

# CUMULUS

24 November 2020 – by J Malherbe, R Kuschke

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## Summary

### *Widespread rain by the weekend over the maize-production region*

Widespread rain and thundershowers occurred during the last few days over the summer rainfall region, including the maize-production area. During the coming days, thundershowers will at first concentrate over the northeastern parts. By the weekend however, there will be another period, according to current forecasts, of more widespread rain and thundershowers over the central to northeastern parts. Higher temperatures currently will trend lower towards and during the weekend (especially daytime temperature) when abundant cloud cover should limit heating during the day and possibly result in favorable conditions for fungal pathogens over some of the summer grain-production areas.

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

- **General:**

- Conditions over the summer-grain producing areas should generally be favorable for crop production.
- The central to northeastern summer rainfall region should receive normal to above normal rainfall.
- The western interior is expected to remain dry according to current forecasts.
- Some rain is expected over the winter rainfall region and the Garden Route.
- Temperatures will be near normal to above normal over the interior, decreasing through the period with mild to cool conditions during the weekend. The southwestern parts will be cooler than normal on average.
- The western to central and southern interior will be windy on several days.
- Maximum temperatures over the western maize production areas will be in the order of 27 – 34°C, with hot conditions during the remainder of the week and lowest temperatures during the weekend. Minimum temperatures will be in the order of 16 – 20°C.
- Maximum temperatures over the eastern maize-production region will range between 22 and 29°C, with highest temperatures during the remainder of the week and lowest temperatures during the weekend. Minimums will be in the order of 12 – 17°C.

- **Detailed:**

- Tuesday (24<sup>th</sup>): Sunny to partly cloudy, warm and windy over the central to western interior. Isolated thundershowers are possible over the northeastern parts where it will be warm to hot. A cold front will bring showers to the winter rainfall region, but falls will remain mostly light. It will be cool and windy over the southwestern parts as the front moves through.
- Wednesday (25<sup>th</sup>): Scattered thundershowers are expected over the northeastern parts where it will become cooler – while some storms over southern to central Limpopo and northern Mpumalanga may become severe. The central to western parts of the country are expected to remain warm and dry, while still cool in the south and southwest
- Thursday (26<sup>th</sup>): Thundershowers will shift into the North West province, with little to no precipitation expected in the northeast where it will be somewhat cooler. The central to western and southern interior should remain warm, dry and windy, but the Garden Route and Karoo will remain mild.
- Friday (27<sup>th</sup>): Widespread thundershowers are expected over the eastern Northern Cape, Free State and North West, expending onto the Eastern Highveld. Rain and showers are expected along the Garden Route with some showers also in the Karoo.
- Saturday (28<sup>th</sup>): Cloudy conditions with showers will invade the northeastern parts with a new band of widespread thundershowers, with significant falls in places, expected over the Free State, eastern parts of the Northern Cape and western to central and southern North West – according to current forecasts. Some of the storms over the central parts may become severe. Widespread rain and thundershowers with significant falls in places are also indicated for the eastern parts of the Eastern Cape and into KZN. Showers are also still possible over the Karoo and Garden Route where it should be cloudy, windy and cool.
- Sunday, Monday (29<sup>th</sup> & 30<sup>th</sup>): Isolated to scattered thundershowers are expected to remain in place over the northeastern half of the country, with indications of organized thunderstorms moving SW-NE in a line from the Free State and northeastern Northern Cape into the northeastern interior. This pattern will be

located somewhat further northeast on Monday according to current forecasts. Temperatures will remain lower over the central to northeastern summer rainfall region while the western interior (mostly Northern Cape) will be warm, windy and dry. Cloudy, cool and windy conditions are still possible over the Garden Route and Karoo, contracting eastwards on Monday.

## Seasonal overview

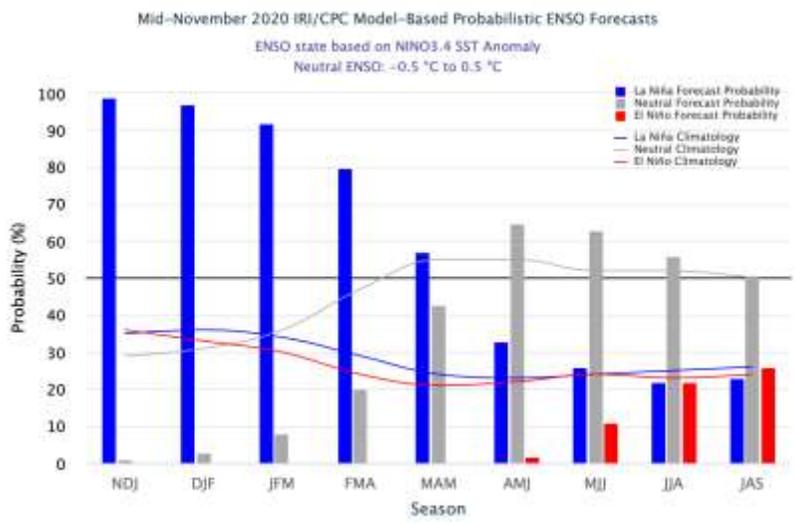
### ENSO and seasonal forecasts

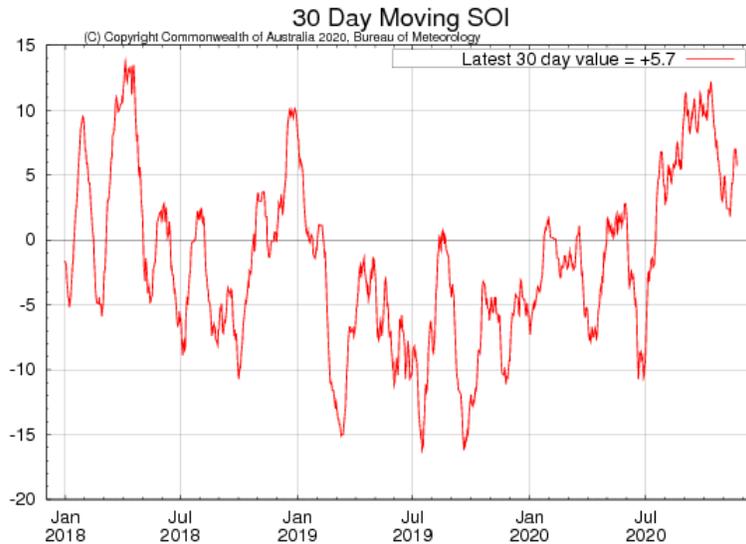
**Due to a positive association with La Niña, rainfall over the southern African interior is expected to be above normal through the summer according to seasonal forecast models.**

**According to the Australian Bureau of Meteorology** (Updated 24 November): La Niña continues in the tropical Pacific. International climate models suggest it is likely to continue to at least February 2021. Central and eastern tropical Pacific Ocean sea surface temperatures (SSTs) are at La Niña levels. Models suggest the current La Niña will strengthen further, peaking in December 2020 or January 2021 at moderate to strong levels. Most oceanic and atmospheric indicators reflect a mature La Niña. Recent variability in the Southern Oscillation Index have been related to the Madden–Julian Oscillation (MJO), rather than the state of the La Niña.

The Southern Annular Mode (SAM) is neutral but is expected to increase to positive values over the coming week. This is driven in part by the La Niña influence, and in part by a stronger than average polar vortex over Antarctica.....**Australian Bureau of Meteorology** - <http://www.bom.gov.au> (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)

**According to the IRI** (Updated 19 November): In mid-November, SSTs in the east-central Pacific are roughly 1 degree C below average, and all key atmospheric variables are consistent with La Niña conditions. A large majority of the model forecasts exceeds the threshold of La Niña SST conditions through the *SH summer*, dissipating during *SH autumn*. The new official CPC/IRI outlook issued earlier this month is similar to these model forecasts, calling for a 95% chance of La Niña for the *next few months*. A La Niña advisory is in effect. **International Research Institute for Climate and Society**- <http://iri.columbia.edu/>





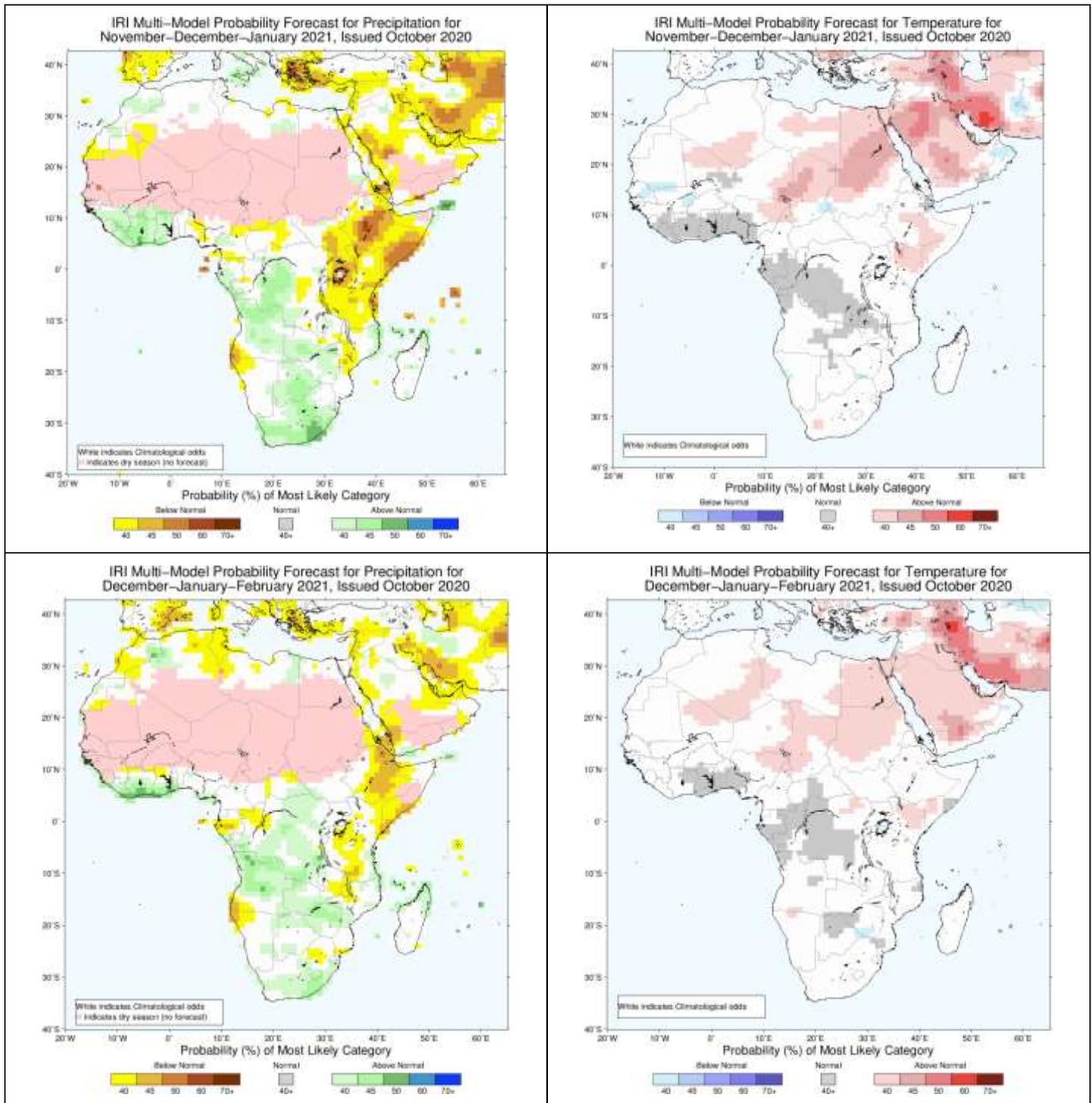
Australian Bureau of Meteorology - <http://www.bom.gov.au>

***The Southern Oscillation Index remains positive and generally upward trending. This is indicative of atmospheric circulation patterns consistent with La Niña conditions.***

## Seasonal forecasts issued by various international institutions

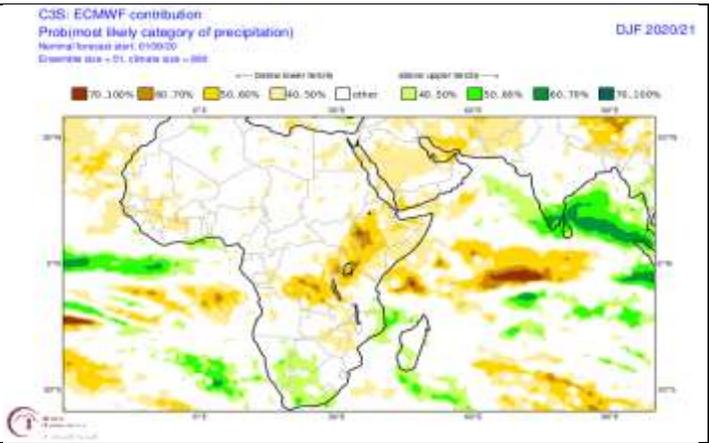
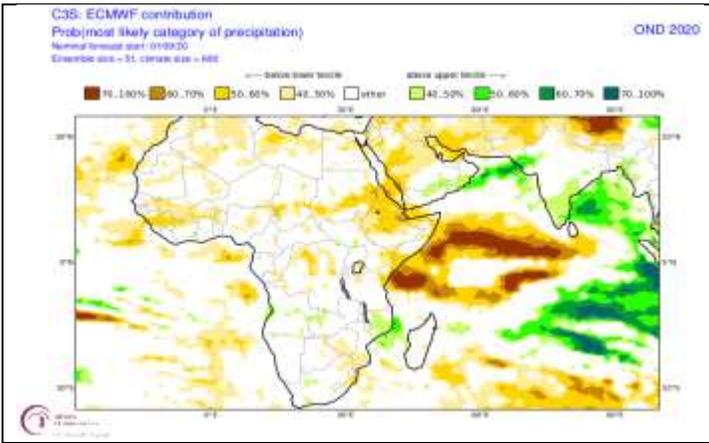
### IRI, ECMWF, NCEP, UKMO

The seasonal forecast by the IRI for Africa favours relatively wet conditions for both early and late summer 2020/21 over South Africa. Coupled with the relatively wet conditions expected over the interior, temperatures are expected to remain near normal.

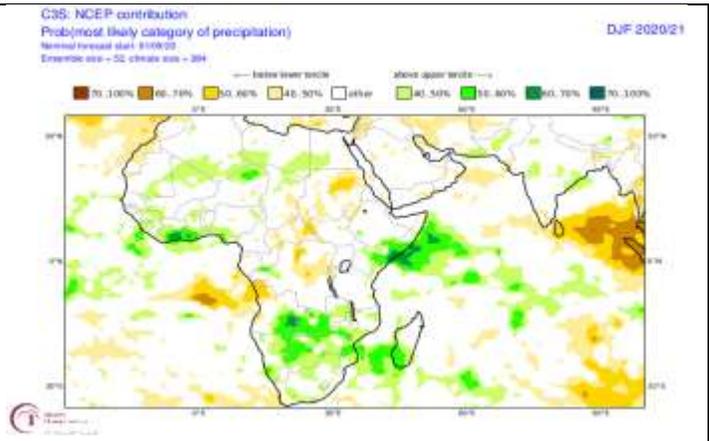
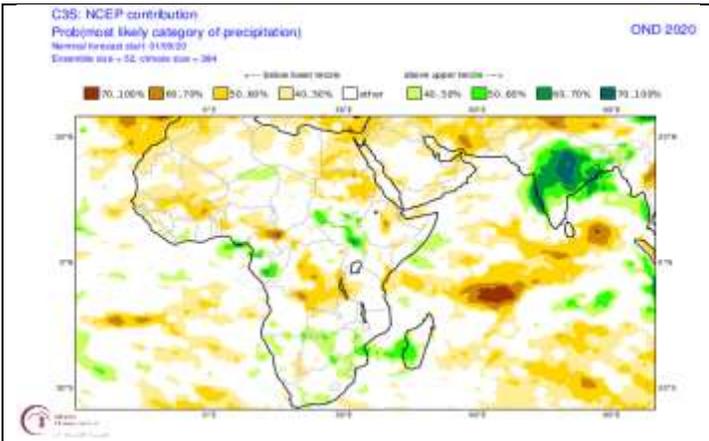


**Probabilistic forecasts for rainfall (left) and temperatures (right) for mid-summer (November – January 2020/21; top) and mid-to-late summer (December – February 2020/21; bottom) (Forecast issued in 2020-10 by the IRI - <http://iri.columbia.edu>).**

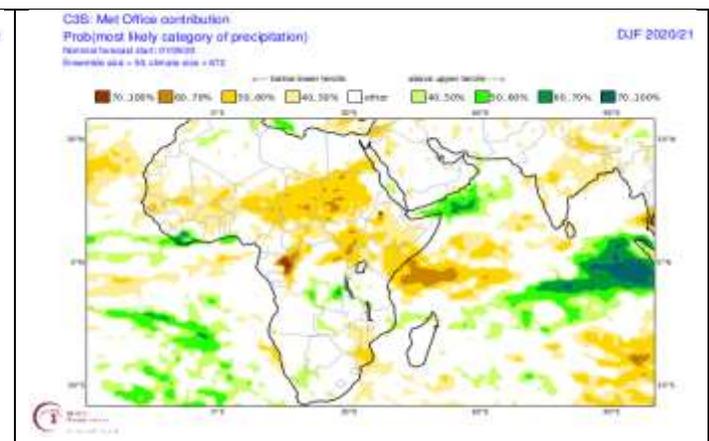
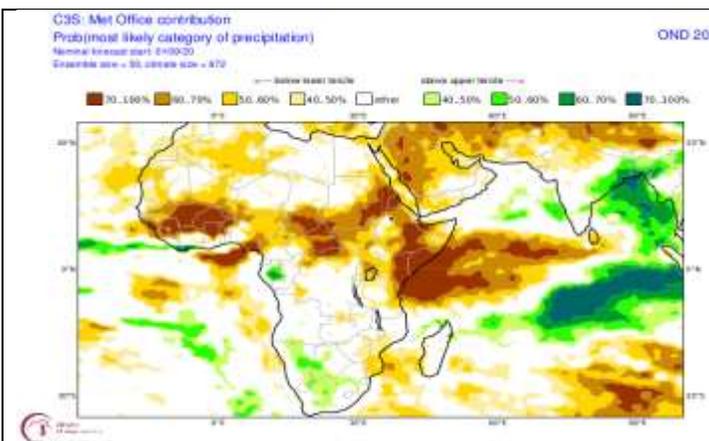
Seasonal forecasts by the ECMWF, NCEP, UKMO, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) for both early and mid-summer, reflect similar patterns with regards to rainfall for southern Africa as those by the IRI. The signal for relatively dry conditions over the summer rainfall region of South Africa is somewhat stronger for mid-summer to late summer (DJF) for most of these. This is probably associated with the weak negative Indian Ocean Dipole the developing and expected La-Niña-like conditions.



**Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for early-summer (October – December 2020; left) and mid-to late summer (December – February 2020/21) (Forecasts issued in 2020-09).**



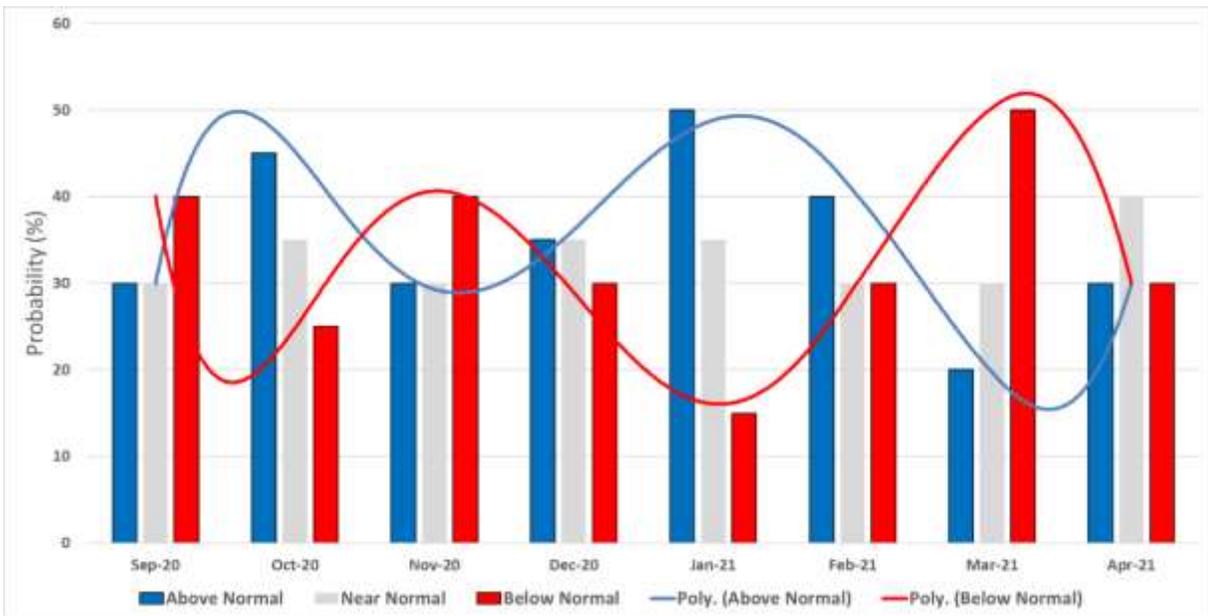
**Same as above, but forecasts issued by the National Centres for Environmental Prediction.**



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

## CUMULUS seasonal outlook, based on decadal variability

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:



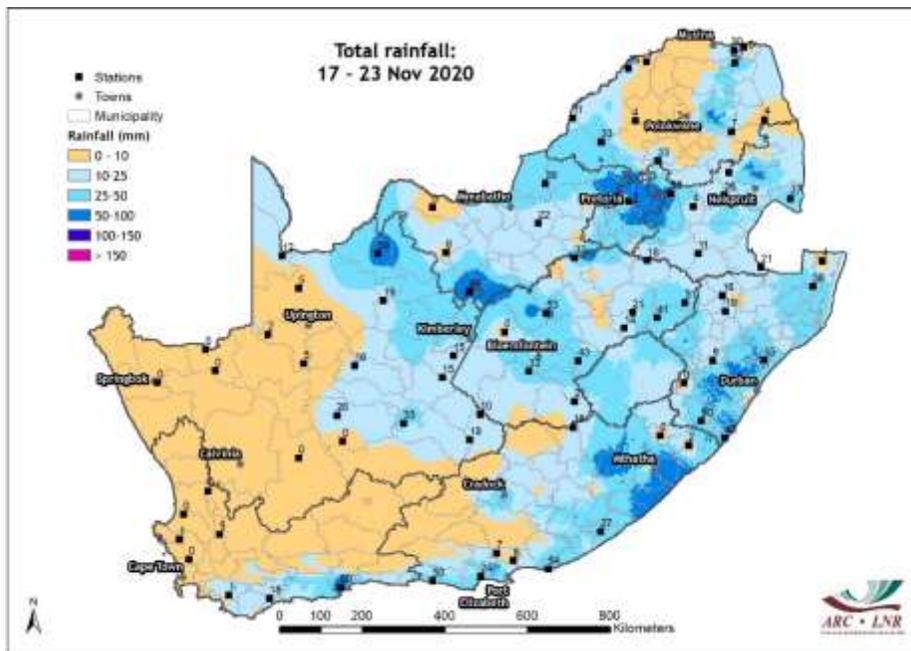
***Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).***

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

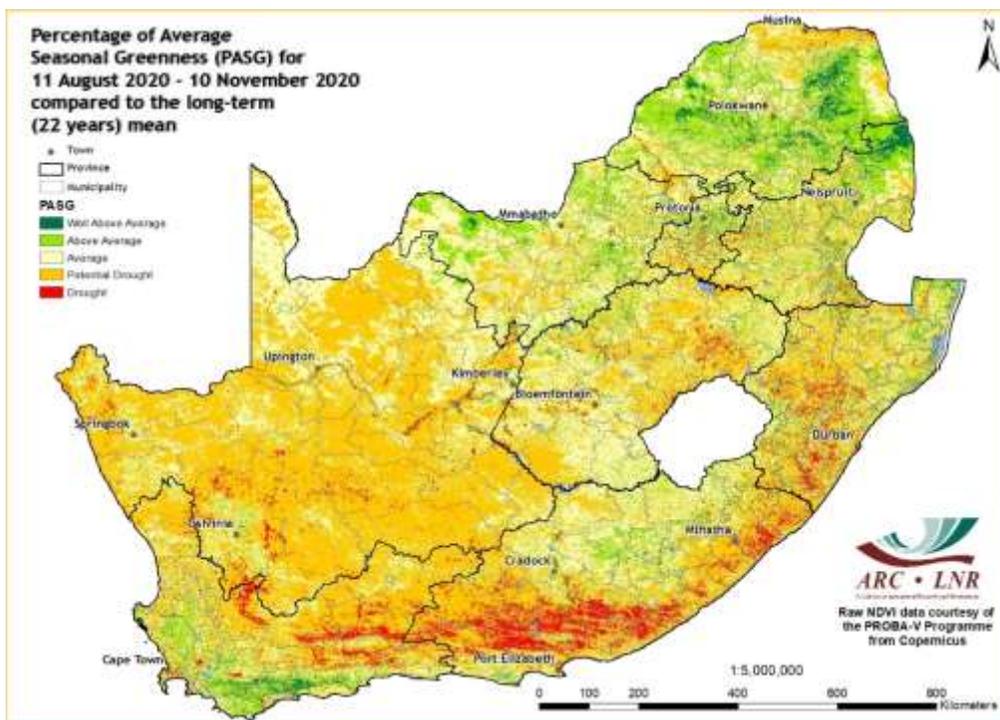


## Rainfall (mm): 17 – 23 November 2020



*Most of the summer rainfall region received rain during the last few days, with highest totals around northern Gauteng, northeastern Eastern Cape, southern KZN as well as an area covering the western North West into northeastern Northern Cape.*

## Percentage of Average Seasonal Greenness: 11 August – 10 November 2020



*Cumulative vegetation activity for 11 August to 10 November is above normal over the winter grain-production region following widespread above-normal rainfall during most of the winter. Cumulative vegetation activity is also above normal over the northeastern parts of the summer rainfall region where above-normal rainfall occurred late September into early October. Parts of the Karoo still experience below-normal activity due to relatively dry conditions during the winter and spring.*



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

Upper-air perturbations together with surface moisture circulating into the country from an anti-cyclonic circulation over the Indian Ocean will support thundershowers over the northeastern parts. A steepening upper-air trough in the southwest together with a ridging high-pressure system at the surface will from Friday onwards result in more widespread rain and thundershowers, spreading over the northeastern to central areas.

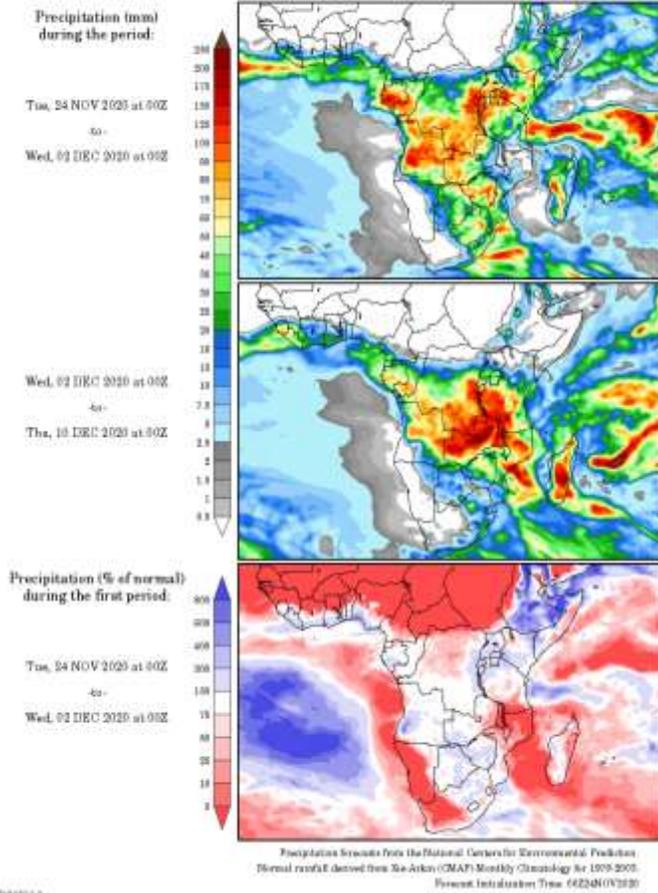
### Conditions in main agricultural production regions (17 – 23 November)

**Maize production region:** Favourable conditions will generally occur over the entire area, with sufficient moisture and temperatures mostly in a favourable range for maize production. Conditions during the weekend may favour fungal pathogen development especially over the eastern parts.

It will be partly cloudy with little to no rain initially except for thundershowers over the eastern parts. Through the period, thundershowers will expand further west, so that largest daily totals should occur over the western parts from Saturday onwards, where multi-day totals may exceed 50 mm. Some of the thunderstorms, especially in the west, may become severe during the weekend. Cloud cover will be abundant during the weekend, especially over the eastern parts where rain and thundershowers are possible. By Monday, activity will move back to the central to north-eastern parts, with scattered thundershowers expected while the western parts should be sunny and dry. Thunderstorms over the central to eastern parts by Monday may also have a tendency to become severe. Maximum temperatures over the western maize production areas will be in the order of 27 – 34°C, with hot conditions during the remainder of the week and lowest temperatures during the weekend. Minimum temperatures will be in the order of 16 – 20°C. Maximum temperatures over the eastern maize-production region will range between 22 and 29°C, with highest temperatures during the remainder of the week and lowest temperatures during the weekend. Minimums will be in the order of 12 – 17°C.

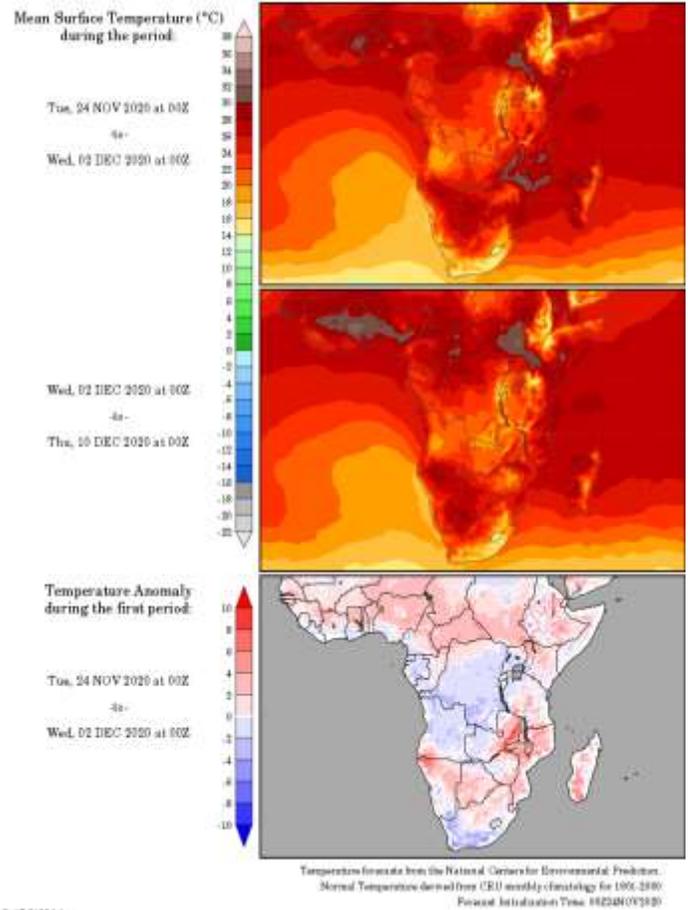
**Cape Wine Lands and Ruens:** It will be cool initially with westerly winds and showers as a frontal system moves through. From Thursday onwards, westerly winds will be replaced by southerly to southeasterly winds, with showers along the garden route while the West Coast and Swartland will become warm. Strong southeasterlies are expected in the southwest from Thursday onwards, reaching gale force by Saturday.

### Precipitation Forecasts



GRADS/COLA

### Temperature Forecasts



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 24 November) 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:

- Thundershowers may in some cases become severe, producing strong winds and hail:
  - Wednesday (25<sup>th</sup>): Central parts of Limpopo and northern Mpumalanga.
  - Saturday (28<sup>th</sup>): Central to western Free State, northeastern Northern Cape and western to southern North West.
  - Monday (21<sup>st</sup>): Eastern North West, Gauteng, western Mpumalanga and northeastern Free State.
- Cloudy, wet and mild conditions over the northeastern parts may be favorable for fungal pathogens especially over the central to eastern maize-production areas.
- Strong to gale-force southeasterlies are expected over the southwestern coastal areas, especially on Saturday (28<sup>th</sup>). Where vegetation is dry, these conditions may be conducive to the development and spread of wild fires.
- Cool, wet and windy conditions over the Karoo and Garden Route on Tuesday (24<sup>th</sup> – especially western half) and again from Friday (27<sup>th</sup> – especially eastern half) onwards may adversely affect small stock.

## 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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