

CUMULUS



20 January 2021 – by J Malherbe, R Kuschke

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Summary

Drier conditions as Tropical Cyclone Eloise tracks closer

Most of the interior will be relatively warm and dry during the remainder of the week while Eloise moves southwestward, intensifying into a tropical cyclone in the Mozambique Channel (track according to the official forecast by the Tropical Cyclone Centre La Réunion). The expected track of the system towards the southern African subcontinent proved to be very difficult to forecast during the last few days and there were a lot of adjustments of the expected landfall position and subsequent movement of the system with each update of the most widely used weather models. Changes in the landfall position and movement into southern Africa have profound impacts on the area receiving rain during the next few days as well as the rainfall intensity and possibility of flooding.

While there is still considerable differences in the expected track towards and during the weekend, the latest projections seem to converge to suggest the following:

- Intensification to tropical cyclone while tracking southwestwards over the Mozambique Channel during the remainder of the week.
- Landfall in the vicinity of Vilanculos on the Mozambique coast early Saturday (23rd).
- Southwestward track towards the southern and central Lowveld, resulting in heavy rain in the Lowveld and along the northeastern escarpment including Swaziland by Sunday and Monday (24th, 25th).
- Further westward movement from Sunday (24th) to Tuesday (26th), as far west as eastern Botswana, as a weakened system that will, according to current projections, result in showers and thundershowers over most of Limpopo, Gauteng, Mpumalanga and eastern North West.

Given the large uncertainty of the system's expected track during the last few days, even the latest convergence of outlooks is still subject to change and it is advisable to keep an eye on the latest forecasts during the next few days in areas that might be influenced by the system directly.

As is typical when a tropical system moves through the Mozambique Channel, the interior will be largely warm and dry, with only isolated thundershowers mainly over the central parts until the weekend. Temperatures will on average be above normal with abundant sunshine. On average, rainfall will be below normal over most of the interior, but above normal in the northeast if the tropical system remains on course in agreement with current outlooks.

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

- **General:**
 - It will be warm and dry for the most part.
 - Most of the summer rainfall region should see below-normal rainfall, but above-normal rainfall is expected in the northeast – if the tropical system moves sufficiently far westwards as currently projected.
 - If the tropical system moves into the interior, there is a good chance that conditions will become favorable for widespread rain over the summer rainfall region next week.
 - Temperatures over the main summer-grain production region will be relatively high compared to earlier this summer, but if the tropical system moves significantly inland, temperatures will be lower from Sunday onwards:
 - Maximum temperatures over the western maize production areas will be in the order of 30 – 35°C, but could fall to the mid-twenties by Monday (25th) if the tropical system keeps its currently projected track. Minimum temperatures will be in the order of 17 – 21°C.
 - Maximum temperatures over the eastern maize-production region will range between 28 and 34°C, but will be in the lower- to mid-twenties from Sunday onwards if the tropical system keeps its currently projected westward track. Minimums will be in the order of 12 – 16°C.

- **Detailed:**

- Wednesday (20th): Sunny to partly cloudy and warm to hot over most of the interior. Isolated thundershowers are possible over the central areas later. Showers or thundershowers are possible over the northern to eastern parts of Limpopo. The southern to eastern seaboard will be partly-cloudy and cooler. Fresh southeasterlies are expected in the southwest.
- Thursday (21st): Sunny to partly cloudy and warm to hot over the interior. Isolated thundershowers are possible in the Drakensberg and surroundings. A frontal system will bring light showers to the winter rainfall region with lower temperatures later.
- Friday (22nd): Sunny to partly cloudy and warm to hot over the interior. Isolated thundershowers are possible over the central to southeastern areas.
- Saturday (23rd): Sunny to partly cloudy and warm to hot over the interior. Isolated thundershowers are possible over the central to southeastern areas. It will become cloudy and windy with showers over the Lowveld and extreme northeastern KZN. A cold front will bring cooler conditions with light showers to the winter rainfall region.
- Sunday (24th): Sunny to partly cloudy and warm to hot over the central to northern and northwestern interior, with isolated thundershowers still possible over the central areas. It will be partly cloudy to cloudy and windy with rain and thundershowers over the Lowveld, northeastern escarpment and extreme northeastern KZN – with heavy falls, especially along the escarpment and southern to central Lowveld. It will be cooler with southeasterly winds over the southern to eastern parts of the country and with showers along the southeastern to eastern seaboard.
- Monday (25th): It will be cloudy and windy with scattered rain and thundershowers over the northeastern parts of the country (Limpopo, Mpumalanga, Gauteng and northeastern KZN. Heavy falls are still possible along the northeastern escarpment. Sunny to partly cloudy and warm to hot conditions will continue over the central to northern and northwestern interior, with isolated thundershowers still possible over the central areas. It will remain relatively cool along the southern to eastern seaboard.

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.

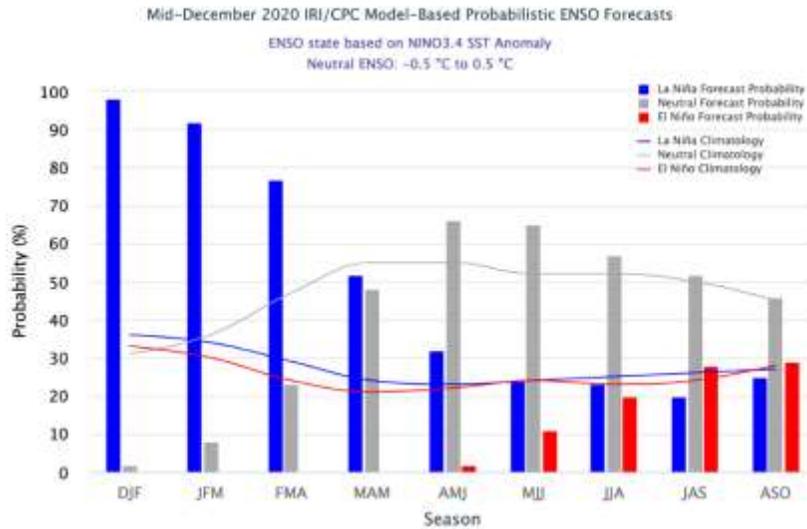
According to the Australian Bureau of Meteorology (Updated 19 January): The 2020–21 La Niña is likely to have reached its peak with respect to sea surface temperature patterns in the eastern and central Pacific Ocean. However, impacts associated with La Niña are expected to persist into early autumn.

Over the past fortnight the sea surface temperatures across the western and central Pacific Ocean have cooled slightly while those in the eastern side of the basin have warmed. The Southern Oscillation Index continues to remain high with a value well above the La Niña threshold of +7. Model outlooks indicate a return to neutral conditions during the late southern summer or early autumn.

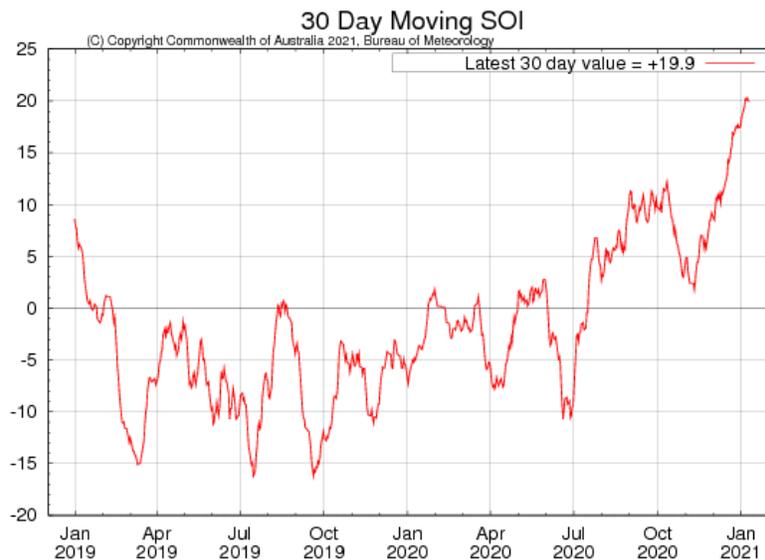
The Southern Annular Mode (SAM) has decreased towards neutral values and is expected to be neutral for the next fortnight. Strongly positive SAM over the last month were driven by an exceptionally strong polar vortex over Antarctica which has largely subsided now... ..**Australian Bureau of Meteorology** - <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 14 January): In mid-January, SSTs in the east-central Pacific are roughly 1.2 degree C below average, and all key atmospheric variables are consistent with 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 *SH autumn*. The new official CPC/IRI outlook issued earlier this month calls for a 95% chance of La Niña for the Jan-Feb-Mar season. A La Niña advisory is in effect.....**International Research Institute for Climate and Society**-
<http://iri.columbia.edu/>



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



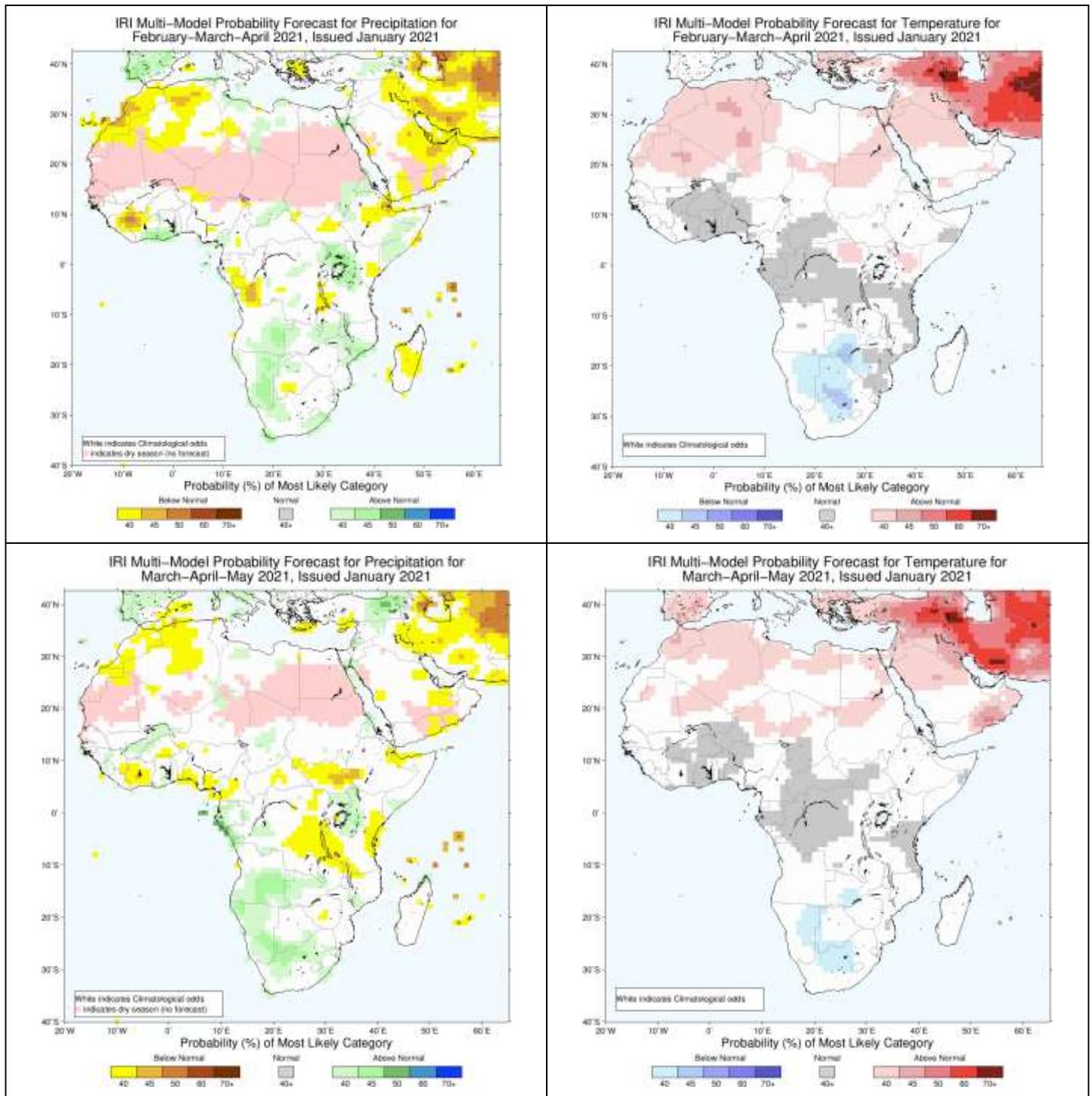
Australian Bureau of Meteorology - <http://www.bom.gov.au>

The Southern Oscillation Index has risen sharply to +19, well above the La Niña threshold and generally upward trending. This is indicative of atmospheric circulation patterns consistent with La Niña conditions.

Seasonal forecasts issued by various international institutions

IRI

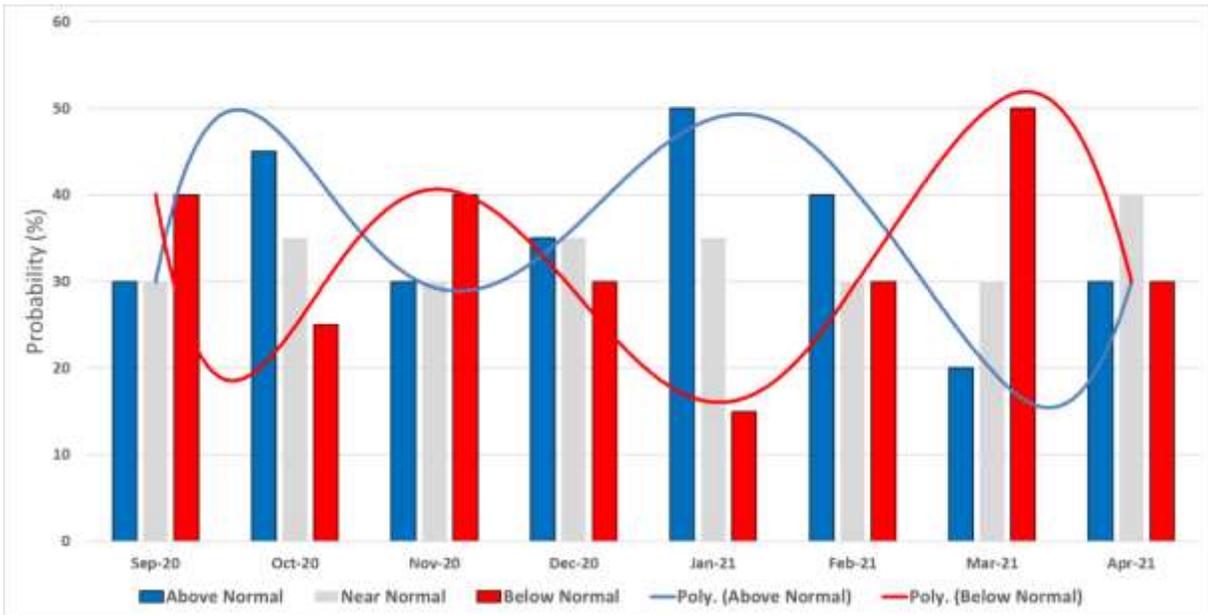
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

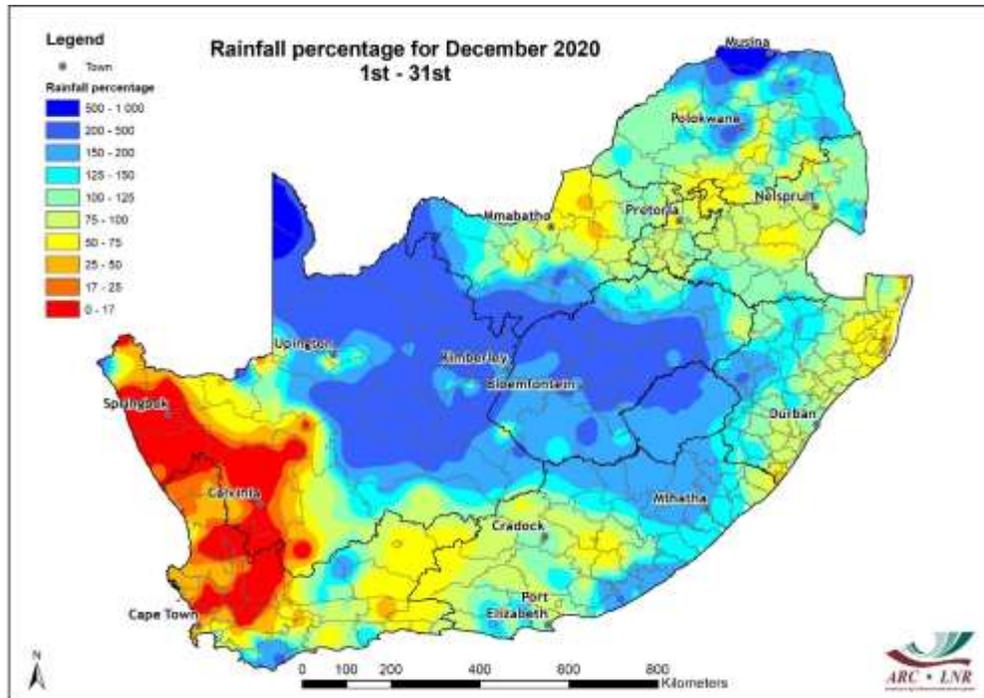


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

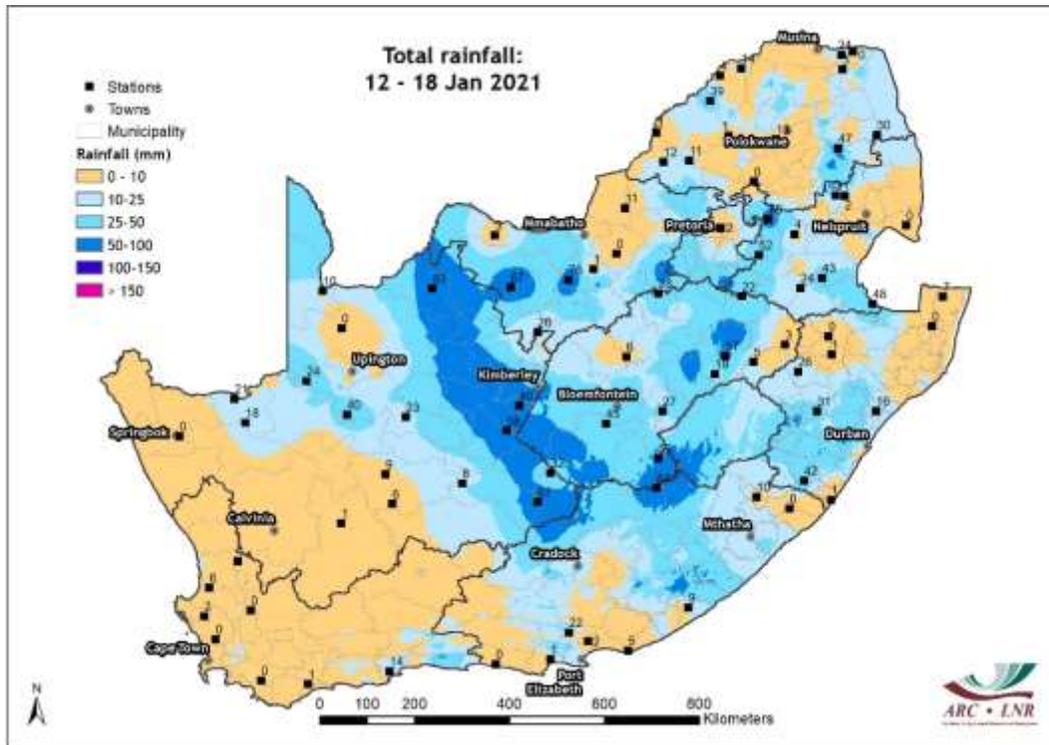
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

Rainfall (% of long-term mean): December 2020



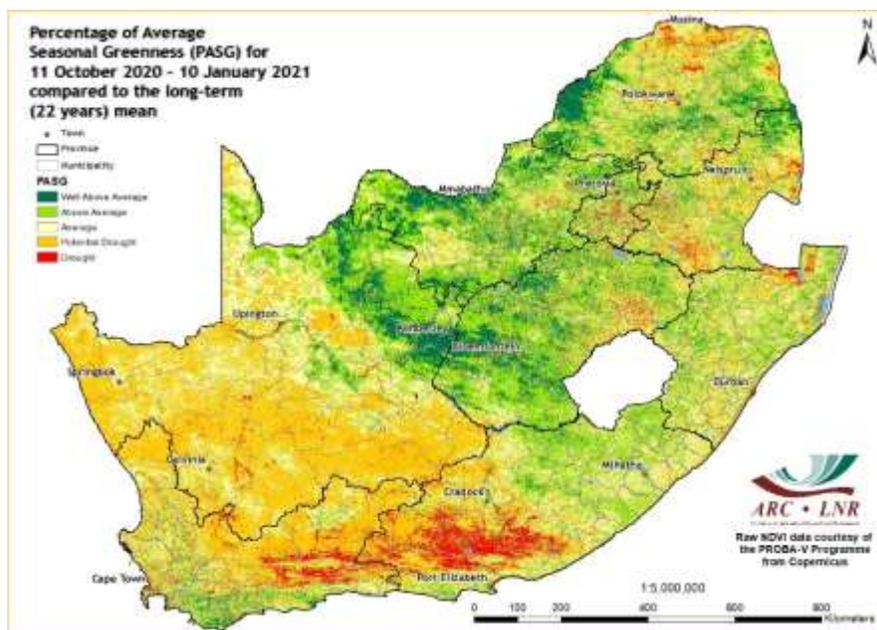
Most of the summer rainfall region and Garden route received above-average rainfall during December, but the largest positive deviations in terms of the percentage of average occurred over the central interior. The eastern maize-production region received near-normal rainfall while the western production region received well-above-normal rainfall.

Rainfall (mm): 12 – 18 January 2020



Most of the country received rain during this period, with the highest totals mostly over the central areas, focusing on the eastern parts of the Northern Cape. The winter rainfall region was dry.

Percentage of Average Seasonal Greenness: 11 October – 10 January 2020



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 interior will be dominated by anti-cyclonic conditions with only isolated thundershowers over the central parts for most of the period. Frontal systems will bring some showers over the winter rainfall region, but these systems will not be significant according to current forecasts. Tropical Cyclone Eloise is expected to move inland across southern Mozambique and into the Lowveld from Saturday onwards. The system may result in very heavy rainfall and flooding over the Lowveld and along the escarpment from Sunday onwards. As the system weakens but moves further west, it may also result in cooler conditions with widespread showers and thundershowers over the northeastern parts of the country early next week.

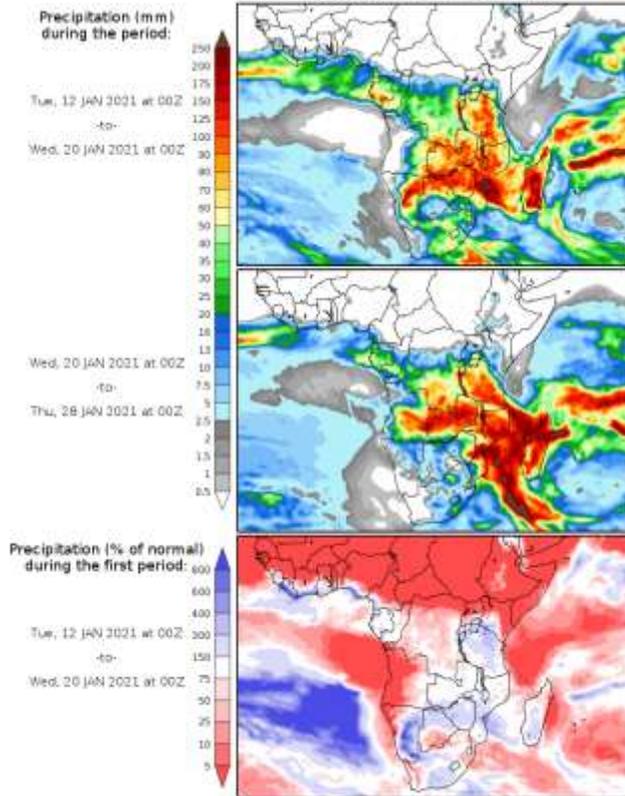
Conditions in main agricultural production regions (20 – 25 January)

Maize production region: Sunny to partly cloudy and warm conditions will dominate, with isolated thundershowers possible on most days over the western parts. The eastern areas may become cooler and cloudy by Sunday with widespread showers and thundershowers by early next week. These conditions may also spread further west later depending on the movement of the tropical system over the interior.

Temperatures over the entire region will be above normal for most of the period. However, it will become cooler in the east from Sunday onwards: Maximum temperatures over the western maize production areas will be in the order of 30 – 35°C, but could fall to the mid-twenties by Monday (25th) if the tropical system keeps its currently projected track. Minimum temperatures will be in the order of 17 – 21°C. Maximum temperatures over the eastern maize-production region will range between 28 and 34°C, but will be in the lower- to mid-twenties from Sunday onwards if the tropical system keeps its currently projected westward track. Minimums in the east will be in the order of 12 – 16°C.

Cape Wine Lands and Ruens: It will be relatively warm over the region, but hot over the Swartland, West Coast and Karoo on most days. Cold fronts will bring cooler conditions with light showers to some areas late Thursday and late Saturday according to current forecasts. The wind will be fresh to strong southeasterly on most days, especially during the afternoons, in the southwest.

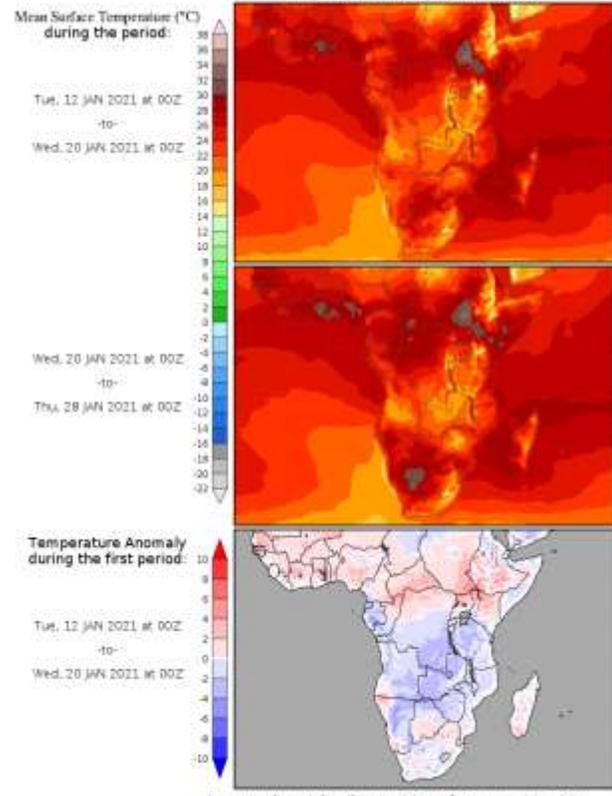
Precipitation Forecasts



Precipitation forecasts from the National Centers for Environmental Prediction.
 Normal rainfall derived from Klu-Arks (CMAPI Monthly Climatology for 1979-2000).
 Forecast Initialization Time: 00Z12JAN2021

GHDS/COLA

Temperature Forecasts



Temperature forecasts from the National Centers for Environmental Prediction.
 Normal Temperature derived from CRU monthly climatology for 1961-2000.
 Forecast Initialization Time: 00Z12JAN2021

GHDS/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 20 January) period. It is therefore advised to keep track of warnings that may be issued by the SAWS (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:

- Heavy rain (>100 mm) may occur over the Lowveld and along the northeastern escarpment from Sunday to Monday (24th – 25th).
- It will be hot to very hot over the Northern Cape and the Karoo of the Western and Eastern Cape provinces from Thursday (21st) to Saturday (23rd).

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

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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