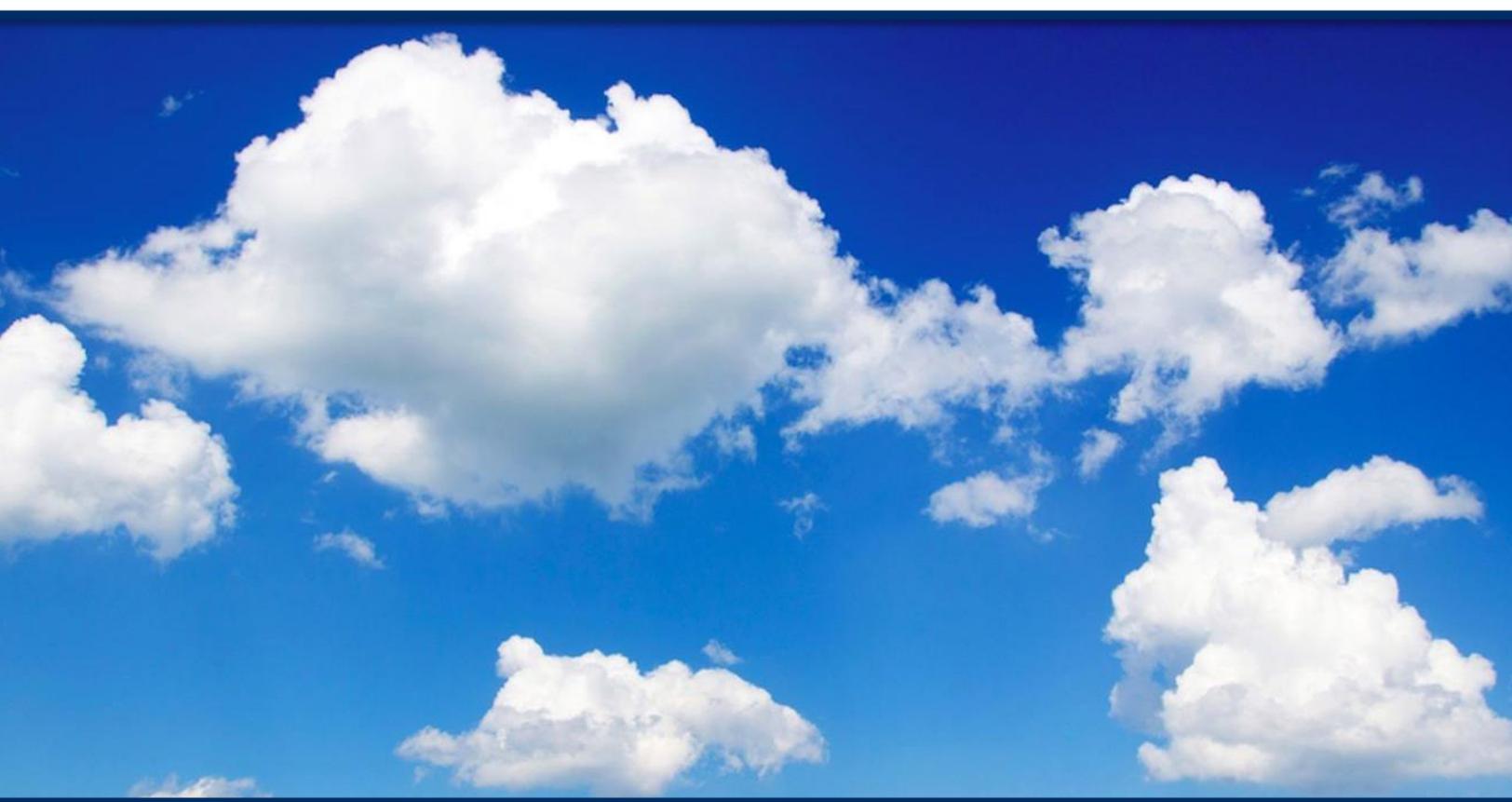


# CUMULUS

16 March 2021 – *by J Malherbe, R Kuschke*



## Contents

|  |    |
|--|----|
| Summary .....  | 2  |
| Seasonal overview .....  | 3  |
| <i>ENSO and seasonal forecasts</i> .....   | 3  |
| Seasonal forecasts issued by various international institutions .....            | 5  |
| IRI .....  | 5  |
| CUMULUS seasonal outlook, based on decadal variability .....                     | 6  |
| Rainfall (% of long-term mean): February 2021 .....                              | 7  |
| Rainfall (mm): 1 – 14 March 2021 .....   | 8  |
| Percentage of Average Seasonal Greenness: 1 December – 28 February 2021 .....    | 9  |
| Overview of expected conditions over South Africa during the next few days ..... | 9  |
| <i>Conditions in main agricultural production regions (16 – 22 March)</i> .....  | 9  |
| <i>Possible extreme conditions - relevant to agriculture</i> .....               | 11 |
| Sources of information .....   | 12 |



## Summary

### *Better prospects for rain over the interior going forward*

Drier conditions dominated across most of the summer rainfall region, including the grain-production areas, since late February. The first half of March saw little in the way of precipitation – in stark contrast to earlier conditions. The next few days will see a return of somewhat wetter conditions, with scattered thundershowers expected over most of the summer rainfall region, including the important grain-production areas. Coupled with the wetter conditions over the summer rainfall region, the southern parts of the country will experience a return of strong south-easterlies, with some rain along the Garden Route while most of the winter rainfall region should remain dry according to current forecasts.

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

- **General:**

- Temperatures will be normal to slightly above-normal for this time of the year over most of the country.
- Rainfall will be normal to above normal for this time of the year over the central to eastern and northeastern parts, but below normal over the southwestern parts and the extreme northeast according to current forecasts.
- Showers or thundershowers are expected over most of the interior except for the southwestern parts, including the winter rainfall region, during the next few days.
- Scattered thundershowers will occur over the interior on most days, focusing especially on a northwest-southeast stretching band that includes the Free State.
- A southerly flow will result in cooler conditions along the Garden Route and Little Karoo on most days. These areas should experience several days of cloudy, cool and rainy conditions.
- Strong southeasterlies are expected in the southwest initially and again during the weekend.
- Temperatures over the summer-grain production area will be very supportive of production:
  - Maximum temperatures over the western maize-production areas will be in the order of 24 – 30°C, with cooler conditions expected only by next week (and therefore not a certainty). Minimum temperatures will be in the order of 15 – 21°C.
  - Maximum temperatures over the eastern maize-production region will range between 23 and 28°C. Minimums will be in the order of 11 – 15°C.

- **Detailed:**

- Tuesday - Wednesday (16<sup>th</sup>, 17<sup>th</sup>): It will be partly cloudy and warm with scattered thundershowers over the central to southeastern parts. Light showers are expected along the Garden Route on Tuesday. Some thundershowers may become severe over the eastern parts of the Northern Cape and western Free State on Wednesday. The thundershowers over the interior will generally track northeastwards, reaching as far northeast as southern Mpumalanga and Gauteng. It should remain mostly dry over northeastern North West, Limpopo and northern Mpumalanga.
- Thursday (18<sup>th</sup>): The central to western parts should be sunny to partly cloudy and warm without rain. Isolated thundershowers are expected north of the Vaal River while it will be partly cloudy to cloudy and mild with scattered thundershowers over KZN and central to southeastern Mpumalanga (where a few storms may become severe). A westerly flow will result in somewhat lower maximum temperatures over the southwestern parts, including the southwestern interior.
- Friday (19<sup>th</sup>): Isolated to scattered thundershowers will expand into the central parts again whilst also occurring over the rest of the country to the east and northeast. The southwestern parts will be sunny and mild, but it will be cloudy along the Garden Route and into the Little Karoo with light showers. The wind will become fresh to strong southeasterly in the southwest.
- Saturday (20<sup>th</sup>): Thundershowers over the central to southeastern parts will become scattered, with severe storms possible over the eastern parts of the Eastern Cape and surrounding areas. It will remain cloudy

with showers along the Garden Route and adjacent areas. The wind in the southwest will remain strong southeasterly.

- Sunday and Monday (21<sup>st</sup>, 22<sup>nd</sup>): Thundershower activity will shift to the northern and northeastern parts while the southern half of the country is expected to be sunny to partly cloudy and warm. Strong southeasterlies are expected to persist in the southwest. Cloudy conditions with thundershowers may also move into the northern and northwestern parts of the Northern Cape according to current forecasts.

## Seasonal overview

### ENSO and seasonal forecasts

**Due to the positive association with La Niña, rainfall over the southern African interior is expected to remain above normal through the rest of the summer according to the latest seasonal forecasts.**

**According to the Australian Bureau of Meteorology** (Updated 2 March): The 2020–21 La Niña is nearing its end, with most oceanic indicators of the El Niño-Southern Oscillation (ENSO) now at neutral levels. However, a number of atmospheric indicators remain at La Niña levels, meaning La Niña's influence is likely to persist into April..... *(Seasonal forecasts for South Africa continue to lean towards wetter than normal conditions during March to May)*

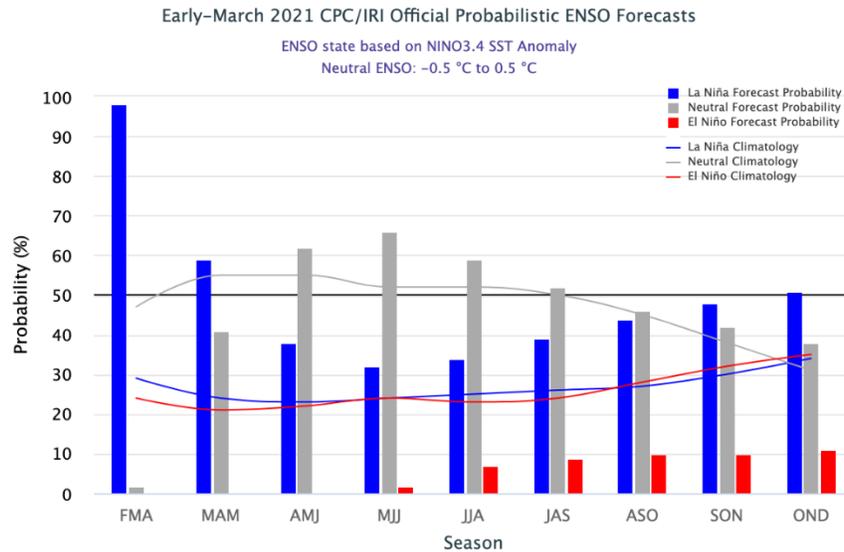
Tropical Pacific Ocean sea surface temperatures have returned to ENSO-neutral values in the past fortnight. Below the surface, waters have also been warming. However, atmospheric indicators such as cloudiness near the Date Line and trade winds persist at La Niña levels. The Southern Oscillation Index (SOI) in recent days has dipped below La Niña thresholds, although this may just be a temporary easing.

These changes in indicators are consistent with climate model outlooks, which for several weeks have indicated a return to ENSO neutral during the southern hemisphere autumn. While around 40% of past La Niña events have re-strengthened for a second year, there are currently no models suggesting that La Niña will return during winter.

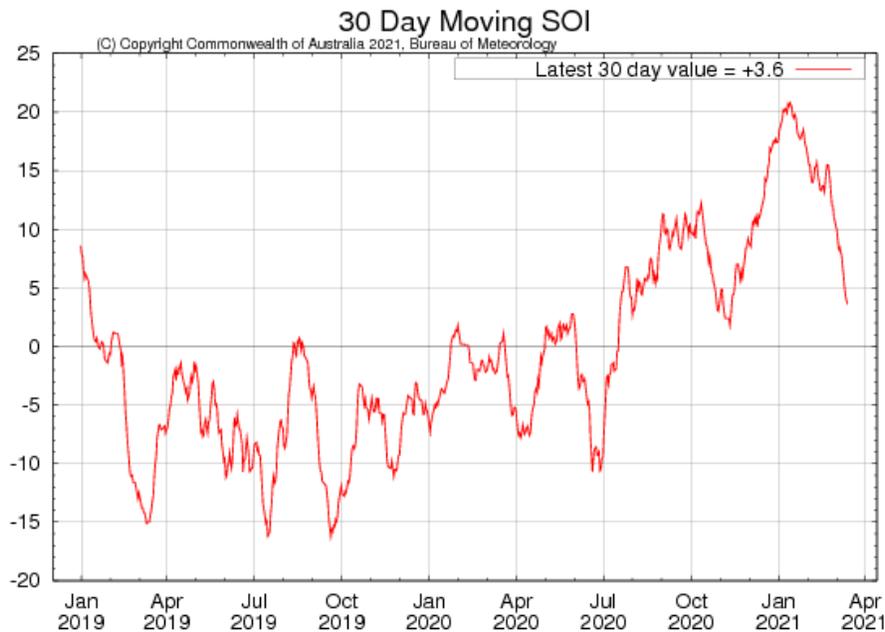
The Southern Annular Mode (SAM) has briefly reached positive levels. However, this is expected to be short-lived, with forecasts indicating neutral SAM values will persist for the coming fortnight.... *(A positive SAM is usually indicative of relatively wet conditions over the summer rainfall region during mid-summer, with drier conditions over the winter rainfall region of South Africa, as witnessed during early February)*

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

**According to the IRI** (Updated 11 March): In mid-February, SSTs in the east-central Pacific are roughly 1.1 degree C below average, and most key atmospheric variables are consistent with continued La Niña conditions. A large majority of the model forecasts predict SSTs to be cooler than the threshold of La Niña SST conditions through the *SH summer*, dissipating during spring. The new official CPC/IRI outlook issued earlier this month is similar to these model forecasts, calling for a 82% chance of La Niña for the Feb-Mar-Apr season, and a likely transition in Apr-May-Jun. A La Niña advisory remains in effect.....**International Research Institute for Climate and Society-** <http://iri.columbia.edu/>



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



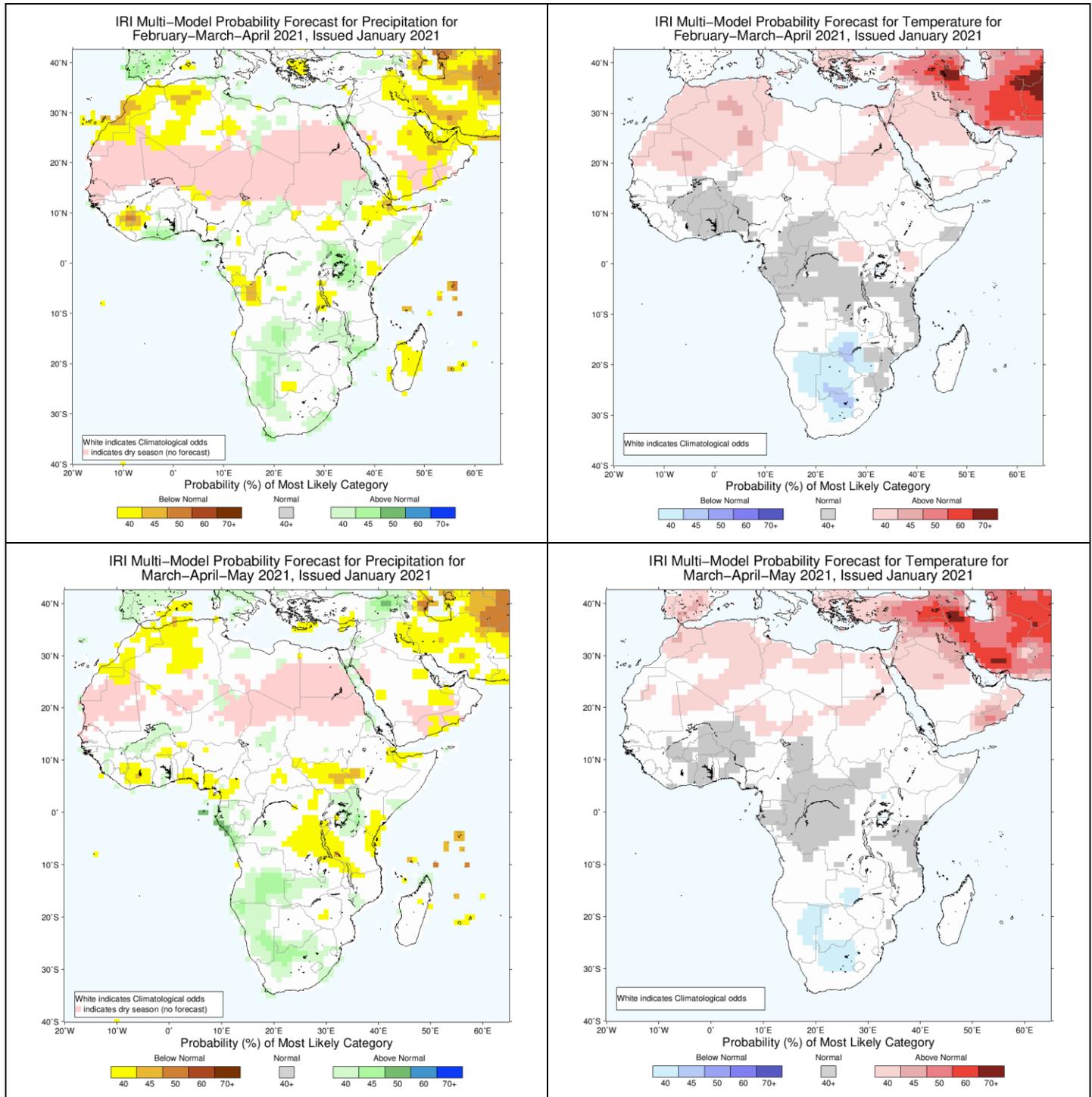
*Australian Bureau of Meteorology -* <http://www.bom.gov.au>

**The Southern Oscillation Index has recently trended lower, with a value of 3.5 being below the La Niña threshold. This is indicative of atmospheric circulation patterns moving towards neutral conditions.**

# Seasonal forecasts issued by various international institutions

## IRI

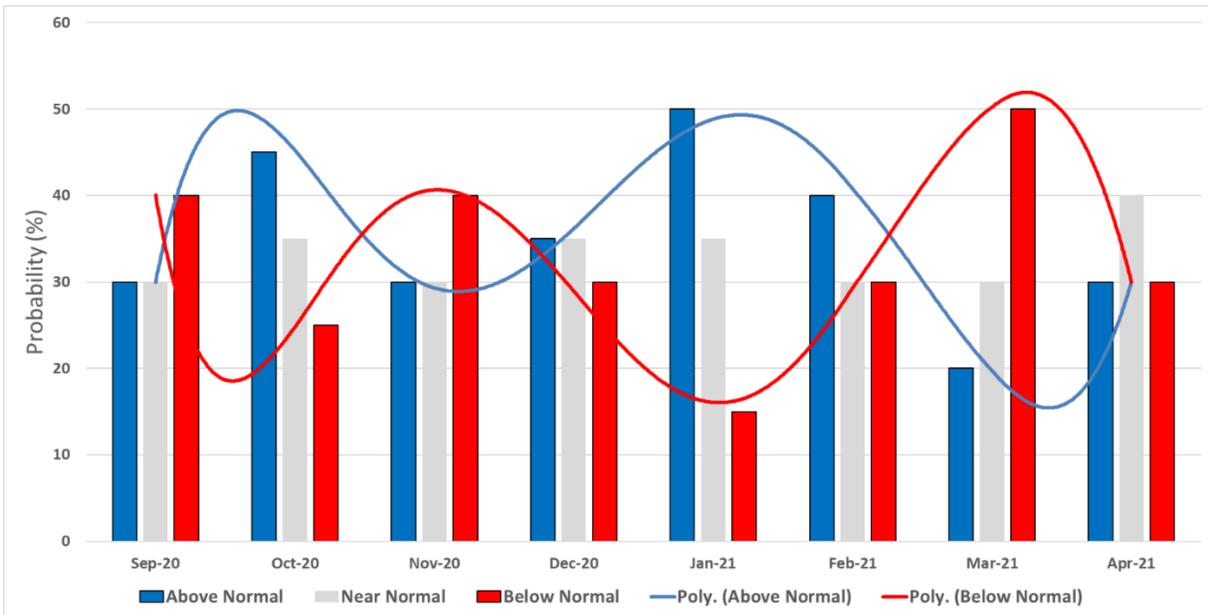
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



**Probabilistic forecasts for rainfall (left) and temperatures (right) for late-summer (February – April 2021; top) and autumn (March – May 2021; bottom) (Forecast issued in 2021-01 by the IRI - <http://iri.columbia.edu/>).**

## CUMULUS seasonal outlook, based on decadal variability

Based on the typical observed rainfall patterns over the northeastern half of the country (most of the summer rainfall region - from the central Free State north-eastwards), as associated with the cyclic variability of the global climate system, similar summers as 2020/21 more often experience a seasonal rainfall curve that differs from normal conditions as indicated in the bar graph below:

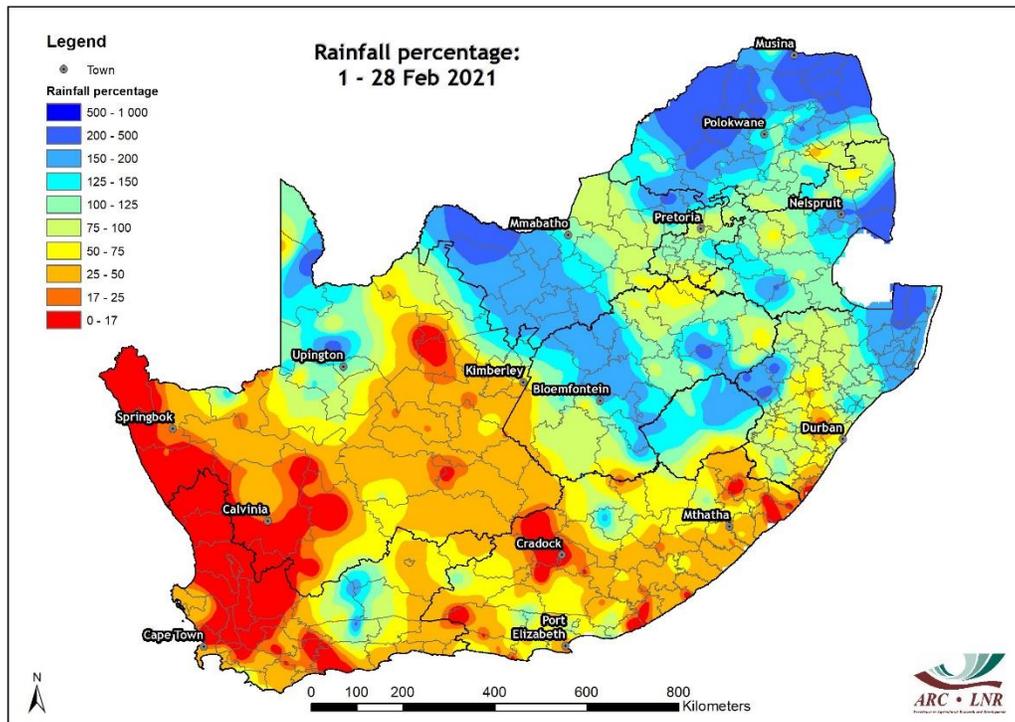


***Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).***

Typical patterns during similar summers are:

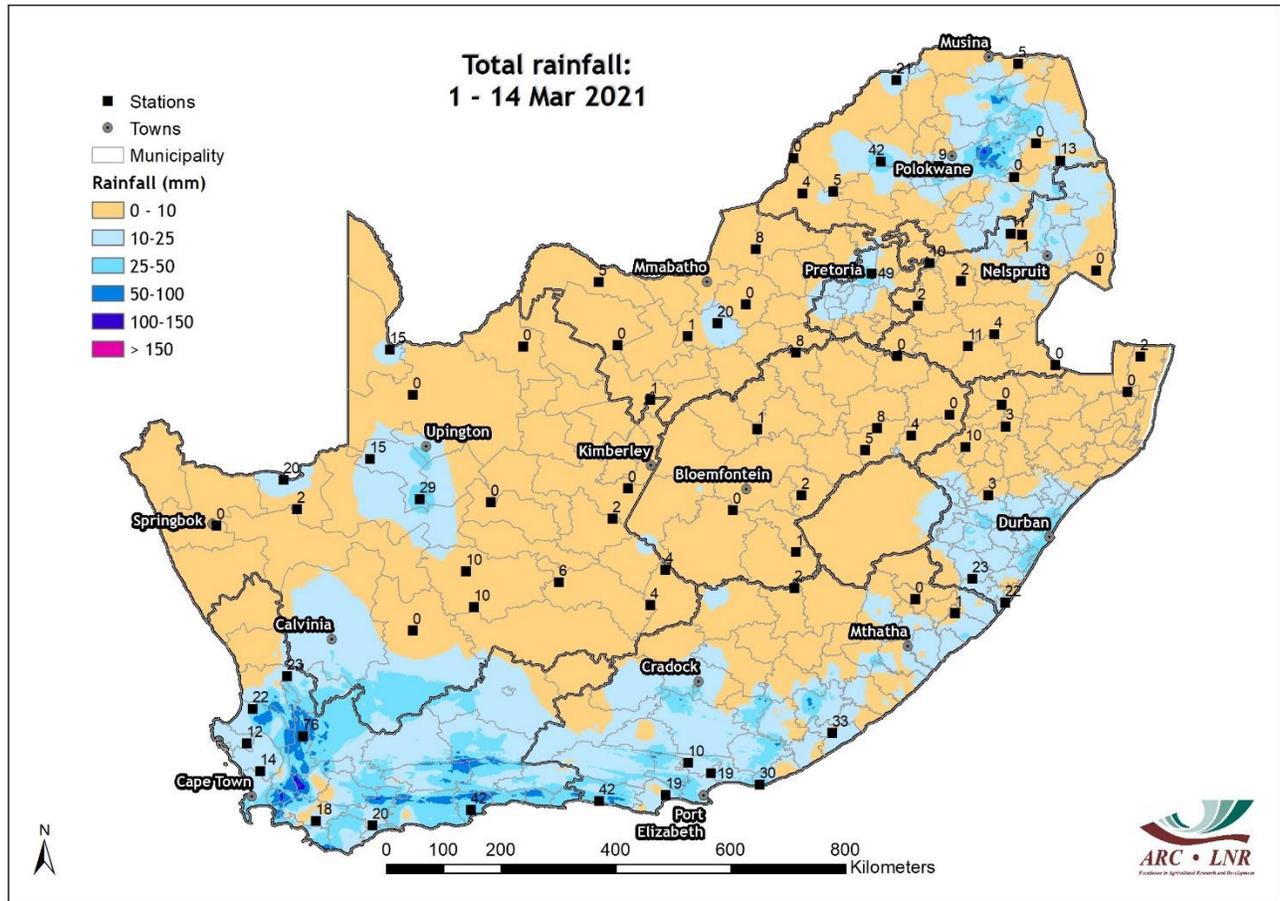
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the summer rainfall region
- Late February – March: Mostly drier than normal

## Rainfall (% of long-term mean): February 2021



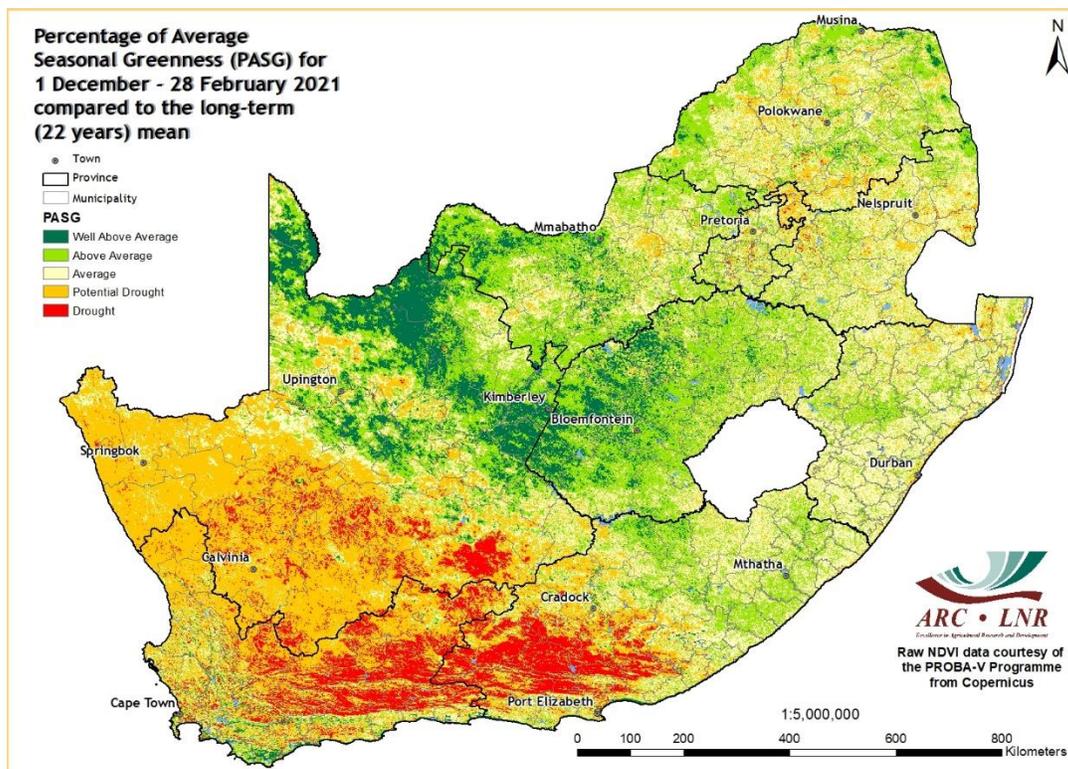
*Rainfall during February 2021 was once again above normal over much of the summer rainfall region, but larger areas of the region received normal to below normal rainfall than during January.*

# Rainfall (mm): 1 – 14 March 2021



*Very little rain occurred during the first half of March 2021 over most of the summer rainfall region. Somewhat more widespread falls were recorded over the southwestern parts of the country, including the winter rainfall region.*

## Percentage of Average Seasonal Greenness: 1 December – 28 February 2021



*Above-normal rainfall over the summer rainfall region during the current and previous summer, especially over the central to northern parts of the country, had a very positive effect on vegetation activity during this period. Parts of the Karoo still show the effect of relatively dry conditions.*

## Overview of expected conditions over South Africa during the next few days

Weak upper-air troughs traversing the southern parts together with ridging anticyclones at the surface in the south will keep conditions generally favorable for some thundershowers over the country on most days during the period. The ridging high in the south will support cooler, cloudy conditions with showers along the Garden Route while resulting in strong southeasterlies over the southwestern parts. Cold fronts are not expected to have an impact during the next few days and the winter rainfall region is expected to remain dry according to current forecasts.

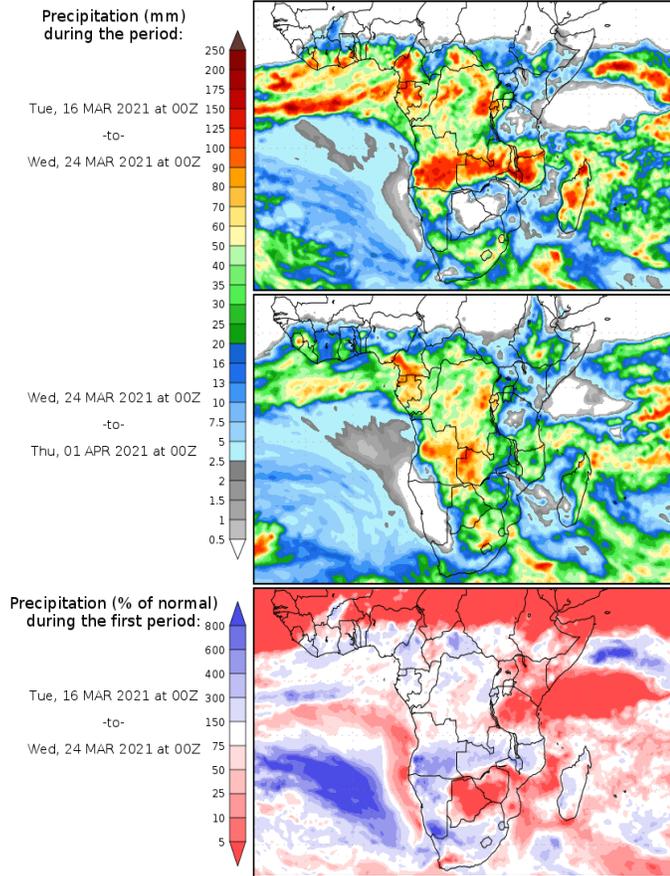
### Conditions in main agricultural production regions (16 – 22 March)

**Maize production region:** Partly cloudy and mild to warm conditions are expected to dominate in this region. The western to central parts of the region should experience isolated to scattered thundershowers on most days while the eastern parts should remain dry at first, with scattered thundershowers from Thursday (18<sup>th</sup>) onwards. A few thundershowers may become severe in the east on Thursday (18<sup>th</sup>). Temperatures will be slightly above normal for this time of the year, but generally very supportive of production. Maximum temperatures over the western maize-production areas will be in the order of 24 – 30°C, with cooler conditions expected only by next week (and therefore not a certainty). Minimum temperatures will be in the order of 15 – 21°C. Maximum temperatures over the eastern maize-production region will range between 23 and 28°C. Minimums will be in the order of 11 – 15°C.

**Cape Wine Lands and Ruens:** It will be sunny and mild to warm for the most part over this region, with mostly southerly to southeasterly winds. The southerly flow will result in cloudy conditions with showers along the Garden Route on Tuesday

(16<sup>th</sup>) and Friday to Saturday (19<sup>th</sup> – 20<sup>th</sup>). The wind will be strong southeasterly in the southwest on Tuesday (16<sup>th</sup>) and again during the weekend.

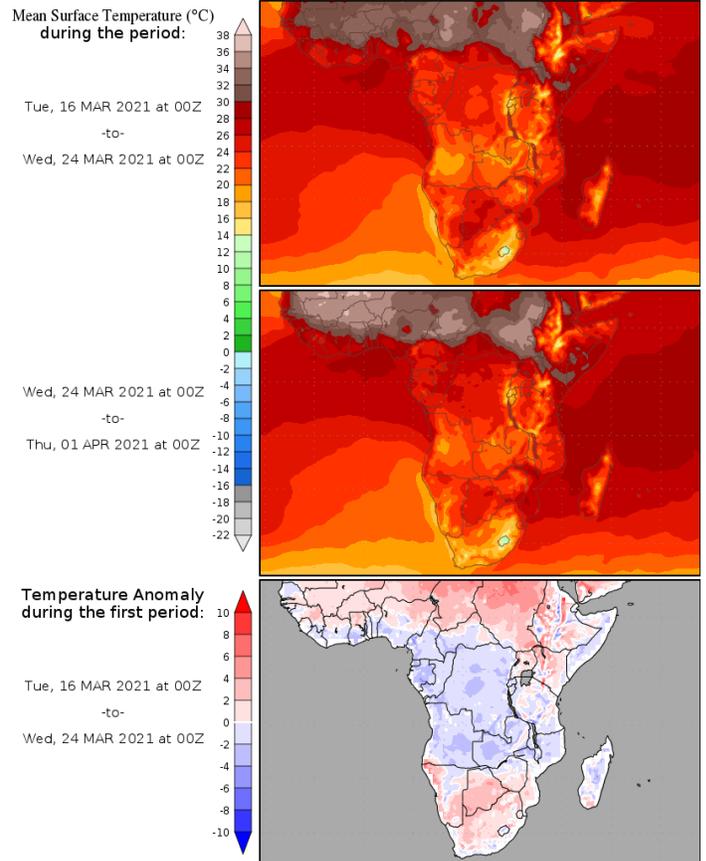
### Precipitation Forecasts



Precipitation forecasts from the National Centers for Environmental Prediction.  
Normal rainfall derived from Xie-Arkin (CMAP) Monthly Climatology for 1979-2003.  
Forecast Initialization Time: 00Z16MAR2021

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: 00Z16MAR2021

GRADS/COLA

**Center for Ocean-Land-Atmosphere Studies (COLA) and Institute of Global Environment and Society (IGES) –**  
<http://Wxmaps.org>

## 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 16 March) 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:

- Strong southeasterly winds are expected over the southwestern parts on Tuesday (16<sup>th</sup>) and during the weekend. Where vegetation is dry, these conditions may be conducive to the development and spread of wild fires.
- Thundershowers over eastern Northern Cape and western Free State may become severe on Wednesday (17<sup>th</sup>).
- Thundershowers over northern KZN and southern Mpumalanga may become severe on Thursday (18<sup>th</sup>).
- Thundershowers over the Eastern Cape, southern Free State and southern KZN may become severe on Saturday (20<sup>th</sup>).

## 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:**

CSIR NRE (National Resources and the Environment)

“CSIR NRE produces forecasts on an experimental basis, doesn't guarantee the accuracy of the daily forecasts and cannot be held accountable for the results of decisions taken based on the forecasts”

### **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>

“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.