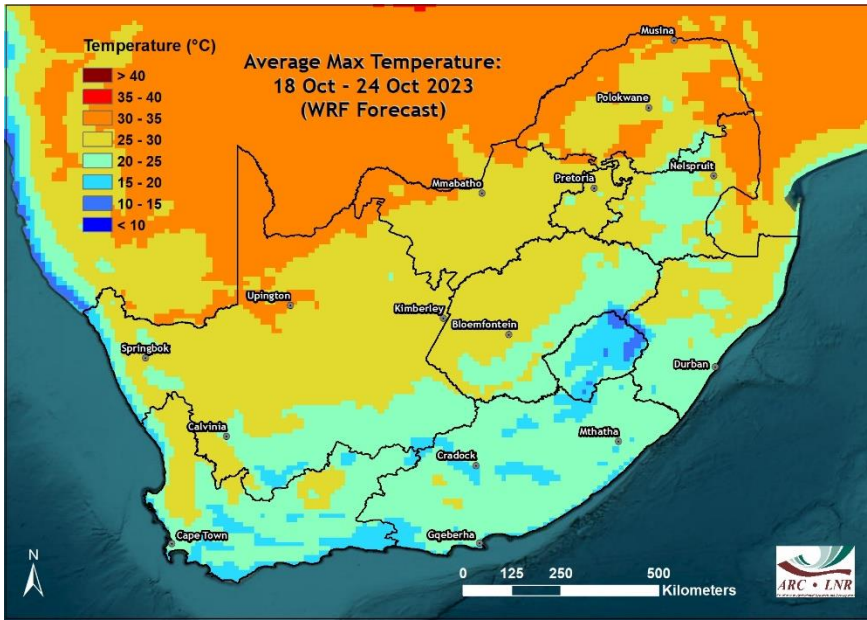
Average minimum temperatures

- Average minimum temperatures over the interior will be close to 10°C.
- Average minimum temperatures will be lowest along the Lesotho Drakensberg (0 to 5°C).
- Average minimum temperatures in the Lowveld and eastern seaboard will exceed 15°C.



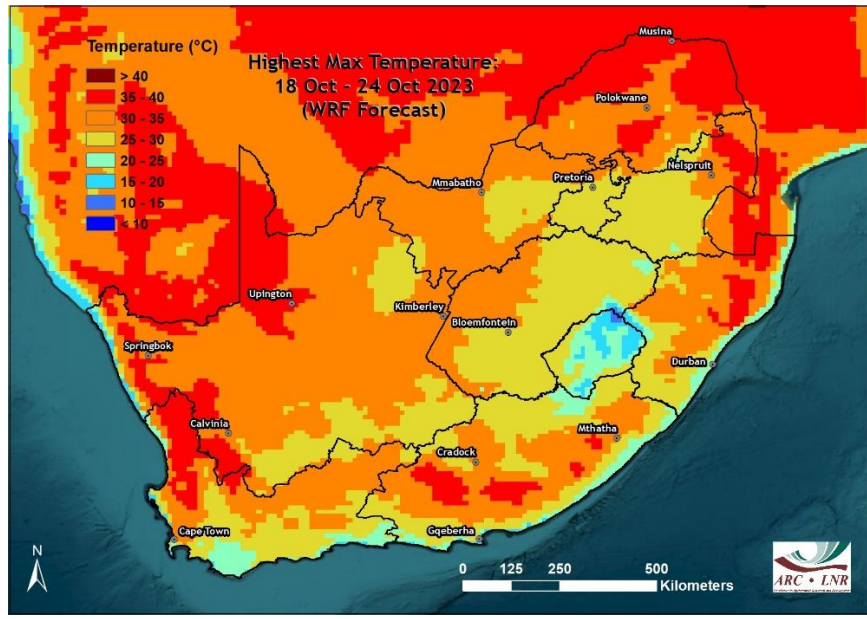
Lowest minimum temperatures

- Lowest minimum temperatures over almost the entire grain production area will remain above 5°C.
- Lowest minimum temperatures are expected on Thursday (19th) morning over the Eastern Highveld and along the Drakensberg. Minimum temperatures may also be relatively low on Monday morning.



Average maximum temperatures

- Average maximum temperatures over most of the interior will range between 15 over the Garden Route and southern escarpment and 30 - 35°C in the north over the Limpopo River Valley and northern parts of the Northern Cape.

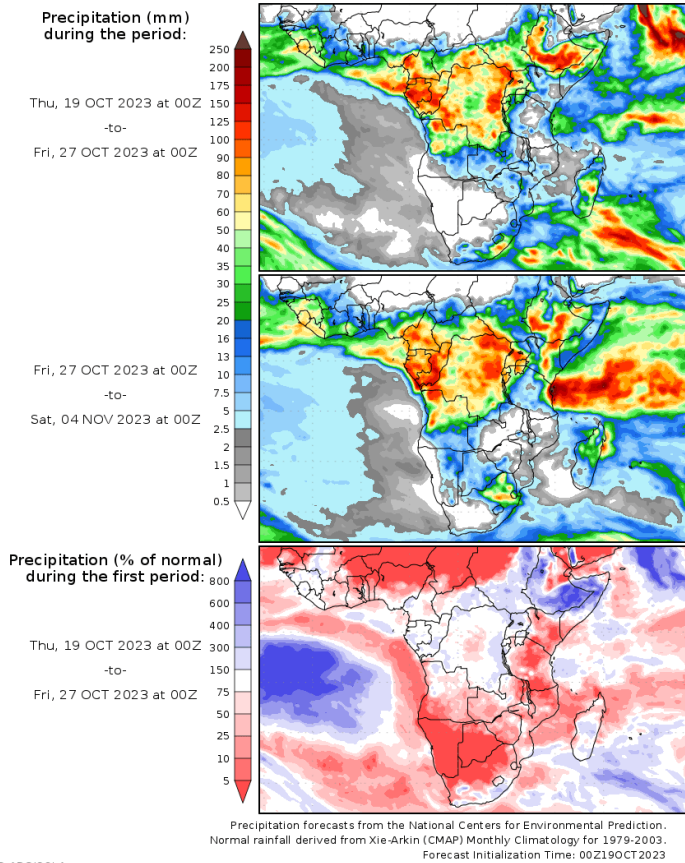


Highest maximum temperatures

- Hot conditions (>35°C) will occur over the southern to western parts initially, cooling by Friday (20th).
- Hot conditions (>35°C) will shift to the northeastern parts during the weekend.
- Hot conditions (>35°C) will expand to the northern to northwestern interior by the middle of next week while also remaining hot in the northeast.

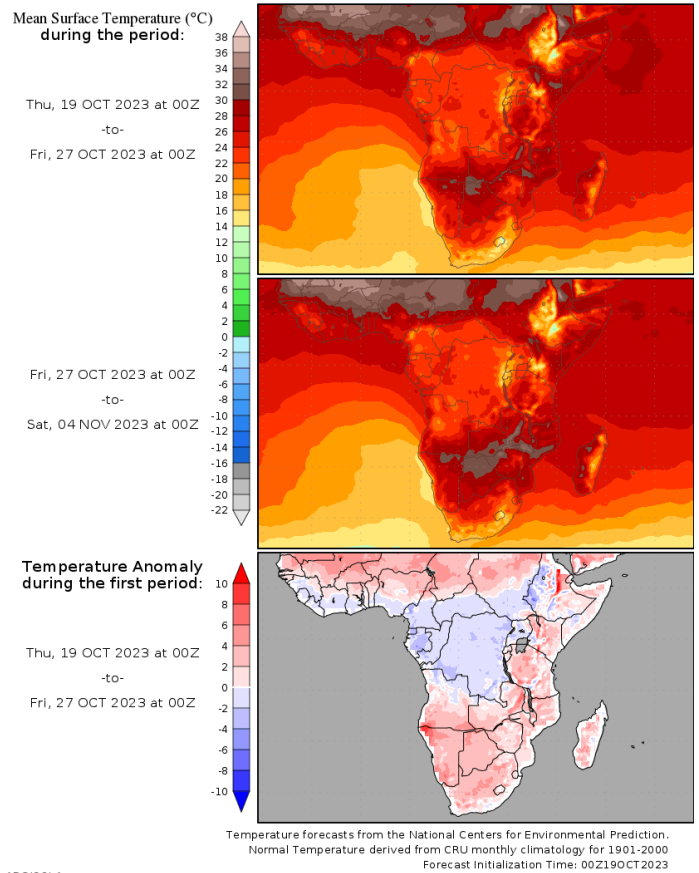
Medium term rainfall and temperature summary

Precipitation Forecasts

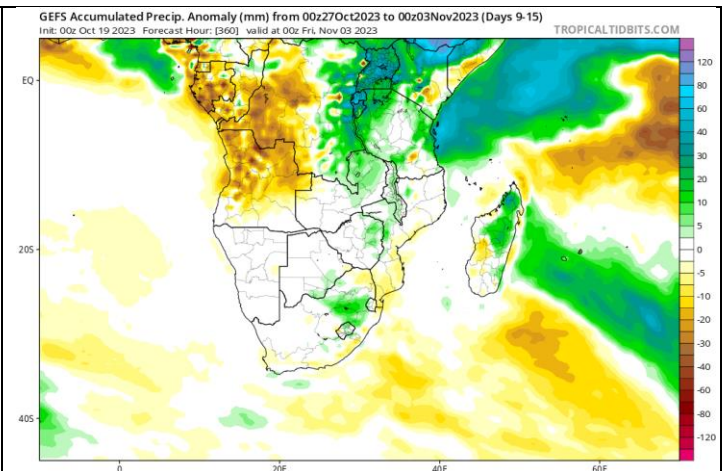
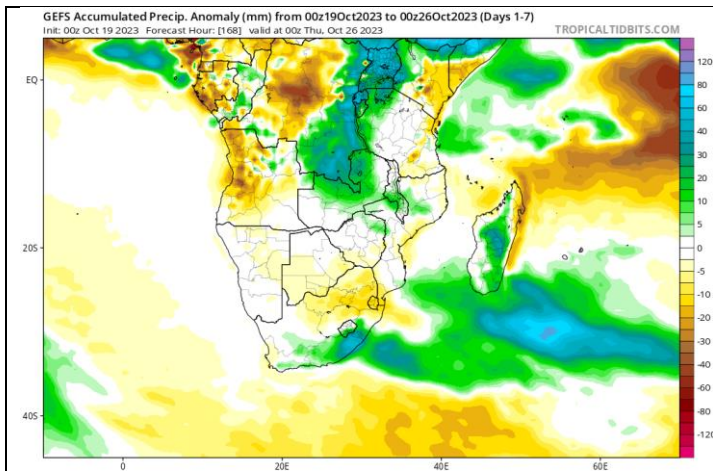


GRADS/COLA

Temperature Forecasts



GRADS/COLA



The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors relatively wet conditions over the southern to southeastern parts while the central to northern and northeastern interior will be relatively dry. During the second week (right), there are some model agreement leaning towards wetter than average conditions over the summer-grain area. Forecasts this far ahead of time is much more uncertain than for the first few days.

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 19 October) 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.

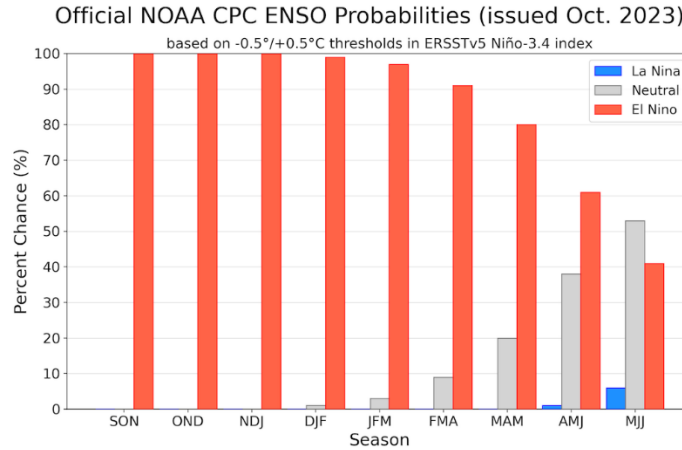
According to current model projections (GFS / ECMWF models) of weather conditions during the coming week, the following may negatively affect agricultural activities and production:

- **Significant daily rainfall totals (>50 mm) are possible:**
 - Eastern and northeastern Eastern Cape and southern KZN: **Saturday and Sunday (21st - 22nd).**
- **Thunderstorms with little rainfall but strong winds may result in the development and spread of wild fires where vegetation is dry:**
 - Northeastern parts of the Northern Cape, North West, northwestern Free State, western Limpopo: **Saturday (21st).**
- **Thunderstorms may become severe:**
 - Central to southern and eastern Free State, northern parts of the Eastern Cape: **Saturday (21st).**
 - Southern Escarpment (including parts of the Western Cape interior and extreme southern parts of the Northern Cape: **Saturday (21st).**
 - Northern KZN, central to eastern Mpumalanga, eastern Limpopo: **Sunday (22nd).**
- **It will be hot:**
 - Western to southern interior: **Thursday and Friday (19th – 20th) and Wednesday (25th).**
 - The Limpopo River Valley and Lowveld: **Saturday and Sunday (21st – 22nd) and Tuesday (24th).**
 - Northern interior: **Saturday to Wednesday (21st – 25th).**
- **It will be windy, enhancing the fire hazard where vegetation is dry:**
 - Central interior: **Friday to Saturday (20th – 21st).**
 - Limpopo and northern North West: **Sunday (22nd).**
- **Strong south-easterly winds are expected:**
 - Southwestern Cape coast: **Friday to Sunday (20th – 22nd).**
- **It will be cool, wet and windy, interfering especially with harvest activities:**
 - Garden Route, southern to southeastern interior: **Friday to Saturday (20th – 21st).**

Seasonal forecast

Current ENSO conditions:

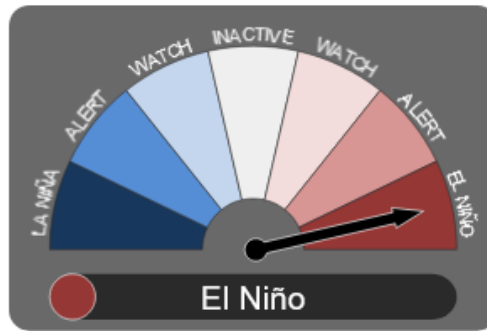
The El Niño is expected to last through our summer at least into early 2024. Various international institutions indicate the expectation of further intensification, albeit not to such strong levels as expected during earlier forecasts. One example of current El Niño forecasts is the IRI's latest ENSO forecast:



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

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

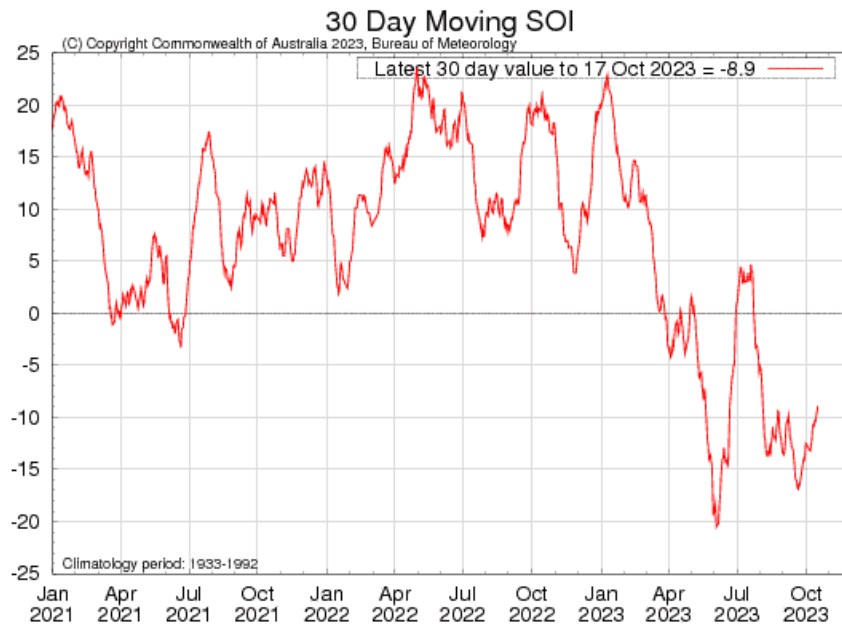
El Niño under way in the tropical Pacific



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

The Australian Bureau of Meteorology also note that 3 out of 4 indicators they use to determine the state of ENSO, are in ENSO territory:

- Sea surface temperature: Temperatures in the NINO3 or NINO3.4 regions of the Pacific Ocean are 0.8 °C warmer than average.
- Models: A majority of surveyed climate models show sustained warming to at least 0.8 °C above average in the NINO3 or NINO3.4 regions of the Pacific until the end of the year.
- SOI: The three-month average Southern Oscillation Index is -7 or lower.



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

However, they (the Australian Bureau of Meteorology) do note that the trade winds have not yet been weaker than average in the western or central equatorial Pacific Ocean during any three of the last four months, which is the 4th criterion used.

In their most recent update (10 October), the BOM further notes that while Sea Surface Temperatures indicate the presence of an El Niño, coupling between the ocean and atmosphere, regarding El Niño, also seems to be happening, and is potentially indicative of a strengthening of the event:

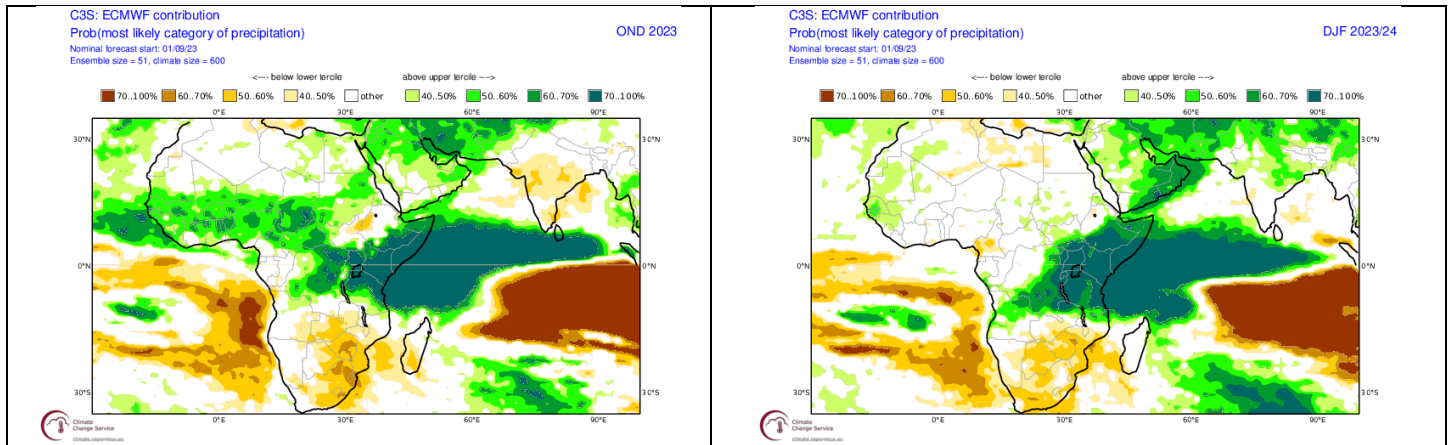
“Oceanic indicators firmly exhibit an El Niño state. Central and eastern Pacific sea surface temperatures (SSTs) continue to exceed El Niño thresholds. Models indicate further warming of the central to eastern Pacific is likely.

Broadscale pressure and cloud patterns over the Pacific reflect El Niño. Trade wind strength over the past fortnight has been weaker than average in the western Pacific but is close to normal elsewhere. Overall, there are signs that the atmosphere is responding to the warm SSTs over the Pacific and coupling of ocean and atmosphere is occurring. This coupling is a characteristic of an El Niño event and is what strengthens and sustains an event for an extended period....” -

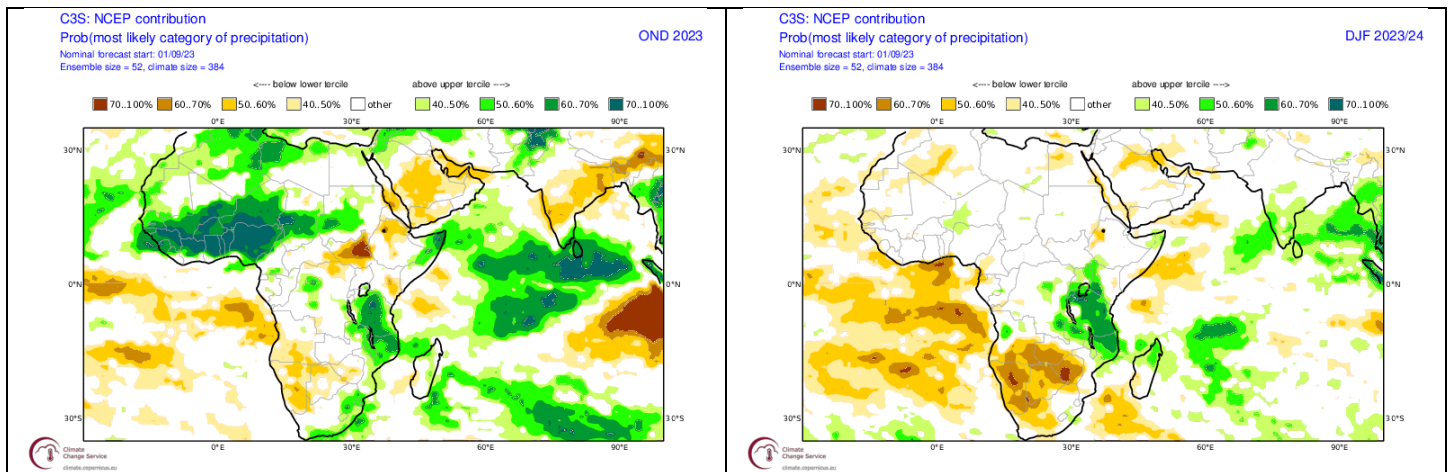
Australian Bureau of Meteorology - <http://www.bom.gov.au>

Seasonal forecasts issued by various international institutions

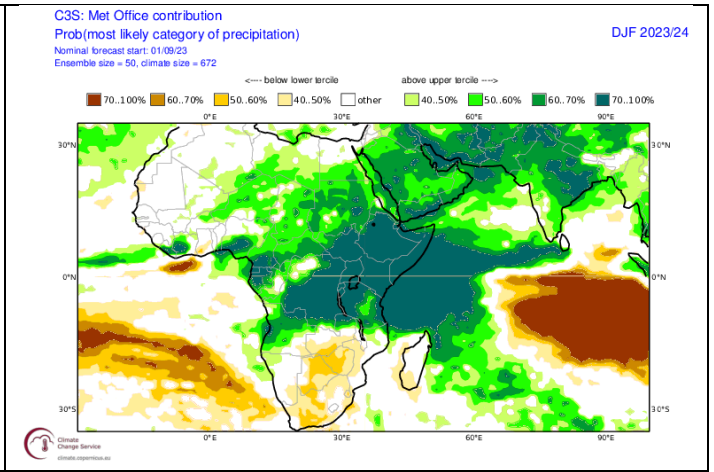
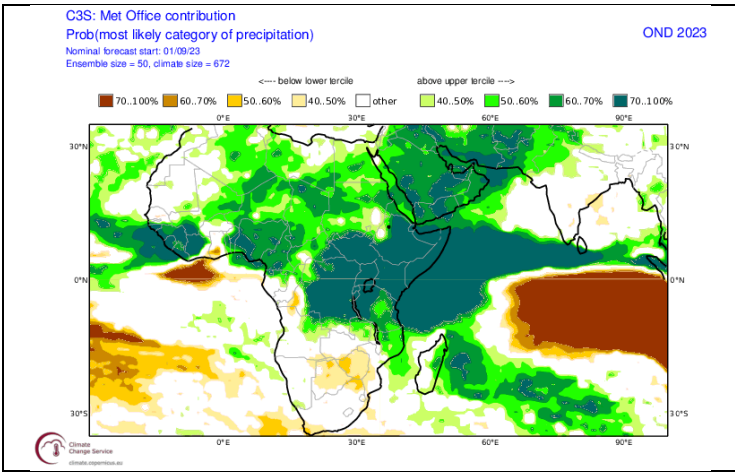
Seasonal forecasts (updated in September 2023) by these institutions, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) and by the IRI, reflect near-normal to below-normal rainfall expected over most of southern Africa, as can be expected during an El Niño summer. In general, the dry signal, according to the forecasts, is somewhat stronger during the December – February period than during the October – December period. During the December – February period, forecasts lean towards drier than normal conditions especially over the central to western parts of the country, but the eastern parts are forecasted to receive near normal rainfall and even above normal according to some of these forecasts. The wetter mid-to-late summer signal in the east by some of the models is not typical of forecasts issued during El Niño events.



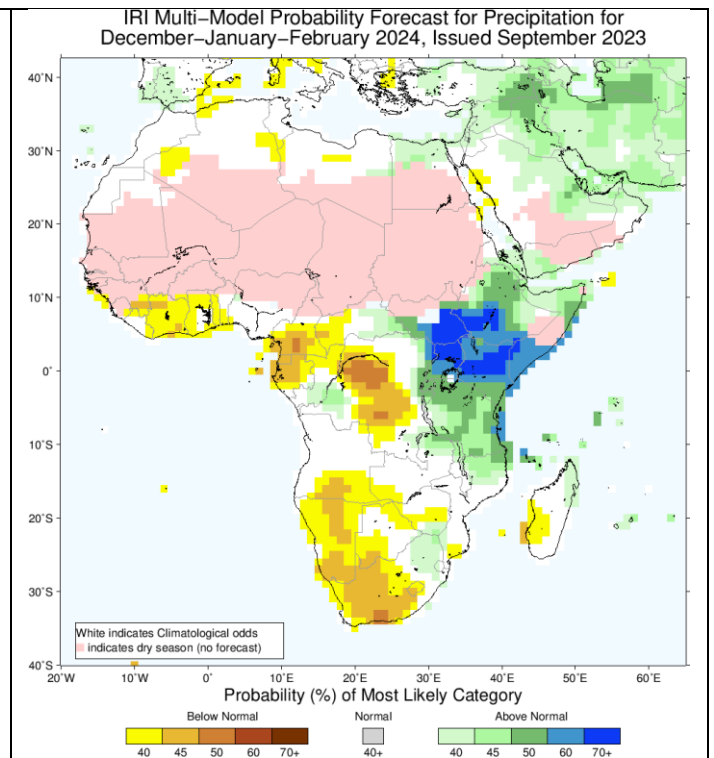
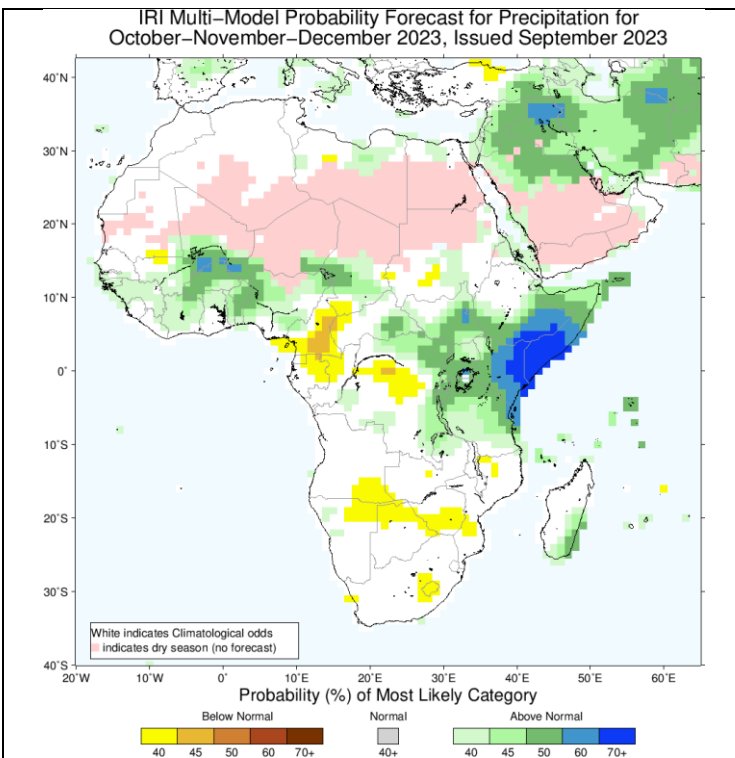
Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for spring to early summer (October-December 2023; left - Forecast issued in 2023-09) and summer (December to February 2024; right).



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



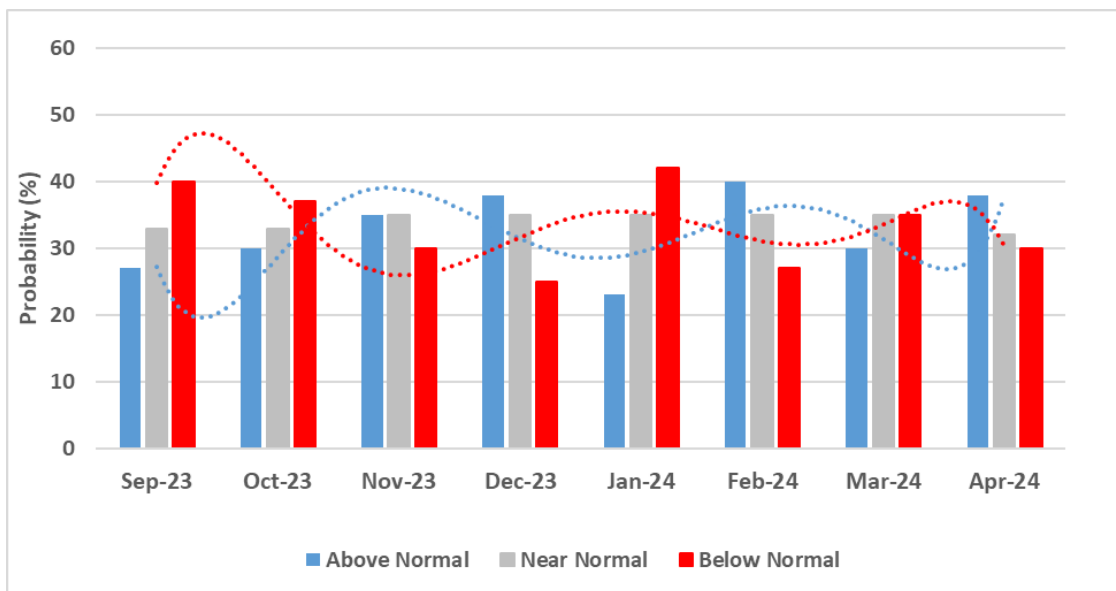
Same as above, but forecasts issued by the UK Met Office.



Same as above, but forecasts issued by the IRI.

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.



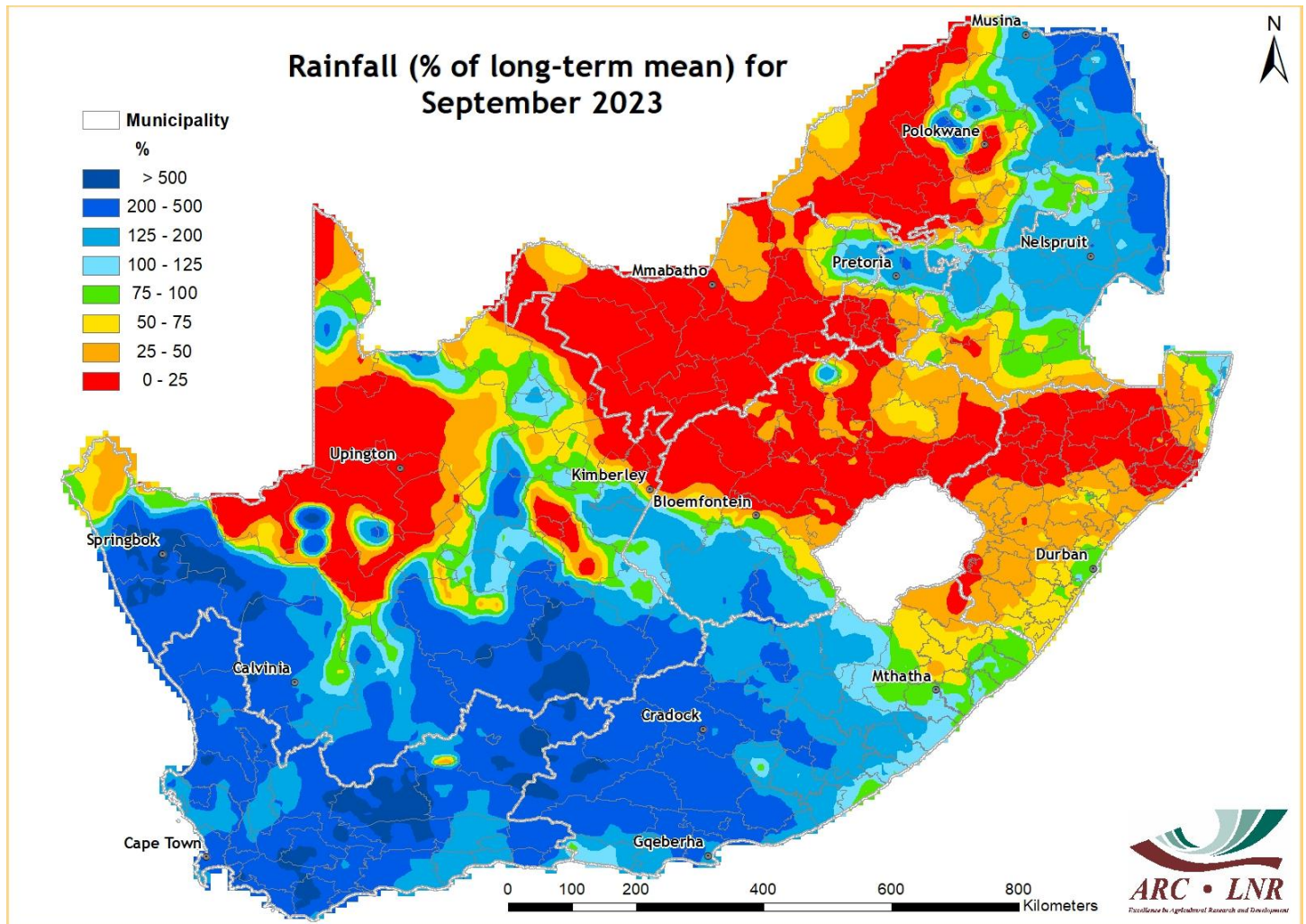
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2023 – April 2024 (Forecast issued in 2023-09).

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

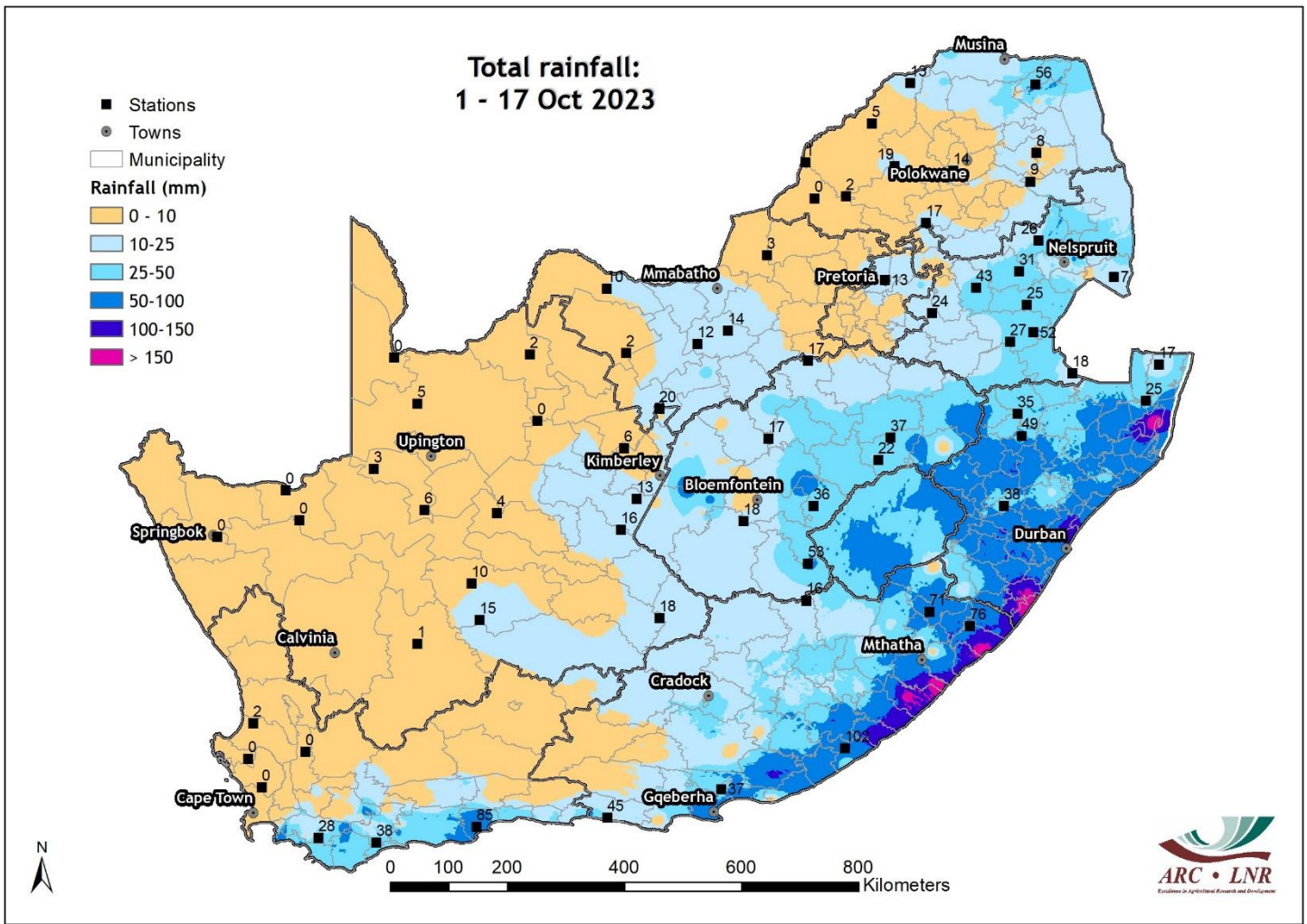
Observed conditions

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



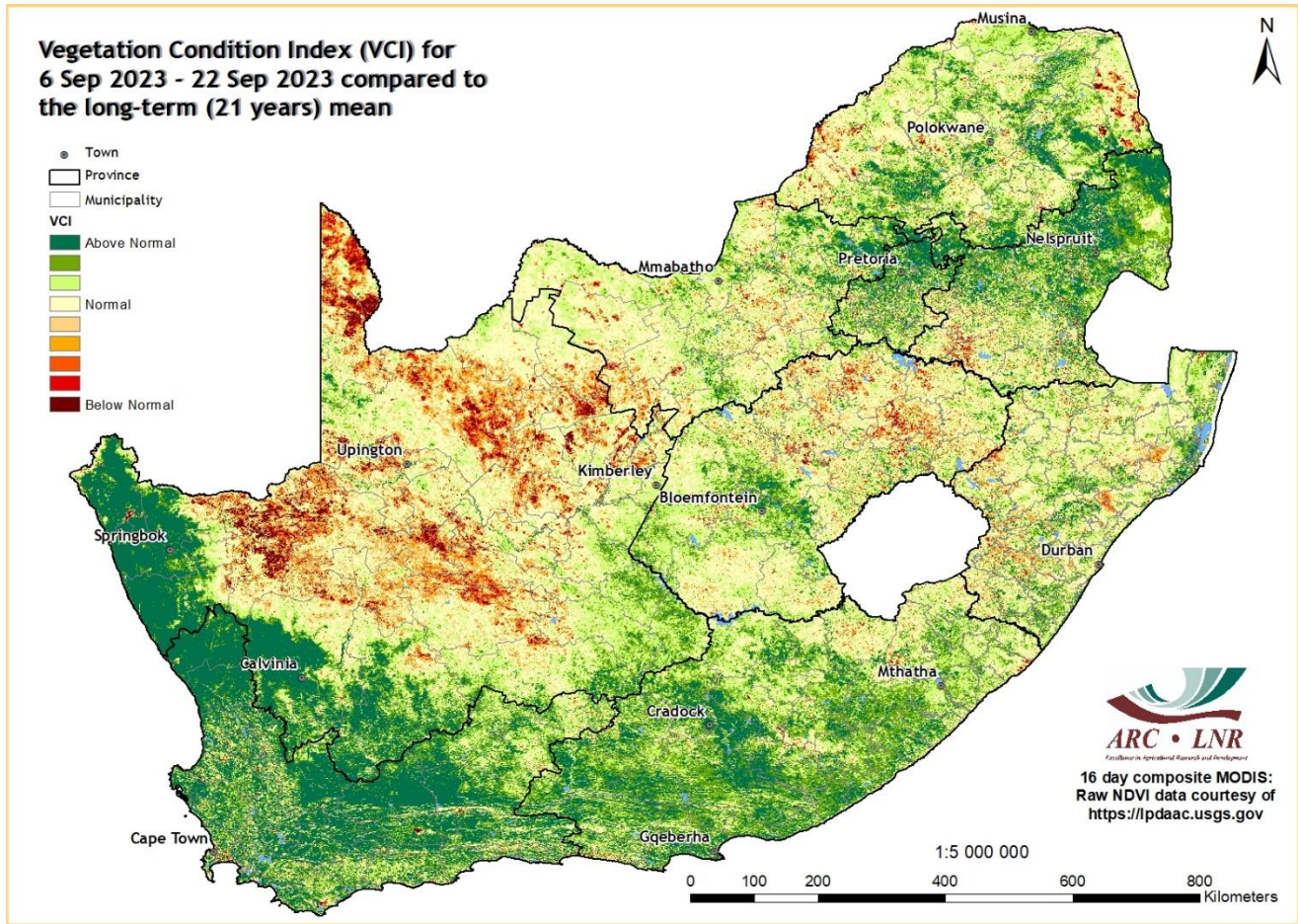
Above-average rainfall occurred over the southern-to-far-western parts of the country, including the winter rainfall region. Above-average rainfall also occurred over the northern parts of Gauteng, most of Mpumalanga and eastern Limpopo. The rest of the interior was relatively dry.

Rainfall (mm): 1 – 17 October 2023



The central to northern interior and western parts of the country were relatively dry during the first 17 days of October. Totals however exceeded 25 mm over large parts of the eastern interior. Higher totals were recorded over KZN, the eastern to southern parts of the Eastern Cape and some areas along the Garden Route.

Vegetation Condition Index: September 2023



By late September, drier conditions earlier over the Northern Cape interior and western Limpopo resulted in below-normal vegetation activity over the Northern Cape. Wetter than normal conditions supported above-normal vegetation activity over the rest of the country, especially the winter rainfall- and all-year rainfall regions in the southwest.

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