

# CUMULUS

6 April 2021 – by J Malherbe, R Kuschke

## Contents

Summary.....	2
Seasonal overview.....	3
ENSO and seasonal forecasts.....	3
Seasonal forecasts issued by various international institutions .....	5
IRI .....	5
CUMULUS seasonal outlook, based on decadal variability .....	6
Rainfall (% of long-term mean): March 2021.....	7
Rainfall (mm): 28 March – 4 April 2021.....	8
Percentage of Average Seasonal Greenness: 11 December – 10 March 2021.....	9
Overview of expected conditions over South Africa during the next few days .....	9
Conditions in main agricultural production regions (6 - 12 April).....	9
Possible extreme conditions - relevant to agriculture.....	11
Sources of information .....	12



## Summary

### *Drier autumn weather continues*

Apart from scattered thundershowers initially over the summer rainfall region (mostly northeastern Northern Cape, Free State, North West, Gauteng, Mpumalanga and southern Limpopo), it will be sunny to partly cloudy and warm. There is no indication yet of a strong frontal system bringing rain to the winter rainfall region during the period of interest. However, 1 to 2 days of cooler, cloudy and wet conditions are expected along the southern to southeastern coastal belt. It will be warmer than normal for this time of the year, especially over the central to western interior.

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

- **General:**

- Temperatures will be above normal for this time of the year, with largest positive deviations expected over the central to western interior.
- Rainfall will be below normal for this time of the year except for a belt stretching from North West to KZN where rainfall could be near normal.
- There is no indication of early frost over the interior during the next few days.
- Sunny to partly cloudy and warm conditions will again dominate across the interior.
- Conditions over the summer-grain production region will be conducive to the ripening of the crop.
- Temperatures over the summer-grain production area will be relatively high except initially when scattered thundershowers are expected to suppress maximum temperatures. From Thursday onwards it will be sunny to partly cloudy, warm and dry for the most part:
  - Maximum temperatures over the eastern maize-production areas will be in the order of 21 – 27°C. Minimum temperatures will be in the order of 9 – 17°C.
  - Maximum temperatures over the western maize-production region will range between 26 and 32°C. Minimums will be in the order of 15 – 19°C.
- Light showers are expected initially along the Garden Route initially and along the southeastern coastal belt. Light showers are also expected along the southeastern coastal areas during the weekend.
- The winter rainfall region is expected to receive very little to no rain during the next few days.

- **Detailed:**

- Tuesday and Wednesday (6<sup>th</sup>/7<sup>th</sup>): Partly cloudy and warm with scattered thundershowers over the northeastern Northern Cape, Free State, North West, Gauteng, Mpumalanga and southern Limpopo. Thundershowers at this time of the summer / autumn may have a tendency to produce hail – usually small. The rest of the interior will be warm and dry. It will initially be cloudy with showers along the KZN coast.
- Thursday (8<sup>th</sup>): Sunny to partly cloudy and warm. Isolated thundershowers are still possible, mainly in the east, over Mpumalanga and KZN.
- Friday (9<sup>th</sup>): Sunny to partly cloudy, warm and dry for the most part. Very isolated thundershowers still possible, mainly over Mpumalanga. A frontal system to the south will result in high clouds over the southern parts while light showers are possible along the Garden Route.
- Saturday and Sunday (10<sup>th</sup>/11<sup>th</sup>): Sunny to partly cloudy, warm and dry over the entire country except for cloudy spells and light showers along the southeastern coastal belt. It will be hot over the central to northwestern Northern Cape.
- Monday (12<sup>th</sup>): Sunny to partly cloudy and warm across the country, but hot over the central to northern and northwestern Northern Cape. Isolated thundershowers are possible over the central to southeastern interior.

## Seasonal overview

### ENSO and seasonal forecasts

**Due to the weakening of the La-Niña signal, it can be expected that seasonal outlooks at the end of summer, for the interior of South Africa, will trend somewhat drier.**

**According to the Australian Bureau of Meteorology** (Updated 30 March): The Bureau's ENSO Outlook has moved from LA NIÑA to INACTIVE as most El Niño–Southern Oscillation (ENSO) indicators have now returned to neutral levels. Climate model outlooks suggest the Pacific will remain at neutral ENSO levels at least until the winter.

Tropical Pacific Ocean sea surface temperatures have persisted at ENSO-neutral values for several weeks. Below the surface, much of the tropical Pacific is now at near average temperatures. Atmospheric indicators are also generally at neutral ENSO levels. The Southern Oscillation Index (SOI) is close to zero, while trade winds are currently being enhanced by the Madden–Julian Oscillation (MJO). Only cloudiness near the Date Line continues to show a weak La Niña-like signature.

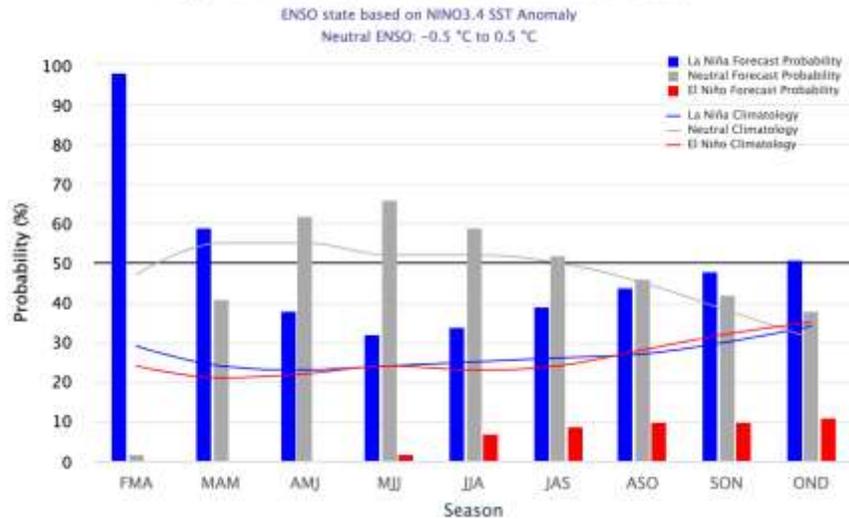
These changes are consistent with climate model outlooks, which have indicated a return to ENSO neutral during the southern hemisphere autumn, with little indication of a return to La Niña patterns in the coming months. A return to ENSO neutral conditions in autumn is also typical of the life cycle of ENSO events. All models indicate ENSO will remain neutral until at least the end of the southern winter.

The Southern Annular Mode (SAM) is currently neutral and expected to remain neutral for the coming fortnight. A neutral SAM has little influence on Australian rainfall..... *(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)*

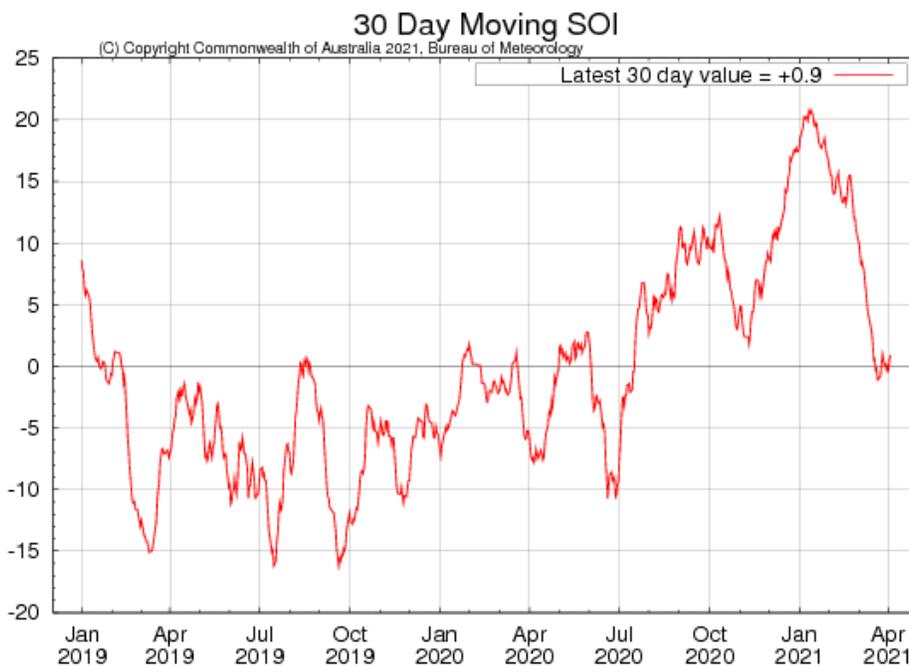
.....**Australian Bureau of Meteorology** - <http://www.bom.gov.au>

**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/>

Early-March 2021 CPC/IRI Official Probabilistic ENSO Forecasts



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



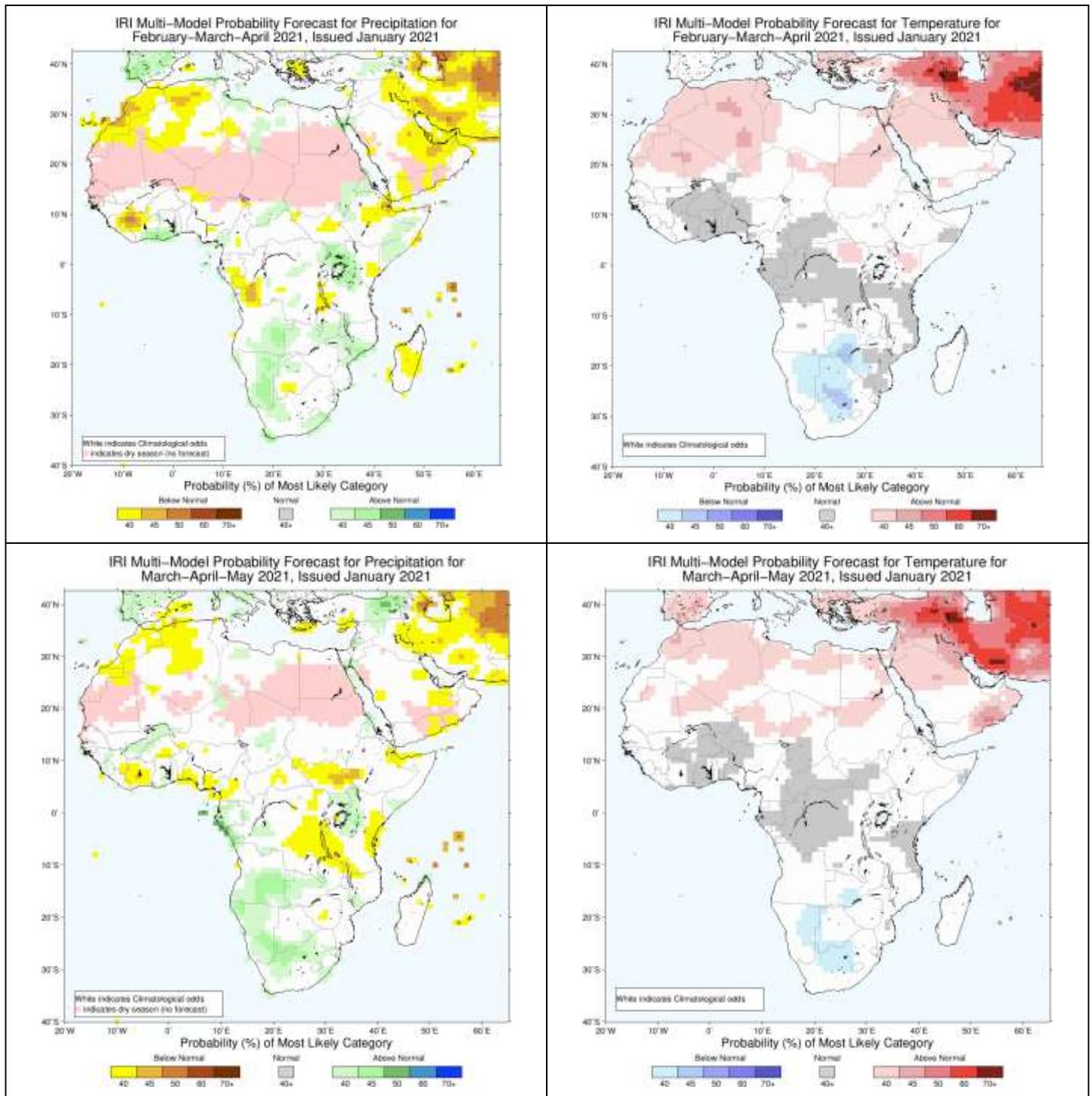
Australian Bureau of Meteorology - <http://www.bom.gov.au>

**The Southern Oscillation Index remains in neutral territory (+0.9). This is indicative of atmospheric circulation patterns moving towards neutral conditions.**

## Seasonal forecasts issued by various international institutions

### IRI

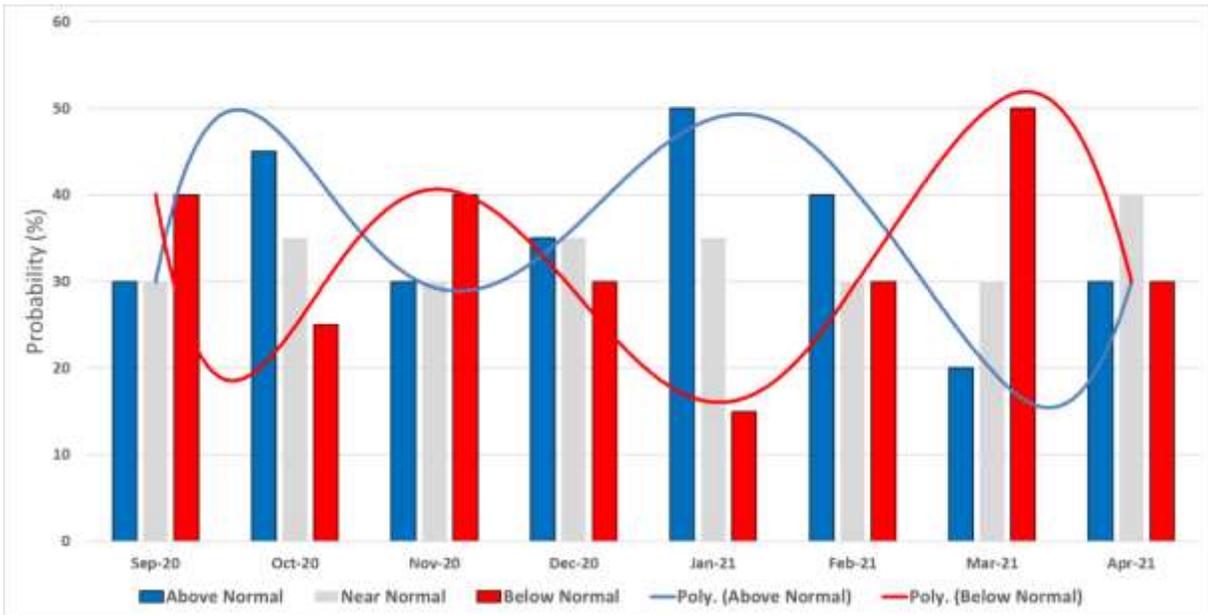
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

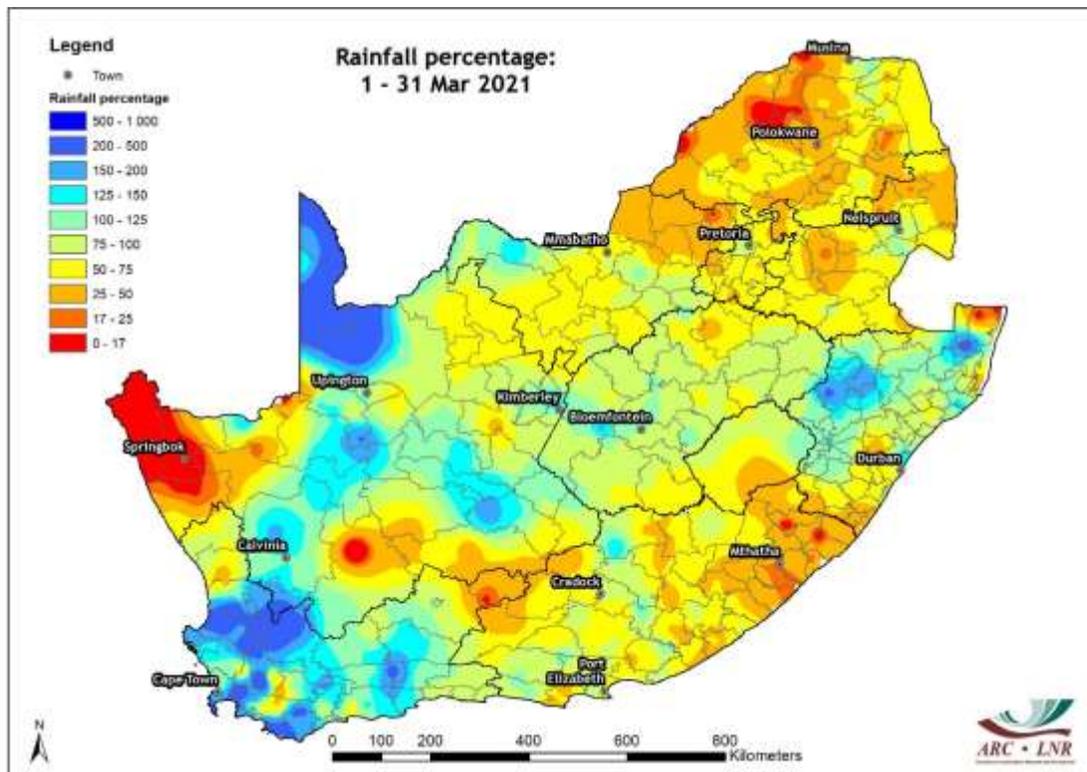


***Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).***

Typical patterns during similar summers are:

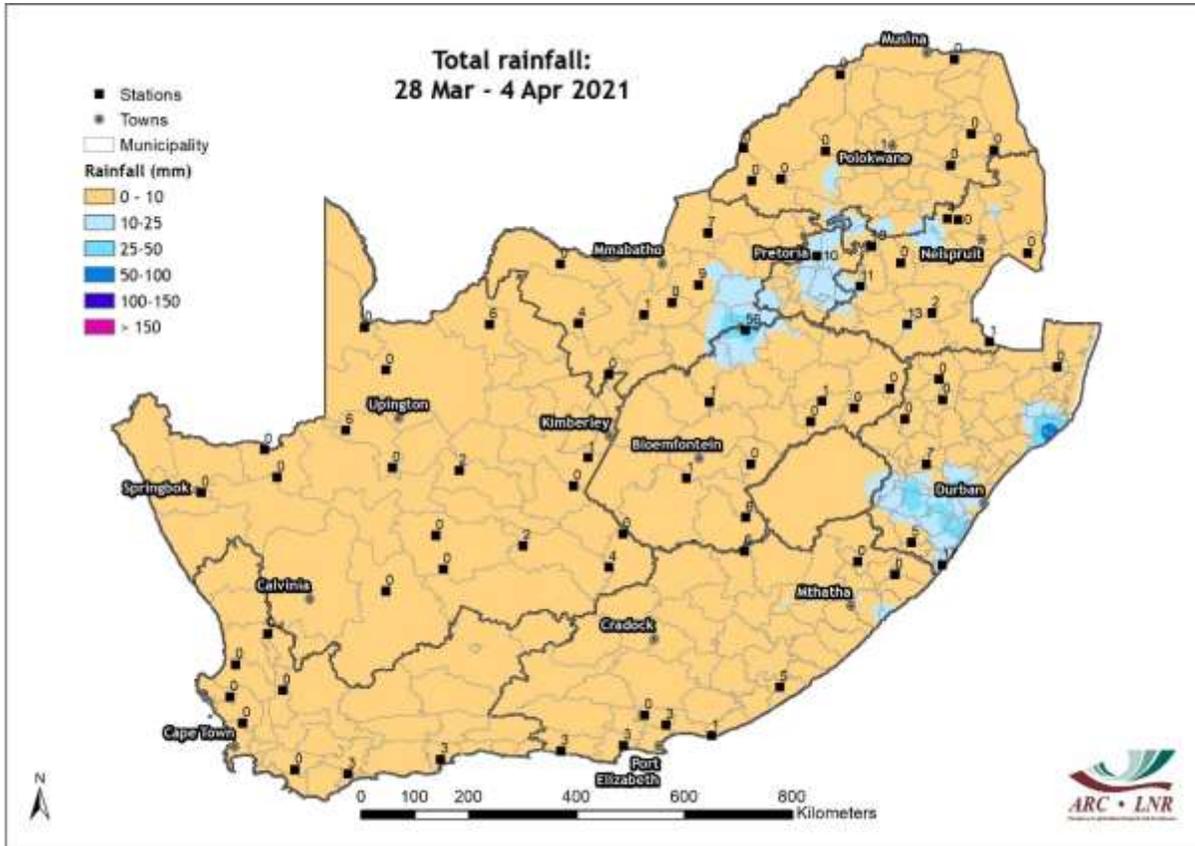
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



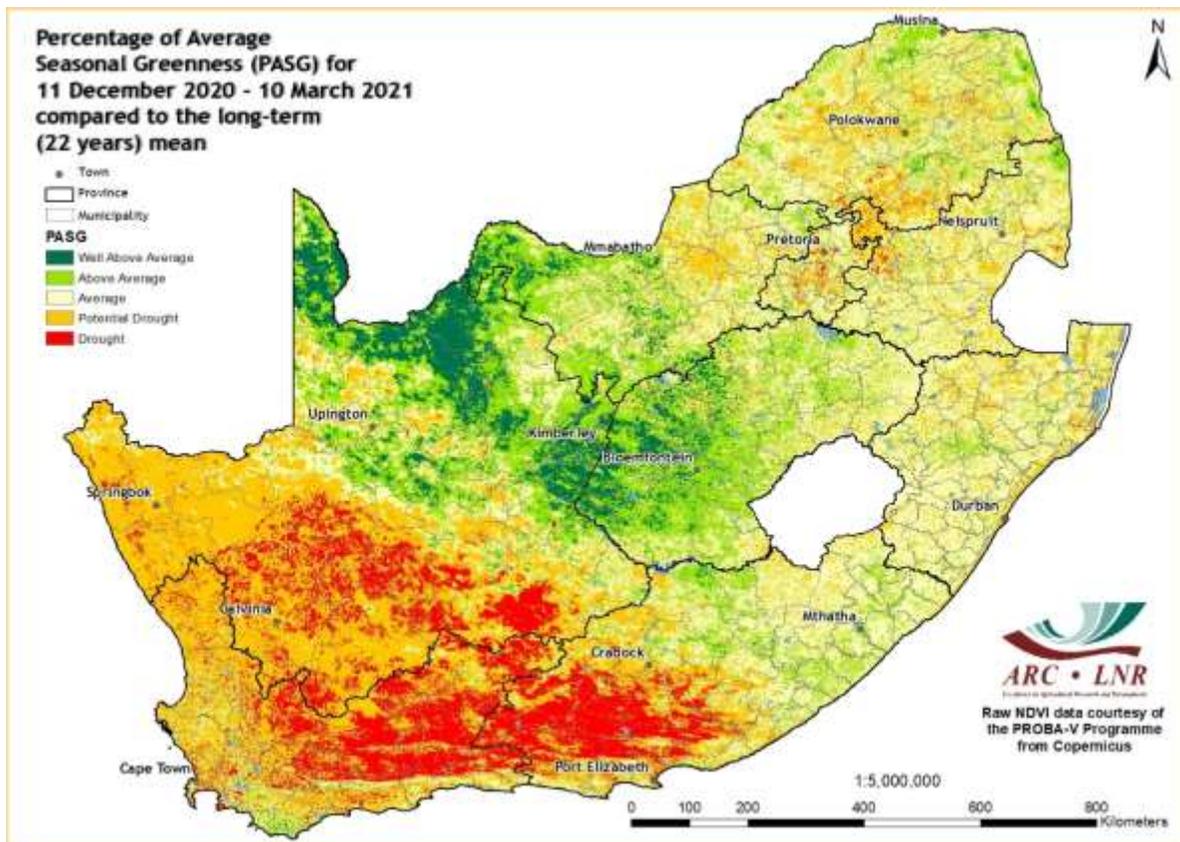
*While large parts of the summer rainfall region received below-normal rainfall during March (especially in the northeast), some parts of the central interior received normal to above-normal rainfall while the western to southwestern parts, including most of the winter rainfall region, received above normal rainfall.*

## Rainfall (mm): 28 March – 4 April 2021



*The last few days were mostly dry, but thundershowers did bring some rain to parts of North West and Gauteng as well as the coastal and southern parts of KZN. Light showers also occurred along the Garden Route.*

## Percentage of Average Seasonal Greenness: 11 December – 10 March 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

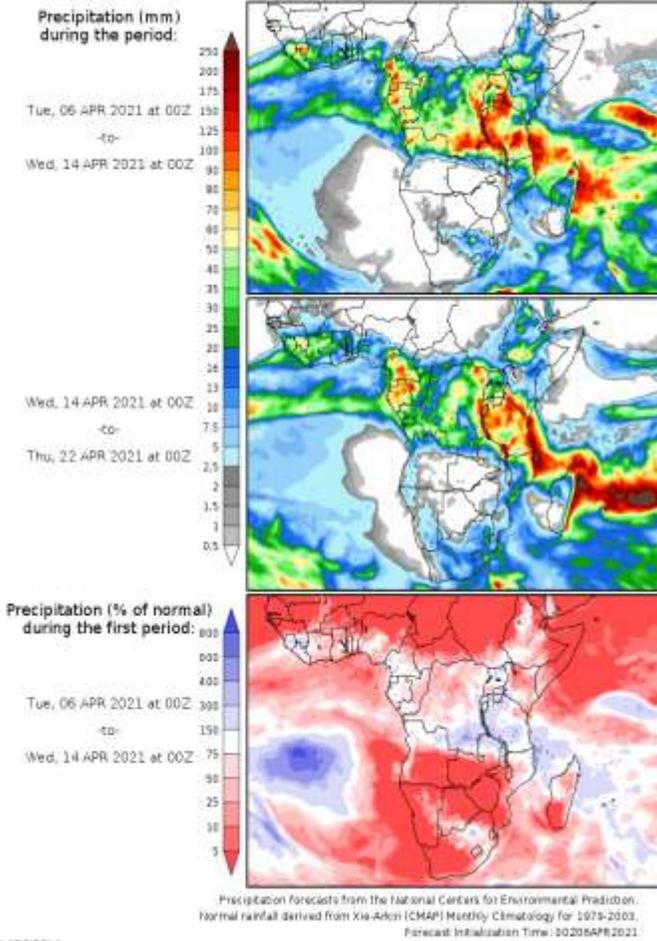
Except for some instability during the first few days over the interior, associated with a weak upper-air trough moving through, the circulation pattern will be anti-cyclonic, resulting in mostly sunny to partly cloudy and dry conditions, becoming hot over the northwestern interior. Occasional ridging of the Atlantic Ocean High will result in light showers along the coast in the south and southeast at times.

## Conditions in main agricultural production regions (6 - 12 April)

**Maize production region:** Conditions over this region will generally be supportive of a ripening harvest. Scattered thundershowers are expected over the entire region on Tuesday and Wednesday (6<sup>th</sup>/7<sup>th</sup>). While some residual thundershowers are still possible over the eastern parts after the 7<sup>th</sup>, sunny to partly cloudy, warm and dry conditions should dominate. Maximum temperatures over the eastern maize-production areas will be in the order of 21 – 27°C. Minimum temperatures will be in the order of 9 – 17°C. Maximum temperatures over the western maize-production region will range between 26 and 32°C. Minimums will be in the order of 15 – 19°C.

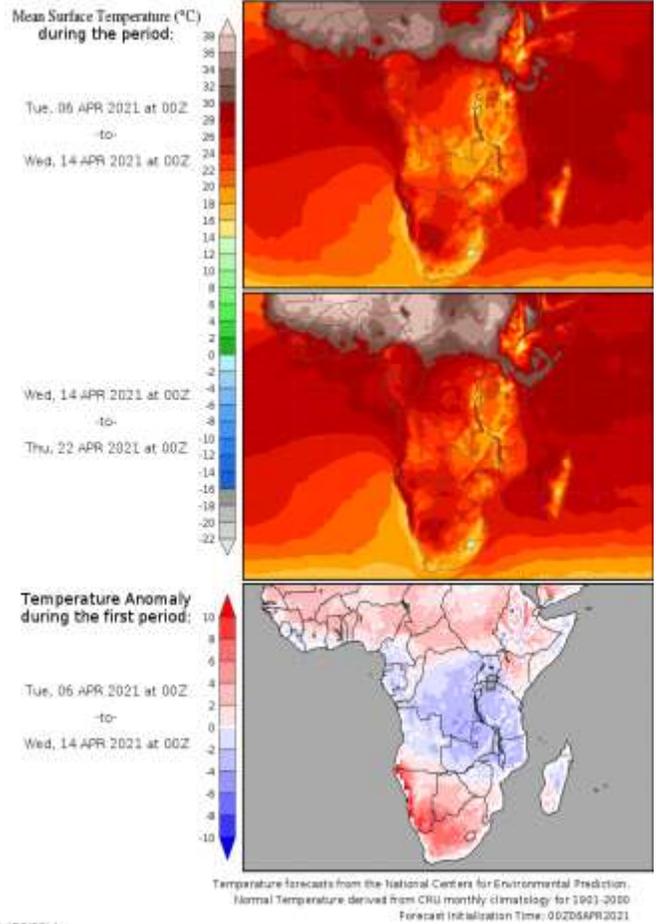
**Cape Wine Lands and Ruens:** It will be sunny to partly cloudy and warm for the most part but mild along the coast. Light showers are possible initially along the Garden Route and possibly again by Friday (9<sup>th</sup>). The wind will vary mostly from southeasterly to westerly and will at times become fresh in the afternoon. The advent of a frontal system may result in fresh to strong northwesterlies by late Monday (12<sup>th</sup>).

### Precipitation Forecasts



GRADS/COLA

### Temperature Forecasts



GRADS/COLA

GFS rainfall forecast – <https://mag.ncep.noaa.gov>

## 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 6 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:

- It will be warm with fresh westerly winds in the afternoons over the central to western parts of the Northern Cape. Where vegetation is dry, these conditions may be conducive to the development and spread of wild fires.
- The western to northwestern interior is expected to become hot during the weekend into early next week.
- Given relatively low atmospheric temperatures by this time of autumn, thundershowers over the interior may at times be associated with hail – these should for the most part be small.

## 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.