

# CUMULUS



16 February 2021 – by J Malherbe, R Kuschke



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## Summary

### *Drier weather to continue until next week*

Scattered to widespread showers and thundershowers occurred during the last few days over the eastern and northeastern parts due mainly to the presence of the low-pressure system located over Mozambique. The system remained fairly stationary during this time and is expected to track slowly southwards along the Mozambican coast and later out over the southern Mozambique Channel. Fairly widespread thundershowers also occurred over the central to western and southern parts.

Very little to no rainfall is expected during the next few days, with the circulation over the country unfavorable for rainfall as the tropical system slowly makes its way south along the coast of Mozambique. Conditions are only expected to improve towards next week - when tropical moisture and instability are expected to invade from the north.

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

- **General:**

- It is expected to be mostly sunny and dry over the central to southwestern interior for the remainder of the week, with thundershowers over the central parts only by early next week according to current forecasts.
- Rainfall is expected to be near normal over the central to northeastern parts, but these falls are only expected to occur from Sunday (21<sup>st</sup>) into next week.
- Temperatures will on average be near normal across the country, but cooler over the far northeastern parts and also in the southwest.
- While the central to western and southwestern parts are expected to be warm and dry on most days, a southerly to southwesterly flow will result in cooler conditions over the winter rainfall region, Garden Route and southwestern interior from Thursday (18<sup>th</sup>) onwards.
- Light showers are expected over the southwestern parts of the winter rainfall region and along the Garden Route on several days.
- The tropical system in the northeast is expected to have very little to no direct impact on our weather. Forecasts with relation to this type of system can change drastically and it is advisable to keep an eye on further developments.
- Temperatures over the main summer-grain production region will generally be supportive of crop production – with warmer conditions expected to continue until possible widespread rainfall by next week. Drier conditions this week will also result in a slightly larger diurnal temperature range:
  - Maximum temperatures over the western maize-production areas will be in the order of 24 – 31°C, with cooler, cloudy conditions concentrated towards early next week. Minimum temperatures will be in the order of 14 – 21°C.
  - Maximum temperatures over the eastern maize-production region will range between 20 and 33°C, with the cooler conditions expected in the beginning of the period and next week, and highest temperatures towards the weekend. Minimums will be in the order of 7 – 16°C, with the lower temperatures confined to the beginning of the period, followed by warmer nights.

- **Detailed:**

- Tuesday (16<sup>th</sup>): Cloudy to partly cloudy and windy over the northeastern parts. Isolated showers and thundershowers are still possible over the northeastern parts, as far west as North West, but the distribution and intensity will be less than the previous days. It will be sunny and warm over the central to western and southern interior. A southerly flow will result in cloudy conditions with light showers along the Garden Route and up the southeast and east coast.
- Wednesday to Saturday (17<sup>th</sup>/20<sup>th</sup>): Cloudy to partly cloudy over the northeastern parts with very isolated thundershowers as far west as the central to eastern parts of North West. It will become progressively warmer during this period. It will remain sunny and warm over the central to western parts, but will

become mild over the southwestern parts from Thursday (18<sup>th</sup>) as southwesterly winds invade these areas. Frontal systems will result in light showers over the southwestern parts of the winter rainfall region while an associated southwesterly flow will result in showers moving up along the Garden Route while keeping the southwestern interior cool. During this period also, the tropical system along the coast of Mozambique is expected to track south and eventually southwestwards away from southern Africa.

- Sunday (21<sup>st</sup>): Cloud cover is expected to increase over the northern and northeastern parts as well as into KZN, with scattered thundershowers. It will become cloudy and cooler along the coast of the Eastern Cape and KZN. The central to southern and western parts are expected to remain sunny and warm while yet another cold front will result in light showers over the southwestern parts of the winter rainfall region and along the Garden Route.
- Monday (22<sup>nd</sup>): It will be cloudy to partly cloudy and cooler over the northeastern to central parts with scattered thundershowers. Thundershowers are expected to be more widespread in a band stretching from North West into the Free State and KZN. It will remain cloudy with rain along the coast of KZN and eastern parts of the Eastern Cape. The western to southwestern parts are expected to be sunny and dry, with a southerly flow keeping the southwestern interior relatively cool.

## 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 16 February) In terms of typical indicators of La Niña, the 2020/21 event has peaked. Climate model outlooks indicate the El Niño–Southern Oscillation (ENSO) will return to neutral during autumn, that is, neither La Niña nor El Niño. The wetter influence from La Niña is likely to continue for the shorter term... *(Seasonal forecasts for South Africa continue to lean towards wet conditions during the remainder of summer)*

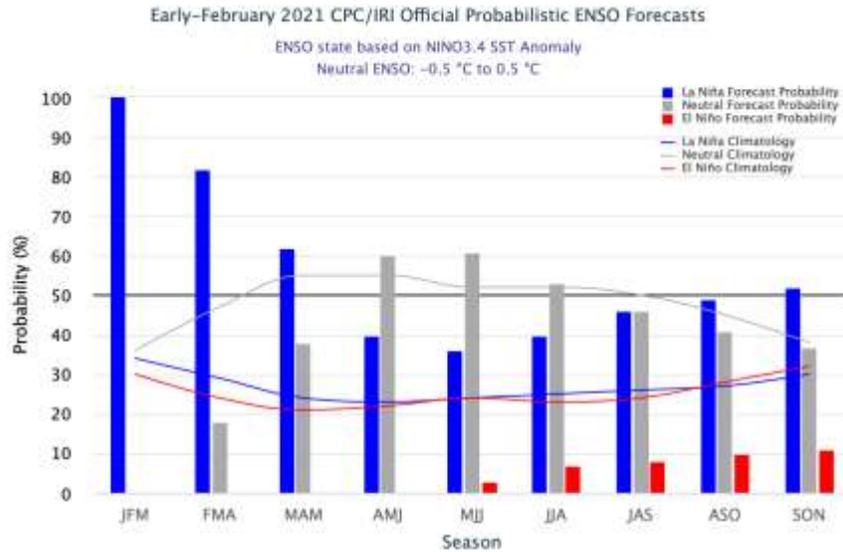
In the tropical Pacific Ocean, sea surface temperatures remain similar to last fortnight's, with a cooler than average tongue of water still present across the central to western Pacific. Beneath the surface, cooler water is still present. In the atmosphere, the Southern Oscillation Index (SOI) still clearly remains within the La Niña range, and cloudiness near the Date Line is below average, a typical La Niña atmospheric pattern.

The Southern Annular Mode (SAM) has recently been positive, but forecasts expect a return to neutral values in coming days. *(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)*

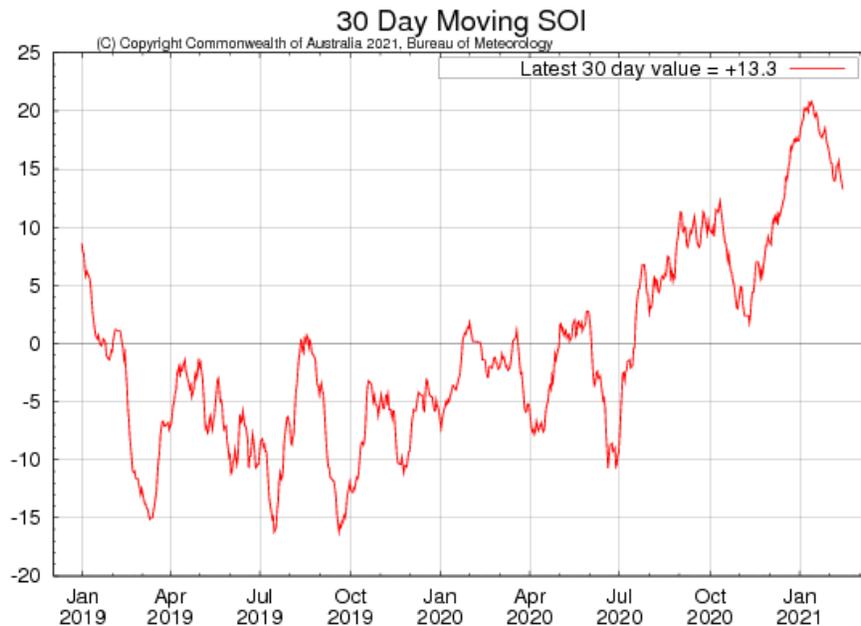
The Indian Ocean Dipole (IOD) is currently neutral.....**Australian Bureau of Meteorology** - <http://www.bom.gov.au>

**According to the IRI** (Updated 11 February): La Niña persisted in January, reflected by below-average sea surface temperatures (SST) anomalies extending from the western to east-central Pacific Ocean. SSTs returned to near average in the eastern Pacific Ocean by the end of the month, as indicated by the latest weekly Niño-3 and Niño-1+2 index values of -0.3°C and -0.2°C, respectively. However, the latest weekly Niño index values in the central (Niño-4) and east-central (Niño-3.4) Pacific Ocean were -1.1°C and -0.7°C. The below-average SSTs were supported by negative subsurface temperature anomalies, which extended from the surface to at least ~150m below the surface between 160°E and 130°W. Low-level wind anomalies remained easterly from the western to east-central (~140°W) tropical Pacific, with the largest amplitude near the Date Line. Upper-level wind anomalies were westerly across most of the tropical Pacific. Tropical convection continued to be suppressed over the western and central Pacific and enhanced around the Philippines and Indonesia, while both the Southern Oscillation and Equatorial Southern Oscillation remained positive. Overall, the coupled ocean-atmosphere system remains consistent with La Niña.

Most of the models in the IRI/CPC plume predict a transition to ENSO-neutral during the *Southern Hemisphere autumn* 2021. The forecaster consensus is in agreement with this transition and then predicts a continuation of ENSO-neutral at least through the *Southern Hemisphere winter*. In part, due to the inherent uncertainty in predictions made at this time of year, the forecast for the Southern Hemisphere spring remains split (~50%) between La Niña and the combination of the other two possibilities (El Niño and Neutral). In summary, there is a ~60% chance of a transition from La Niña to ENSO-Neutral during the April-June period.....**International Research Institute for Climate and Society**- <http://iri.columbia.edu/>



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



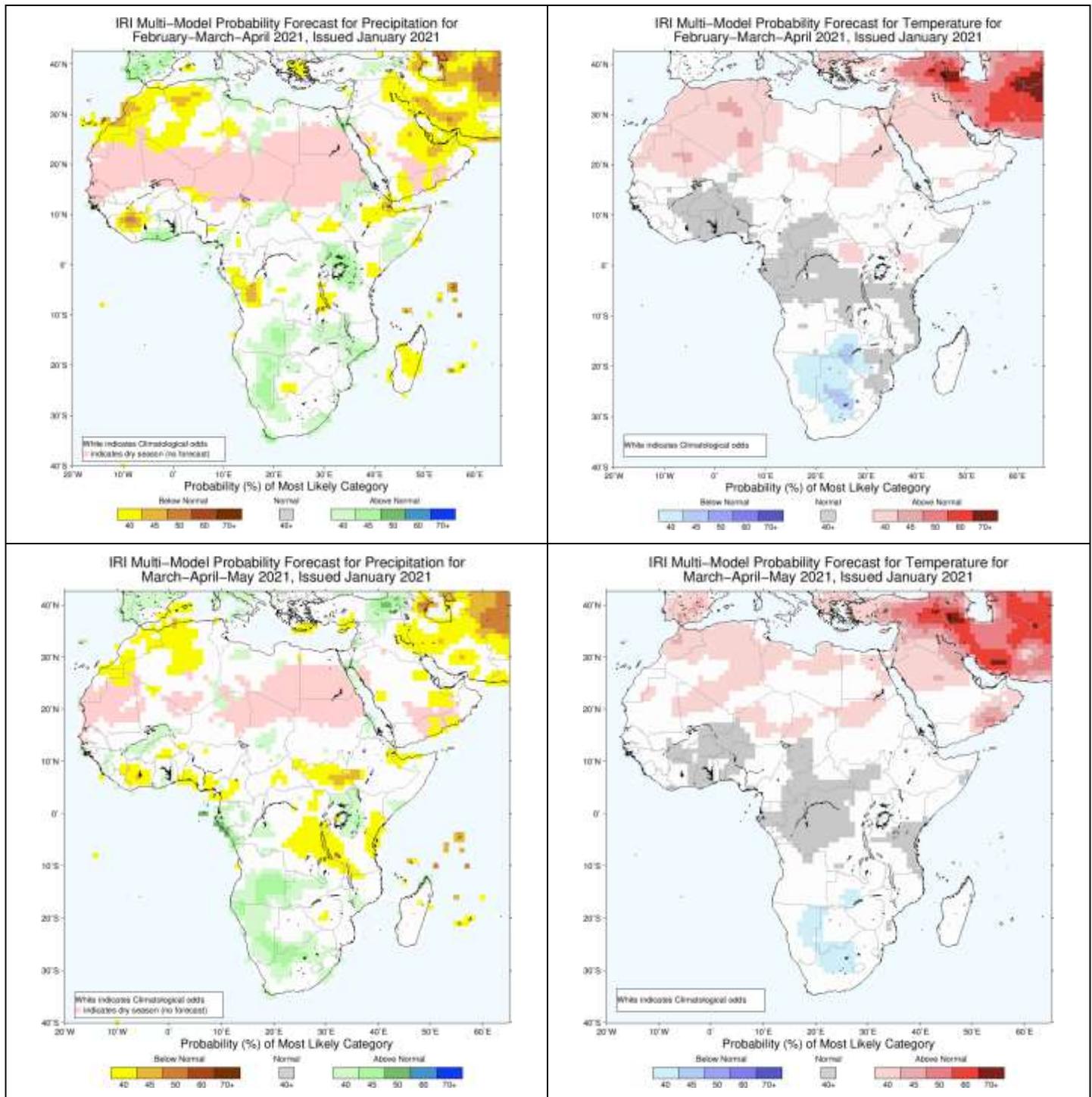
*Australian Bureau of Meteorology* - <http://www.bom.gov.au>

**The Southern Oscillation Index is still high (+13.3), well above the La Niña threshold. This is indicative of atmospheric circulation patterns consistent with La Niña conditions.**

## Seasonal forecasts issued by various international institutions

### IRI

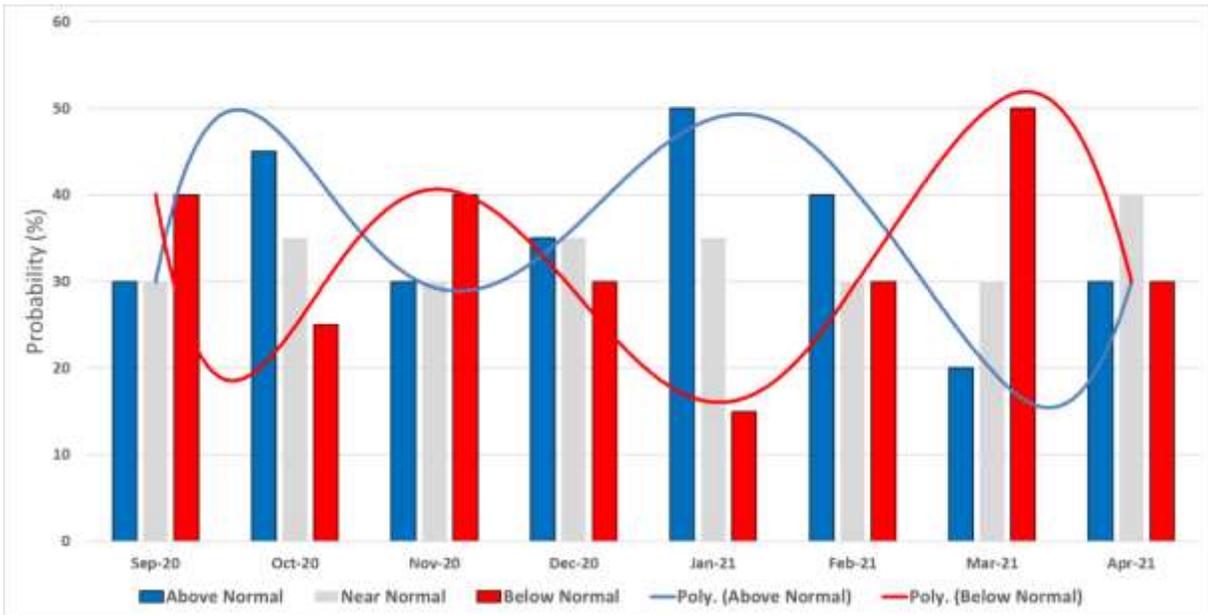
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



*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:

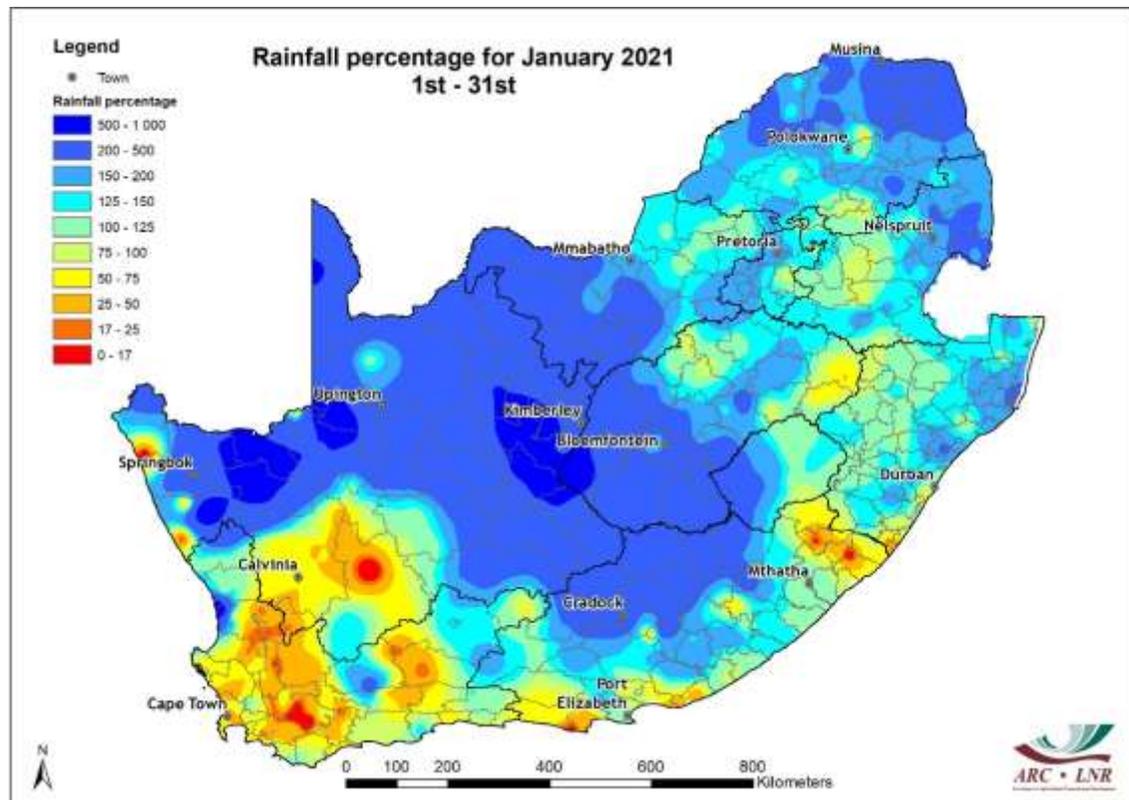


***Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).***

Typical patterns during similar summers are:

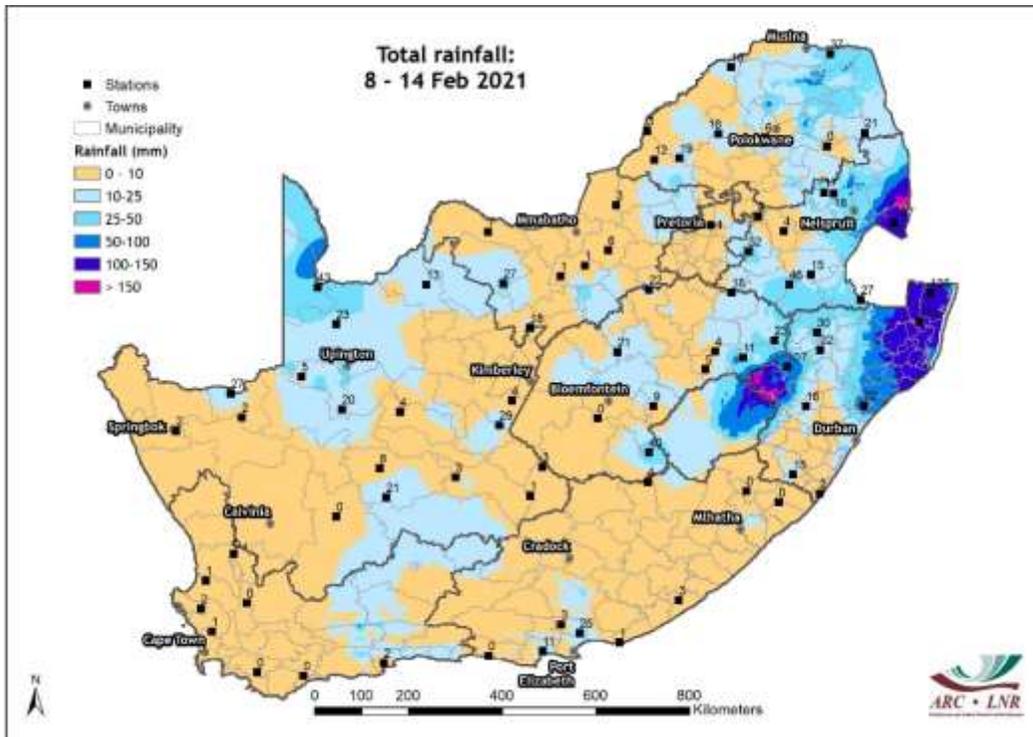
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



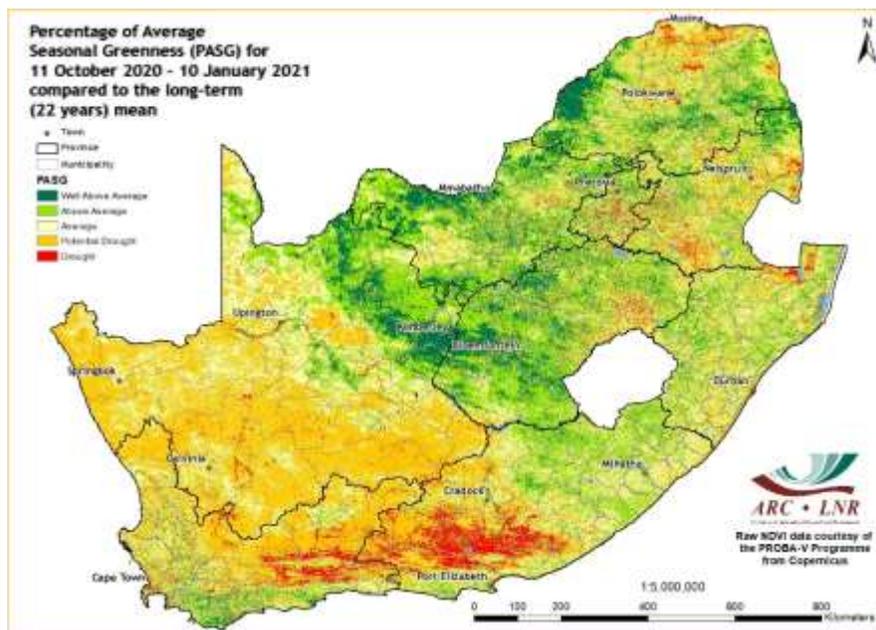
*Most of the summer rainfall region received above-average rainfall during January, but the largest positive deviations in terms of the percentage of average occurred over the central interior as well as the northern parts of Limpopo and the Lowveld. The eastern maize-production region received near-normal rainfall while the western production region received well-above-normal rainfall.*

## Rainfall (mm): 8 – 14 February 2021



*Widespread rain occurred over the country as a result of the tropical system towards the northeast and also as a result of an upper-air low to the west. Falls were generally on the low side, except for the southeastern parts of Mpumalanga and northeastern KZN where the influence of the tropical system to the northeast was stronger and totals exceeded 100 mm.*

## Percentage of Average Seasonal Greenness: 11 October – 10 January 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

The upper-air conditions will be stable across the country until the weekend as the tropical system is expected to remain towards the east and an upper-air trough builds far to the southwest. The trough in the west is expected to strengthen closer to the country by the weekend while a new tropical low will develop/deepen over the southeastern Angolan/northeastern Namibian region. Frontal systems will be relatively far north and southwesterly winds will bring occasional showers to the southern parts of the winter rainfall region and Garden Route. A return of tropical moisture from the north, associated with the new system to the northwest together with upper-air instability related in part to the upper-air trough to the southwest and an easterly wave in the north will result in favorable conditions for thundershowers from Sunday (21<sup>st</sup>) onwards over the summer rainfall region. Ridging by the Atlantic Ocean High to the south will further contribute moisture, supporting more widespread thundershowers over the eastern to central parts.

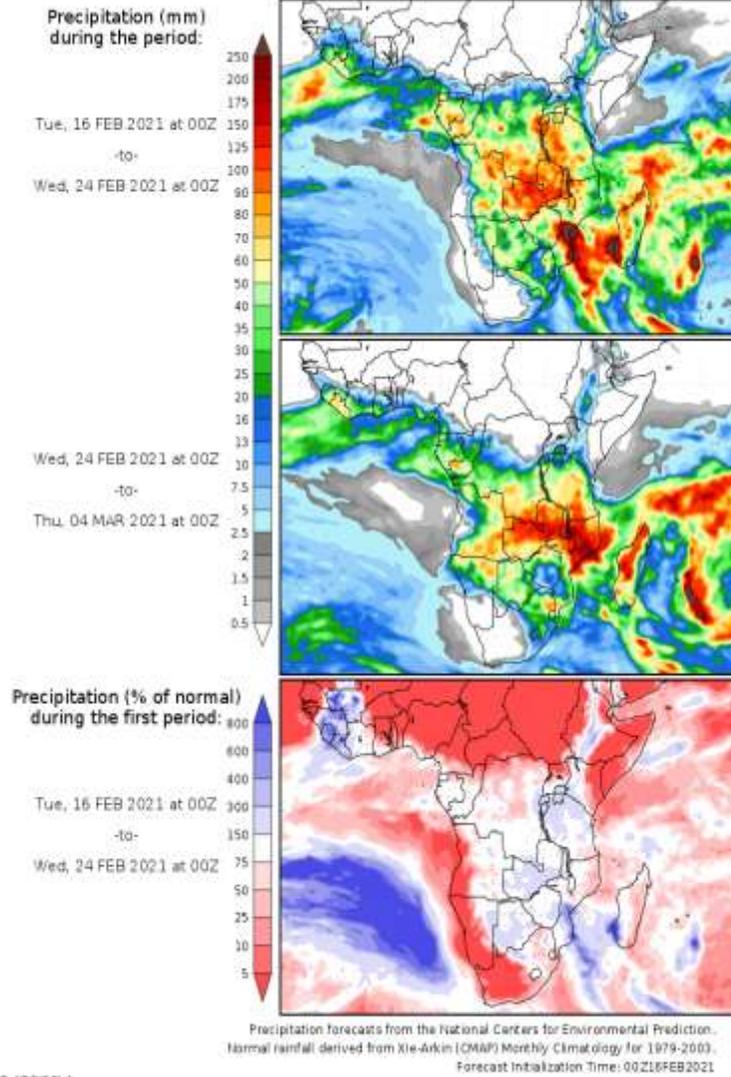
### Conditions in main agricultural production regions (16 - 22 February)

**Maize production region:** It will be sunny to partly-cloudy and mild to warm for almost the entire period across the region. Conditions will change from Sunday (21<sup>st</sup>) when scattered thundershowers are expected to invade the region from the north. These are expected to become widespread over the central to western parts by Monday (22<sup>nd</sup>) according to current forecasts.

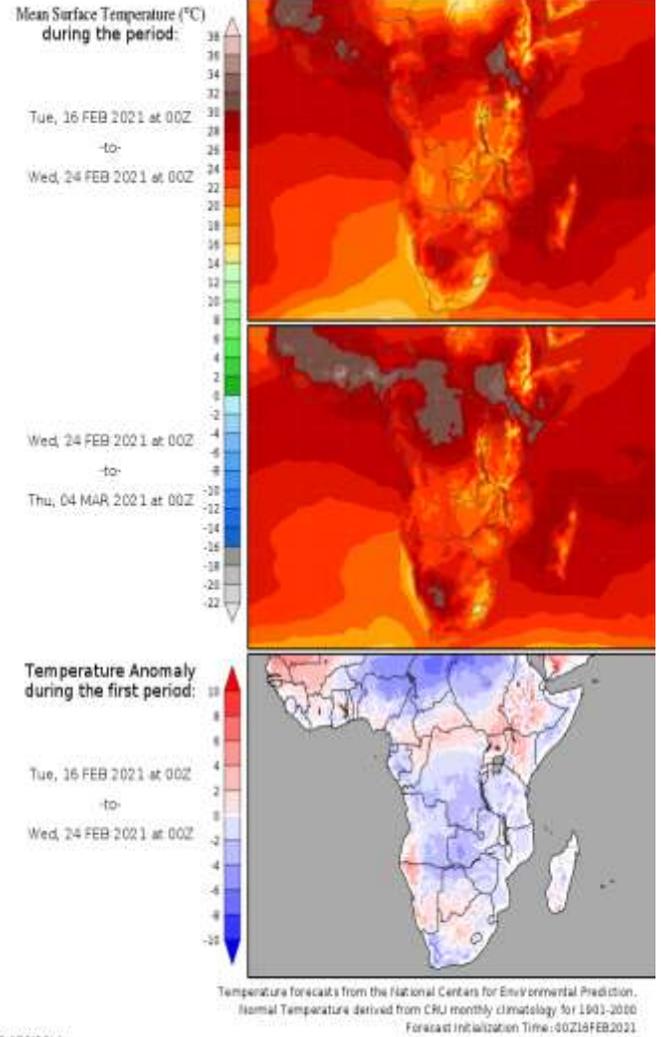
Temperatures over the region will generally be supportive of crop production with warmer conditions expected to continue until possible widespread rainfall by next week. Drier conditions this week will also result in a slightly larger diurnal temperature range. Maximum temperatures over the western maize production areas will be in the order of 24 – 31°C, with cooler, cloudy conditions concentrated towards early next week. Minimum temperatures will be in the order of 14 – 21°C. Maximum temperatures over the eastern maize-production region will range between 20 and 33°C, with the cooler conditions expected in the beginning of the period and next week, with highest temperatures towards the weekend. Minimums will be in the order of 7 – 16°C, with the lower temperatures confined to the beginning of the period, followed by warmer nights.

**Cape Wine Lands and Ruens:** It will initially be warm with strong southeasterlies in the southwest and light showers along the Garden Route. It will be partly cloudy to cloudy and cool with southerly to southwesterly winds during most of the remainder of the period while occasional showers are expected, mostly over the southern parts and along the Garden Route. These showers will be associated with the passage of cold fronts, specifically on Thursday and Saturday/Sunday. The wind in the southwest will become strong southeasterly from Sunday (21<sup>st</sup>) when it will become warmer to hot along the West Coast.

### Precipitation Forecasts



### Temperature Forecasts



GRADS/COLA

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 February) 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 is advisable to keep track of the movement and intensity of the tropical system along the coast of Mozambique as the movement of these systems and their subsequent impacts are difficult to predict several days ahead.
- It will be warm to hot and dry with moderate to strong westerly winds over the central to northern and eastern parts of the Northern Cape, western Free State, northeastern parts of the Western Cape and northern parts of the Eastern Cape from Wednesday (17<sup>th</sup>) to Saturday (20<sup>th</sup>). Where vegetation is dry, these conditions may be conducive to the development and spread of wild fires.
- Fresh to strong south-easterlies are expected over the southwestern parts during Tuesday (16<sup>th</sup>) and again from Sunday (21<sup>st</sup>). Where vegetation is dry, this may be conducive to the development and spread of wild fires.

## 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>

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