

# CUMULUS

**WE GET  
AGRICULTURE'S  
♥ BEAT**



**13 April 2022**

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Photo credit: Stefni Kuschke

# Summary

## *More rain over the summer rainfall region*

More wet conditions are in store over the summer rainfall region during the next few days. An upper-air trough will be responsible for most of the action, and while not as intense as the system of the previous few days, it may still generate cool, cloudy periods with widespread showers or thundershowers during the long weekend across the central to eastern interior. Yet another cold front will move over the southern parts of the country early in the period and with a fairly strong flow of colder air from the south, light frost is possible again over the southern high-lying interior and possibly in isolated pockets further north.

Certain areas may receive cumulative totals in excess of 50 mm of rain during the weekend, especially over the central to eastern North West, southern Limpopo, Gauteng, southern and western Mpumalanga as well as the northern Free State. Following earlier wet weather, these may lead to water-logged conditions.

Given the expected weather patterns of the next few days, there is no imminent threat of widespread significant frost according to current short to medium-term outlooks.

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

- **General:**

- Temperatures will on average be below normal over the central and eastern parts, but above normal in the west.
- Rainfall should be above normal for this time of the year over the central to northeastern parts and Garden Route, but below normal over the western parts of the country.
- The western to northern parts of the winter rainfall region are expected to be dry except for possible light showers initially.
- Showers are expected on several days along the Garden Route.
- A cold front will result in cooler conditions over the southern parts from Thursday to Saturday, with possible light frost over the high-lying southern interior.
- Widespread showers and thundershowers will occur over the central to eastern parts from Friday until Sunday.
- The rainy conditions over the interior should clear on Monday, with drier conditions setting in from the west.
- Much of the summer grain production region will be cool during the cloudy conditions from Friday afternoon to Sunday.
- Fresh to strong southeasterlies are expected in the southwest most of the time.
- Temperatures over the summer-grain production area are expected to be in the below-normal category for this time of the year, associated with the increased cloud cover and rain during the weekend:
  - Maximum temperatures over the eastern maize-production areas will be in the order of 12 – 25°C, with lowest temperatures expected during the weekend when it will be cloudy to overcast for the most part. Minimums will be in the order of 6 – 14°C.
  - Maximum temperatures over the western maize-production region will range between 16 and 26°C, with the higher temperatures earlier in the period and cool, cloudy conditions during the weekend. Minimums will be in the order of 9 – 15°C.

## Overview of expected conditions over the main agricultural production areas

Another rain-producing system is expected to develop during the next few days, with partly cloudy to cloudy and cool conditions at times with scattered to widespread showers and thundershowers expected over the central to northeastern parts, mostly during the weekend. The system (an upper-air trough over the western to southern parts) will be associated with a cold front in the south and a strong Atlantic Ocean High-pressure system ridging south and around the country. As the cold front moves over the southern parts, there will be another period of possible frost, mainly over the southern, high-lying parts of the country. The strong ridging action by the high to the south will also result in strong south-easterlies in the southwest. The high ridging around the country will feed in ample amounts of moisture from the east, supporting cloudy, cooler conditions over the central to eastern and northeastern areas with scattered to widespread showers and thundershowers. As the trough moves out east, it will clear from the west, with mostly dry conditions by late Monday and Tuesday over the interior according to current forecasts. At this stage, there is no indication of a repeat of the intensification of the system in the east, therefore there are no indications currently of similar heavy rain along the eastern seaboard as was experienced on Monday this week.

**Maize production region:** Following a sunnier, warmer start, thundershowers will develop by Friday initially over the western parts of this region, moving eastwards to cover also Mpumalanga by early Saturday. Thundershowers may produce hail as is typical this time of the year due to the cooler atmosphere and associated with strong upper-air instability. Widespread showers or thundershowers during the long weekend will be associated with cloudy, cooler conditions. It will clear and start warming up again from Monday onwards. Given the mixed situation going forward, the next few days are expected to see near-normal to below-normal temperatures on average for this time of the year:

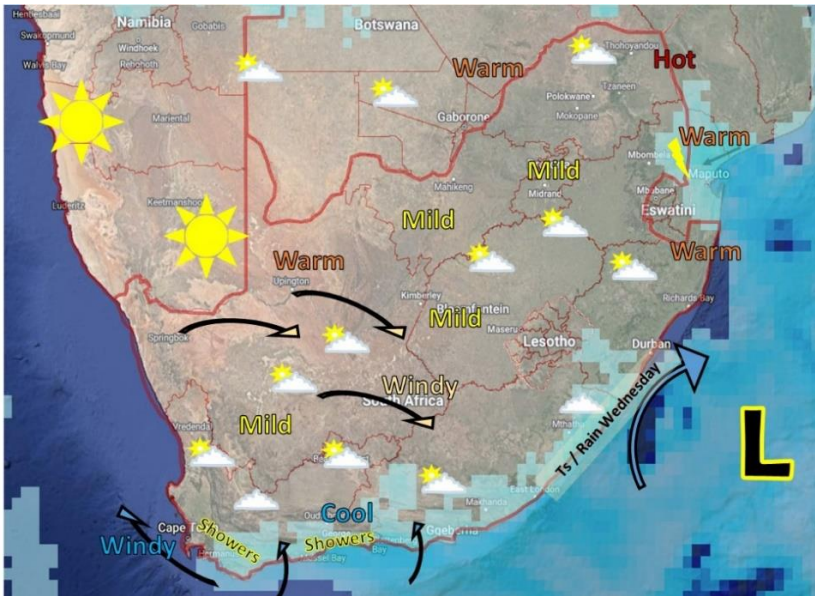
- Maximum temperatures over the eastern maize-production areas will be in the order of 12 – 25°C, with lowest temperatures expected during the weekend when it will be cloudy to overcast for the most part. Minimums will be in the order of 6 – 14°C.
  - Maximum temperatures over the western maize-production region will range between 16 and 26°C, with the higher temperatures earlier in the period and cool, cloudy conditions over the weekend. Minimums will be in the order of 9 – 15°C.
- **Wednesday and Thursday (13<sup>th</sup>, 14<sup>th</sup>):** Cool in the morning and evening in the east, otherwise sunny to partly cloudy and mild to warm.
  - **Friday (15<sup>th</sup>):** Partly cloudy and mild to warm, becoming cloudy and windy with scattered thundershowers over the western to central parts, spreading eastwards during the evening.
  - **Saturday to Sunday (16<sup>th</sup> to 17<sup>th</sup>):** Partly cloudy to cloudy and mild to cool with widespread showers and thundershowers, becoming less widespread on Sunday.
  - **Monday (18<sup>th</sup>):** Partly cloudy and mild with isolated thundershowers over the central to eastern parts, clearing.
  - **Tuesday (12<sup>th</sup>):** Partly cloudy and mild.

**Cape Wine Lands and Ruens:** A cold front will result in inclement conditions initially, mostly on Thursday until early Friday. The West Coast, Swartland and western parts of the Karoo should be sunny and warm for the entire period except for the initial windy and cooler conditions with possible light showers in places until Friday. Strong southeasterly to easterly winds will occur in the south and southwest most of the time. With the persistent southerly to easterly winds, showers are possible along the Garden Route, clearing by Saturday. The easterly flow over the interior will result in warming along the West Coast and Swartland, where it may become hot early next week. The entire region should be predominantly dry from late Saturday onwards, with mild conditions in the south and east while warming and becoming hot over the western to northwestern parts.

# Daily summary of expected conditions

(GFS forecasted rainfall for indicated periods shown in shades of blue, with darkest shading > 50mm)

## Wednesday and Thursday, 13 – 14 April



Sunny to partly cloudy and mostly dry over the interior.

Residual rain and showers along southern KZN coast on Wednesday.

Light to moderate showers along the Garden Route.

Isolated showers or thundershowers over the Lowveld of Mpumalanga on Thursday.

It will be mild to warm over the northern parts of the country.

It will be mild over the central parts of the country.

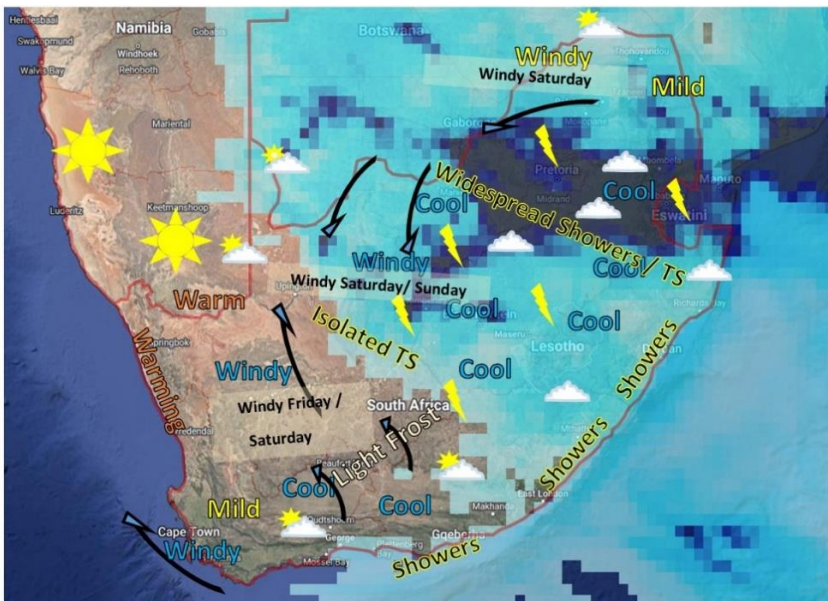
It will be cool over the southern and southwestern parts.

It will be hot over the northern Lowveld.

Strong southeasterlies in the southwest.

Windy over the central to western interior on Thursday.

## Friday to Sunday, 15 - 17 April



Cloudy and cool over North West, northern Free State, Gauteng, Mpumalanga and southern to western Limpopo with widespread showers or thundershowers from late Friday, clearing from the west later on Sunday.

Partly cloudy to cloudy with scattered thundershowers over the rest of the Free State, KZN, eastern half of the Northern Cape, Eastern Cape.

Cloudy with showers along the southern to eastern coastal belt.

Cool over the eastern and southern parts.

Light frost possible over the high-lying southern interior.

Warm in the west and northwest.

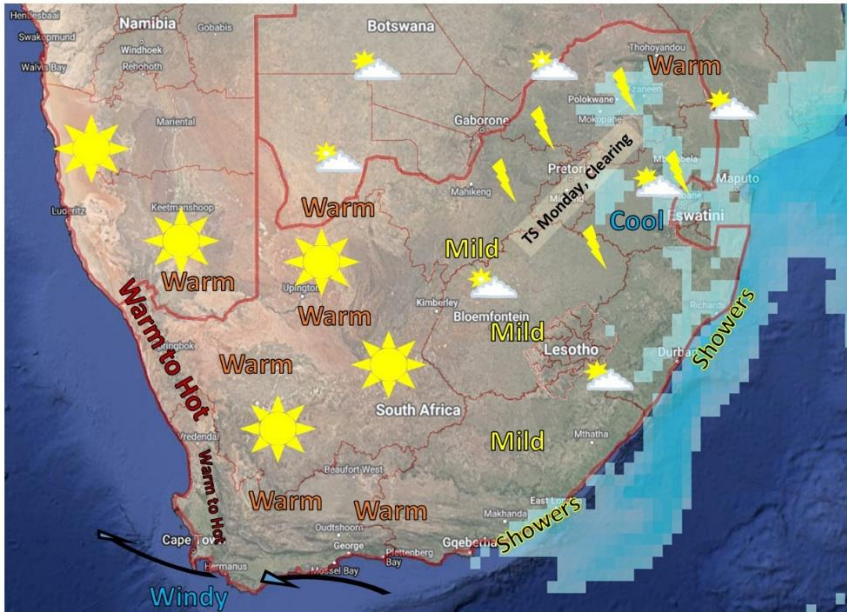
Windy over the southwestern to western interior on Friday and Saturday.

Windy over the central interior on Saturday and Sunday.

Windy over Limpopo on Saturday.

Strong southeasterlies in the southwest.

## Monday to Tuesday 18 – 19 April



Partly cloudy and cool to mild over the eastern parts with isolated showers or thundershowers, clearing during Monday.

Most of the interior should be sunny to partly cloudy and mild to warm and dry by Tuesday.

Light showers possible along the southeastern to eastern coastal belt.

It will be warm over the western to central parts.

It will become warm to hot along the West Coast and Swatland.

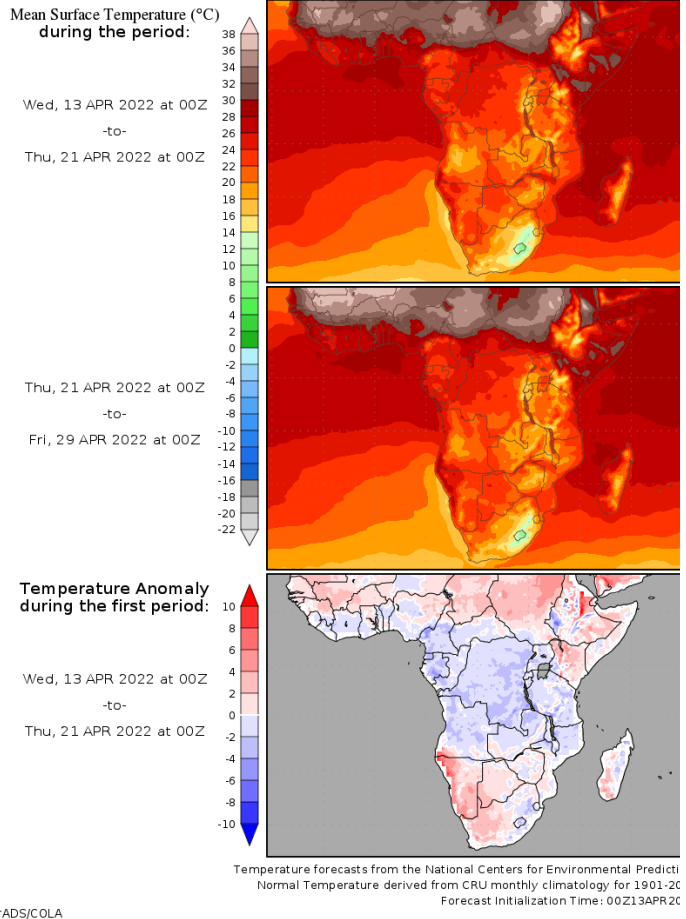
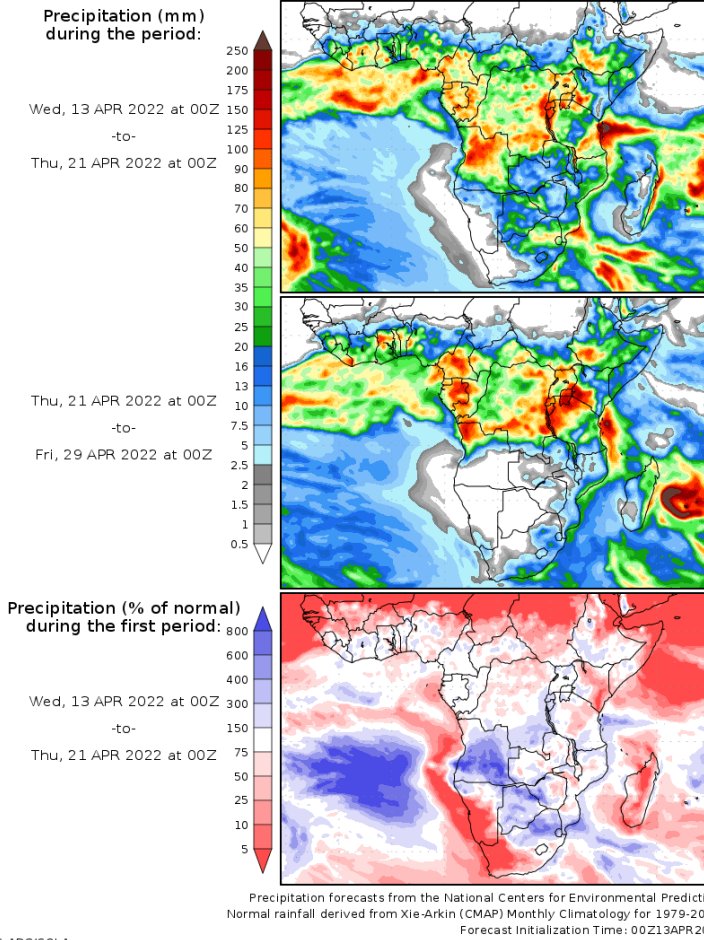
It will be cool over the Eastern Highveld.

Strong south-earlies to easterlies in the southwest.

# Medium term rainfall and temperature summary

## Precipitation Forecasts

## Temperature Forecasts



GRADS/COLA

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 one single weather model (GFS atmospheric model - *Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES)* – <http://Wxmaps.org>) considered here in the beginning of a week-long (starting 13 April) period. It is therefore advised to keep track of warnings that may be issued by the SAWS ([www.weathersa.co.za](http://www.weathersa.co.za)) as the week progresses.

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

- Cool to cold, windy conditions over the high-lying southern parts **on Friday and Saturday morning (15<sup>th</sup>, 16<sup>th</sup>)** may adversely affect small stock.
- It will be hot:
  - Over the Lowveld on **Wednesday and Thursday (13<sup>th</sup>, 14<sup>th</sup>)**.
  - Over the West Coast and adjacent interior and southwards into the Swartland from **Monday (18<sup>th</sup>) to Tuesday (19<sup>th</sup>)**.
- Significant rainfall totals may lead to waterlogged conditions and possibly flash flooding in isolated areas. Total rainfall exceeding 50 mm may occur:
  - Over the central to northern and eastern North West, Gauteng, southern Limpopo and southern to western Mpumalanga from **Friday (15<sup>th</sup>) to Saturday (16<sup>th</sup>)**.
- Some thundershowers may become severe:
  - North West, Gauteng and northern Free State, western Mpumalanga and southern to western Limpopo on **Friday and Saturday (15<sup>th</sup> and 16<sup>th</sup>)**.
- Strong south-easterlies over the southwestern parts from **Wednesday (13<sup>th</sup>) to Tuesday (19<sup>th</sup>)** may be conducive to the spread of wild fires where vegetation is dry.
- Cloudy to overcast, cool and possibly waterlogged conditions may adversely affect agricultural activities over the central to eastern parts from **late Friday (15<sup>th</sup>) to early Monday (18<sup>th</sup>)**.



## Seasonal forecast

Recently, forecasts have shifted from an expectation of a return to neutral conditions, to a longer continuation of La-Niña into the SH winter. Seasonal forecasts for autumn over South Africa once again favor wetter conditions over the summer rainfall region after trending somewhat drier for February.

### **The Australian Bureau of Meteorology points out that the La Niña retreat stalls as trade winds strengthen**

(Updated 12 April): The 2021–22 La Niña event continues, despite some weakening over recent weeks. Climate outlooks continue to indicate a return to neutral El Niño–Southern Oscillation (ENSO)—neither La Niña nor El Niño—during the late southern hemisphere autumn or in early winter. Even as La Niña weakens, it will continue to influence global weather and climate. La Niña events increase the chances of above average rainfall across large parts of eastern Australia during autumn.

Atmospheric and most oceanic indicators of ENSO persist at La Niña levels. Sea surface temperatures remain cooler than average along the equator. Compared to two weeks ago, surface waters have cooled slightly in the eastern half of the equatorial Pacific. Trade winds remain stronger than average in the western Pacific. Other atmospheric indicators also remain at La Niña levels, with decreased cloudiness persisting along the Date Line and a positive Southern Oscillation Index (SOI).

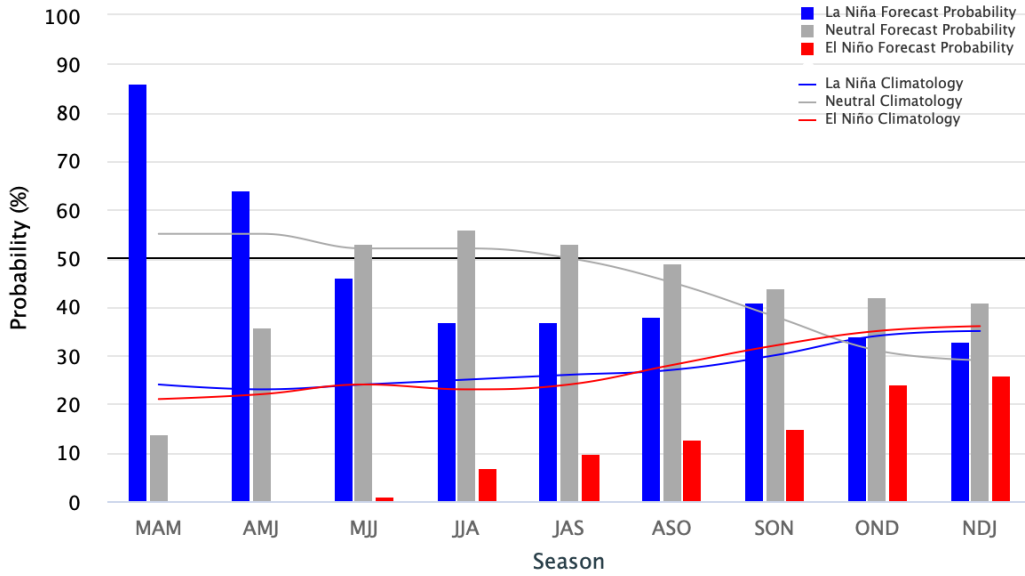
The Madden–Julian Oscillation (MJO) has been weak or indiscernible for the past fortnight. Climate models indicate the MJO is likely to remain weak, having little influence on tropical weather and climate in the coming fortnight. ....*Australian Bureau of Meteorology* - <http://www.bom.gov.au>

### **The International Research Institute for Climate and Society (IRI) also expects La Niña conditions to persist until autumn**

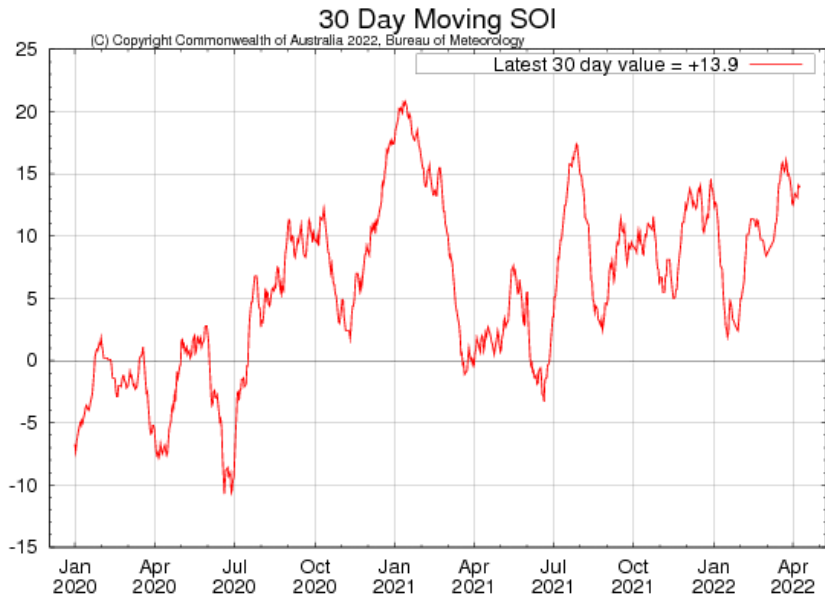
**According to the IRI** (Updated 18 March): In mid-March, Sea Surface Temperatures remain below-average (strengthening slightly) in the central-eastern equatorial Pacific. The evolution of key oceanic and atmospheric variables is consistent with continued La Niña conditions, and therefore, a La Niña Advisory remained in place for March 2022. A large majority of the models in the plume predict SSTs to stay below-normal at the level of a weak La Niña until Apr-Jun, and then return to ENSO-neutral levels in May-Jul 2022. Similar to the most-recent official CPC/IRI ENSO Outlook issued on March 10, 2022, this objective model-based ENSO outlook also predicts a continuation of the La Niña event with high probability during Apr-Jun. However, there is a slight disagreement between the two forecast methods on the dissipation of current event. The objective mid-March model-based forecast gives the transition to ENSO-neutral during May-Jul (53% chance), while early-March subjective consensus indicates the transition around Jul-Sep (with equal chances of 47%, for La Niña or ENSO-neutral). ....*International Research Institute for Climate and Society*- <http://iri.columbia.edu/>

Mid-March 2022 IRI/CPC Model-Based Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly  
Neutral ENSO: -0.5 °C to 0.5 °C



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

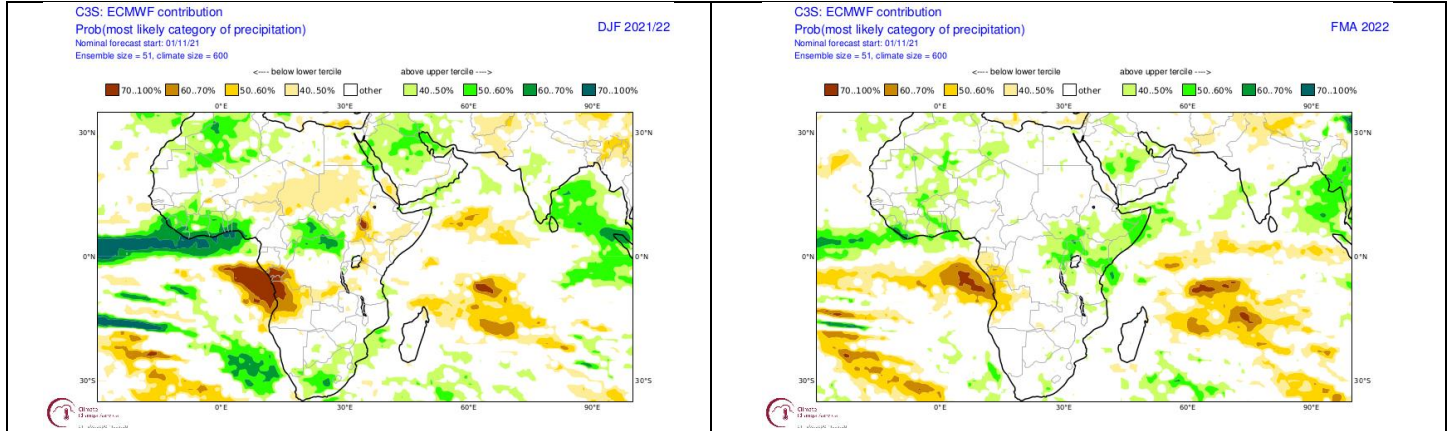


Australian Bureau of Meteorology - <http://www.bom.gov.au>

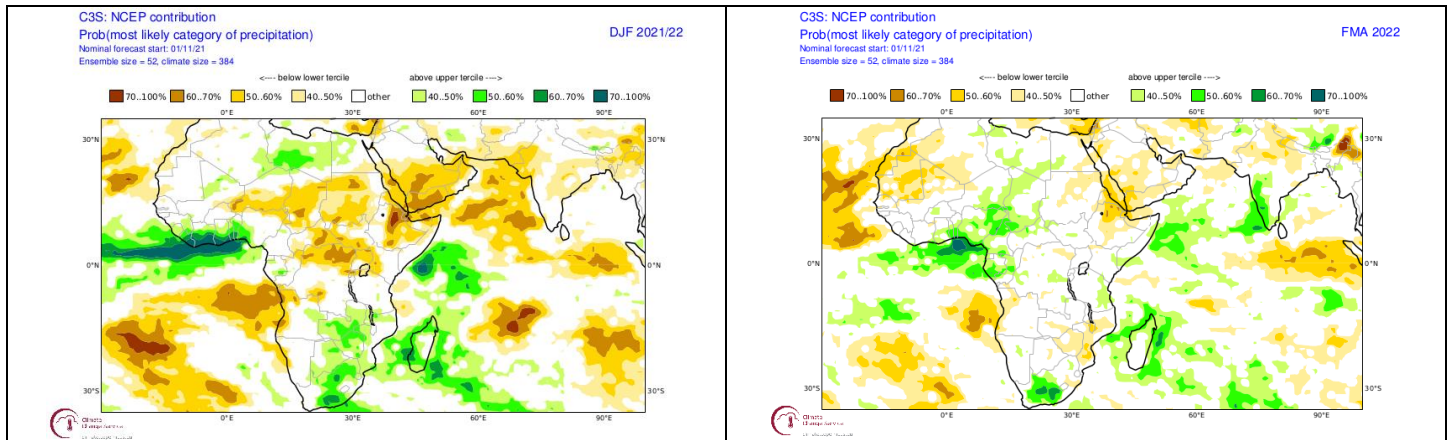
**The Southern Oscillation Index is in positive territory (+13.9). This is indicative of atmospheric circulation patterns reflecting La Niña conditions.**

# Seasonal forecasts issued by various international institutions

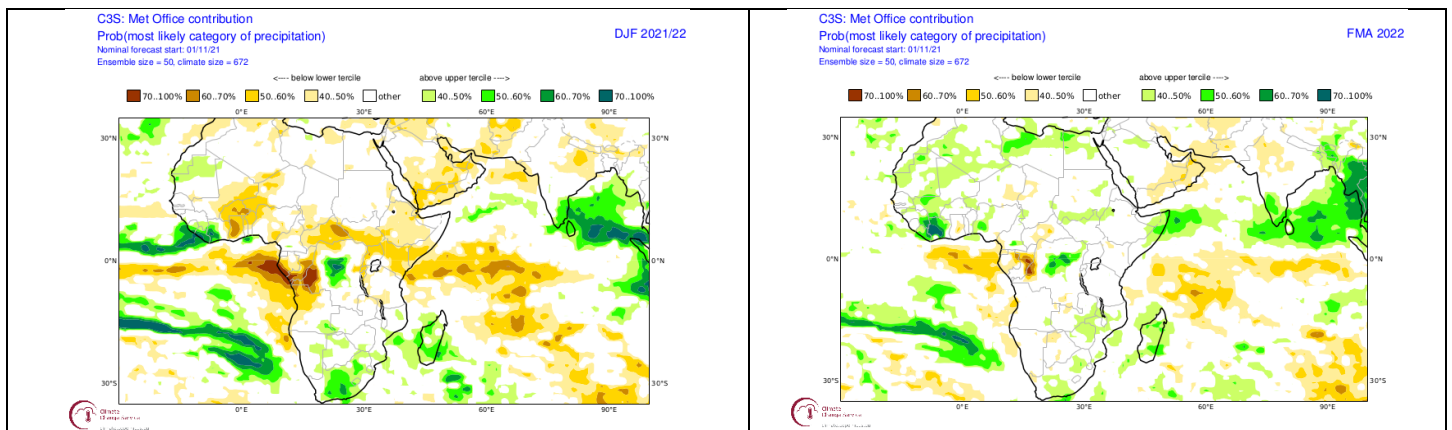
Seasonal forecasts by these institutions, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) for both mid-summer and late summer, reflect similar patterns with regards to rainfall for southern Africa as those by the IRI. The signal for relatively wet conditions over the summer rainfall region of South Africa is somewhat stronger for mid-summer than late summer (FMA). This is partly associated with the observed moderate La-Niña.



**Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for mid-to-late-summer (December - February 2021/22; left) and late summer (February-April 2022; right) (Forecasts issued in 2021-11).**



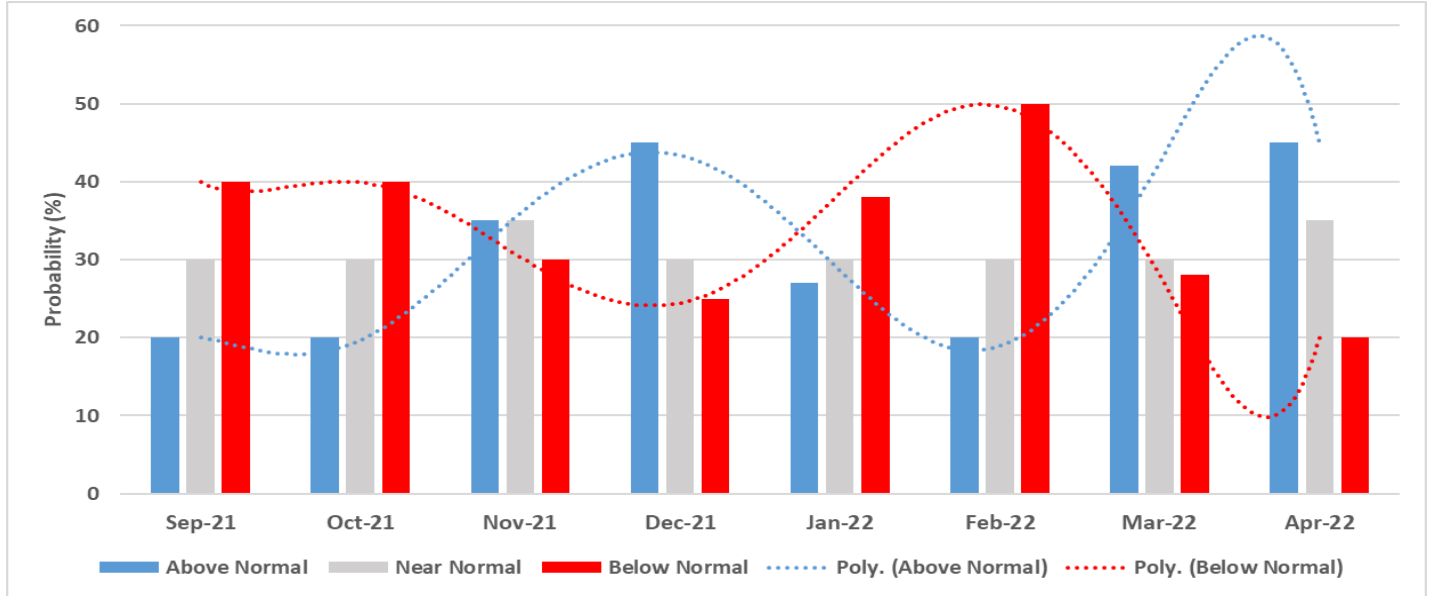
**Same as above, but forecasts issued by the National Centres for Environmental Prediction.**



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

# CUMULUS seasonal outlook, based on decadal variability

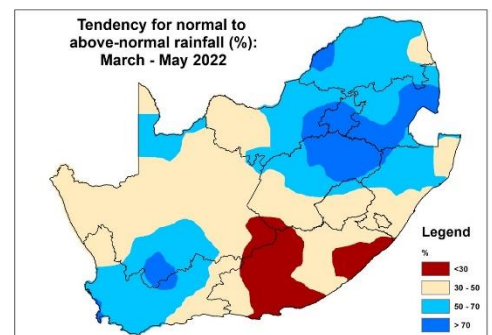
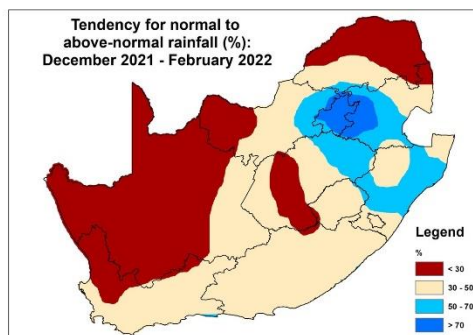
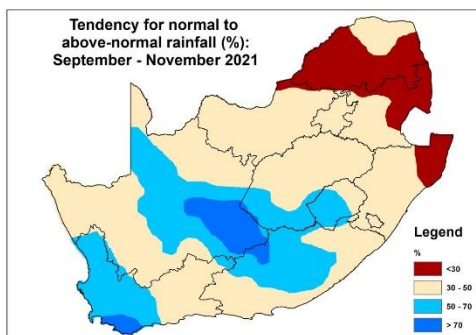
This outlook is based on the typical observed rainfall patterns over the **north-eastern half** of the country (including most of the summer grain production region), as associated with the cyclic variability of the global climate system. Summers that are similar to 2021/22 more often experience a seasonal rainfall curve that compares to normal conditions as indicated in the bar graph below, with wetter conditions focussing on December and March while drier than normal conditions focus on October and 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 2021 – April 2022 (Forecast issued in 2021-09).**

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

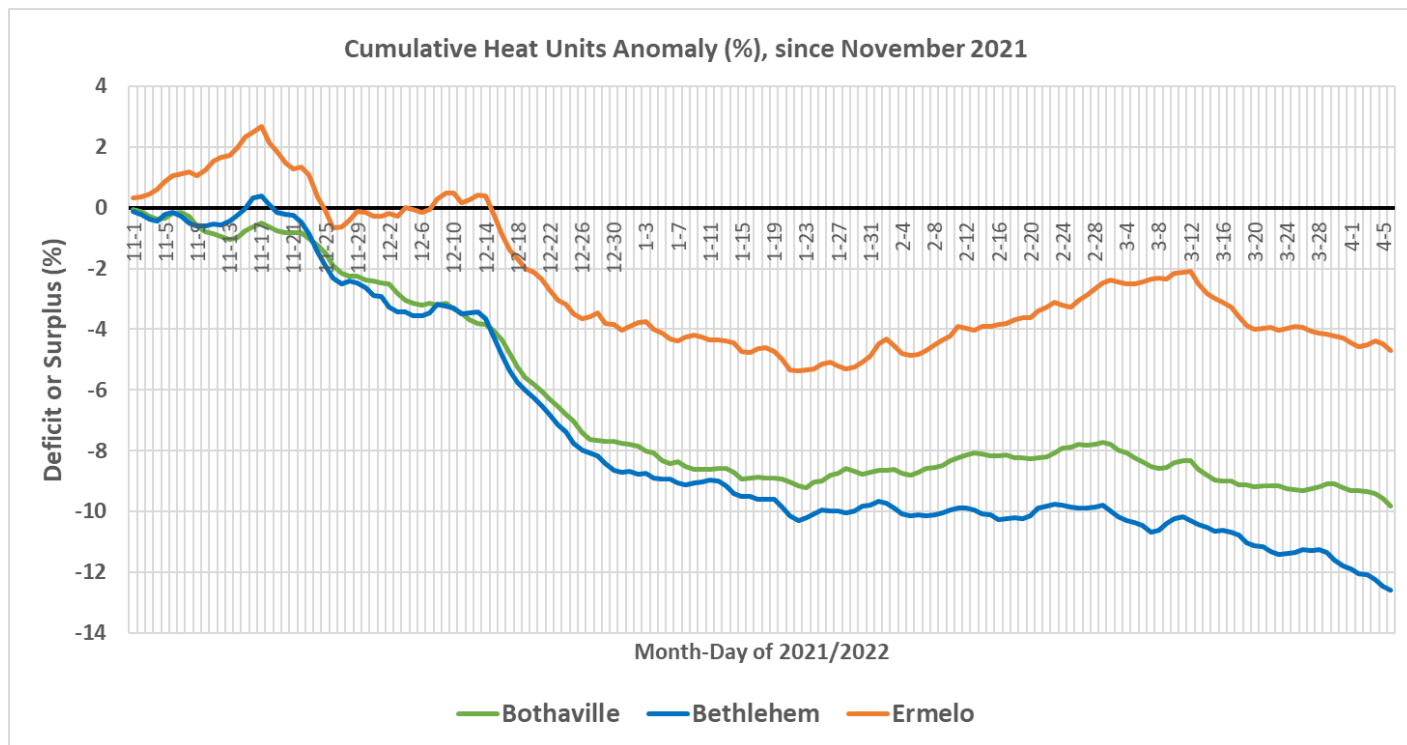
- **September – 20 October:** Relatively dry conditions over the north-eastern half of the summer rainfall region
- **20 October – 20 November:** Near-normal rainfall over the north-eastern half of the summer rainfall region
- **20 November – 15 January:** Near-normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- **15 January – late February:** Below-normal rainfall over the north-eastern half of the summer rainfall region
- **March - April:** Above-normal rainfall over the north-eastern half of the summer rainfall region



**Typical patterns during summers analogous to 2021/22: Early summers during similar years tend to be relatively wet over the western parts of the country while drier than normal over the north-eastern parts of the country (map on the left). During December – February, relatively dry conditions tend to occur over the western and northern parts while rainfall tends to be above normal over parts of the eastern interior and into KZN (map in the centre). By late summer (March – May – map on the right), similar years tend to see above-normal rainfall over large parts of the summer rainfall region.**

## Observed conditions

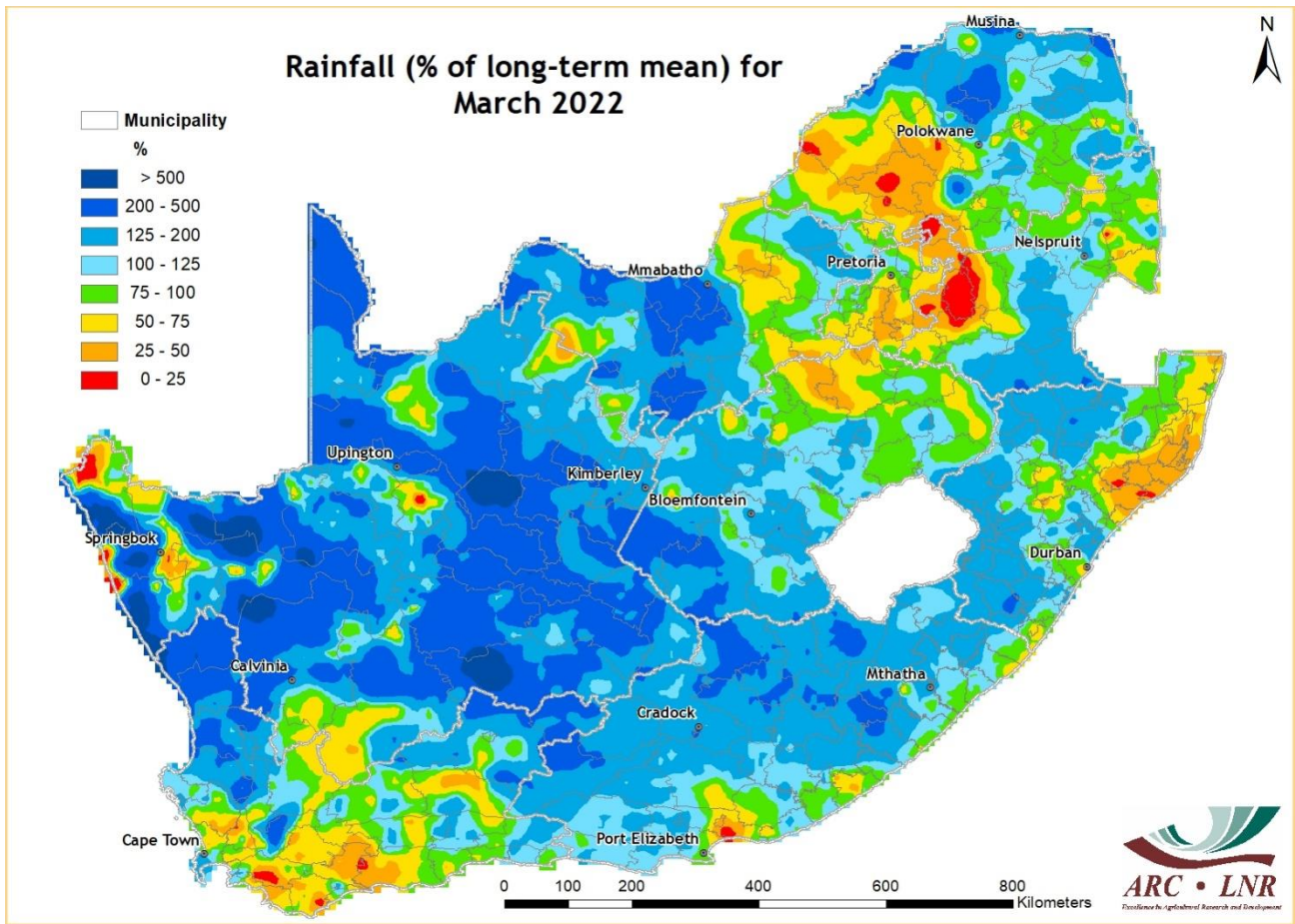
### Heat Units: 1 November 2021 – 8 April 2022



Heat units have been less than the 2014 – 2020 norm the November – April period over the summer-grain production region due to long cloudy and rainy spells especially during December and early January. Given somewhat drier and warmer conditions during mid-January to February, deficits have decreased slightly, especially towards the north-eastern parts of the maize-production region. Since early March, cooler, wetter spells have resulted in a further cumulative deficit over the entire production area.

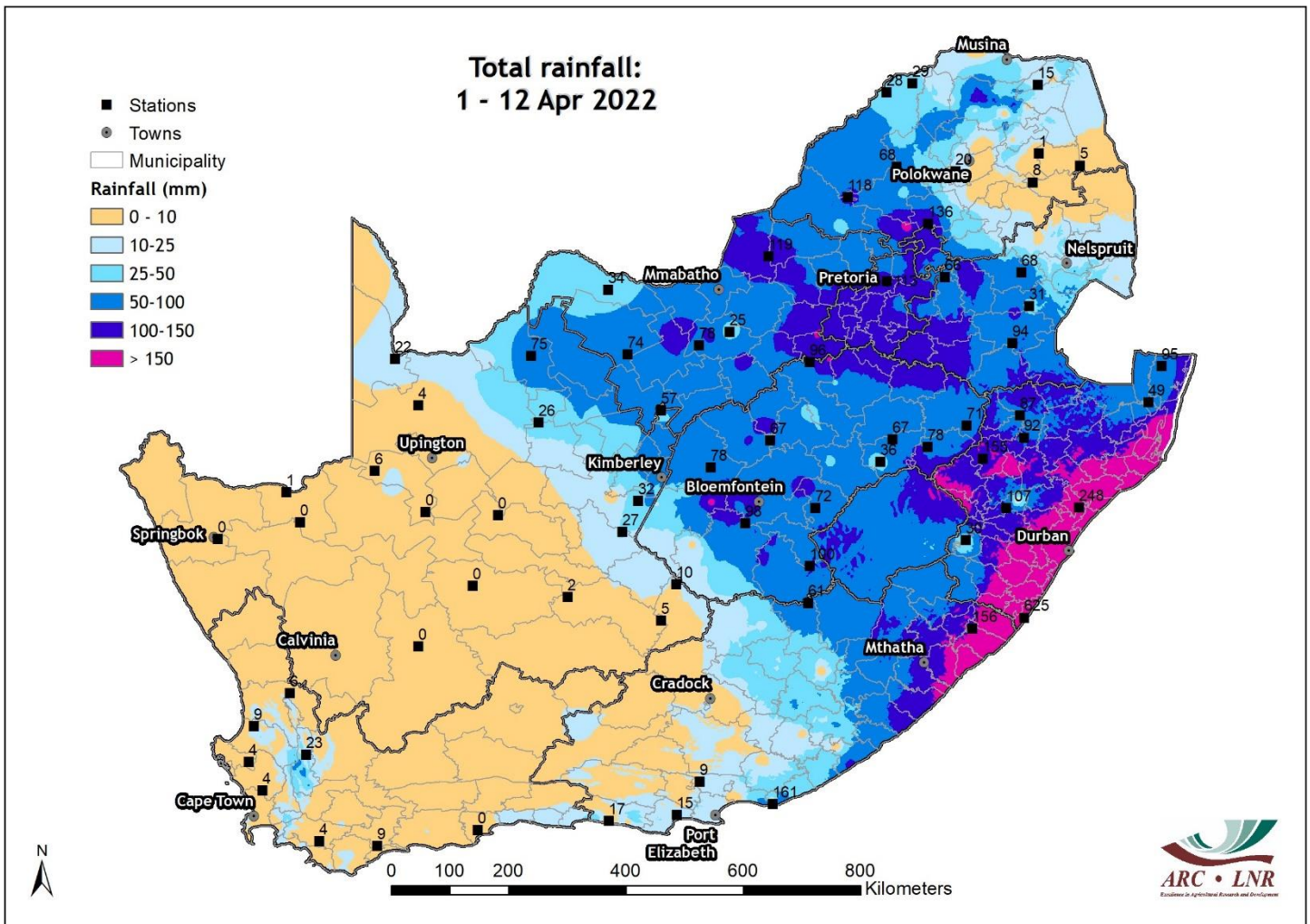
The graph shows the accumulated heat units during November 2021 until 8 April 2022, compared to the median value calculated over the 2014 – 2020 period, expressed as a percentage of the median value over the entire period. Largest negative anomalies are seen over the southern to central and western parts (around 10 – 15 %), with smaller deficits towards the northeast (Ermelo). The largest deficits occurred, at all three locations, during the mid-December to mid-January period, shown by the steeper downward slope in the graph. These deficits exceed 2 standard deviations for the same period during 2014 – 2020 at Bethlehem and Bothaville, and 1 standard deviation at Ermelo according to the recorded data.

## Rainfall (% of long-term mean): March 2022



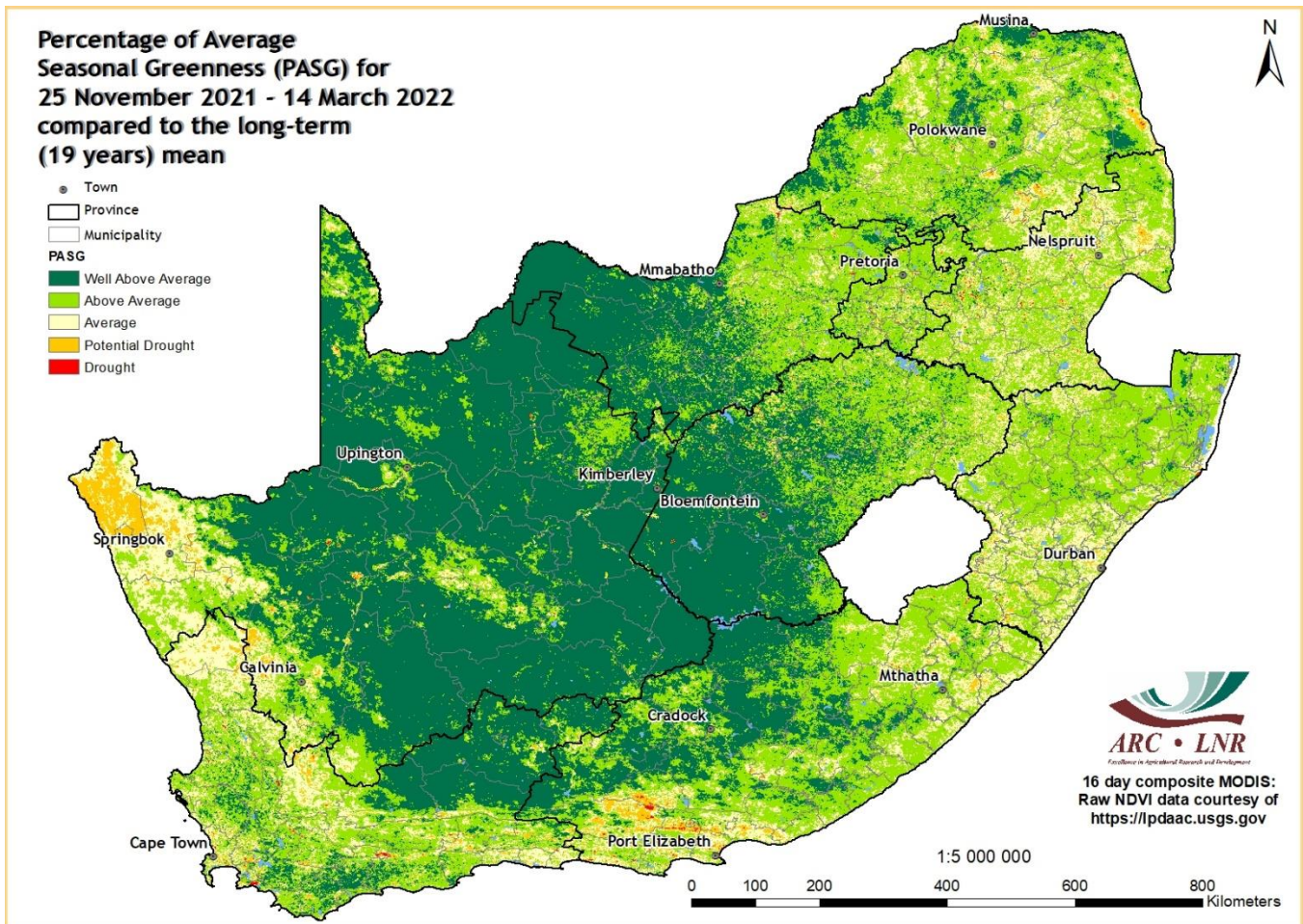
*Rainfall was above average over most of the country during March. Smaller areas that were drier than average include the western parts of Limpopo together with the southern parts of the winter rainfall region, Garden Route and western Karoo.*

## Rainfall (mm): 1 – 12 April 2022



*Large parts of North West, Free State, Gauteng, Mpumalanga and Limpopo received in excess of 50 mm of rain up to 12 April. Some extraordinary totals were recorded along the coast of KZN and northeastern coast of the Eastern Cape.*

## Percentage of Average Seasonal Greenness: November 2021 – 14 March 2022



**Cumulative vegetation activity since late November is largely above normal, especially over the central interior, reflecting the excellent weather conditions in support of vegetation activity. Exceptions are the southern parts of the Eastern Cape as well as the extreme northern parts of the West Coast and inland towards the Richtersveld.**



## 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](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>

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