CUMULUS

02 February 2021 – *by J Malherbe, R Kuschke*

Contents

LAND BANK INSURANCE (SOC) LIMITED

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Summary

Wet weather remains in place over summer grain-production areas

Widespread rain continued over much of the central to northeastern parts of the country during the last few days, with persistent wet conditions leading to increasing levels of rivers ad dams in many areas. For January, rainfall over almost the entire summer rainfall region was above normal. A significant portion of the total rainfall was contributed directly or indirectly by Tropical Cyclone Eloise towards the end of the month. Again, as seen during November and December, it was especially the central parts of the country where above-normal rainfall dominated. This area includes the western maize-production region.

Current forecasts indicate a continuation of wet conditions over the central to northeastern parts, including the entire dryland maize-production region. While generally very much supportive of crop production, cumulative rainfall totals in some areas may further increase the likelihood or extent of flooding while the persistent wet conditions may result in the occurrence of fungal pathogens. Towards and during the weekend, the area of main rainfall activity is expected to shift somewhat northeastwards.

The continued presence of a tropical low pressure system over northern Botswana and Namibia will play an important role, together with favorable upper-air conditions and a surface on-shore flow from the east. These components will yield above-normal rain over the central to northeastern summer rainfall region, coupled with near-normal to below-normal temperatures, with extensive cloud cover keeping maximum temperatures on the low side.

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 to southwestern parts of the country will be warmer and drier than normal.
    - Most of the summer rainfall region should receive above-normal rainfall except for the summer rainfall regions of the Cape Provinces and southern KZN.
    - Cumulative rainfall totals over the next week will likely exceed 50 mm over the entire summer-grain production area, with totals over parts of North West expected to exceed 100 mm.
    - The area of widespread precipitation is expected to contract northwards and northeastwards as the week progresses, with drier conditions expanding from the west into the Free State and western to central North West by the weekend according to current forecasts.
    - The western interior should be warm and dry for the most part, becoming hot towards the weekend while the area of warm and dry conditions should expand somewhat eastwards.
    - 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 generally be supportive of crop production, but somewhat on the low side with regards to maximum temperatures in the east:
        - Maximum temperatures over the western maize production areas will be in the order of 19 – 30°C, with cooler, cloudy conditions concentrated towards the beginning of the period. Minimum temperatures will be in the order of 15 – 20°C.
        - Maximum temperatures over the eastern maize-production region will range between 12 and 26°C, with highest values later this week according to current forecasts, followed by lower temperatures early next week. Minimums will be in the order of 10 – 17°C.

- **Detailed:**
    - Tuesday (2nd): Cloudy, cool and windy over the central to northeastern half of the country. Widespread rain and showers are possible over the North West, Free State, Gauteng, southern Mpumalanga and western KZN. Totals over North West and the northern Free State and surrounding areas may exceed 50 mm. It will be mostly sunny and warm over the southwestern parts, with isolated thundershowers possible as far west as the central parts of the Northern Cape.
    - Wednesday (3rd): The wind over the northeastern parts will calm down while it will also be somewhat warmer. It will remain cloudy to overcast with rain initially over the North West, Free State and western KZN, clearing during the day.
    - Thursday to Saturday (4th –6th): Partly cloudy to cloudy and mild to warm over the northeastern half of the country with scattered thundershowers. The southwestern parts will be warm and dry. It will be hot over the interiors of the Cape provinces.
    - Sunday (7th): Precipitation will generally contract and focus somewhat further northwards while it should be warmer and drier over much of the Free State and central to western North West. It will be partly cloudy to cloudy with isolated thundershowers over the northeastern parts, but scattered over the western parts of Limpopo and the surrounding areas. Scattered thundershowers are also possible over the eastern half of the Eastern Cape into KZN. It will become cloudy and cooler with light showers along the Garden Route, spreading eastwards towards the coast of KZN.
    - Monday (8th): It will be mostly warm and dry, but isolated thundershowers are expected to continue in the northeast and east. The coast and adjacent interior of the Eastern Cape and KZN should see some additional light showers.

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 2 February): The 2020–21 La Niña is likely to have peaked with respect to atmospheric and oceanic patterns in the tropical Pacific. However impacts associated with La Niña……., are expected to persist into early autumn. *(Seasonal forecasts for South Africa continue to lean towards wet conditions during the remainder of summer)*

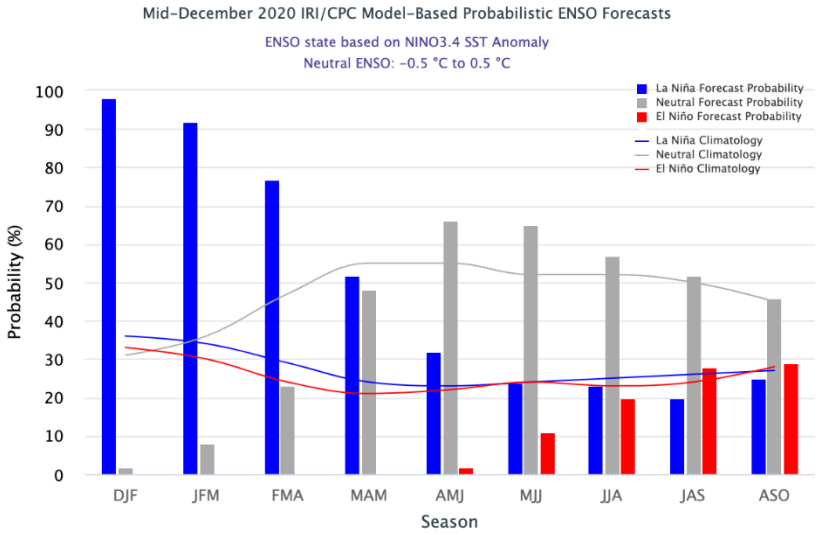
Over the past fortnight the sea surface temperatures across Pacific Ocean basin have warmed by around 0.2 °C. The 90-day Southern Oscillation Index (SOI) has decreased slightly but continues to remain well above the La Niña threshold of +7, and trade winds have returned to near-average strength in the central tropical Pacific. Model outlooks indicate a return to neutral conditions (neither El Niño nor La Niña) during the late southern summer or early autumn.

The Southern Annular Mode (SAM) is positive, but is expected to tend towards neutral values over the next fortnight. ……***Australian Bureau of Meteorology*** - http://www.bom.gov.au

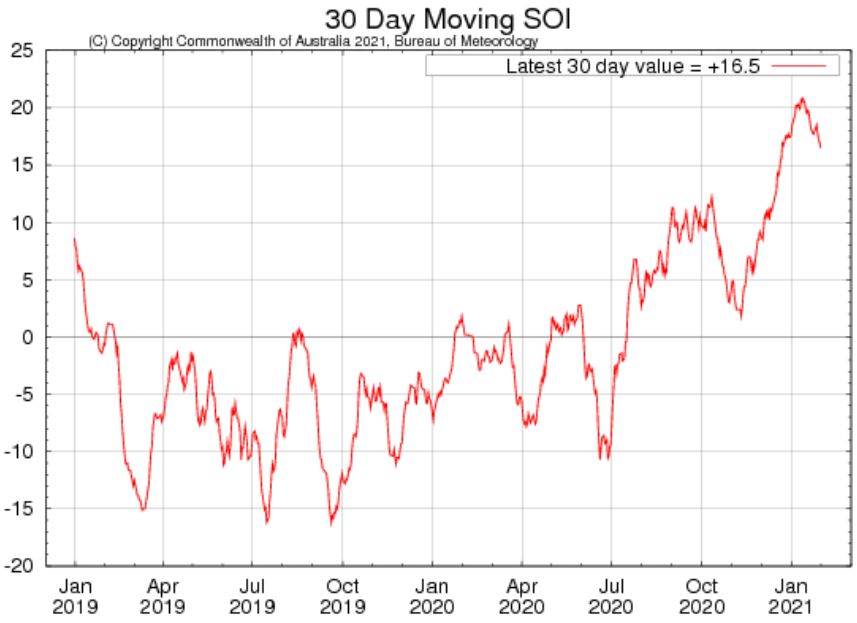
(A positive SAM is usually indicative of relatively wet conditions over the summer rainfall region during mid-summer, with drier conditions over the winter rainfall region of South Africa)

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/



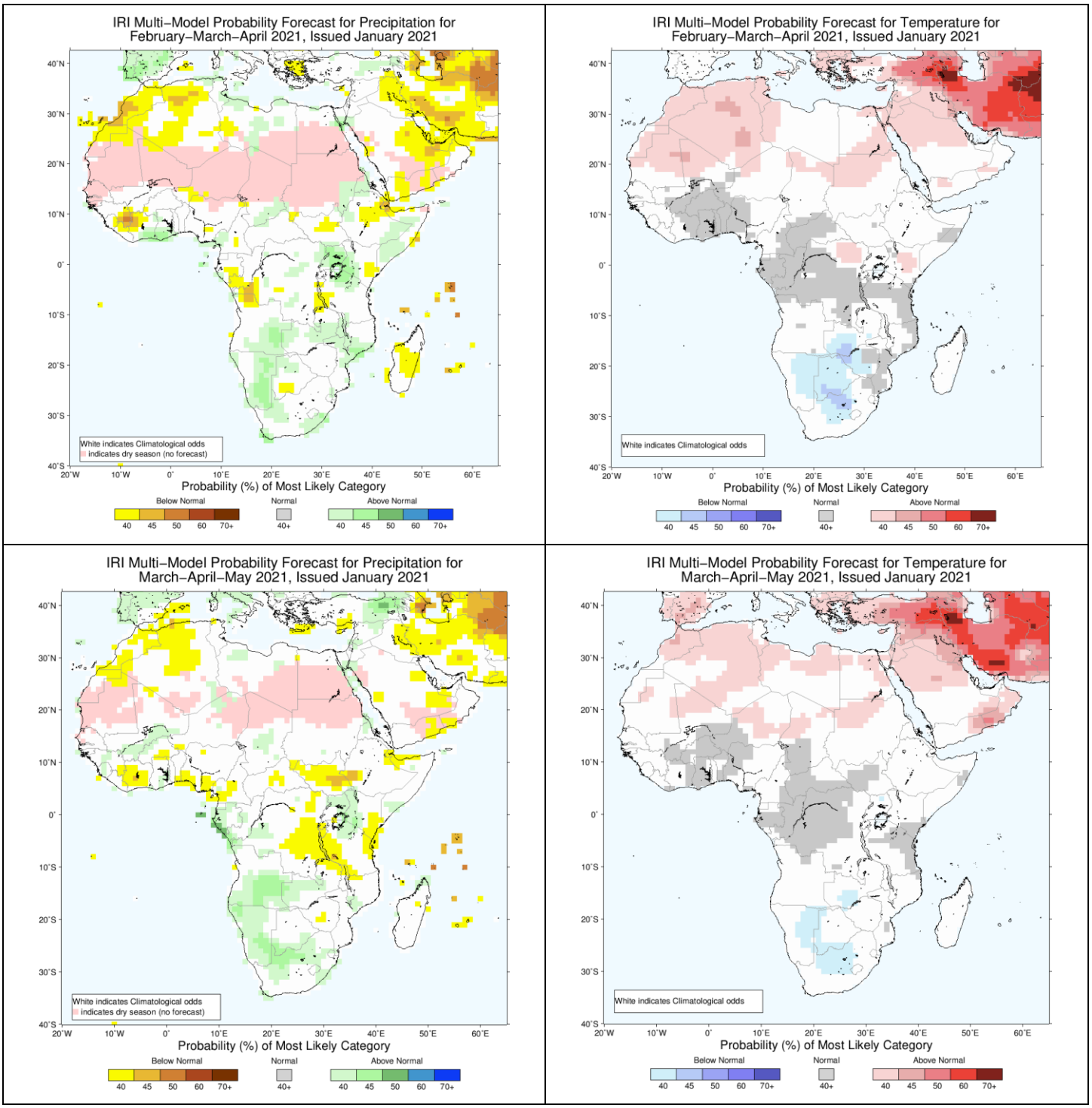
Australian Bureau of Meteorology - http://www.bom.gov.au

The Southern Oscillation Index is still high (+16.5), 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

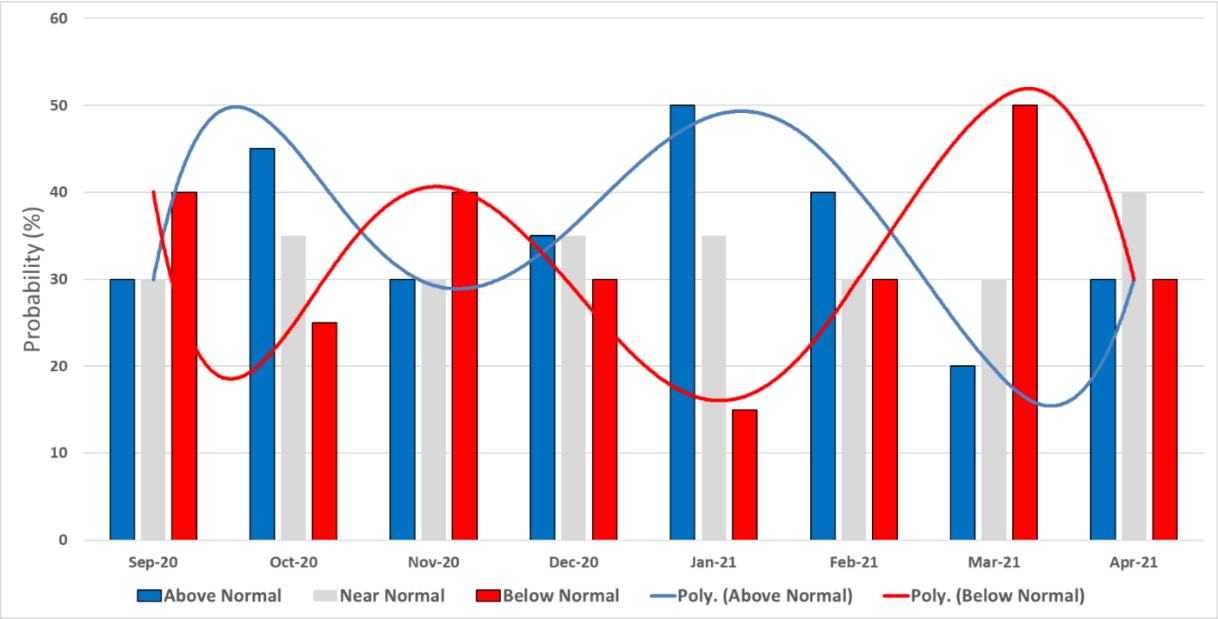
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

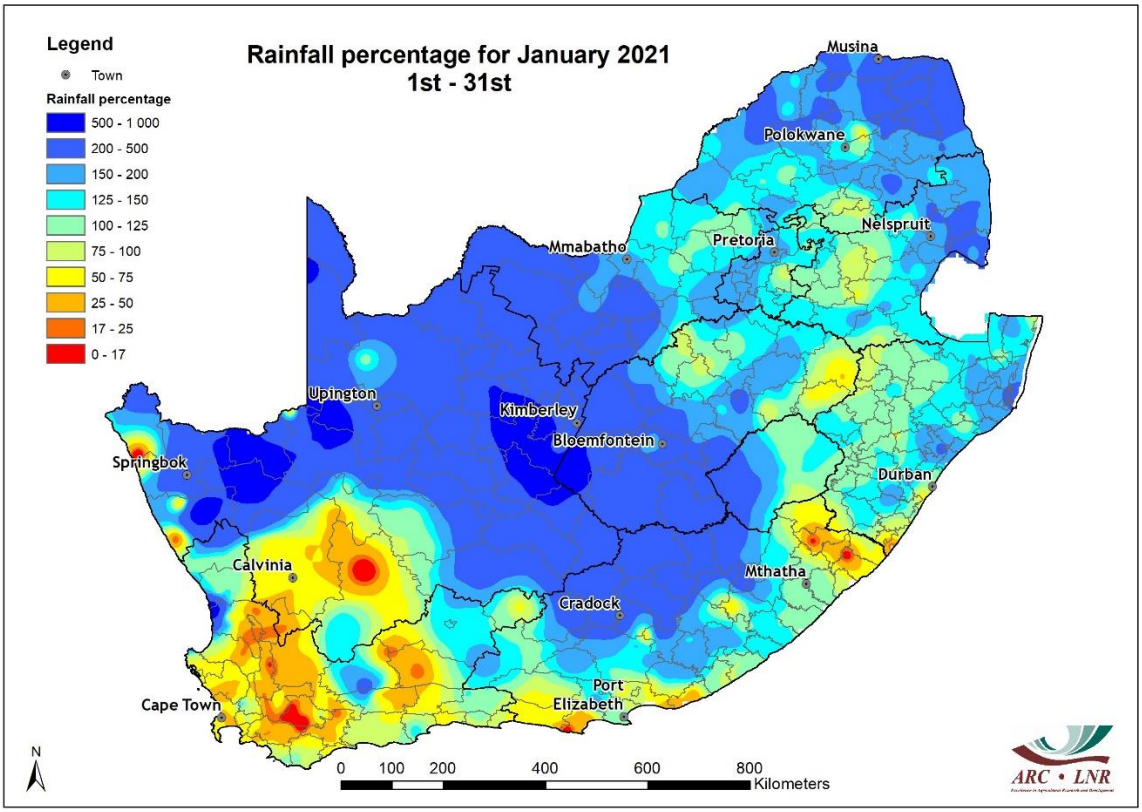


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

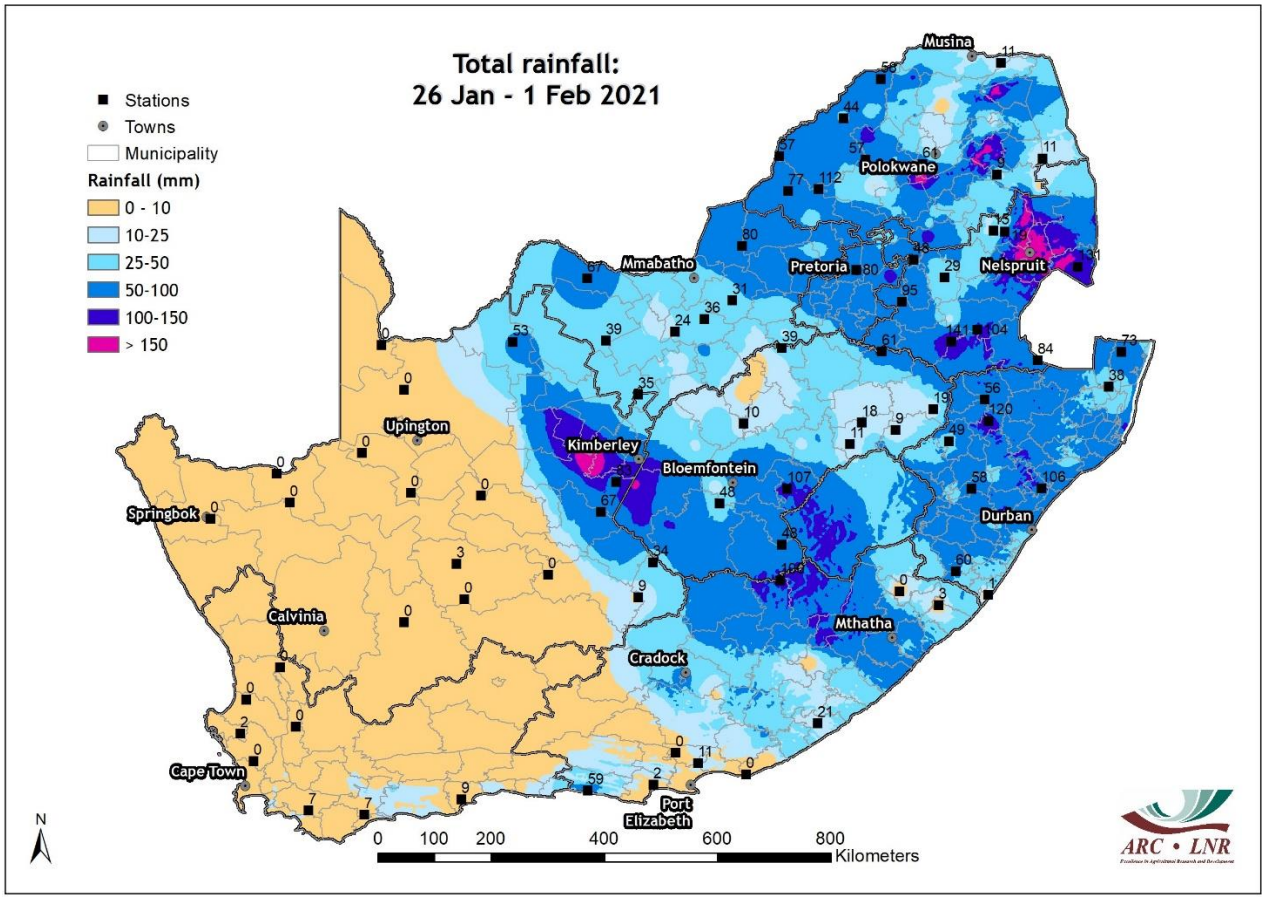
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



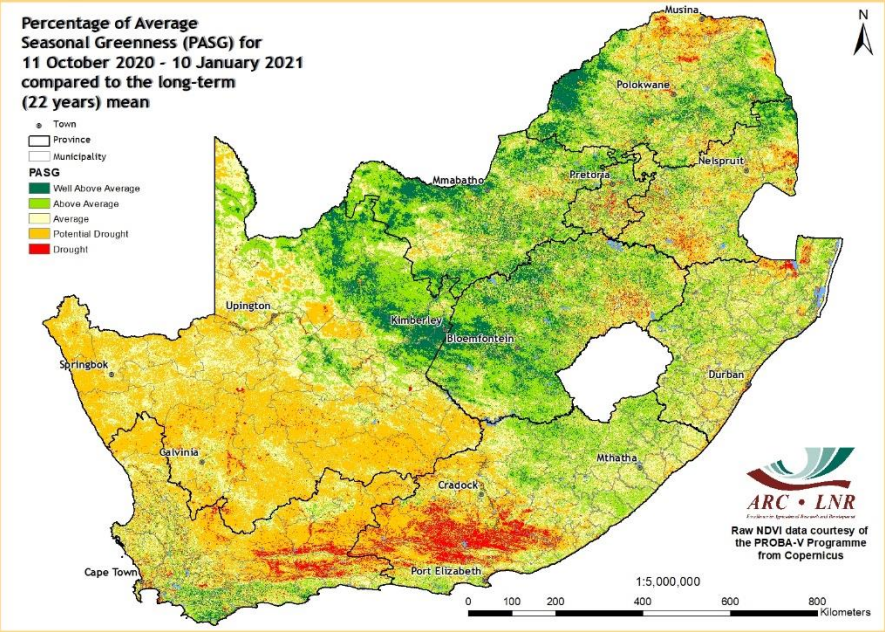
Most of the summer rainfall region received above-average rainfall during January, but the largest positive deviations in terms of the percentage of average occurred over the central interior as well as the northern parts of Limpopo and the Lowveld. The eastern maize-production region received near-normal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

Rainfall (mm): 26 January – 1 February 2020



Widespread rain occurred over the central to northeastern parts in the aftermath of Tropical Cyclone Eloise. Extensive areas received more than 50 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 ridging of the Atlantic Ocean Anticyclone around the country, feeding moisture from the east into the interior, together with the persistence of the tropical low pressure system over Botswana, will keep conditions very favorable for widespread summer rainfall over the central to northeastern parts during the period. An upper-air trough moving slowly northeastwards during the period will drag favorable conditions northeastwards as the week progresses. The system will initially support rainfall over especially North West and the Free State. Towards ad during the weekend, it will support precipitation mostly over the areas surrounding the western parts of Limpopo, according to current forecasts.

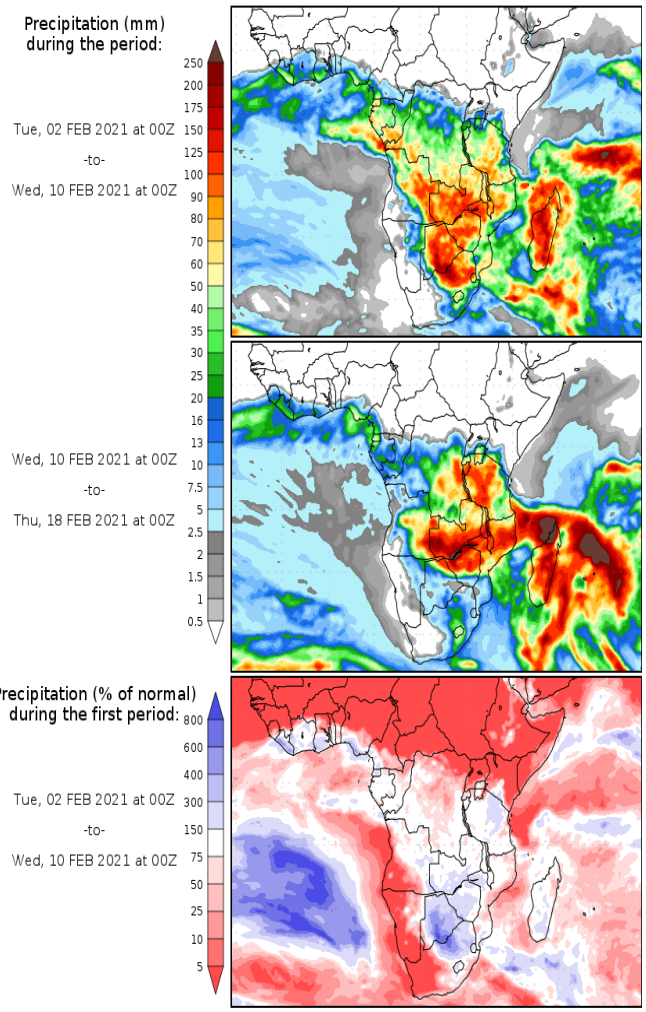
Conditions in main agricultural production regions (2 - 8 February)

Maize production region: It will be cloudy to overcast and cool initially with widespread rain and showers, especially over the western parts, until Wednesday (3rd). During the rest of the week, partly cloudy to cloudy and mild conditions will dominate with scattered thundershowers. Thundershowers should become more isolated in nature and concentrate more towards the north during the weekend when it should clear over the southwestern parts and become warmer.

Temperatures over the entire region will be normal to below normal, with daytime temperatures suppressed by extensive cloud cover. Cool conditions will dominate in the west especially during the early part of the period. Maximum temperatures in the east may be on the low side with respect to grain production. Maximum temperatures over the western maize production areas will be in the order of 19 – 30°C, with cooler, cloudy conditions concentrated towards the beginning of the period. Minimum temperatures will be in the order of 15 – 20°C. Maximum temperatures over the eastern maize-production region will range between 12 and 26°C, with highest values later this week according to current forecasts. Minimums will be in the order of 10 – 17°C.

Cape Wine Lands and Ruens: The period will be characterized by southerly to south-easterly winds, keeping the garden route relatively cool while the Swartland, West Coast, Karoo and Boland will be warm to hot on most days. Light showers are possible mostly along the Garden Route on Thursday (4th) and Saturday (6th). The wind in the southwest will be moderate to fresh southerly to southeasterly most of the time.

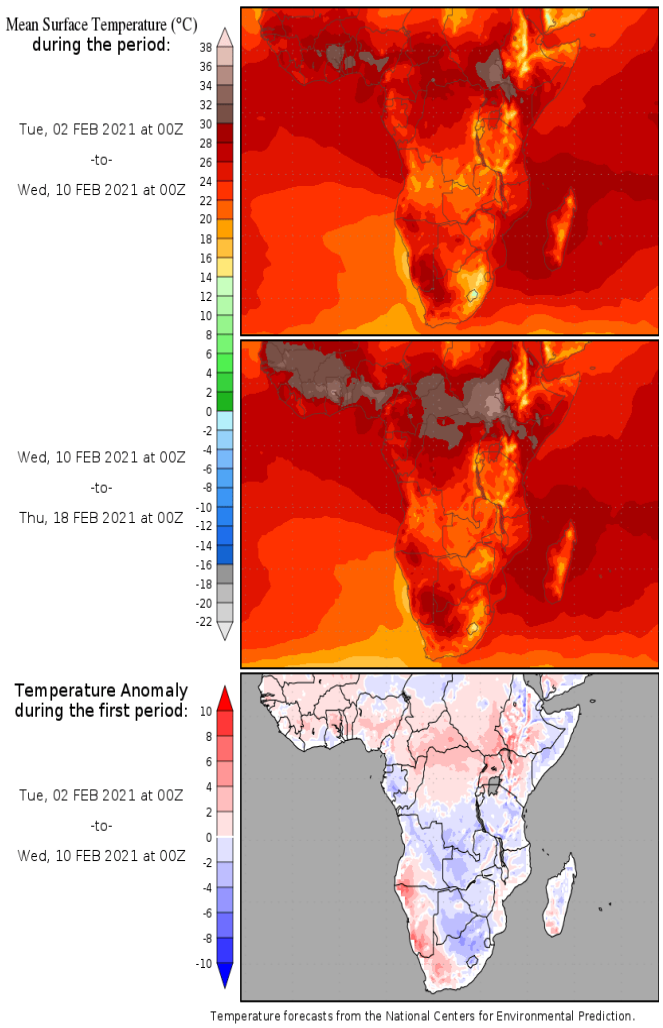
Precipitation Forecasts



Precipitation forecasts from the National Centers for Environmental Prediction.
Normal rainfall derived from Xie-Arkin (CMAP) Monthly Climatology for 1979-2003.
Forecast Initialization Time: 00Z02FEB2021

GrADS/COLA

Temperature Forecasts



Temperature forecasts from the National Centers for Environmental Prediction.
Normal Temperature derived from CRU monthly climatology for 1901-2000
Forecast Initialization Time: 00Z02FEB2021

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 2 February) 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 in 24 hours) are possible over the North West ad northern half of the Free State on Tuesday into early Wednesday (2nd, 3rd). Where soils are saturated and river systems full, this may result in flooding.
- Significant falls (>50 mm in 24 hours) are possible over the eastern to southeastern parts of Botswana and into the adjacent areas of the North West and Limpopo during the weekend (6th, 7th) according to current forecasts (long lead time and more uncertain). Where soils are saturated and river systems full, this may result in flooding.
- 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 surrounding areas especially from Friday (5th) to Monday (8th).
- Fresh to strong south-easterlies are expected over the southwestern parts during most of the period. 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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