

CUMULUS

26 January 2021 – *by J Malherbe, R Kuschke*



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Summary

Wet conditions prevail after Eloise tracked inland

With the remnants of Tropical Cyclone Eloise now situated over southern Botswana and northeastern Northern Cape in the form of a tropical low, the situation with regards to rainfall for the interior has improved tremendously as expected. The track of the tropical system after making landfall on Saturday was indeed very favorable for widespread rain over much of the northeastern parts of the country as the system crossed southwestwards over the Limpopo Province towards southern Botswana, with most of the country to the east of the track receiving widespread rainfall while flooding occurred over the Lowveld – a region particularly prone to the effects of tropical systems from the Southwest Indian Ocean.

The rest of the week will see a continuation of rainy conditions with significant daily totals in some cases in a northwest-southeast-stretching band from Botswana into North West, eastern Northern Cape, Free State, Gauteng, western Limpopo, most of Mpumalanga, KZN and northern parts of the Eastern Cape. The band will be most active at first over the western sections of this region (favoring the western Free State and western to central parts of North West and northern Eastern Cape), but will move northeastwards towards the end of the week, focusing then on the central to eastern parts of North West, northern Free State and areas further east. Large amounts of tropical moisture will result in extensive cloud cover and especially maximum temperatures will be subdued.

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

- **General:**

- The central to northeastern parts will be cooler and wetter than normal while the western interior will be warmer and drier than normal. The winter rainfall area is expected to be dry but relatively cool.
- Most of the summer rainfall region should receive above normal rainfall except for the eastern parts of Limpopo and the western half of the Northern Cape as well as most of the Karoo.
- Rainfall totals over the next week will likely exceed 150 mm over large parts of North West, the Free State, southern Mpumalanga and KZN.
- Persistent cloudy and wet conditions over much of the summer-grain-production region may result in the development of fungal pathogens.
- Temperatures over the main summer-grain production region will be lower compared to the previous 2 weeks:
 - Maximum temperatures over the western maize production areas will be in the order of 21 – 31°C, with cooler, cloudy conditions concentrated towards the beginning of the period. Minimum temperatures will be in the order of 17 – 20°C.
 - Maximum temperatures over the eastern maize-production region will range between 18 and 26°C, with highest values during the weekend according to current forecasts, followed by lower temperatures early next week. Minimums will be in the order of 12 – 16°C.

- **Detailed:**

- Tuesday (26th): Cloudy with widespread rain and thundershowers over the central parts, with scattered to isolated thundershowers in the northeast and to the west. Significant daily totals are possible over the southwestern Free State, eastern Northern Cape, northern Eastern Cape and western North West. The western interior and coastal areas in the west and south will be dry.
- Wednesday (27th): Cloudy with widespread rain and thundershowers over the central to southeastern parts, with scattered to isolated thundershowers in the northeast and to the west. The band of widespread rain and thundershowers will extend down to the southeastern to eastern coastal belt. Significant daily totals are possible over the western to central Free State, northern Eastern Cape and western to central North West. The western interior and coastal areas in the west will be dry, with the band of precipitation shifting somewhat northeastwards. Light showers are expected later along the Garden Route. Strong southeasterlies are expected in the southwest.
- Thursday to Saturday (28th – 30th): Partly cloudy to cloudy and mild over North West, central to northern Free State southern to central Mpumalanga, Gauteng, western Limpopo and western KZN with scattered

rain and thundershowers. Isolated thundershowers are possible over the areas further to the east. The western parts of the country will be warm to hot and dry.

- Sunday to Monday (31st – 1st): Partly cloudy to cloudy with scattered thundershowers over the northeastern parts, but only isolated falls are expected over the eastern parts of Limpopo. It will be cloudy with light showers along the Garden Route. The western to central interior (western Free State, western North West and further westward) is expected to be warm to hot and dry.

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.

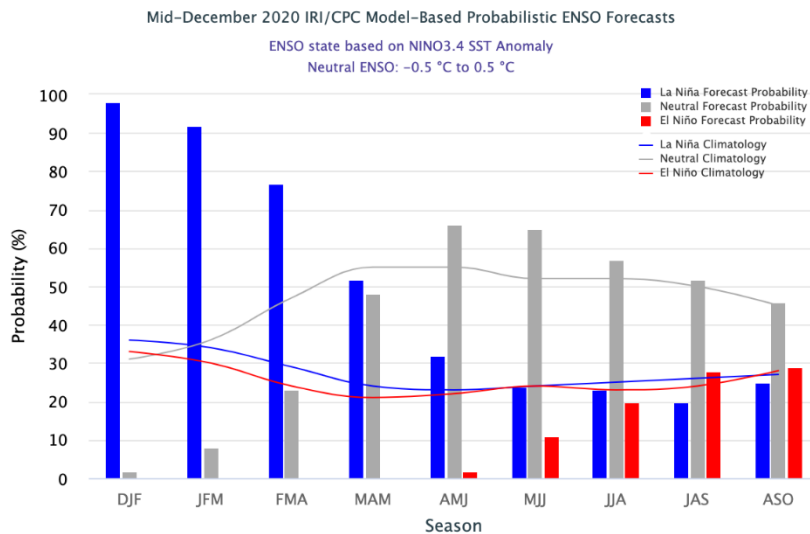
According to the Australian Bureau of Meteorology (Updated 19 January): The 2020–21 La Niña is likely to have reached its peak with respect to sea surface temperature patterns in the eastern and central Pacific Ocean. However, impacts associated with La Niña are expected to persist into early autumn.

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.

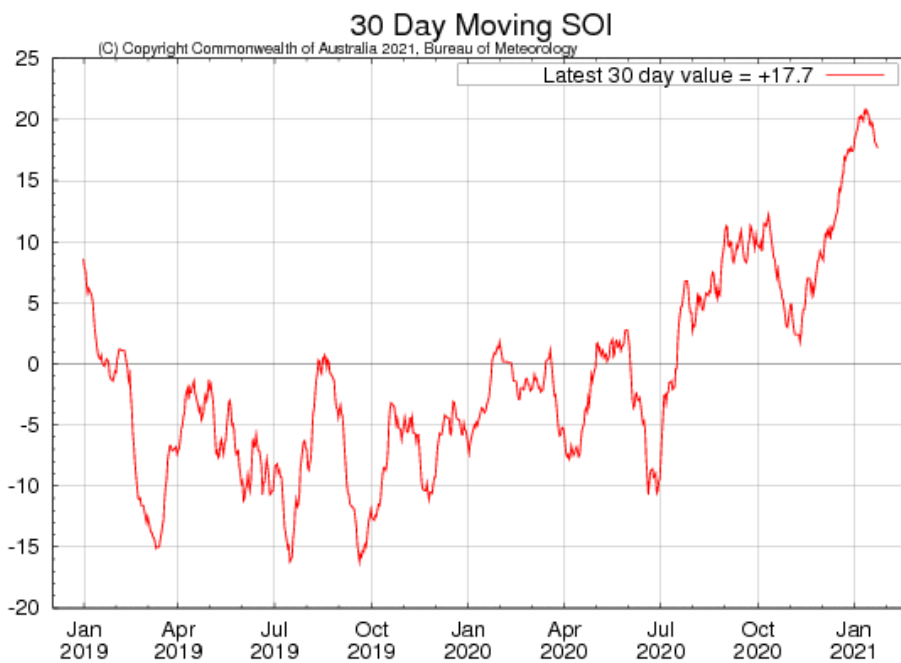
The Southern Annular Mode (SAM) has decreased towards neutral values and is expected to be neutral for the next fortnight. Strongly positive SAM over the last month were driven by an exceptionally strong polar vortex over Antarctica which has largely subsided now..**Australian Bureau of Meteorology** - <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/>



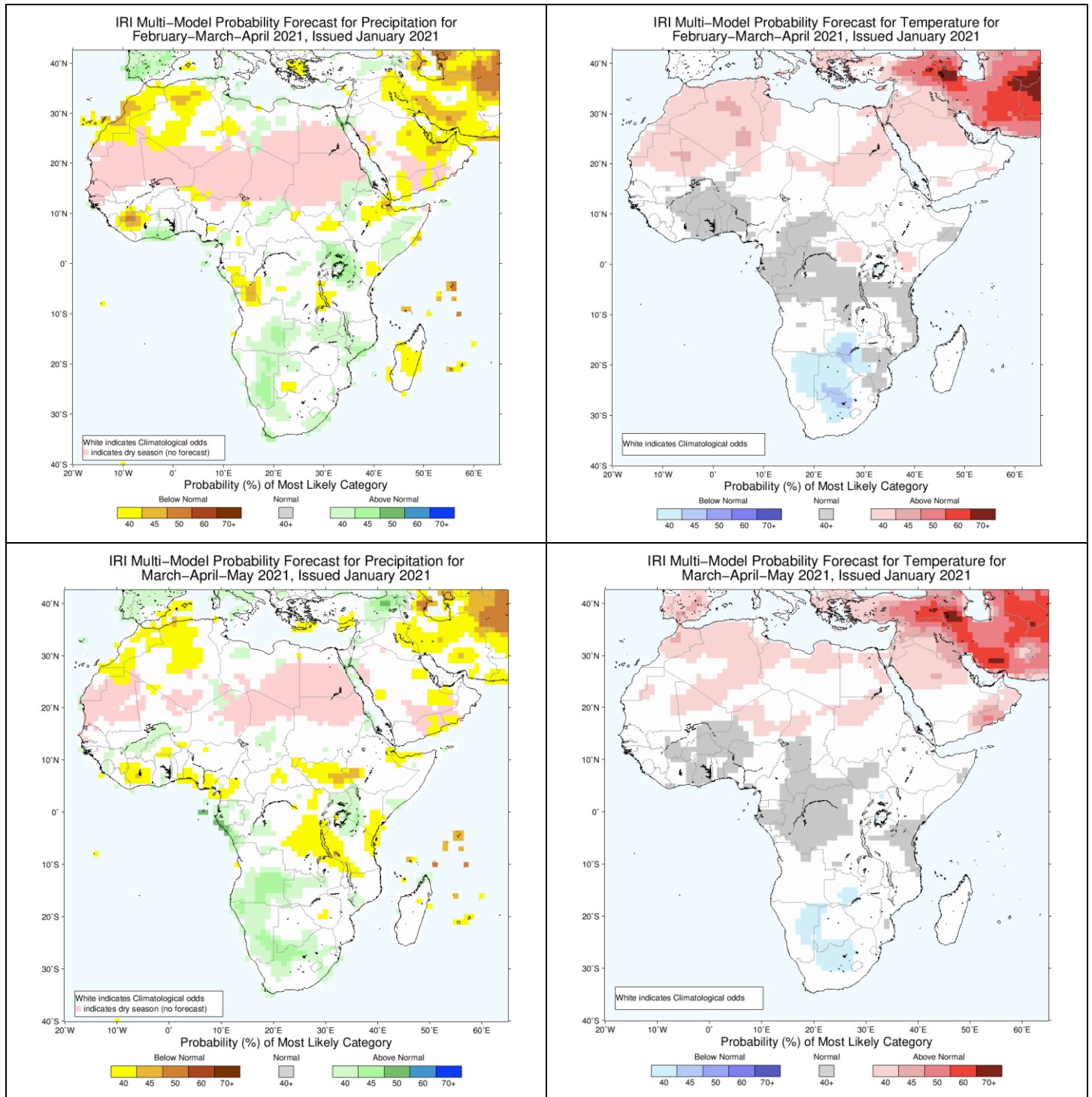
Australian Bureau of Meteorology - <http://www.bom.gov.au>

The Southern Oscillation Index is still high (+17), 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

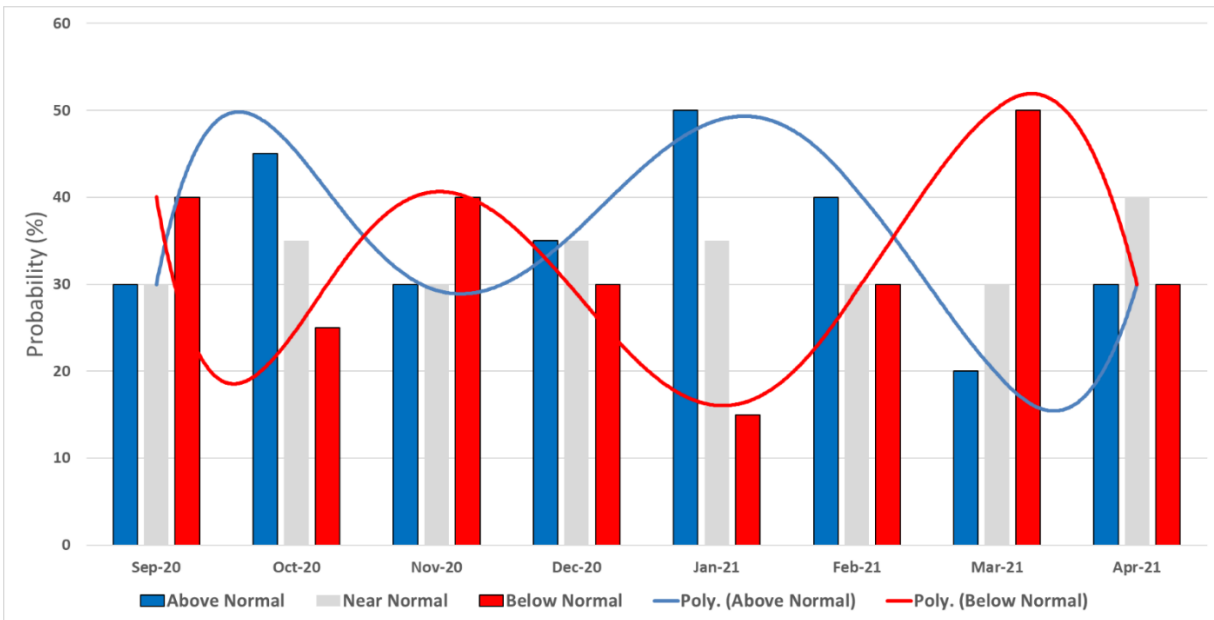
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

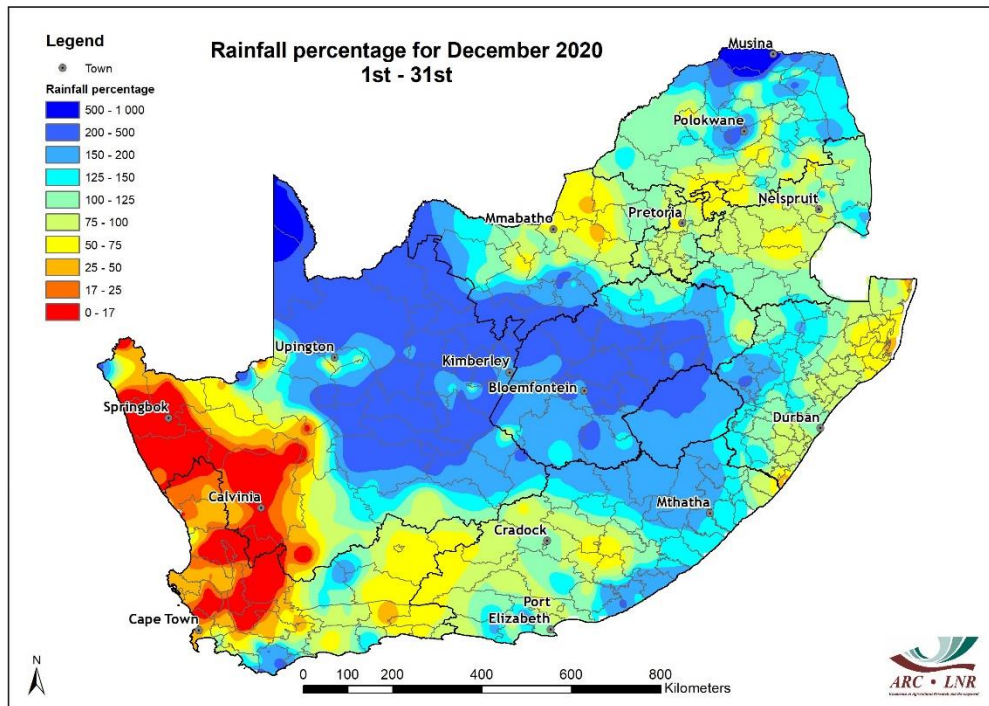


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

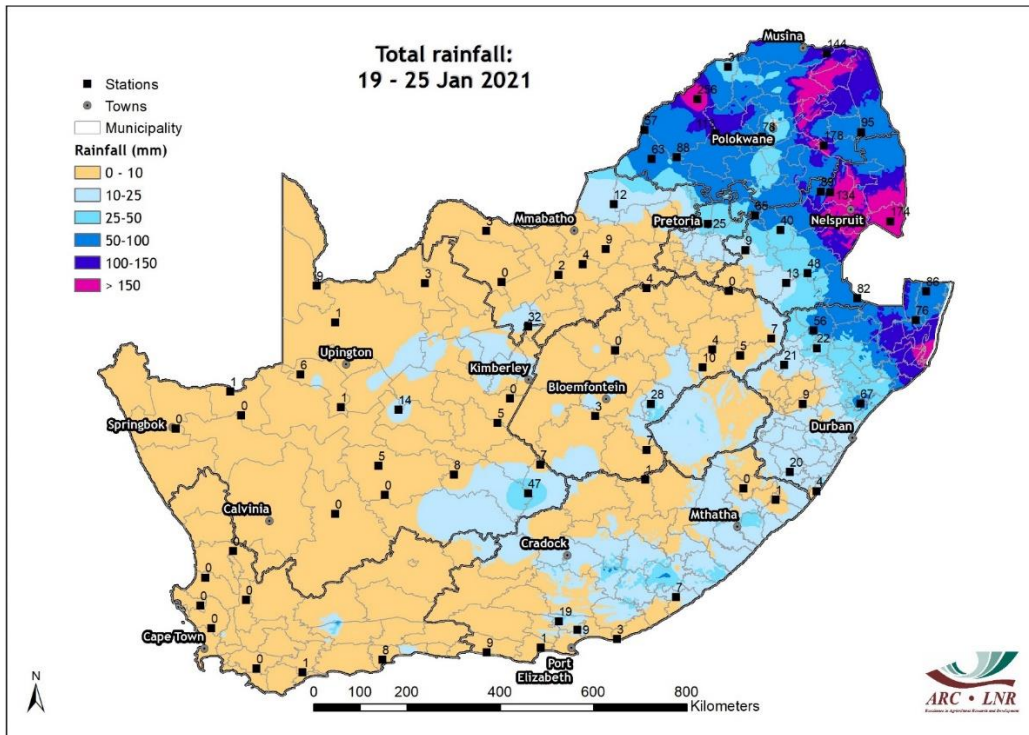
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



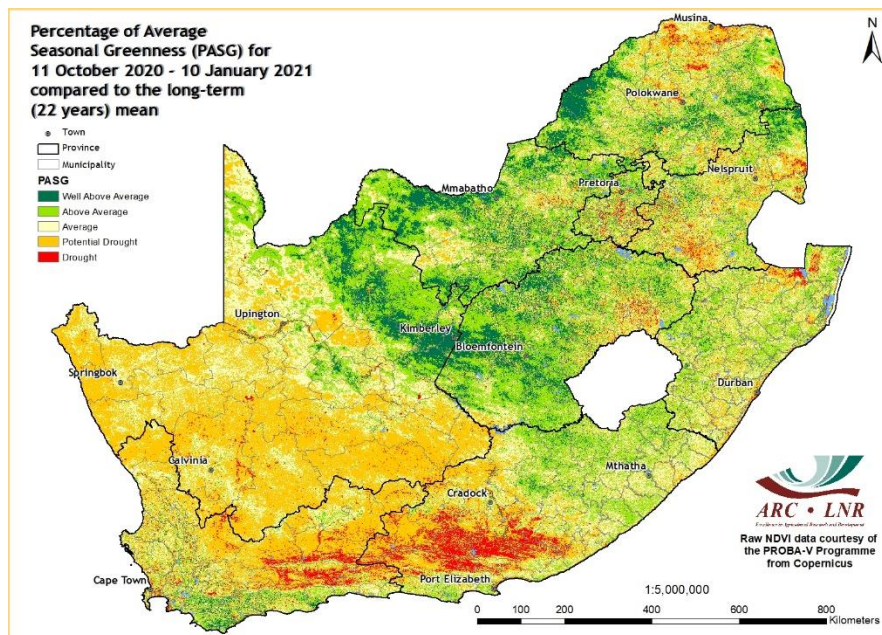
Most of the summer rainfall region and Garden route received above-average rainfall during December, but the largest positive deviations in terms of the percentage of average occurred over the central interior. The eastern maize-production region received near-normal rainfall while the western production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

Rainfall (mm): 19 – 25 January 2020



It was hot and dry for the most part, but Tropical Cyclone Eloise was responsible for widespread significant rainfall over the northeastern parts from the 23rd. Several stations in the Lowveld and along the escarpment received in excess of 150 mm of rain.

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 remnants of Tropical Cyclone Eloise will contribute to a semi-permanent tropical-temperate trough over the central parts. This system will generate a cloud band over the central to southeastern parts that will move slowly northeastwards during the period, with widespread rain and thundershowers over much of the summer rainfall region due to the abundance of tropical moisture from the north. The ridging of the Atlantic Ocean Anticyclone around the country twice during the period will advect additional moisture from the east into the interior, supporting cloudy and rainy weather over large parts of the summer rainfall region while also resulting in some showers along the Garden Route from time to time. Dry air will be present over the western parts, to the west of the trough that will be present mostly over the central parts of the country.

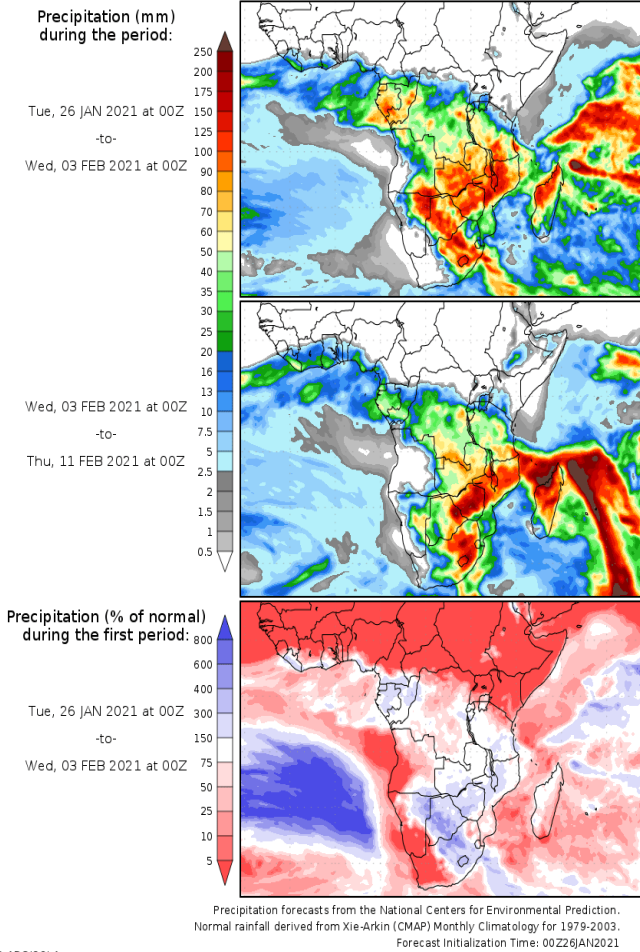
Conditions in main agricultural production regions (26 January – 1 February)

Maize production region: Unlike much of the previous week, cloudy and mild conditions will dominate with scattered to widespread rain and thundershowers. The western areas should see some significant totals on Tuesday (26th) and Wednesday (27th). Current forecasts indicate clearance over the western parts from late Wednesday (27th), but precipitation and abundant cloud with mild daytime conditions should remain in place over the central to eastern parts of this region.

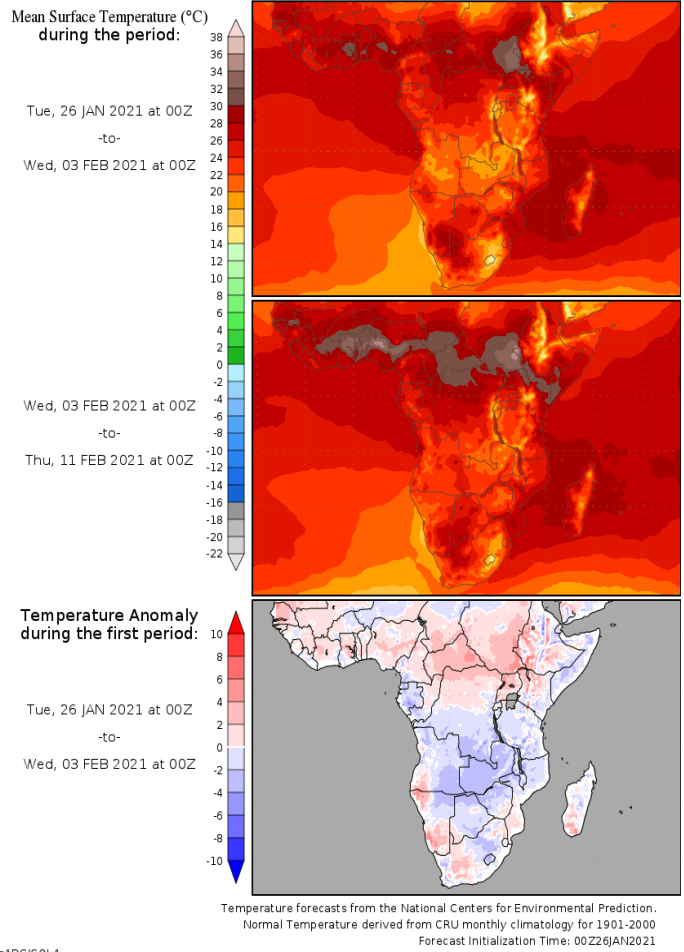
Temperatures over the entire region will be normal to below normal, with daytime temperatures suppressed by extensive cloud cover. Maximum temperatures over the western maize production areas will be in the order of 21 – 31°C, with cooler, cloudy conditions concentrated towards the beginning of the period. Minimum temperatures will be in the order of 17 – 20°C. Maximum temperatures over the eastern maize-production region will range between 18 and 26°C, with highest values during the weekend according to current forecasts, followed by lower temperatures early next week. Minimums will be in the order of 12 – 16°C.

Cape Wine Lands and Ruens: It will be warm to hot over the Swartland and Karoo on most days, with very hot conditions by Monday (1st) over the western parts, including the West Coast. Southerly winds on most days will keep the Garden Route somewhat cooler. Light showers are possible mostly along the Garden Route on Wednesday (27th) and Sunday (31st). The wind will be strong southeasterly in the southwest initially until Thursday (29th) and again by Sunday (31st).

Precipitation Forecasts



Temperature Forecasts



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 26 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:

- Significant falls (>50 mm per day) are possible over the western Free State, northeastern Northern Cape and western North West on Tuesday (26th).
- Significant falls (>50 mm per day) are possible over the western to central Free State, western to central North West and the northern parts of the Eastern Cape on Wednesday (27th).
- The persistent occurrence of rain or thundershowers during this period over central North West and the surrounding areas may result in the occurrence of floods in areas where soils are saturated and reservoirs filled to capacity.
- Persistent cloudy and wet conditions over much of the grain production region may result in the occurrence of fungal pathogens.
- It will be warm to hot and windy over the central and western interior of the Northern Cape and most of the Karoo. These conditions will expand and include the western parts of the Free State and North West from Friday (29th).
- Strong southeasterlies are expected over the southwestern parts until Thursday (28th) and again by Sunday (31st). 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

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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