CUMULUS

SEASON 2023/2024

by J Malherbe, R Kuschke

28 September 2023

YOUNG PEOPLE SEE THE FUTURE *Differently*

"THE FUTURE OF AGRICULTURE... A CERTAIN FUTURE"

AgriSeker

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

Summary

Warmer, dry conditions ahead across the interior

With large-scale atmospheric circulation patterns relatively unfavorable, the next few days will be warm and dry across the country. There are no current indications of a significant weather system that will results in widespread rain for the foreseeable future. However, frontal activity will at times cause some showers over the winter rainfall region and some thundershowers may occur over the western parts of the country by next week, but these will not be associated with a strong upper-air system and will be isolated in nature. The situation may still change during October, but current forecasts are not indicative of widespread early above-normal rainfall over the summer grain production area.

The development of low-pressure systems over the southern parts of the country, such as we saw during the weekend and early this week, usually leads to a pattern of higher rainfall over the Cape provinces while most of the interior remains largely dry, dominated by relatively dry continental air. Some rain has fallen during the last few days over the northern parts of the country as well, but totals were relatively low except in the extreme northeast. It is clear that moisture levels over the central to northern interior are still too low to allow for widespread significant rainfall. With the large-scale circulation patterns expected to remain unfavorable during the next few days, the situation with regard to dry conditions over the interior is not expected to change soon. Forecast models currently indicate the possibility of more widespread rain along the coast and in the far southeastern and eastern interior only by 7 October and the exact strength and position of the potential system together with the expected amount and distribution of rainfall will be closely monitored and discussed in the next Cumulus.

The widespread, heavy rain that occurred over the southern parts of the country during the past week was associated with an intense upper-air low moving across these areas between Saturday and Tuesday. Little to no rainfall occurred over the northern interior during this time. A secondary low subsequently developed to the north of the intense system in the south and was responsible for some thundershowers over parts of North West, Limpopo, Gauteng, northeastern Free State and Mpumalanga on Wednesday (27th). This development was not well forecasts several days ahead. Rainfall totals however remained mostly below 10 mm except for parts of Mpumalanga and Gauteng were totals exceeding 25 mm were recorded in some places.

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

General:

- Temperatures will on average be normal to above normal for this time of the year.
- Rainfall will on average be below normal.
- There is no indication of significant or widespread frost over the summer grain production areas.
- A cold front may result in showers over the winter rainfall region on Friday/Saturday. Another frontal system may result in more showers over the winter rainfall region by Tuesday or Wednesday.
- The cold front moving into the interior by Saturday may also result in cooler conditions over the southern parts, with somewhat cooler conditions also indicated over the central parts by Sunday. Except for the southern interior, current forecasts are not indicative of widespread frost over the interior except for the frost-prone areas along the Drakensberg and into frost-prone parts of the Eastern Highveld by Sunday or Monday morning.
- While the interior should remain dry for the most part, there are some indications of possible isolated thundershowers over the central parts of the Northern Cape and into the Eastern Cape. The exact location of this band of isolated thundershowers will likely be adjusted closer to the time.
- It will be less windy compared to the previous week, but windy conditions may occur over the central to southern parts on some afternoons.

Overview of expected conditions over the main agricultural production areas

Warm, dry conditions will dominate as a high-pressure system in the upper air should be dominant while upper-air troughs will be located to the southwest of the country. A cold front will bring cooler conditions to the southern parts by Saturday/Sunday, with lower temperatures also over the central to eastern parts by Sunday. It will be warmer again by next week when some thundershowers may start to develop over the western to southeastern interior.

Maize production region: It will be dry during the next few days, with windy afternoons especially in the west. A cold front may move across the area late Saturday/Sunday and will result in somewhat lower temperatures. Current forecasts are not indicative of another frost event, except possibly in the high-lying frost-prone parts of the Eastern Highveld and along the Drakensberg. Temperatures should in general trend higher during the period, except for somewhat cooler conditions around Sunday/Monday, warming again from the west:

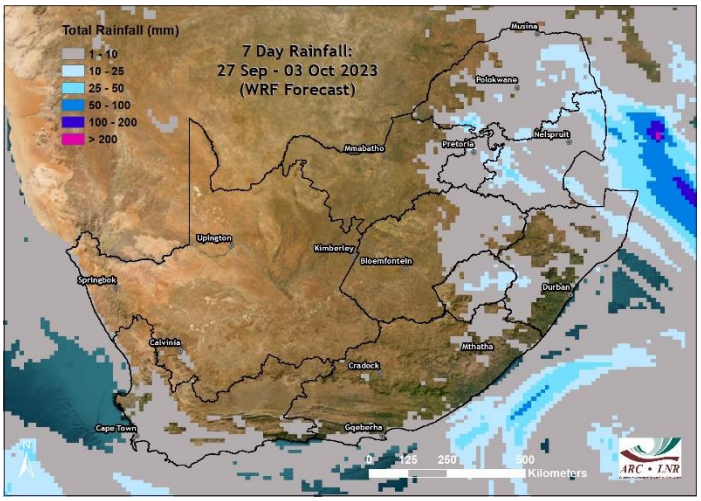
- Maximum temperatures over the eastern maize-production areas will be in the order of 18 – 30°C, with the lower temperatures expected on Monday and Tuesday. Minimum temperatures will be in the order of 4 – 12°C, with lowest values by Tuesday morning and over the high-lying eastern parts.
- Maximum temperatures over the western maize-production region will range between 22 and 34°C, with lowest temperatures early in the period. Minimums will be in the order of 8 - 14°C, with lowest values also early in the period.

- **Thursday (28th):** Sunny and mild to warm.
- **Friday (29th):** Sunny and warm.
- **Saturday (30th):** Sunny and warm with fresh afternoon westerly to north-westerly winds. It will be hot iin the west.
- **Sunday (1st):** Sunny and warm in the northwest and west, but mild to cool over the rest of the region and cold in the morning over high-lying areas in the southeast. A moderate to fresh easterly wind is expected over the eastern half by evening.
- **Monday (2nd):** Sunny and warm, but mild in the east where it may be cold in the morning with isolated areas of frost. Fresh north-westerly winds are expected in the west by the afternoon.
- **Tuesday (3rd):** Sunny and warm, becoming partly cloudy in the west with fresh north-westerly winds by the afternoon.
- **Wednesday (4th):** Sunny and warm, but hot in the west. Current forecasts indicate the possibility of isolated afternoon thundershowers over the far western parts, or possibly further to the west, over the interior of the Northern Cape.

Cape Wine Lands and Ruens: It will be sunny and mild for the most part, but showers will occur by late Friday into Saturday, spreading along the Garden Route, with this sequence expected to recur on Wednesday. It will be partly cloudy to cloudy and cool during the rainy periods Saturday and Wednesday. Fresh westerly winds may occur with the cold front on Friday/Saturday.

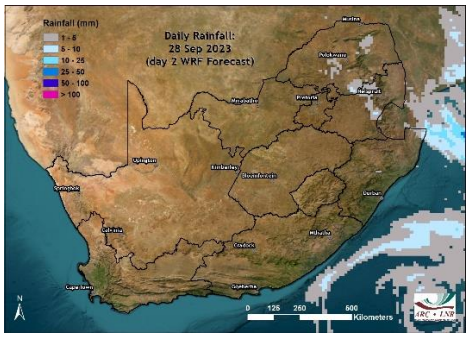
Daily summary of expected conditions

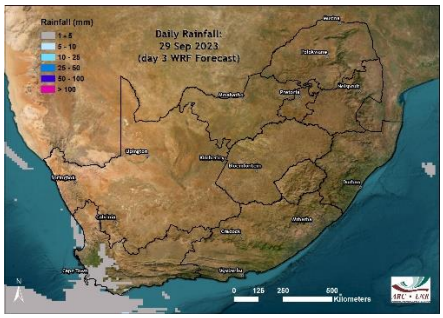
(GFS forecast downscaled using WRF)

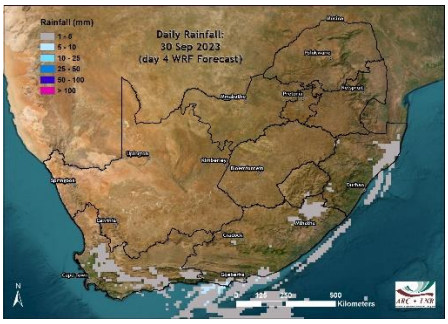


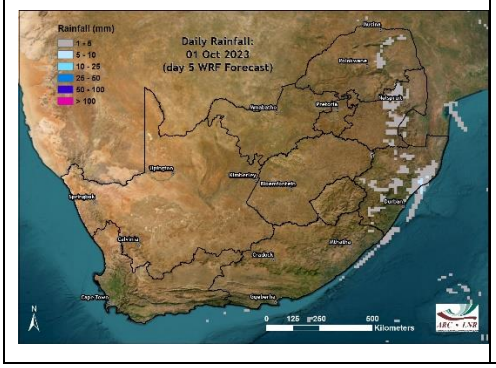
Rainfall

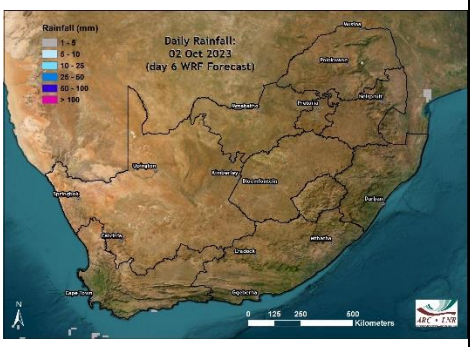
- Rainfall over the eastern parts is limited to Wednesday 27th. Dry conditions should prevail over these areas from the 28th.
- Little to no rain is expected over the interior from the 28th onwards.
- Rainfall indicated for the winter rainfall region is to occur on Friday/Saturday and again by Wednesday next week.
- The western to southern interior should remain dry.

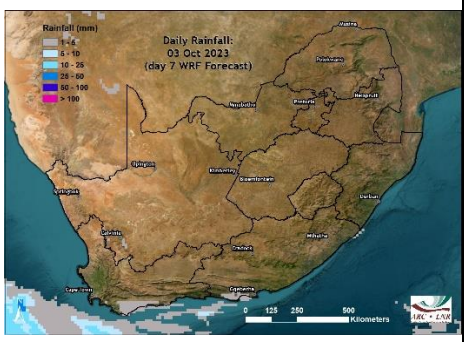




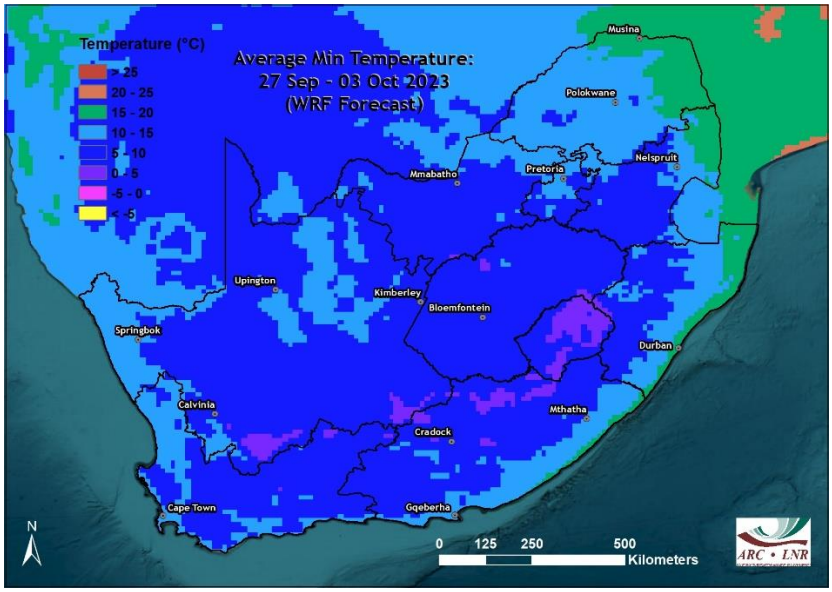






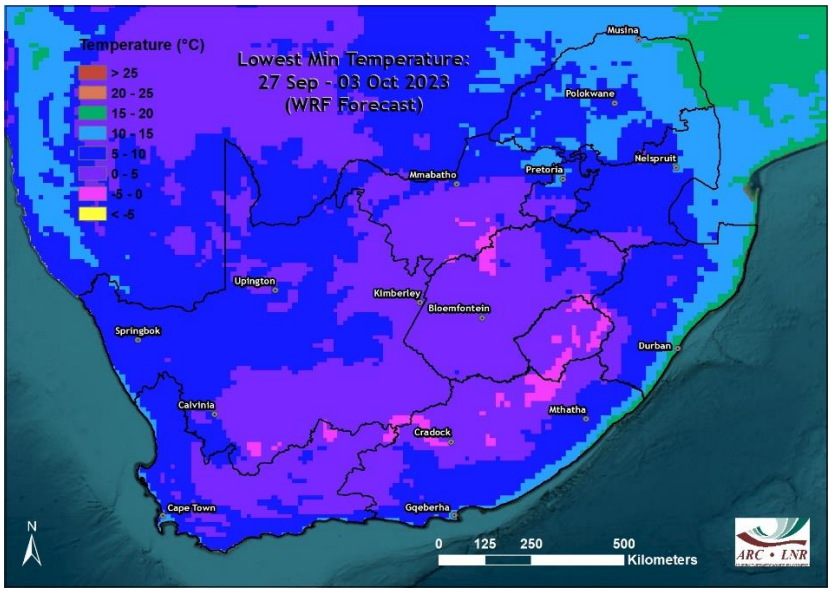


- Thundershowers will focus over the North West / Gauteng / Mpumalanga / Limpopo area initially on Wednesday (27th), with some residual showers possible early on the 28th.
- The interior should remain dry for the rest of the period except for some isolated thundershowers over the western to southeastern interior by the middle of next week.
- Showers are possible over the winter rainfall region on Friday/Saturday, spreading up the south and east coast on Saturday and light showers into the interior of KZN and along the eastern escarpment by Sunday.
- Showers are possible again by Tuesday night / Wednesday over the winter rainfall region, spreading along the



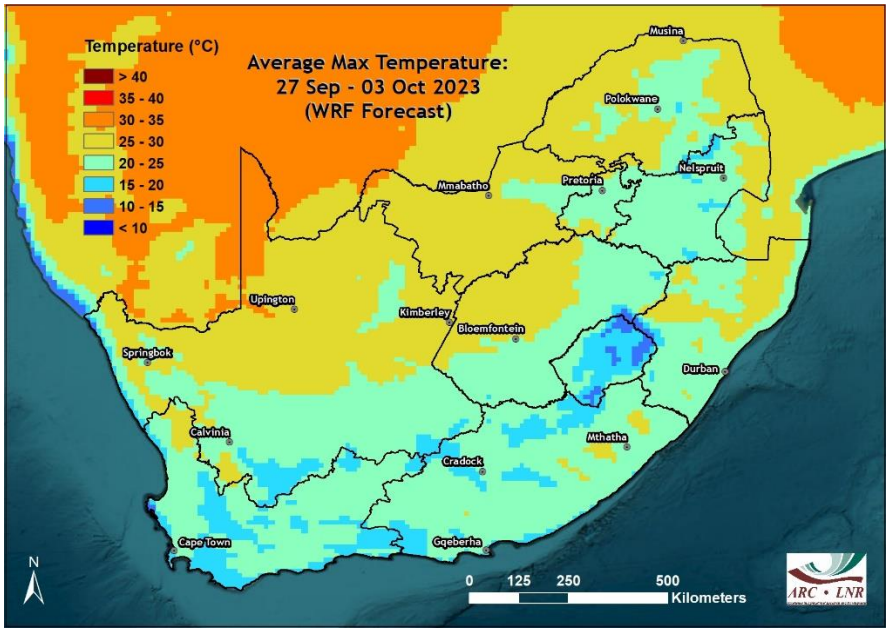
Average minimum temperatures

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



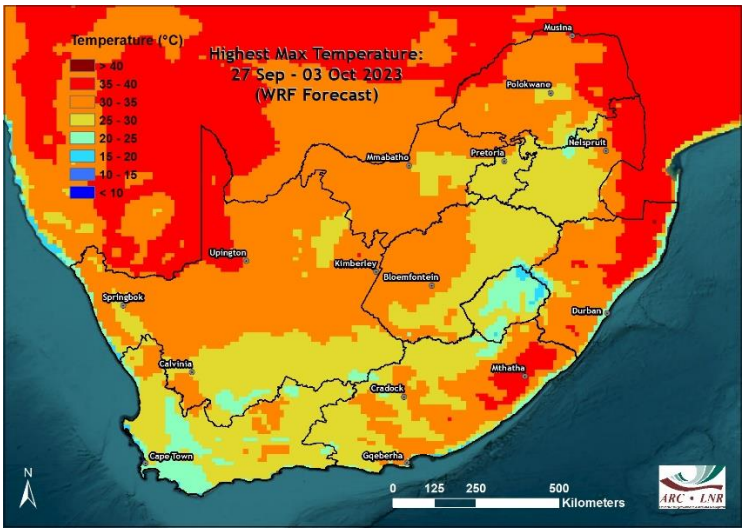
Lowest minimum temperatures

- Lowest minimum temperatures over almost the entire grain production area will remain above 0°C.
- Lowest minimum temperatures along the Drakensberg are expected to occur on Sunday / Monday morning.



Average maximum temperatures

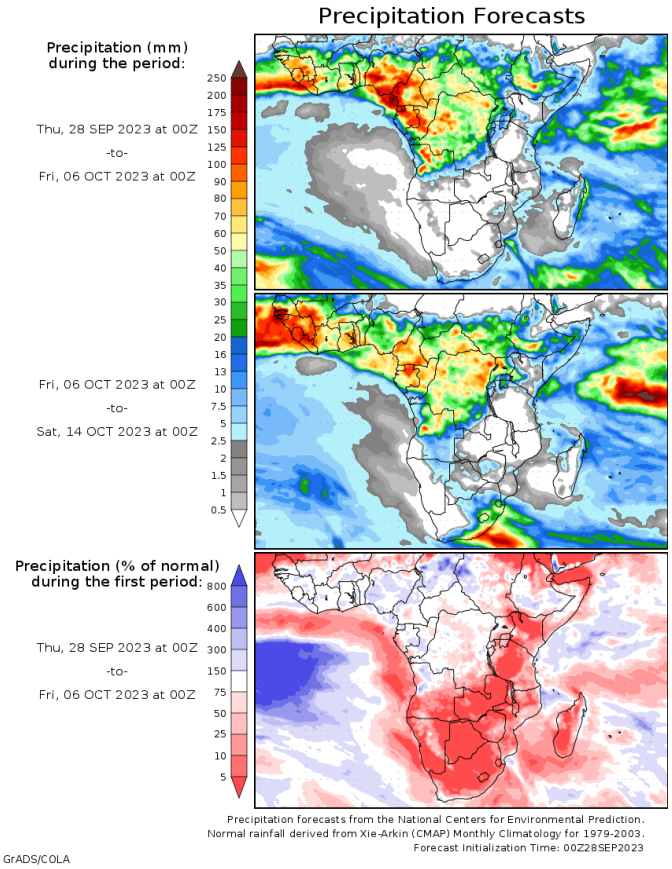
- Average maximum temperatures will range between 20 and 30°C.
- Lowest average minimum maximum temperatures will occur along the southern escarpment and Drakensberg.

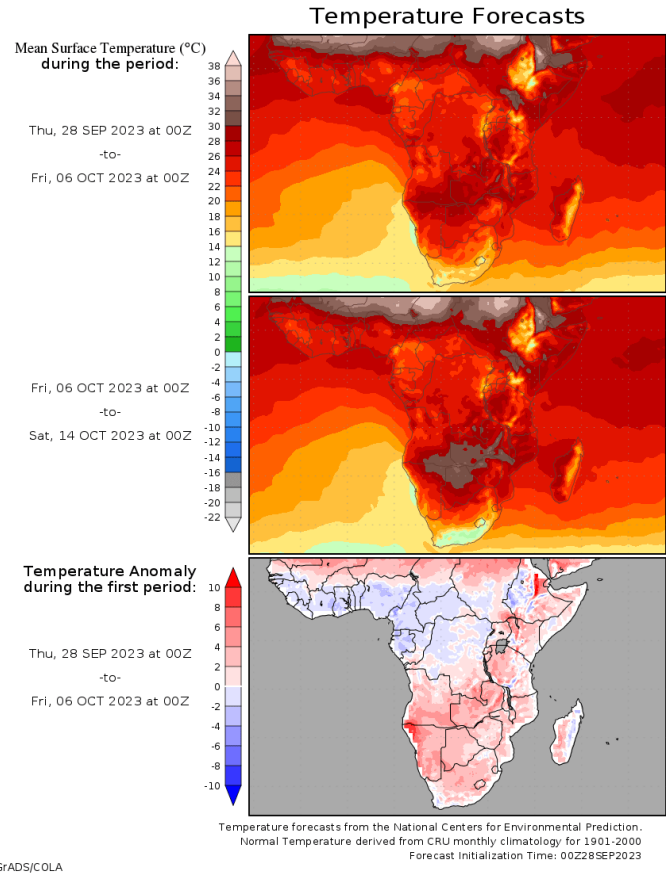


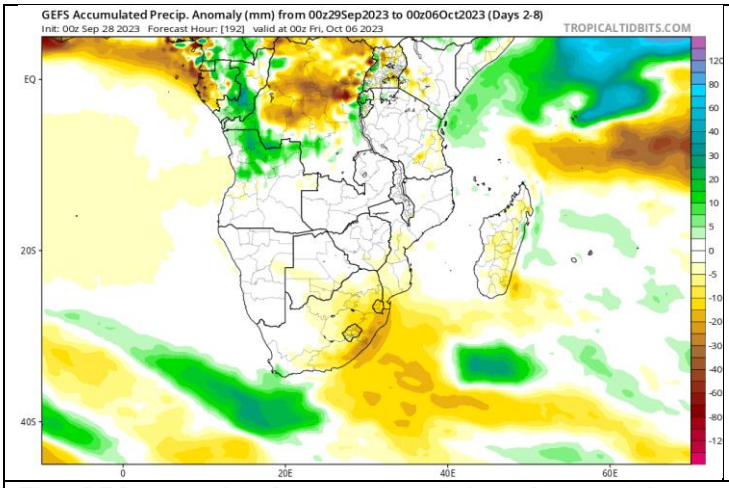
Highest maximum temperatures

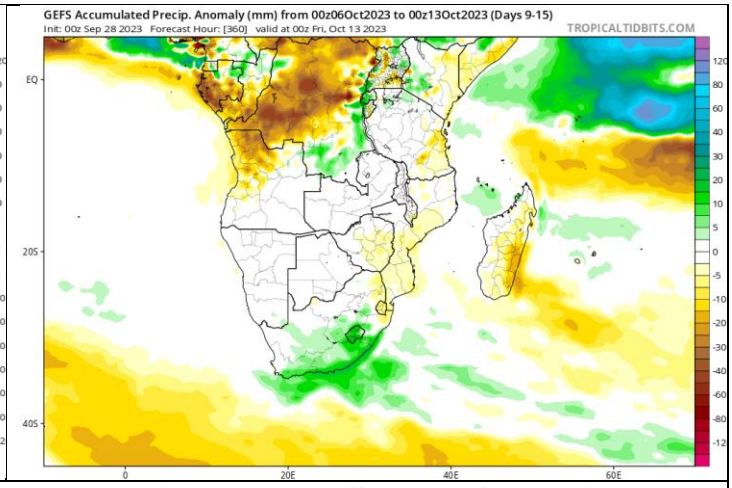
- Hot conditions (>35°C) over the eastern parts of the Eastern Cape, eastern KZN, Lowveld and Limpopo River Valley will occur on Saturday.
- Hot conditions (>35°C) over the northwestern to northern parts of the Northern Cape will occur from Monday onwards.

Medium term rainfall and temperature summary









The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors relatively dry conditions across the interior until 6 October (left), with indications of the possibility of a weather system that may result in above-normal rainfall over the far eastern to southeastern parts thereafter (from the 6th – right) up to the 13th of October.

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 27 September) 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.

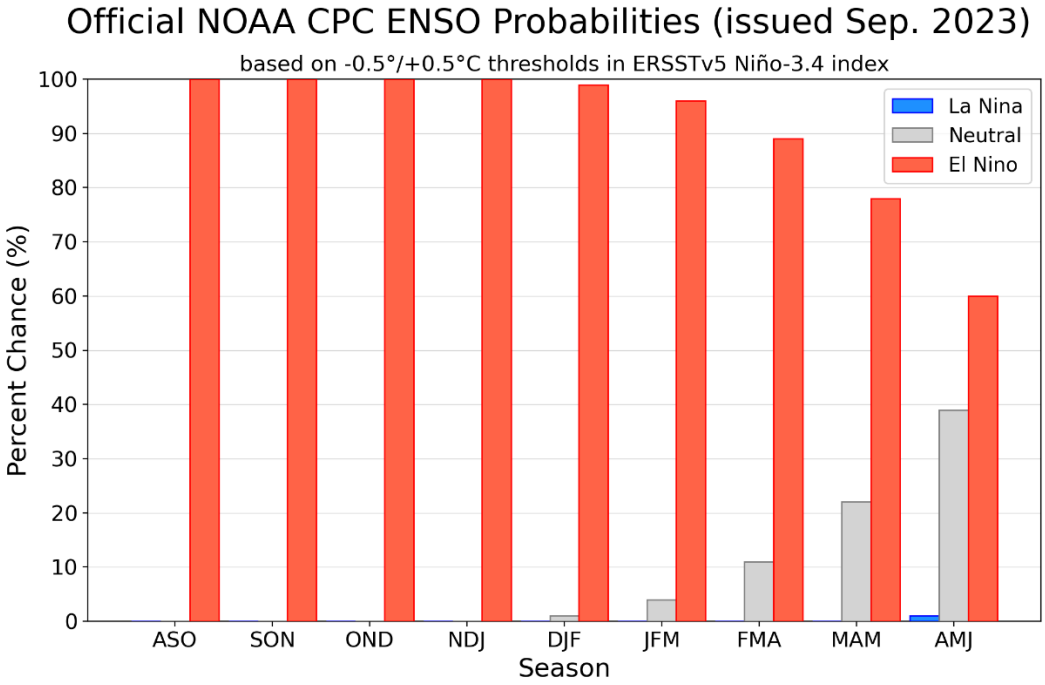
According to current model projections (GFS / ECMWF models) of weather conditions during the coming week, the following may be deduced:

- **It will be hot:**
  - Central to northern and eastern KZN, the Lowveld and Limpopo River Valley: **Saturday (30th).**
- **It will be windy, enhancing the fire hazard where vegetation is dry:**
  - Southern interior: **Friday to Saturday (29th – 30th) and Tuesday to Wednesday (3rd – 4th).**
  - Central to western interior: **Friday to Saturday (29th – 30th) and Monday to Wednesday (2nd – 4th).**
  - Limpopo River Valley: **Sunday to Monday (1st – 2nd).**
- **Light frost may occur:**
  - Southern escarpment, frost-prone areas along the Drakensberg, eastern Free State and southern Highveld of Mpumalanga: **Sunday and Monday mornings (1st, 2nd).**

Seasonal forecast

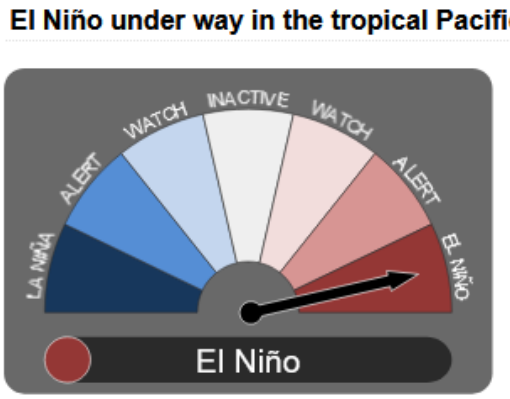
Current ENSO conditions:

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/

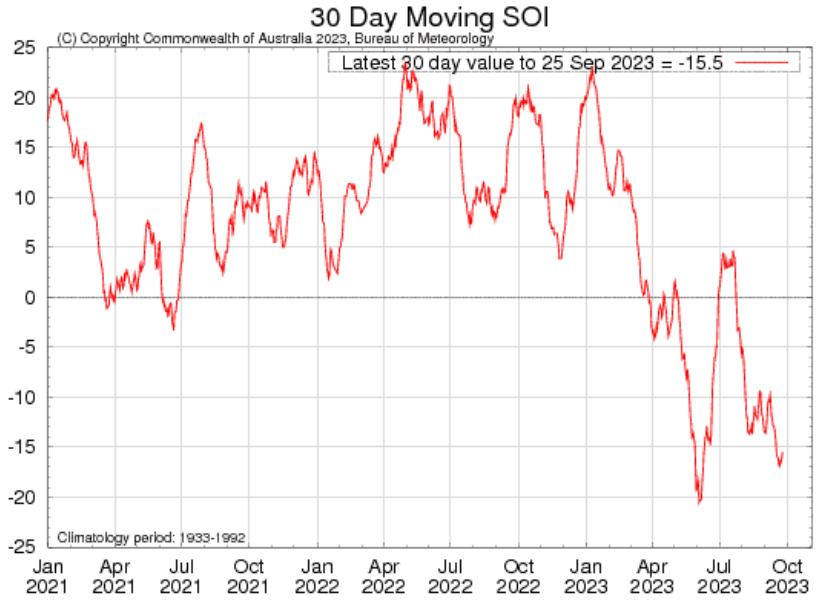
Likewise, the Australian Bureau of Meteorology have set their outlook to "El Niño" ……



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

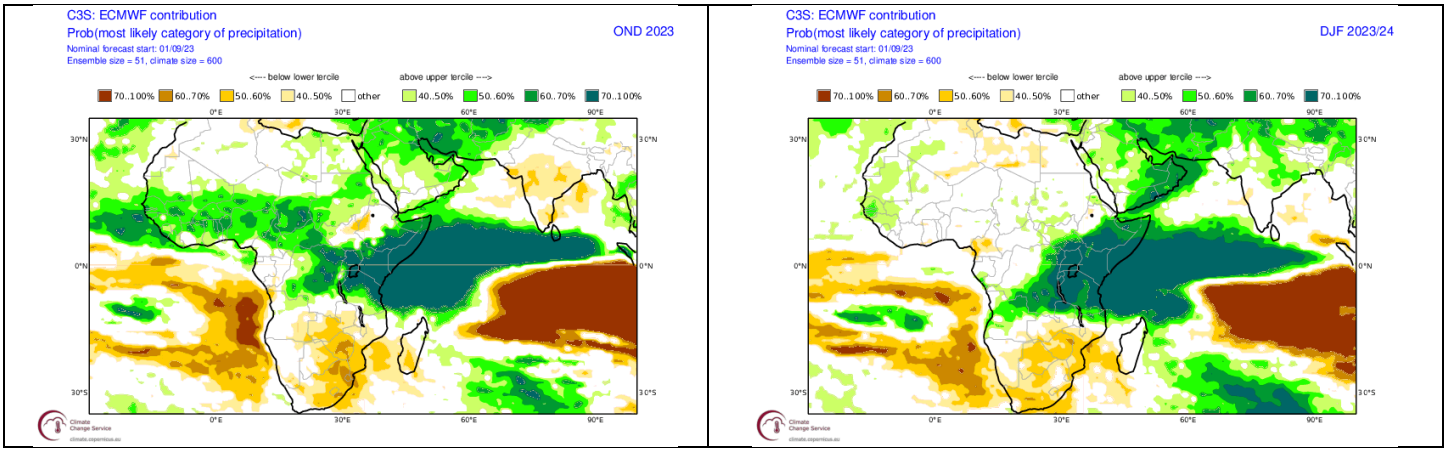
However, they (the Australian Bureau of Meteorology) do note that the trade winds have not yet been weaker than average in the western or central equatorial Pacific Ocean during any three of the last four months, which is the 4th criterion used.

In their most recent update, the BOM further notes that coupling between the ocean and atmosphere, regarding El Niño, seems to be happening, and is potentially indicative of a strengthening of the event:

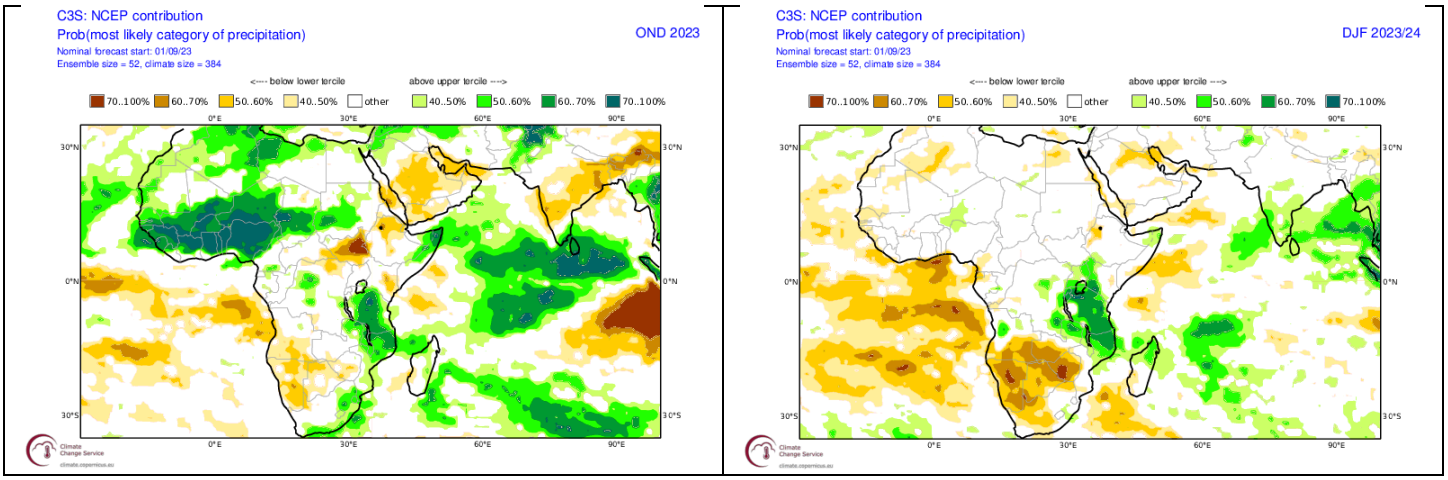
"Broad-scale pressure patterns over the tropical Pacific reflect El Niño, with the 90-day Southern Oscillation Index (SOI) at −10.2. Trade wind strength over the past week has weakened in the far western Pacific, but is close to normal elsewhere. Overall, there are signs that the atmosphere is responding 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

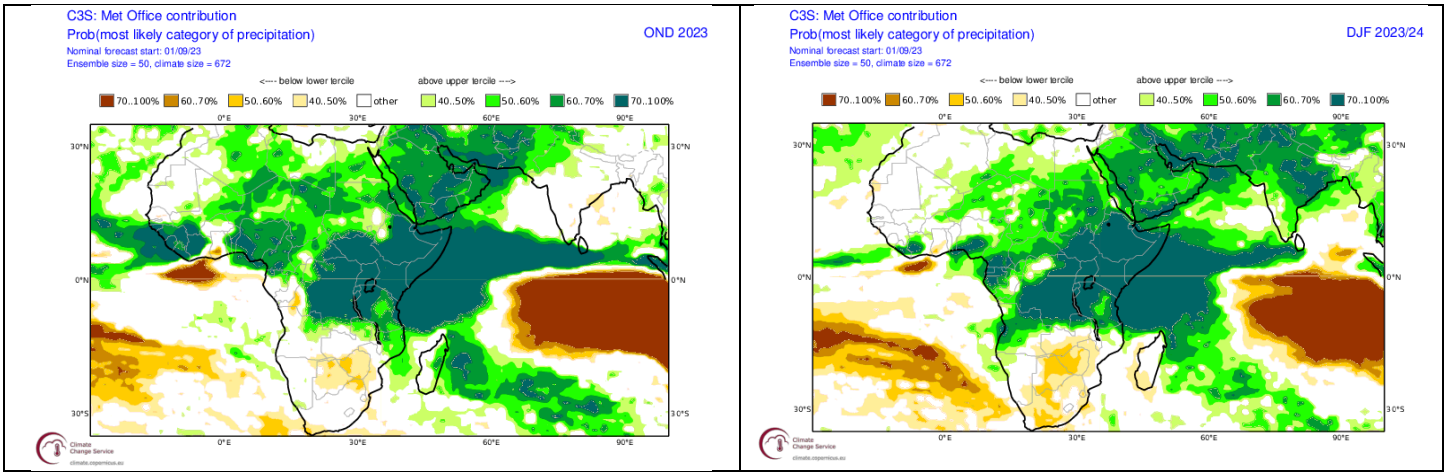
Seasonal forecasts (updated in September 2023) by these institutions, as published by the COPERNICUS Programme (***https://climate.copernicus.eu/seasonal-forecasts***) and by the IRI, reflect near-normal to below-normal rainfall expected over most of southern Africa, as can be expected during an El Niño 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.



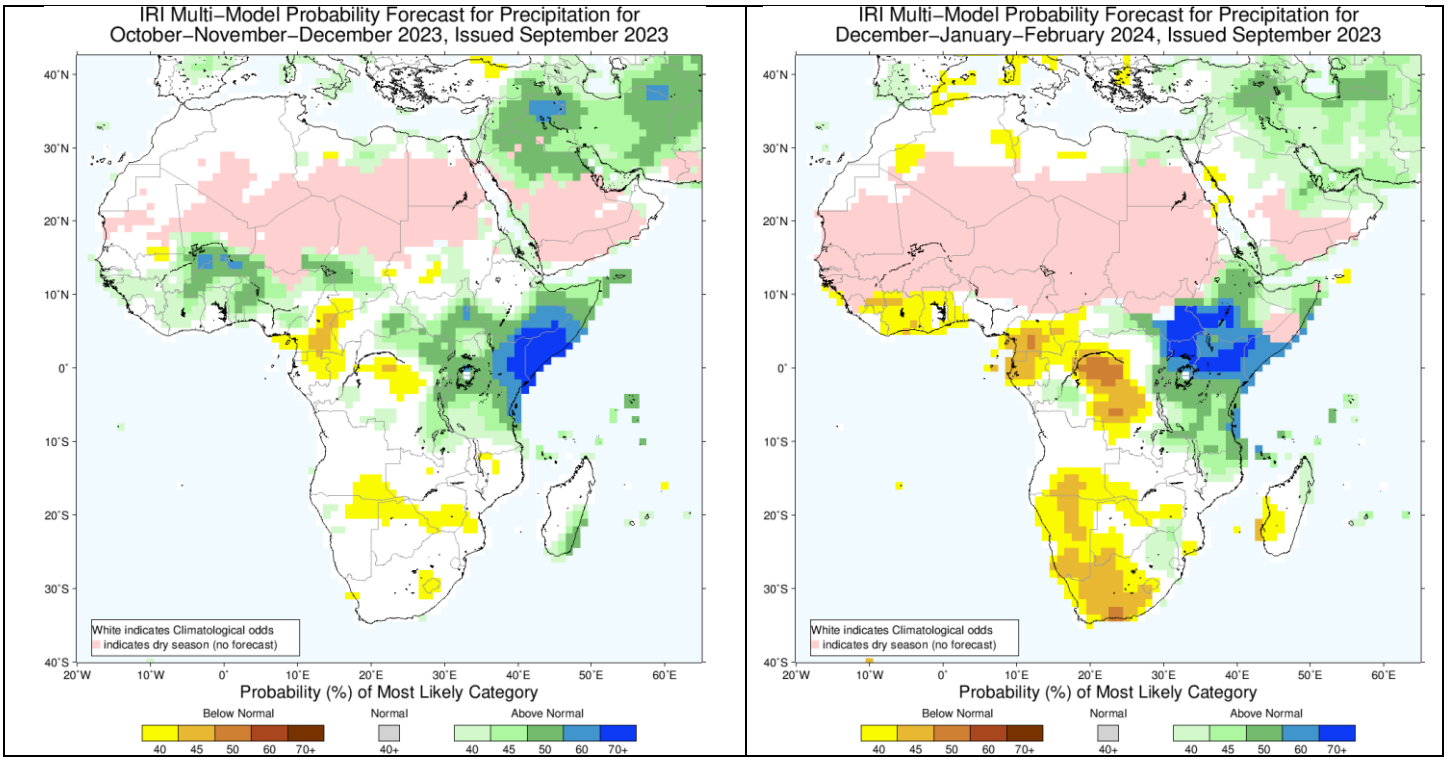
Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for spring to early summer (October-December 2023; left - Forecast issued in 2023-09) and summer (December to February 2024; right).



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



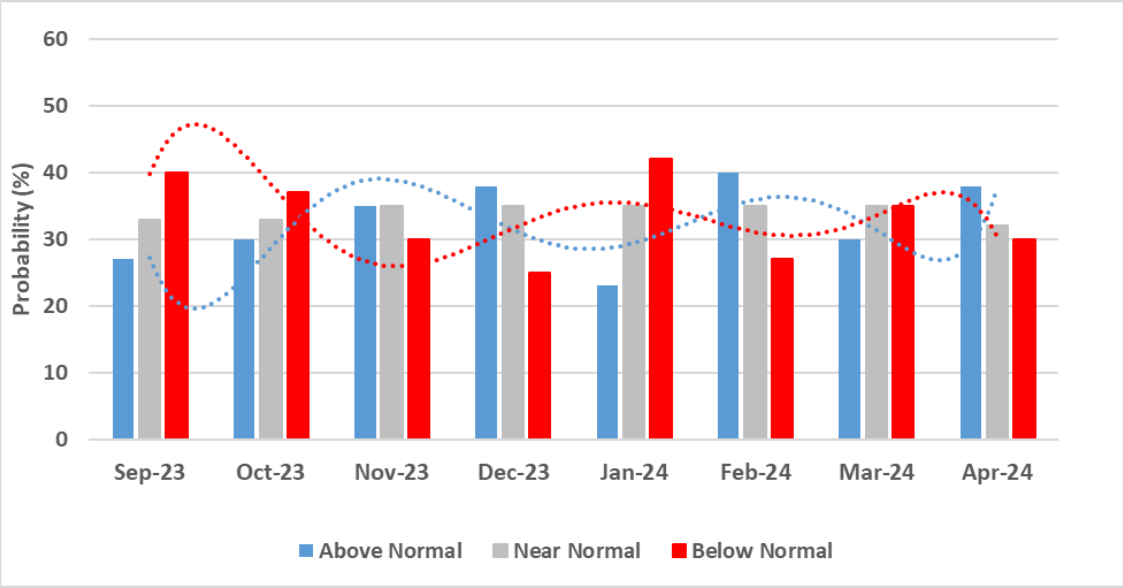
Same as above, but forecasts issued by the UK Met Office.



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.



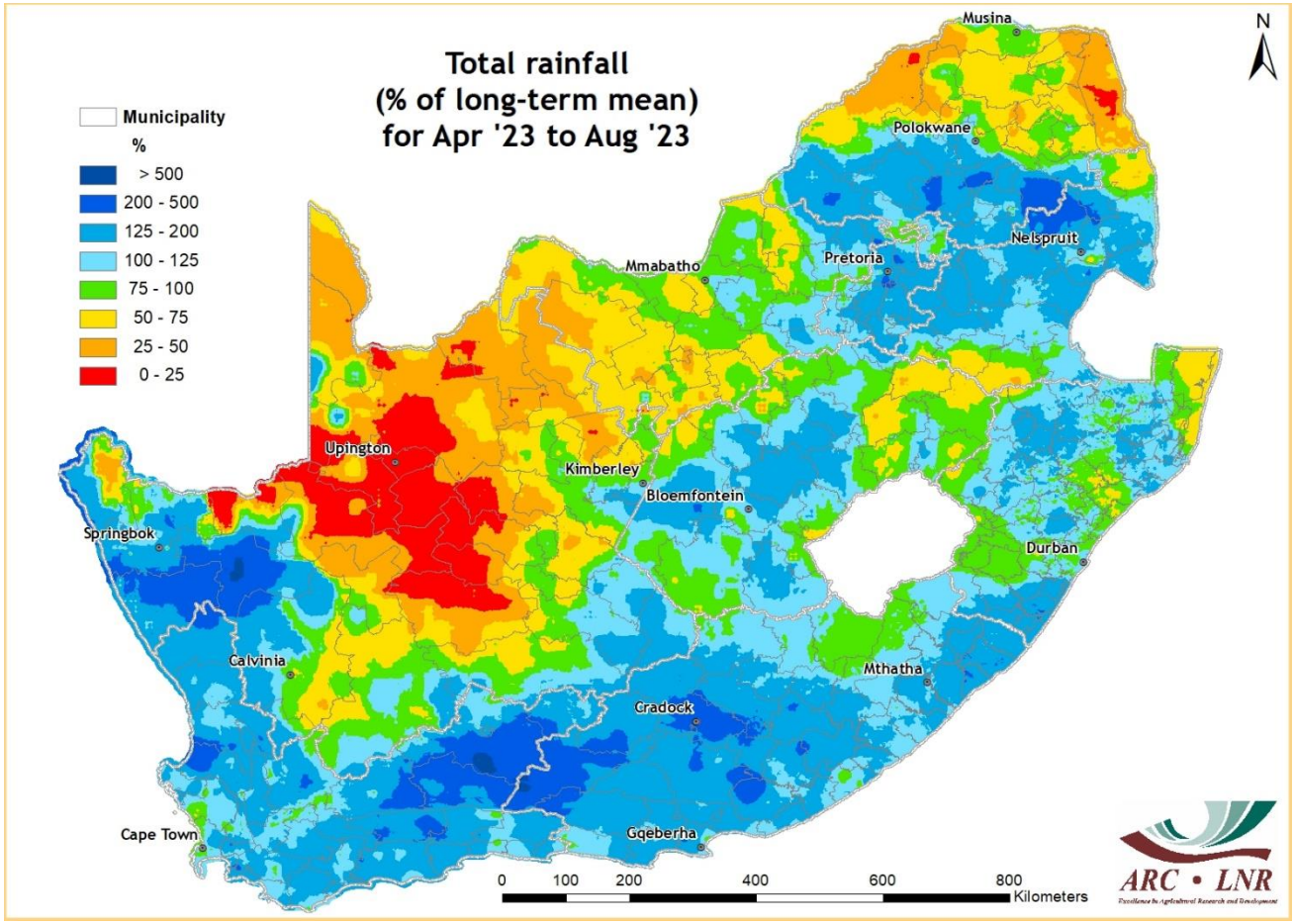
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2023 – April 2024 (Forecast issued in 2023-09).

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

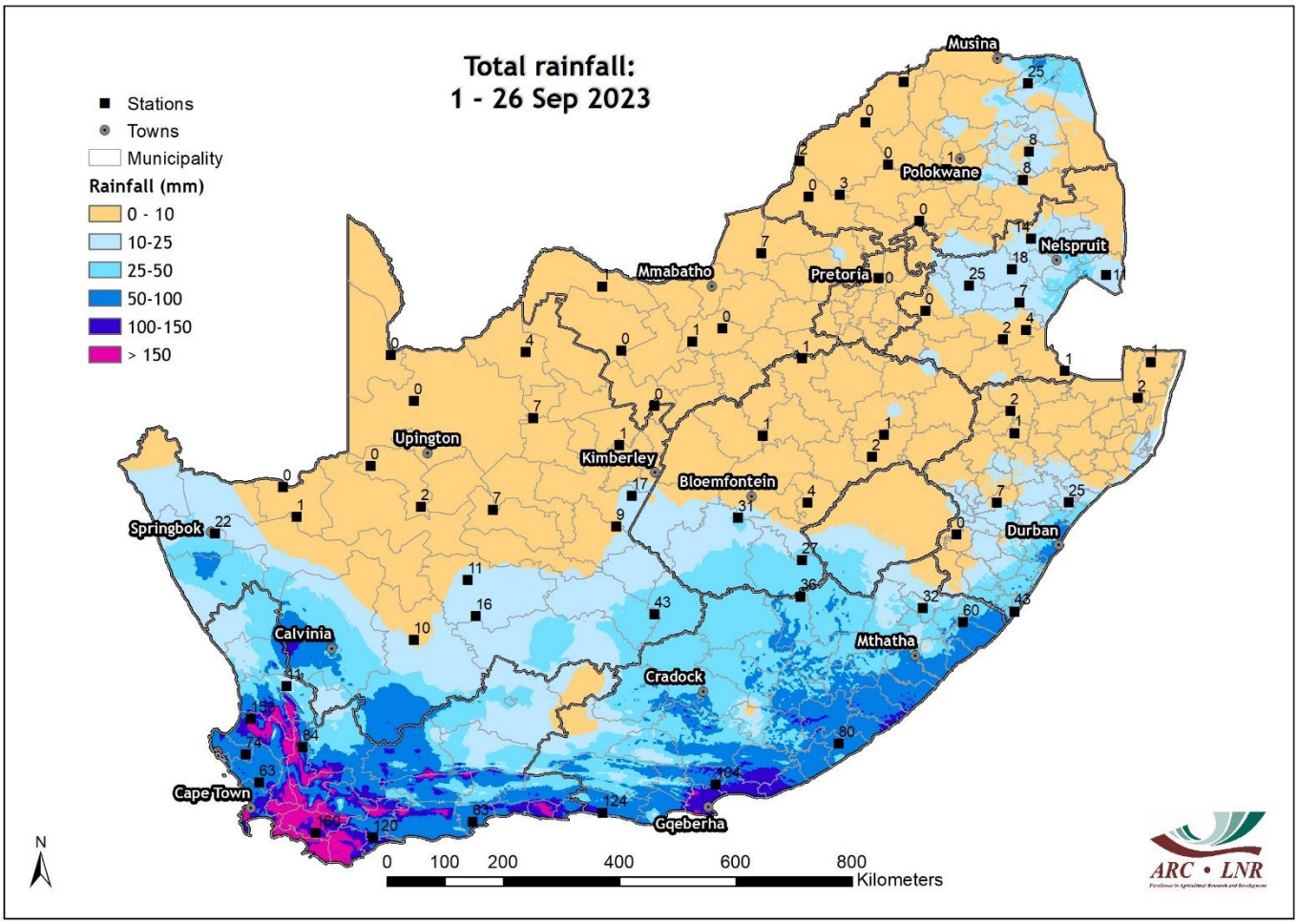
Observed conditions

Rainfall (% of long-term mean): April - August 2023



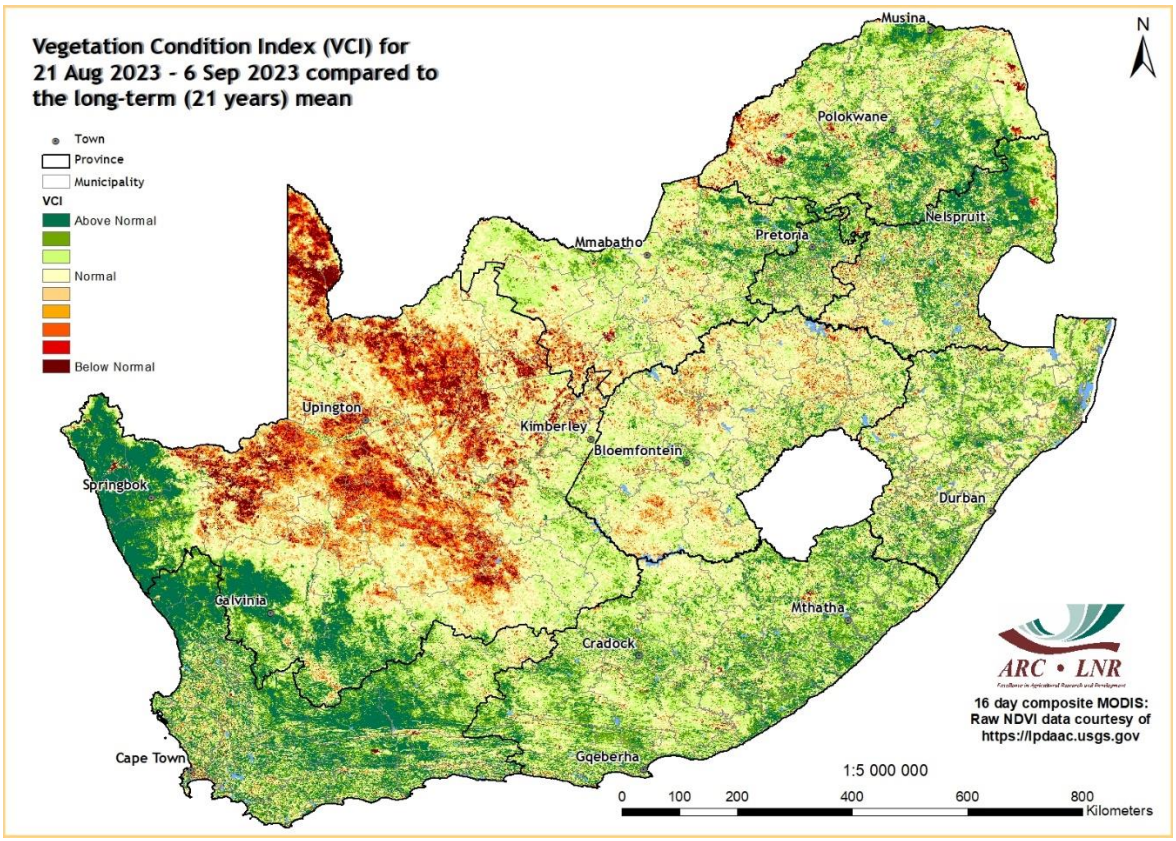
Most of the country, including the winter rainfall region, received above-average rainfall during the winter. The interior of the Northern Cape was drier than average.

Rainfall (mm): 1 – 26 September 2023



Rainfall during September so far was largely confined to the southern parts of the country, including the winter rainfall region. Some of the mountainous areas in the Overberg and Garden Route received in excess of 150 mm. The northern interior received very little rain while the far northeastern parts received some rain, but totals over these areas remained largely below 20 mm. Rainfall of the 27th over Gauteng and Mpumalanga is not reflected in the map.

Vegetation Condition Index: August to September 2023



By August and early 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 Northern Cape.

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*

AgriSeker Onderskrywingsbestuurder (Pty) Ltd. Reg no. 2014/235270/07 is an Authorised Financial Service Provider: FSP no. 45767. Underwritten by Land Bank Insurance (SOC) Ltd. Reg no. 2012/115426/30.