CUMULUS

SEASON 2023/2024

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26 October 2023

Contents

Summary

Widespread rain expected over the summer-rainfall region

The previously-discussed wetter period towards the end of the month is still on track according to the latest forecasts. Widespread rain is expected over large parts of the central to northeastern and eastern parts of the country, including the summer-grain production region. Rainfall totals are expected to range between 20 and 50 mm over large parts of this region according to current forecasts. While the chances are good for widespread rainfall, it is still 4 days before the event and the exact location and intensity of the system will change from forecast to forecast going forward, with implications for areas of heaviest precipitation. Typical conditions associated with such systems during early summer include cloudy and cool conditions with showers and thundershowers. It will also be cold over the eastern high-lying areas, such as along the Drakensberg and into the Eastern Highveld, during the event from Sunday until Tuesday. Some forecasts indicate the possibility of snow over some of these high-lying areas in the east.

Looking further ahead, a continuation of wetter conditions following the expected rainfall early next week is not guaranteed. It is not uncommon for widespread rain due to an upper-air low during late October or early November to be followed by a period of below-normal rainfall. At this stage, forecasts further ahead, while not entirely dry, show less widespread rainfall. With regard to global circulation patterns, the areas of more intense convection along the equator (as indicated by the Madden-Julian Oscillation) will be favorable for widespread rainfall over southern Africa initially, but becomes less favorable for such events by the second week of November. Moreover, the presence of upper-air troughs far to the west in the Atlantic Ocean later next week is an indication of less favorable circulation patterns for rain over the northeastern summer rainfall region by that time, but possibly more favorable for the western to central interior.

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

General:

- Temperatures will on average be below normal over the interior, but above normal in the far west and the west coast.
- Total rainfall is expected to be above-normal for this time of the year over the central to eastern and northeastern parts as well as along the Garden Route.
- It will be hot initially over much of the interior. Hot conditions will be confined to the northeast by Saturday when cool air will have invaded most of the central to southern parts.
- It will be cooler than normal over the country from Sunday onwards, but berg-wind-conditions along the west coast will result in above-normal temperatures in the far west.
- Cool, cloudy weather with showers and thundershowers is expected from late Sunday until Tuesday over most of the central to eastern and northeastern areas. The eastern high-lying areas will be cold.
- The winter-grain-production region in the southwest will experience some showers initially with a cold front moving through, with showers lingering along the Garden Route until Saturday, after which the region is expected to be dry for the rest of the period with strong south-easterlies in the southwest.

Overview of expected conditions over the main agricultural production areas

An upper-air trough over the interior this weekend, with the development of an upper-air cut-off low by Monday, will result in above-normal rainfall over the central to eastern and northeastern parts of the country, including the summer-grain production region. The typical conditions associated with such a system over the interior include cool, cloudy weather with showers on-and-off, together with the development of thundershowers in certain areas. The influx of cooler air from the south and east will result in cold conditions over the high-lying eastern areas from Sunday to Tuesday.

Over the winter grain-production areas in the southwest, high-pressure systems to the south will result in showers at times along the Garden Route, but the western to northwestern parts of the winter rainfall area is expected to remain relatively dry.

Maize production region: **Conditions will start out as warm to hot and dry, but thundershowers will occur from Saturday and it will become cloudy and cool with widespread showers and thundershowers from Sunday, with cold conditions in the east:**

- Maximum temperatures over the western maize-production areas will be in the order of 12 – 35°C, with the hottest conditions initially and cool conditions early next week. Minimum temperatures will be in the order of 11 – 19°C, with lowest temperatures also later in the period.
- Maximum temperatures over the eastern maize-production region will range between 8 and 33°C' with hot conditions initially and low temperatures early next week. Minimum temperatures will be in the order of 7 - 18°C, also with lowest values by early next week.

- **Thursday (26th):** Partly cloudy and warm, but hot in the west.

- **Friday (27th):** Partly cloudy and warm, but hot in the west where it will be windy later and isolated thundershowers are expected, spreading to the central parts later.

- **Saturday (28th):** Partly cloudy and warm, with moderate south-westerly westerly winds in the west. Isolated thundershowers will develop over the central to eastern parts, becoming scattered in the east.

- **Sunday (29th):** Partly cloudy, mild and windy, becoming cloudy over the eastern parts with scattered thundershowers.

- **Monday (30th):** Cloudy and cool with widespread rain and thundershowers, but cold in the east.

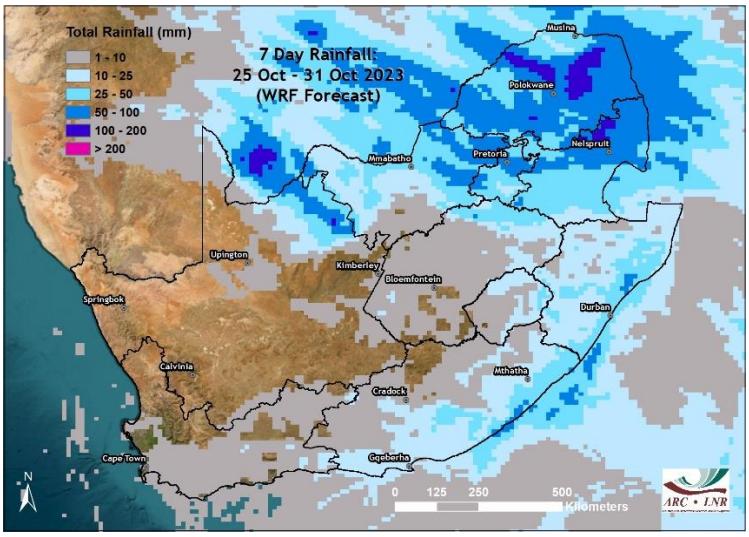
- **Tuesday (31st):** Cloudy and cool with widespread rain and thundershowers, but cold in the east.

- **Wednesday (1st):** Cloudy and cool with showers in the east, but partly cloudy and mild in the west.

Cape Wine Lands and Ruens: A cold front will bring cool conditions with westerly to southwesterly winds initially, with showers over especially the southwestern parts and into the Boland. The wind will become strong southeasterly in the southwest when showers will be focused on the Garden Route by Saturday. From Sunday onwards, strong south-easterlies will dominate in the southwest while the southern parts should remain relatively cool and while the western to northwestern parts of the region will be warm to hot, supporting harvest activities.

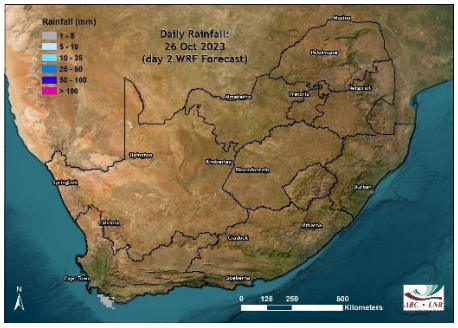
Daily summary of expected conditions

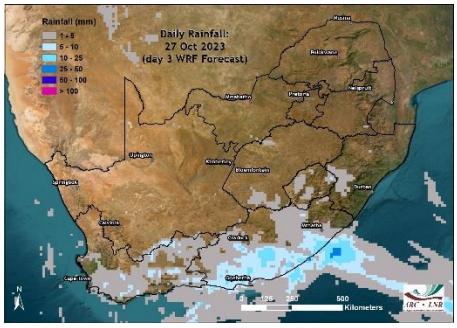
(GFS forecast downscaled using WRF)

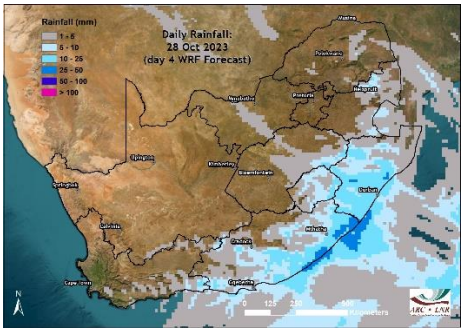


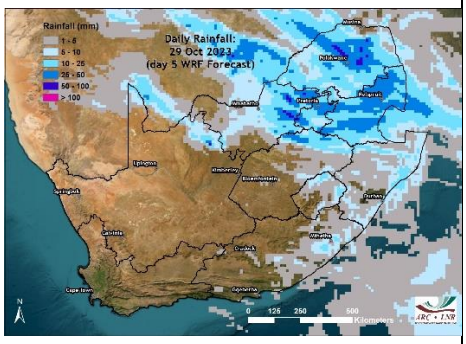
Rainfall

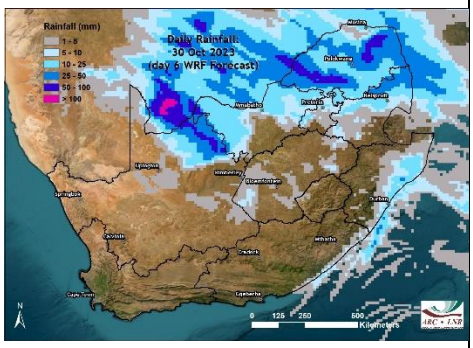
- Large parts of the summer rainfall region may see rainfall totals during the next few days exceeding 25 mm and exceeding 50 mm in some areas.
- The areas with highest totals are currently indicated to be somewhat further south than on this specific model run.
- Large parts of the eastern seaboard and adjacent interior may also receive in excess of 25 mm.
- Rain is expected along the Garden Route, but totals should be lower than 25 mm.

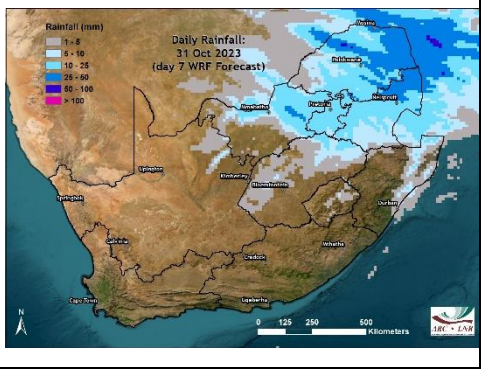




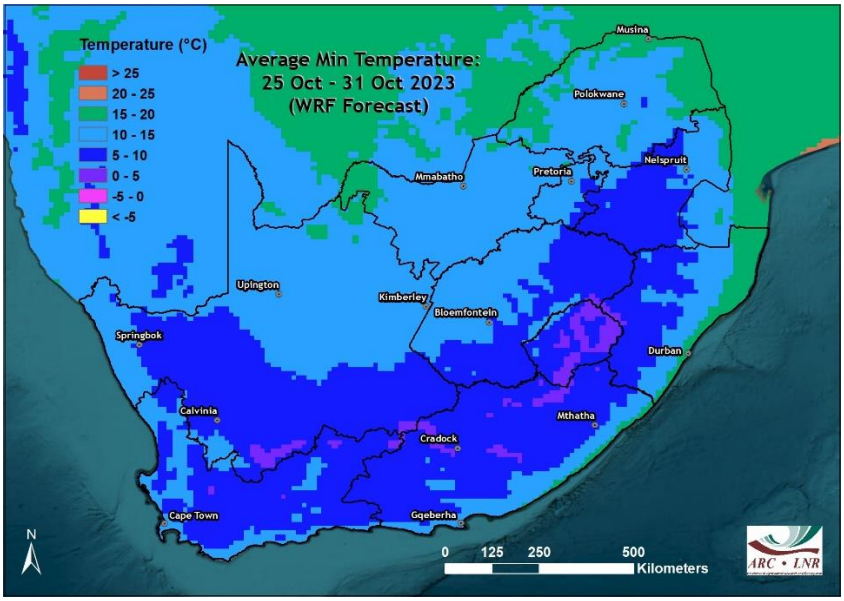






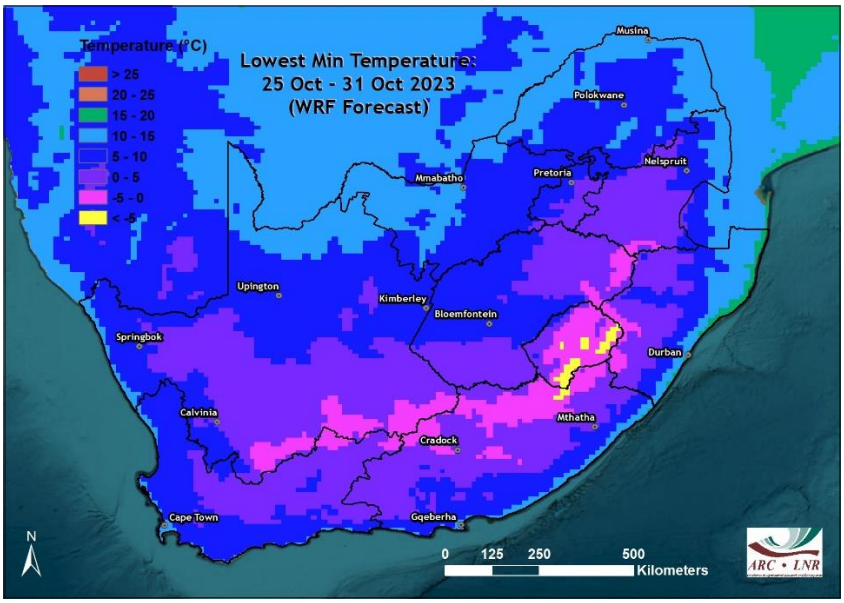


- It will be dry initially.
- Showers are expected along the Garden route and into the Karoo on Friday, spreading up the eastern seaboard and adjacent interior on Saturday when isolated thundershowers will develop in a band over the summer rainfall region. Significant falls are possible over southern KZN.
- Rain and thundershowers will occur over much of the central to eastern and northern parts from Sunday to Tuesday, with the higher totals expected somewhat further south than indicated on the maps for this specific model execution.



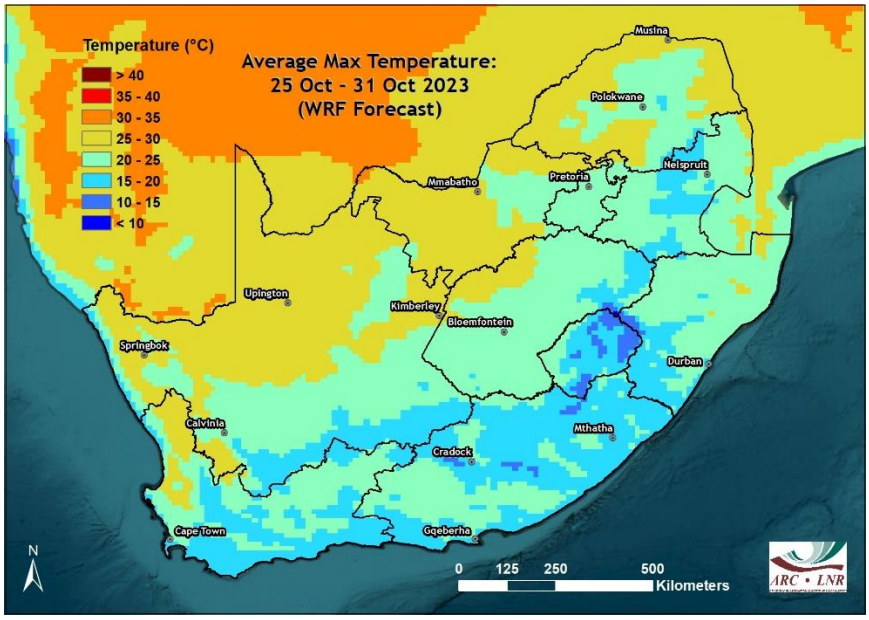
Average minimum temperatures

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



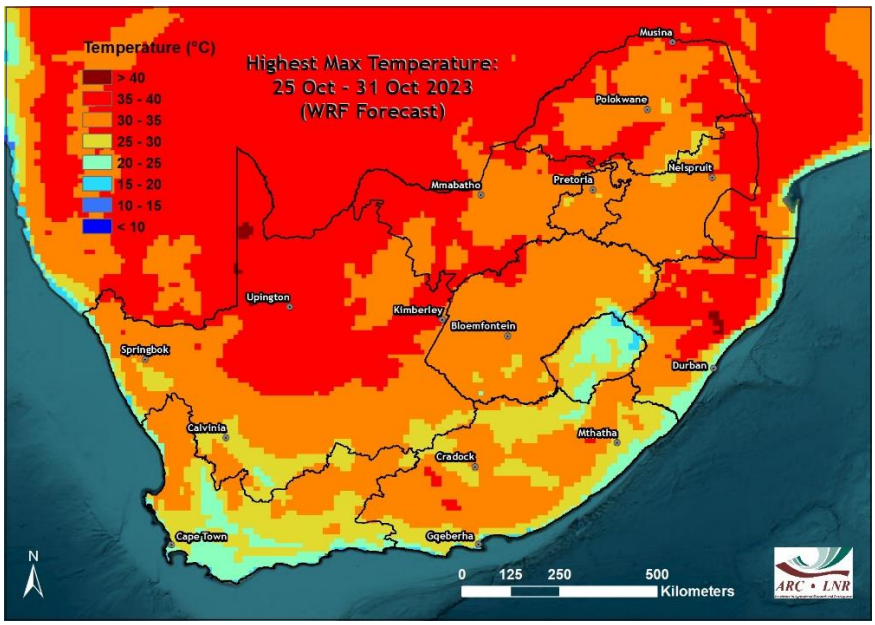
Lowest minimum temperatures

- Lowest minimum temperatures over the Drakensberg and high-lying adjacent areas of the Free State, Mpumalanga, KZN and Eastern Cape as well as along the southern escarpment could be in the order of 0°C early next week according to current forecasts.



Average maximum temperatures

- Average maximum temperatures will be relatively low.
- The average maximum temperature during this period is not expected to exceed 20°C over large parts of Mpumalanga, and large part of the Eastern Cape.

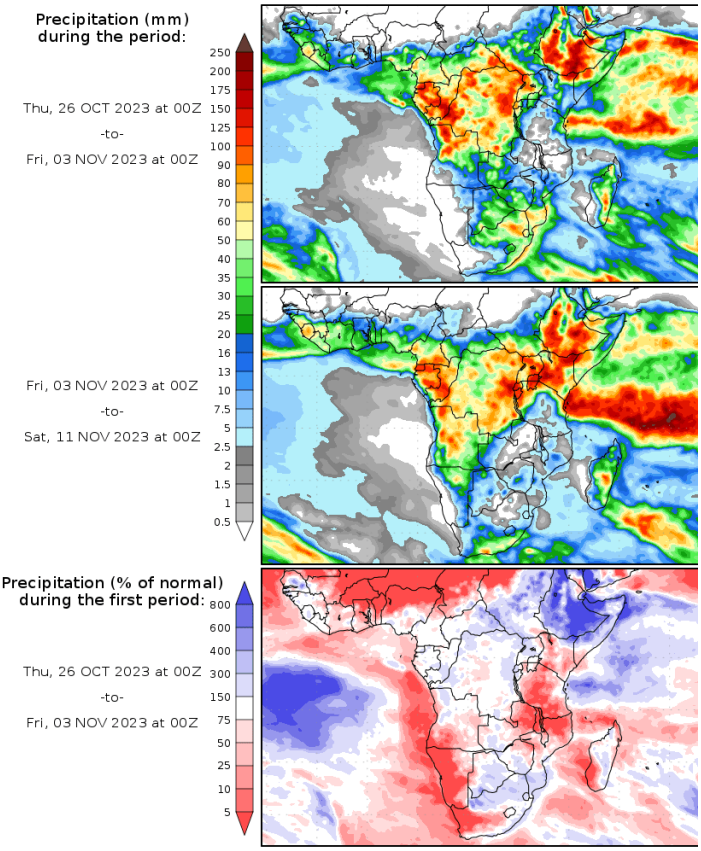


Highest maximum temperatures

- Hot conditions (>35°C) will occur over the central to northern and northeastern interior initially (26th, 27th), becoming cooler from the south on the 27th.
- Hot conditions (>35°C) will occur over large parts of KZN on Friday (27th).
- Hot conditions (>35°C) will continue over the northeastern parts on Saturday (28th).
- Hot conditions (>35°C) will develop in the far west, such as the lower Orange, by next week.

Medium term rainfall and temperature summary

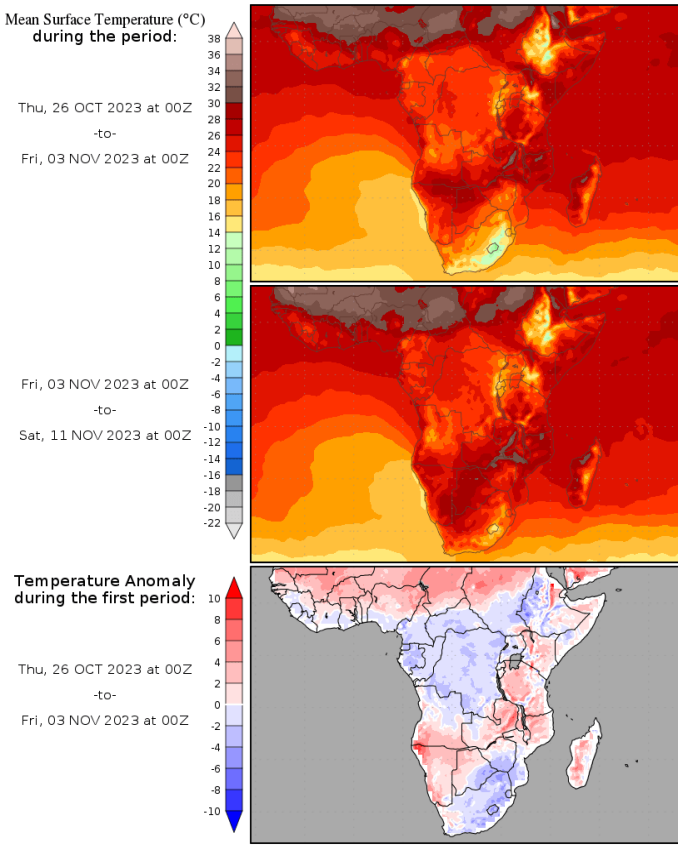
Precipitation Forecasts



Precipitation forecasts from the National Centers for Environmental Prediction.
Normal rainfall derived from Xie-Arkin (CMAP) Monthly Climatology for 1979-2003.
Forecast Initialization Time: 00Z26OCT2023

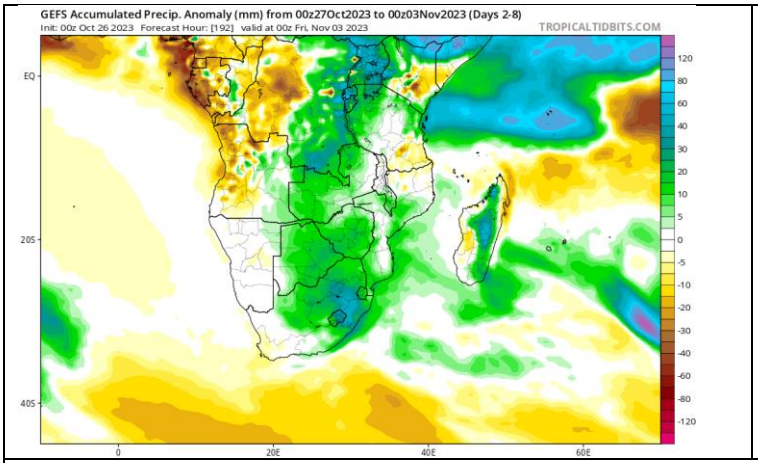
GrADS/COLA

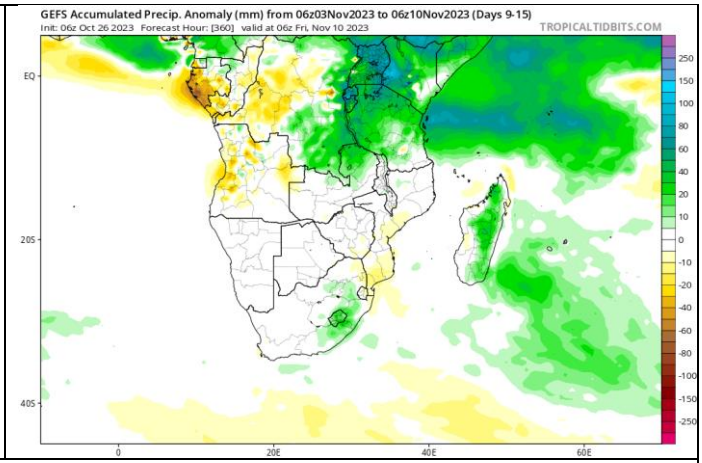
Temperature Forecasts



Temperature forecasts from the National Centers for Environmental Prediction.
Normal Temperature derived from CRU monthly climatology for 1901-2000
Forecast Initialization Time: 00Z26OCT2023

GrADS/COLA





The GFS ensemble forecast (consisting of several forecasts with small initialization differences) favors wet conditions over the central to eastern parts of the country, including the summer-grain areas, associated mostly with the rain-bearing system early next week. Relatively wet conditions may still be present over the southeastern summer-rainfall region towards the second week of November, according to the current forecast.

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 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 (28th).**
  - Eastern parts of the Northern Cape, western to northwestern and central Free State and southern North West: **Monday/Tuesday (30th/31st).**

- **Thunderstorms may become severe:**
  - Central to eastern Northern Cape, western North West, western Free State: **Monday (30th).**

- **It will be hot:**
  - Central to northern, northeastern and eastern interior: **Thursday and Friday (26th – 27th).**
  - The Limpopo River Valley and Lowveld: **Friday and Saturday (27th - 28th).**
  - Central to northern and eastern KZN: **Friday (27th).**

- **Minimum temperatures may be in the low single digits and approach zero, with possible frost of snow::**
  - Lesotho Drakensberg and surrounding parts of SA, including high-lying areas of southeastern Mpumalanga and eastern Free State as well as northern high-lying areas of the Eastern Cape: **Sunday to Tuesday (29th – 31st).**

- **It will be windy, enhancing the fire hazard where vegetation is dry:**
  - Central to southern and western Northern Cape: **Saturday to Monday (28th – 30th).**

- **It will be cool, wet and windy, interfering especially with harvest activities:**
  - Garden Route, southern to southeastern interior: **Friday to Saturday (27th – 28th).**

- **Cloudy, wet and windy conditions may interfere with agricultural activities:**
  - Eastern parts of the Northern Cape, North West, Gauteng, Mpumalanga, Free State, Limpopo, KZN, northern parts of the Eastern Cape: **Monday to Tuesday (30th – 31st).**

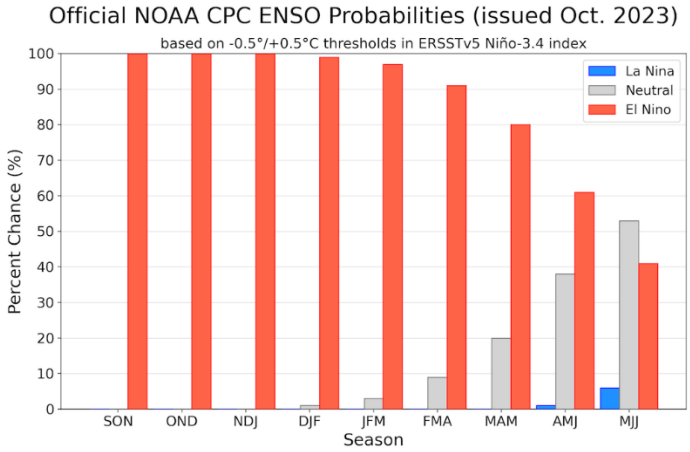
- **It will be cold and wet, with snow possible over high-lying mountainous parts:**
  - Drakensberg and adjacent areas of the Free State, Mpumalanga and Eastern Cape: **Sunday to Tuesday (29th – 31st).**

- **Strong south-easterly winds are expected:**
  - Southwestern Cape coast: **Friday to Tuesday (27th – 31st).**

Seasonal forecast

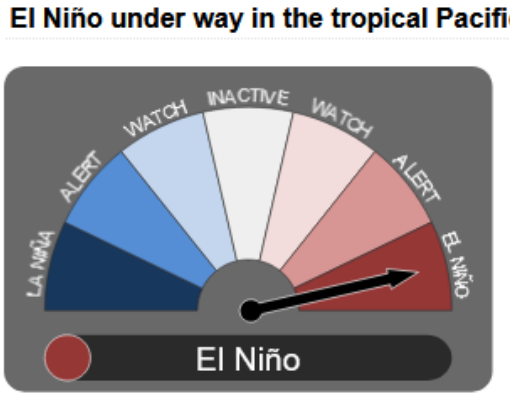
Current ENSO conditions:

The current El Niño event is expected to last through our summer at least into early 2024. Various international institutions indicate the expectation of further intensification. The Australian Bureau of Meteorology has now also reported that observed trade winds in the Equatorial Pacific are weaker than average and even reversed direction in certain areas, showing atmospheric anomalies consistent with a full-fledged El Niño with ocean-atmosphere coupling. The IRI's latest ENSO forecast still maintains the expectation of a continuation into autumn:



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

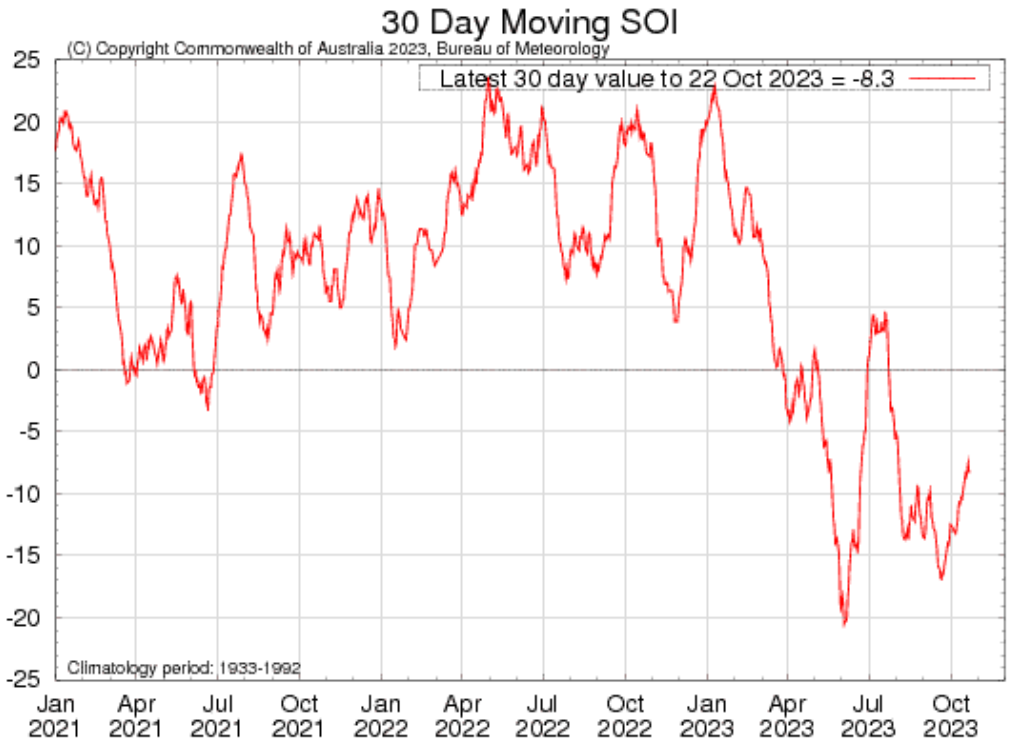
Likewise, the Australian Bureau of Meteorology keeps their outlook to "El Niño" ……



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

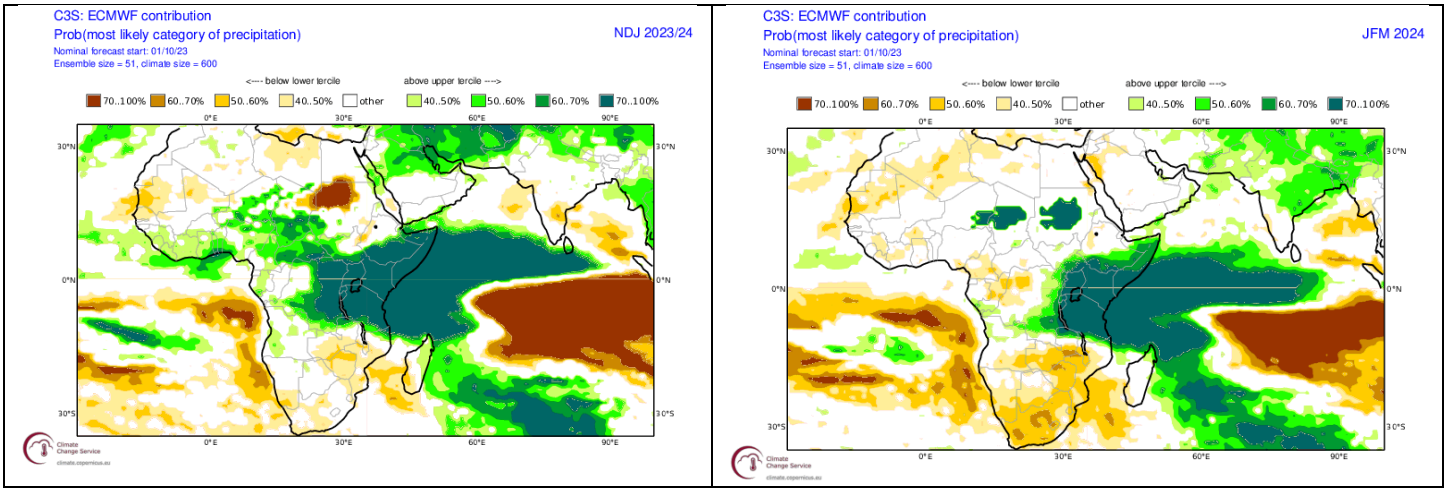
However, they (the Australian Bureau of Meteorology) do note that the trade winds have not yet been weaker than average in the western or central equatorial Pacific Ocean during any three of the last four months, which is the 4th criterion used. It is weaker currently, and if this will persist, the 4th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

In their most recent update (24 October), the BOM further notes the "Oceanic indicators exhibit a clear El Niño state. Central and eastern Pacific sea surface temperatures (SSTs) continue to exceed El Niño thresholds, with warmer than average waters beneath the surface supporting the warmth at the surface. Models indicate some further warming of central to eastern Pacific SSTs is likely, with SSTs remaining above El Niño thresholds into the early southern hemisphere autumn 2024" *Australian Bureau of Meteorology* - http://www.bom.gov.au**.**

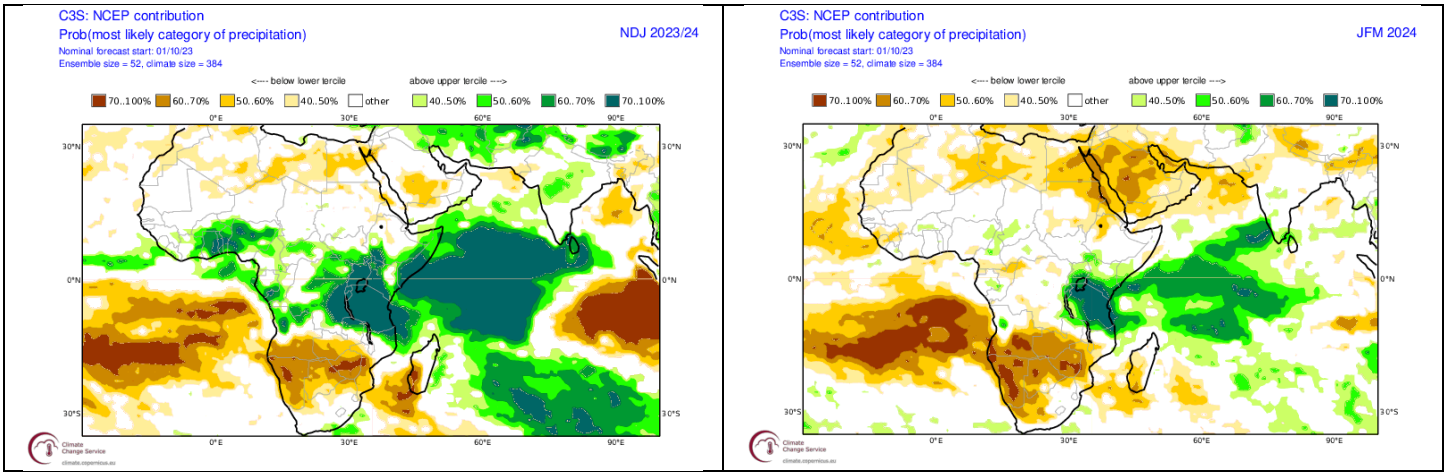
Regarding the atmospheric component, they also note that "Broadscale pressure and cloudiness patterns over the Pacific reflect El Niño. Trade wind strength over the past fortnight has been weaker than average over most of the Pacific" - *Australian Bureau of Meteorology* - http://www.bom.gov.au

Seasonal forecasts issued by various international institutions

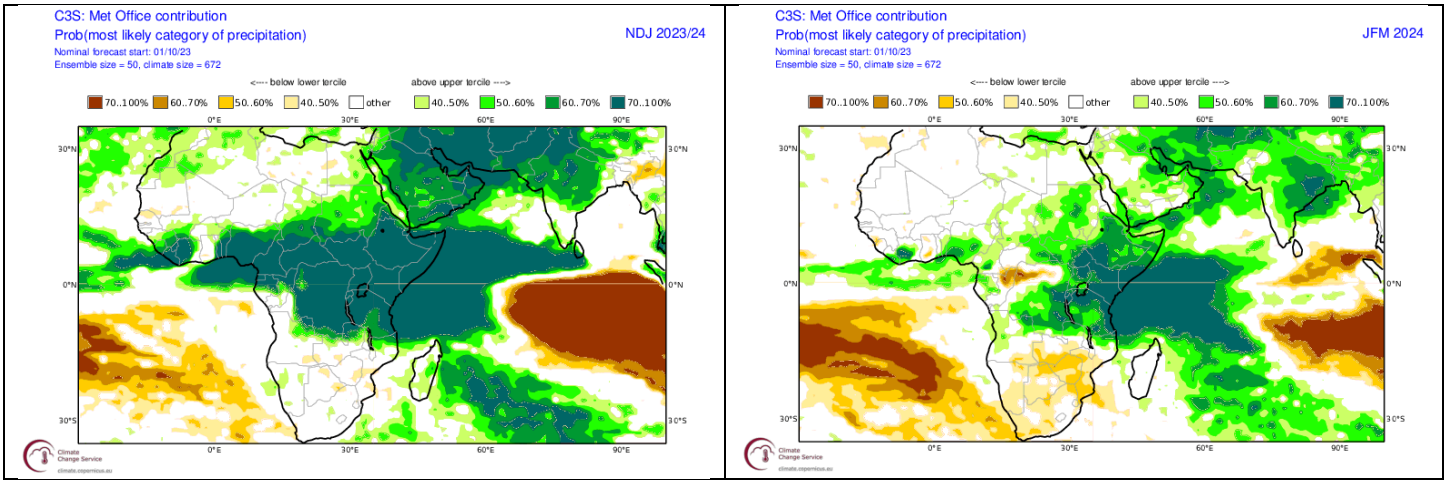
Seasonal forecasts (updated in October 2023) by various institutions, as published by the COPERNICUS Programme (***https://climate.copernicus.eu/seasonal-forecasts***) and by the IRI, still expect drier conditions towards late summer compared to during early and mid-summer. Moreover, the forecasts for late summer have drifted drier with the most recent (October-issued) forecasts. The drier pattern over southern Africa is to be expected with regard to seasonal forecasts given the current El Niño event. During the December – February and January – March period, forecasts still lean more strongly towards drier than normal conditions over the central to western parts of the country while the somewhat wetter signal over the eastern parts have weakened and mostly leans towards drier conditions.



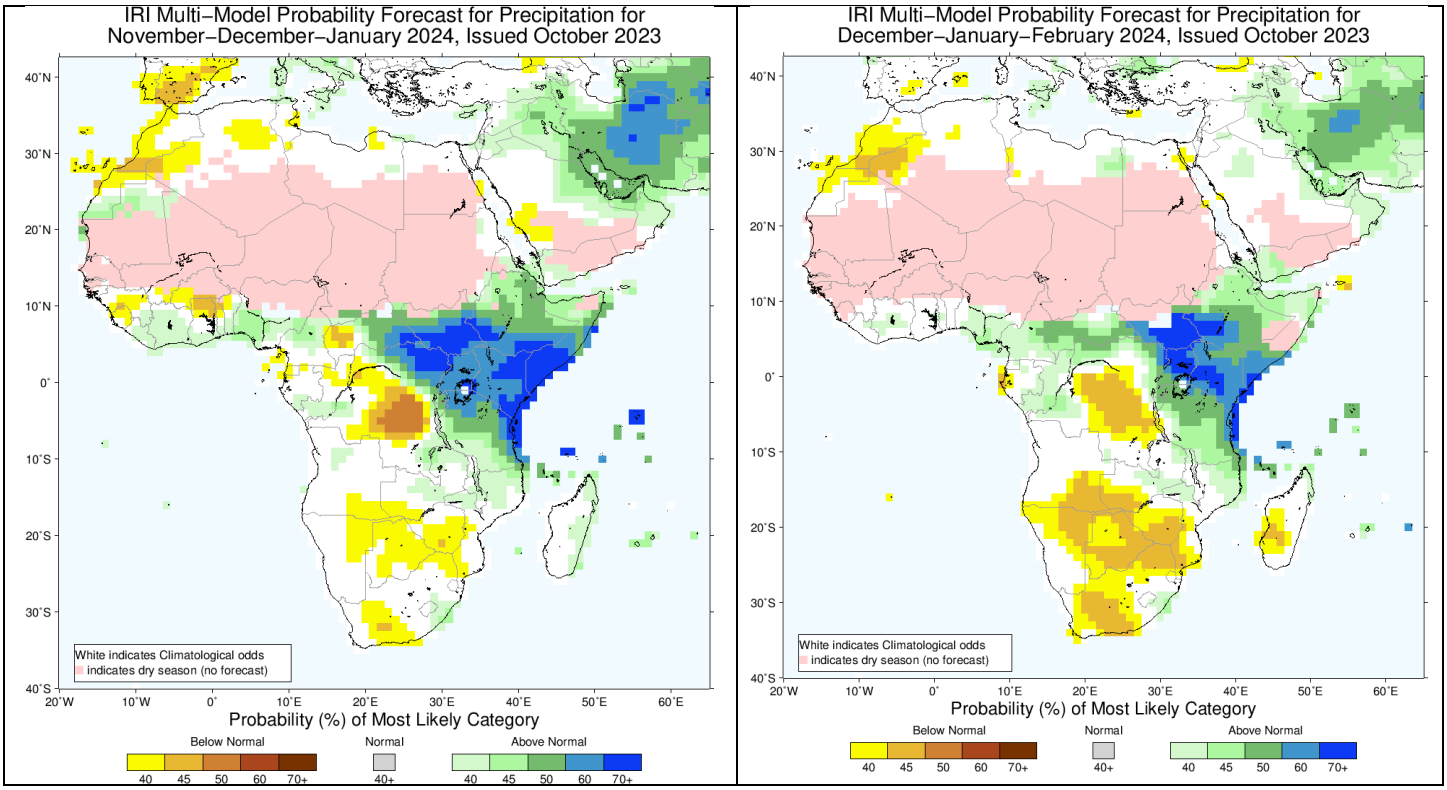
Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for mid-summer (November-January 2023/24; left - Forecast issued in 2023-10) and mid-to-late summer (January to March 2024; right).



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



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



Probabilistic forecasts by the International Research Institute for Climate and Society (IRI) for rainfall for mid-summer (November-January 2023/24; left - Forecast issued in 2023-10) and mid-to-late summer (December to February 2023/24; right).

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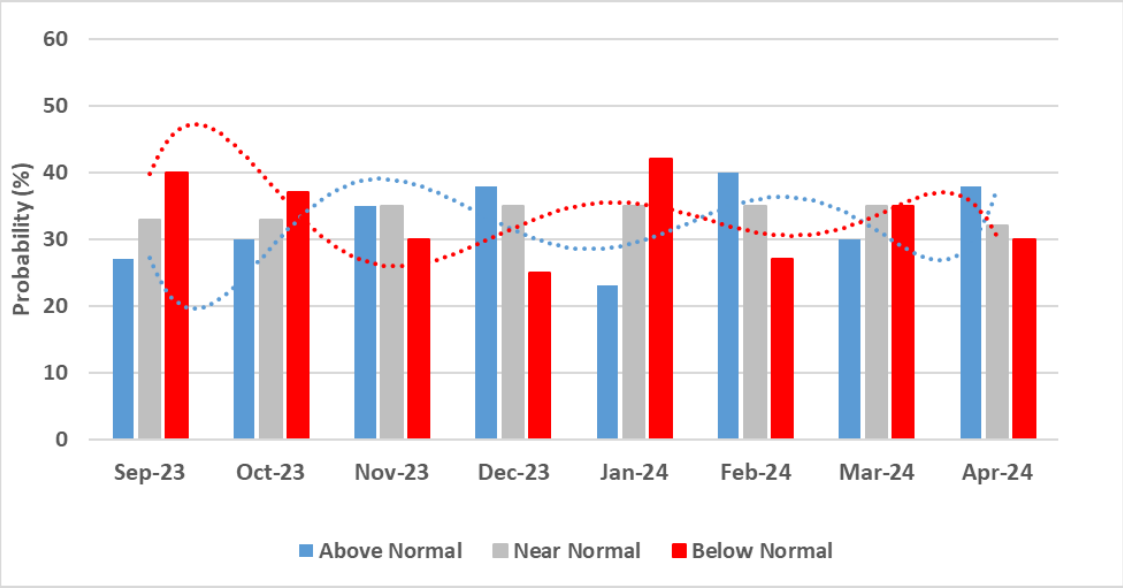
CUMULUS seasonal outlook

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.



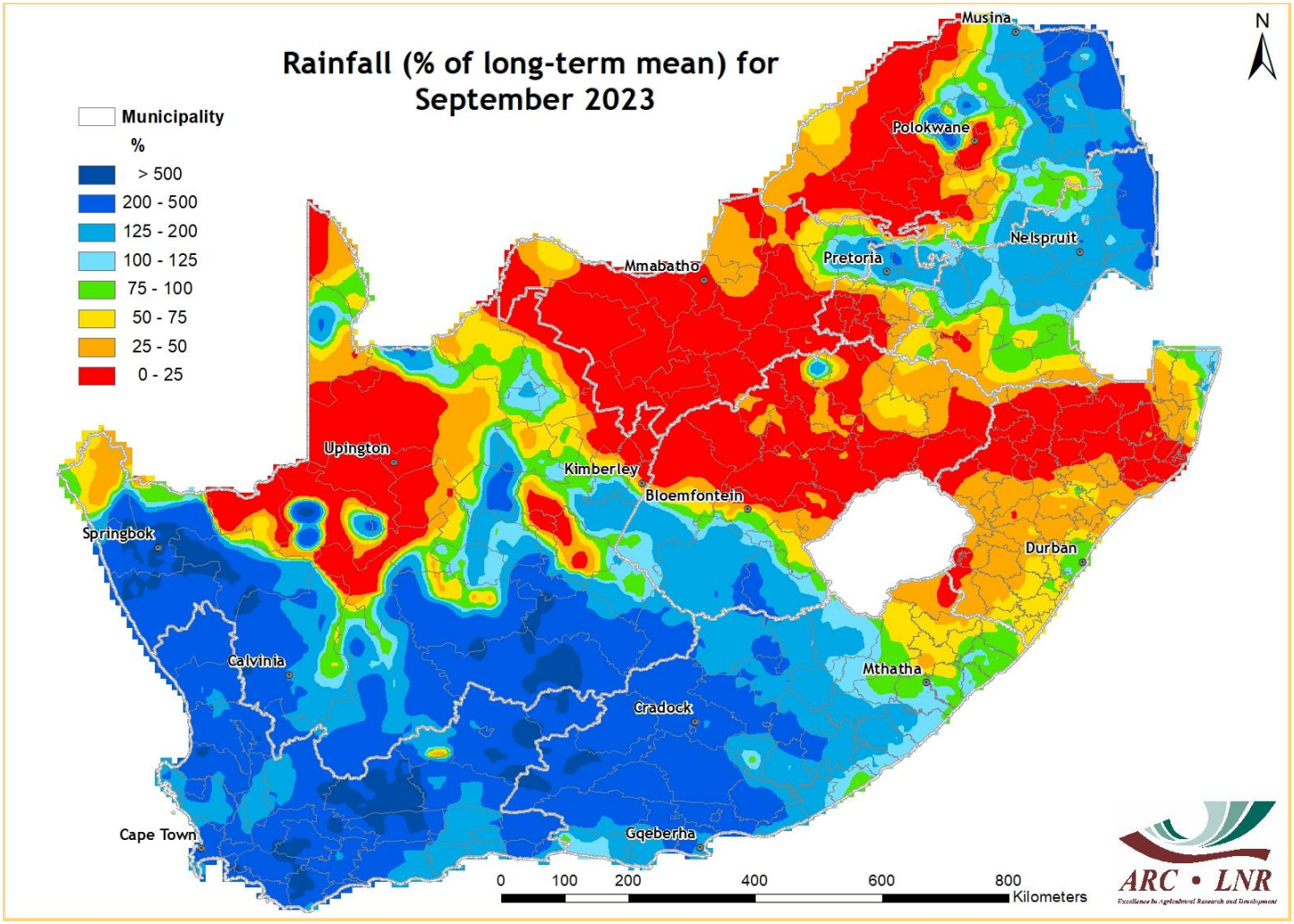
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2023 – April 2024 (Forecast issued in 2023-09).

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

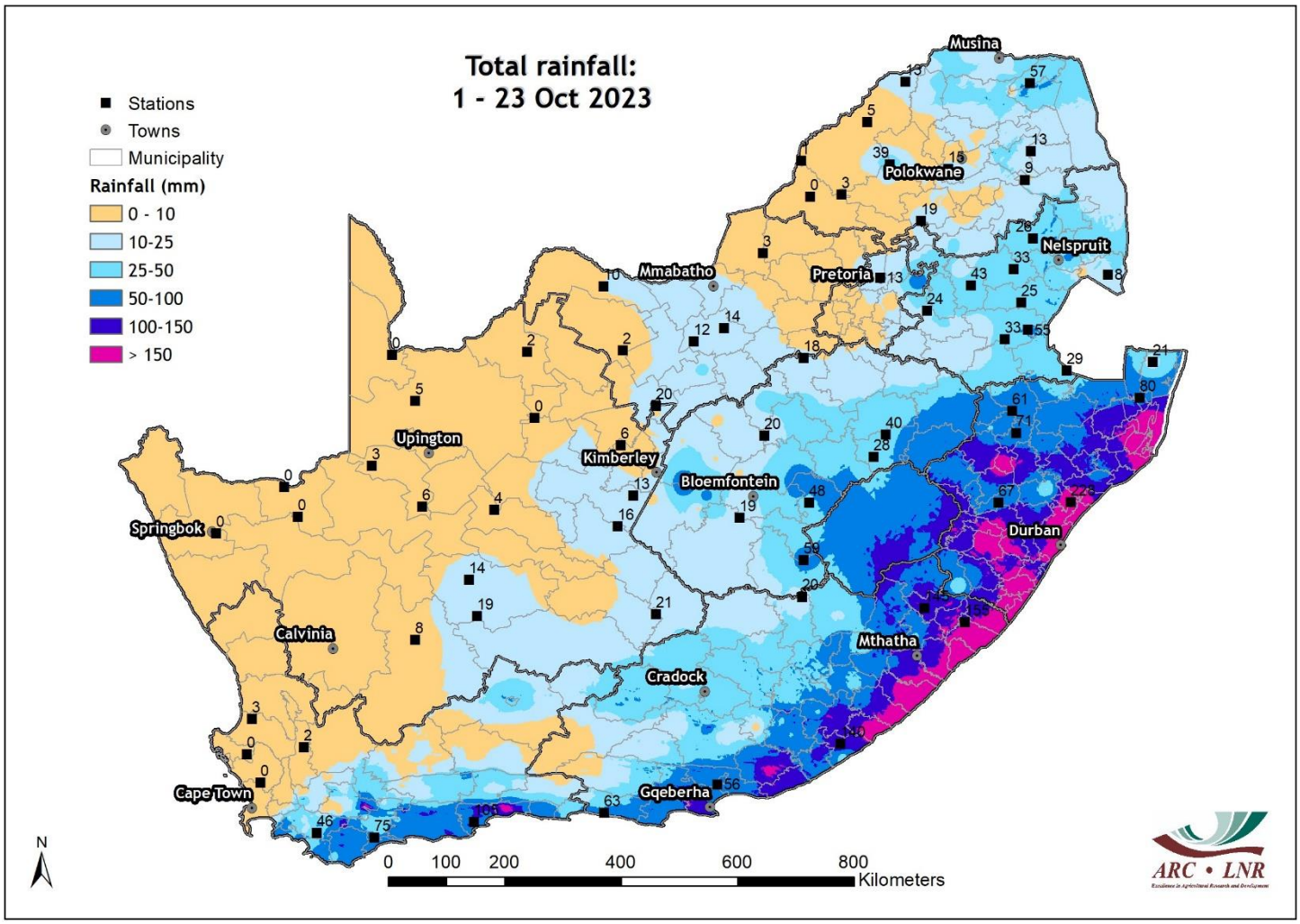
Observed conditions

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



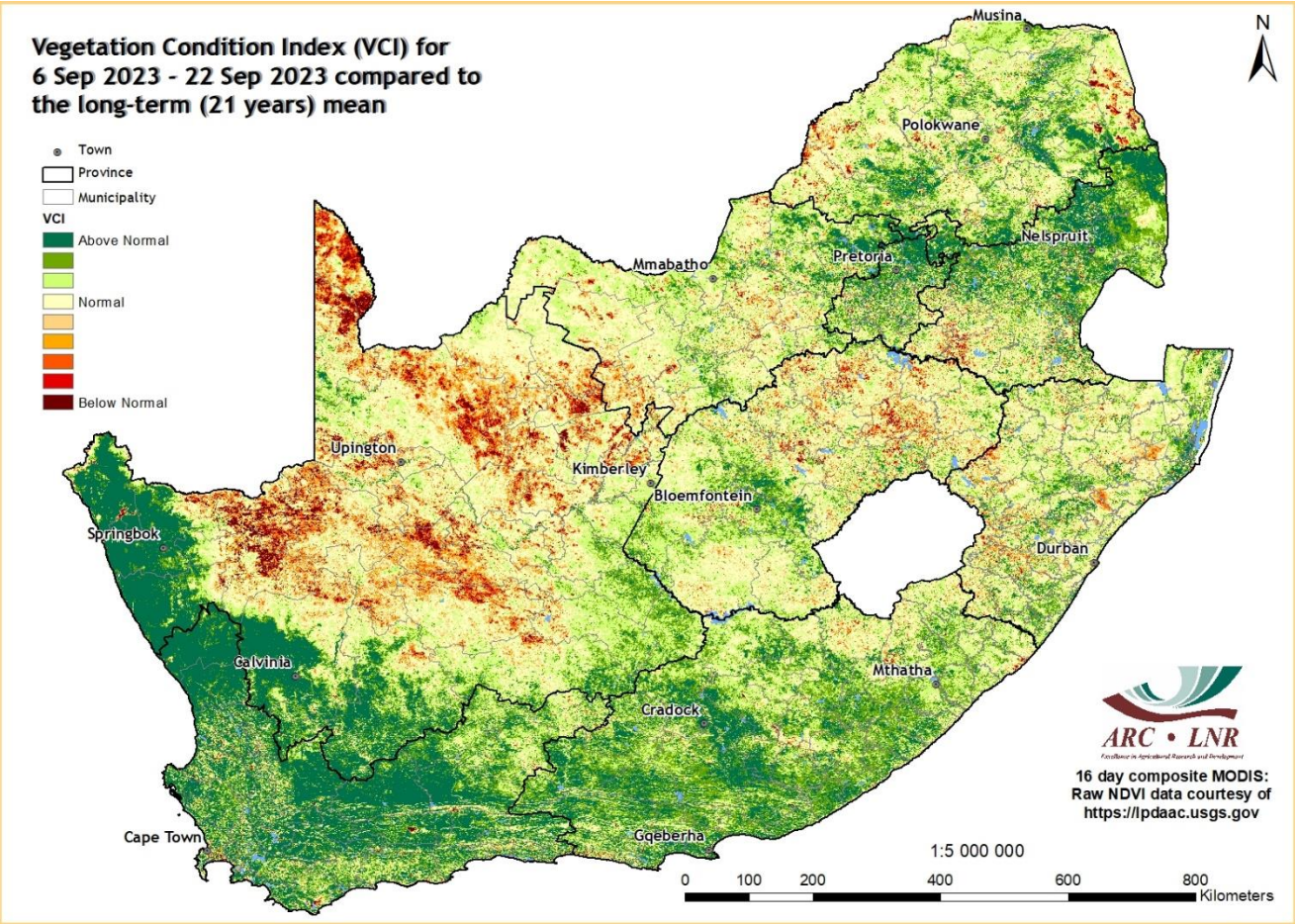
Above-average rainfall occurred over the southern-to-far-western parts of the country, including the winter rainfall region. Above-average rainfall also occurred over the northern parts of Gauteng, most of Mpumalanga and eastern Limpopo. The rest of the interior was relatively dry.

Rainfall (mm): 1 – 23 October 2023



The central to northern interior and western parts of the country were relatively dry during the first 23 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*

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

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

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