CUMULUS

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

Contents

LAND BANK INSURANCE (SOC) LIMITED

Agri Seker 'n Seker Toekoms

LAND BANK We stand by you

Summary

Late summer rains to continue

It has become progressively wetter during the last few days as upper-air conditions improved and Tropical Cyclone Guambe on the coast of Mozambique moved out southeastwards. Large amounts of moisture moved into the country from the north as anticyclonic circulation gave way to a northerly flow with a trough to the southwest.

Conditions will remain favorable for further showers and thundershowers especially over the central to eastern and southeastern areas during the remainder of the week and into the weekend. While cloudy and cool conditions with widespread rain will initially occur over the central parts, the main area of activity will shift somewhat northeastwards during the week but is expected to move back into the central areas by later this weekend. Temperatures will be near normal for this time of the year, but it will become hot over the western parts and winter rainfall region during the week, spreading to the Karoo by the weekend. During this entire time however, large amounts of moisture in circulation will result in scattered to widespread thundershowers over most of the summer rainfall region, including the important grain-production areas.

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

- **General:**
    - It will remain partly cloudy to cloudy and warm to mild with isolated to scattered showers and thundershowers over the summer rainfall region, with especially the central areas favored for more widespread falls earlier in the period.
    - Rainfall is expected to be near normal for this time of the year over the central to northeastern parts, but below normal over the southwestern parts, including the winter rainfall region.
    - Temperatures will on average be near normal across the center of the country, but cooler over the northern parts and warmer than normal over the southwestern and western interior where it will also be mostly dry.
    - Temperatures over the central to western parts will generally trend upwards, while the northeastern areas are expected to become cooler during the period.
    - Light showers are expected along the Garden Route at times during the remainder of the week.
    - Strong southeasterlies are expected over the southwestern parts, especially later this week.
    - Temperatures will be somewhat below average while humidity will be high given cloud cover and rainfall over much of the summer-grain production areas:
        - Maximum temperatures over the western maize-production areas will be in the order of 18 – 30°C, with cooler, cloudy conditions concentrated towards the beginning of the period and warmest conditions expected later this week. Minimum temperatures will be in the order of 15 – 21°C.
        - Maximum temperatures over the eastern maize-production region will range between 20 and 27°C, with the cooler conditions expected to commence during the week and continue into next week. The southern parts of this region will be cool in the beginning of the period also, with widespread showers. Minimums will be in the order of 10 – 14°C.

- **Detailed:**
    - Tuesday (23rd): Cloudy and cool with widespread rain and thundershowers over the central parts, including most of the Free State and North West. Isolated thundershowers are possible to the northeast and southwest of this region.
    - Wednesday and Thursday (24th, 25th): The main area of rainfall will shift somewhat northeastwards, with scattered showers and thundershowers now over Gauteng, Mpumalanga, northern Free State, central to northern KZN and North West and southern Limpopo. Isolated thundershowers are still possible around this area while the western to southwestern interior will be warm and dry. Light showers are possible along the Garden Route with a southerly (on-shore) flow keeping the Karoo cooler also. Cooler, rainy conditions will spread up the southeast to east coast.
    - Friday (26th): Thundershowers are expected to continue over the northeastern parts, with the central and western to southwestern interior expected to be warm to hot and dry. Somewhat more widespread

thundershowers are possible around central to western Mpumalanga and Gauteng. The east coast should remain cloudy and cool with showers.

- Saturday (27th): The area of scattered thundershowers will shift westwards again, to include the Free State, northeastern Northern Cape, northern Eastern Cape and North West. Another low-pressure system to the north is expected to bring widespread showers to the northern parts of Limpopo according to current forecasts. The southwestern interior is expected to remain hot, but an on-shore flow will continue to have a moderating effect on temperatures over the Garden Route and much of the Karoo.
- Sunday (28th): Scattered thundershowers will remain in place over the central parts, expanding further west into the Northern Cape. Scattered showers are also expected to occur over Limpopo, especially the northern parts, associated with the system to the north.
- Monday (1st): Isolated to scattered thundershowers are expected over almost the entire country. The West Coast and adjacent interior are expected to be hot and dry. Temperatures will also remain high over the western to southern interior while an easterly flow will keep the northeastern parts 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 2020/21event 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)*

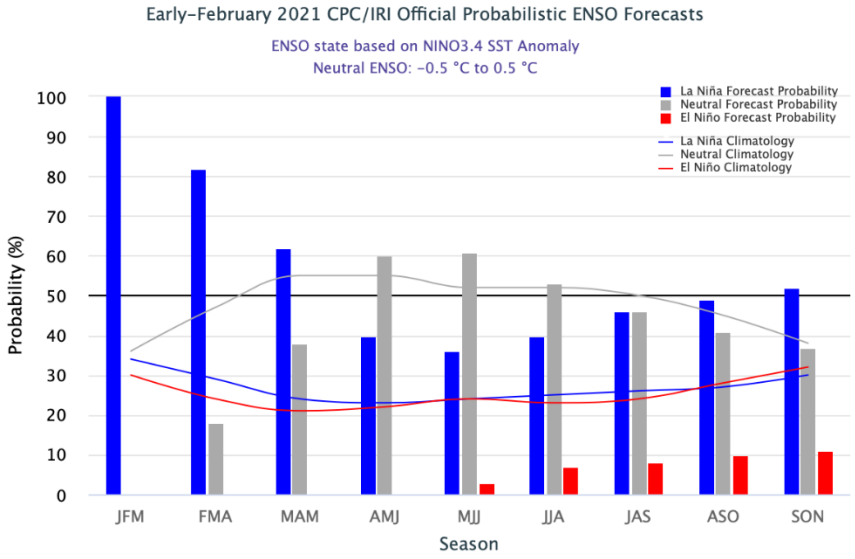
In the tropical Pacific Ocean, sea surface temperatures remain similar to last fortnight's, with a cooler than average tongue of water still present across the central to western Pacific. Beneath the surface, cooler water is still present. In the atmosphere, the Southern Oscillation Index (SOI) still 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)*

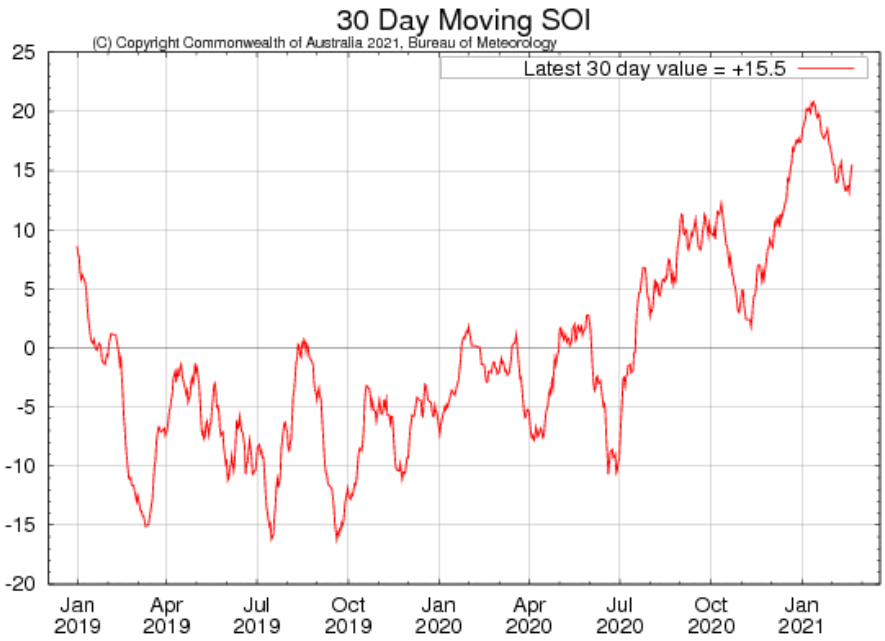
The Indian Ocean Dipole (IOD) is currently neutral…….***Australian Bureau of Meteorology*** - http://www.bom.gov.au

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 -0.3ºC and -0.2ºC, respectively. However, the latest weekly Niño index values in the central (Niño-4) and east-central (Niño-3.4) Pacific Ocean were -1.1ºC and -0.7ºC. 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/



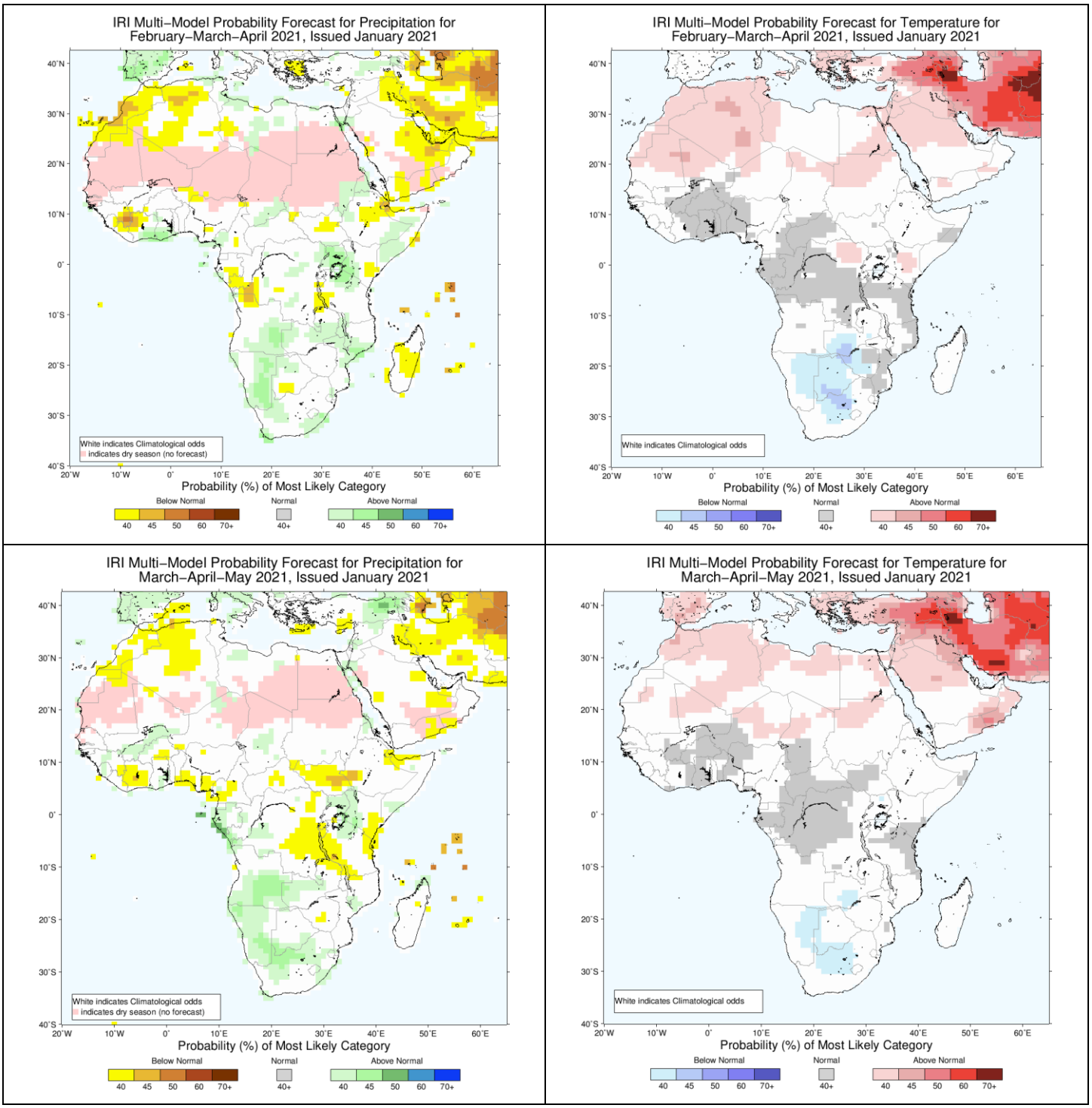
Australian Bureau of Meteorology - http://www.bom.gov.au

The Southern Oscillation Index is still high (+15.5), 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

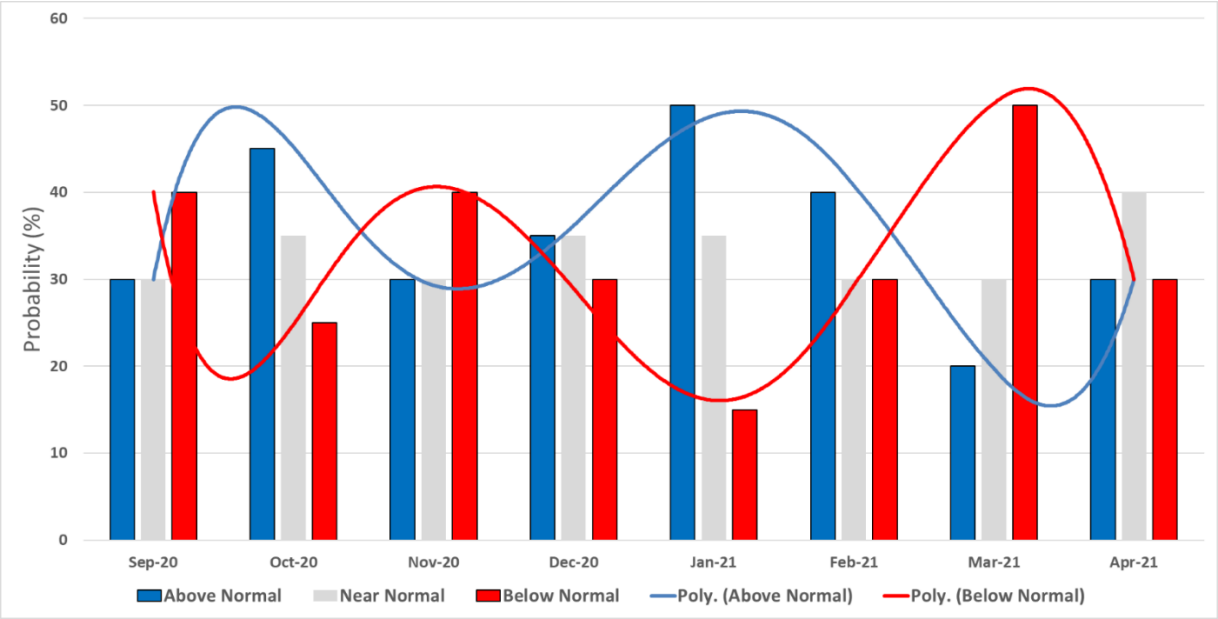
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

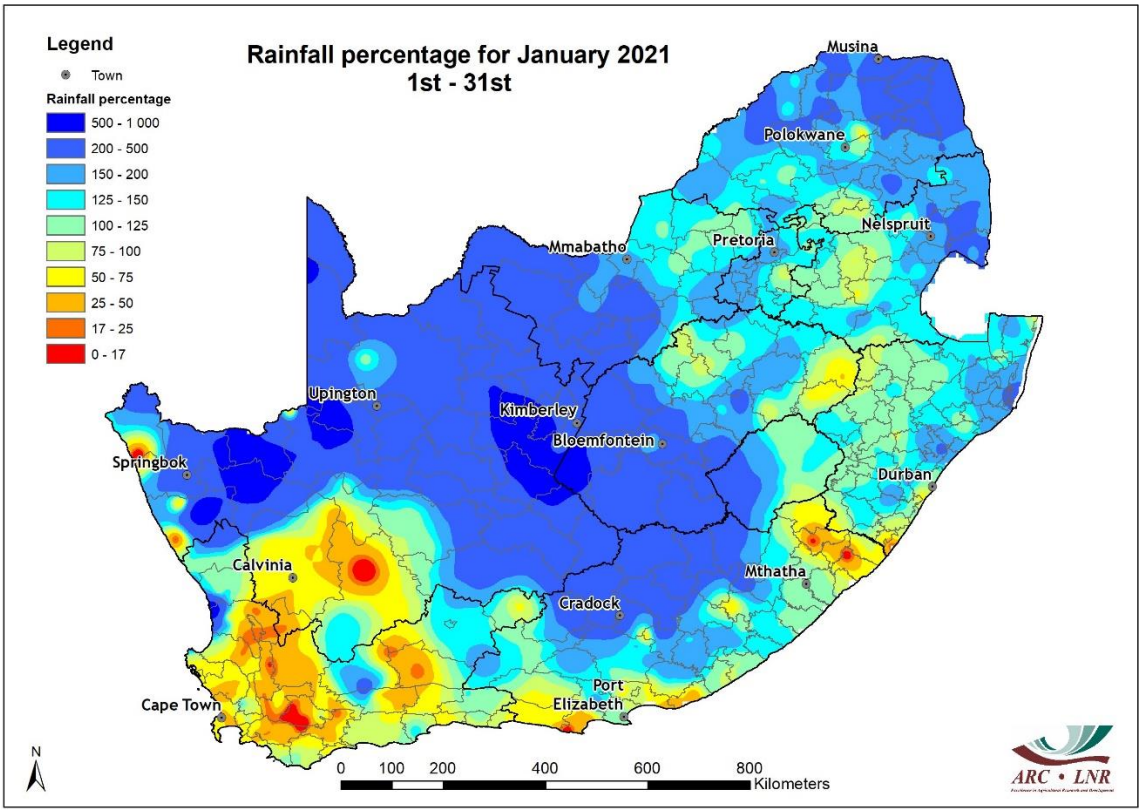


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

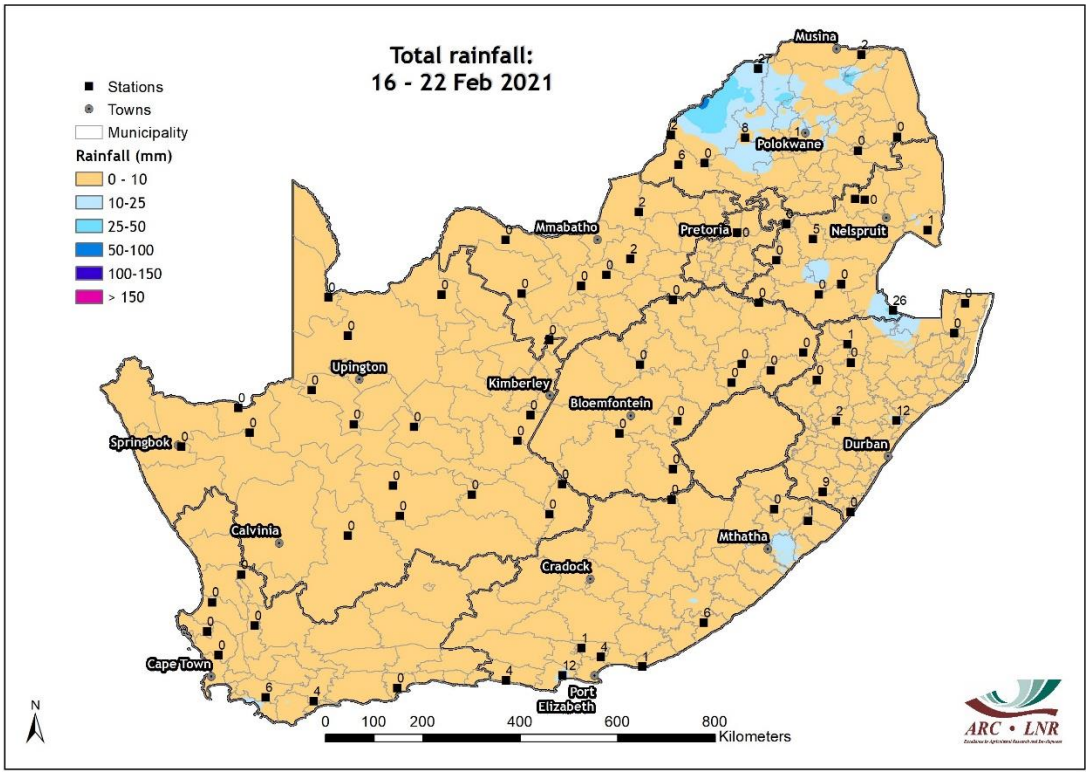
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



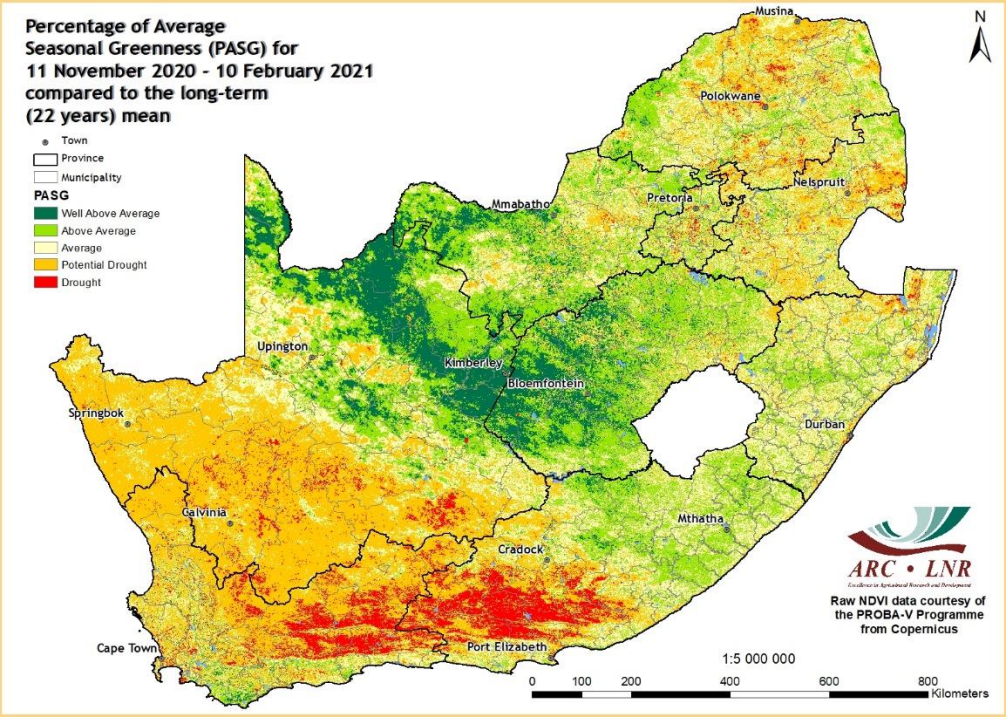
Most of the summer rainfall region received above-average rainfall during January, but the largest positive deviations in terms of the percentage of average occurred over the central interior as well as the northern parts of Limpopo and the Lowveld. The eastern maize-production region received near-normal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

Rainfall (mm): 16 – 22 February 2021



Most of the country was dry during the last few days, until the 16th of February. Thundershowers concentrated mostly over the northeastern interior and totals were on the low side (The map omits rainfall on the 22nd.).

Percentage of Average Seasonal Greenness: 11 November – 10 February 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

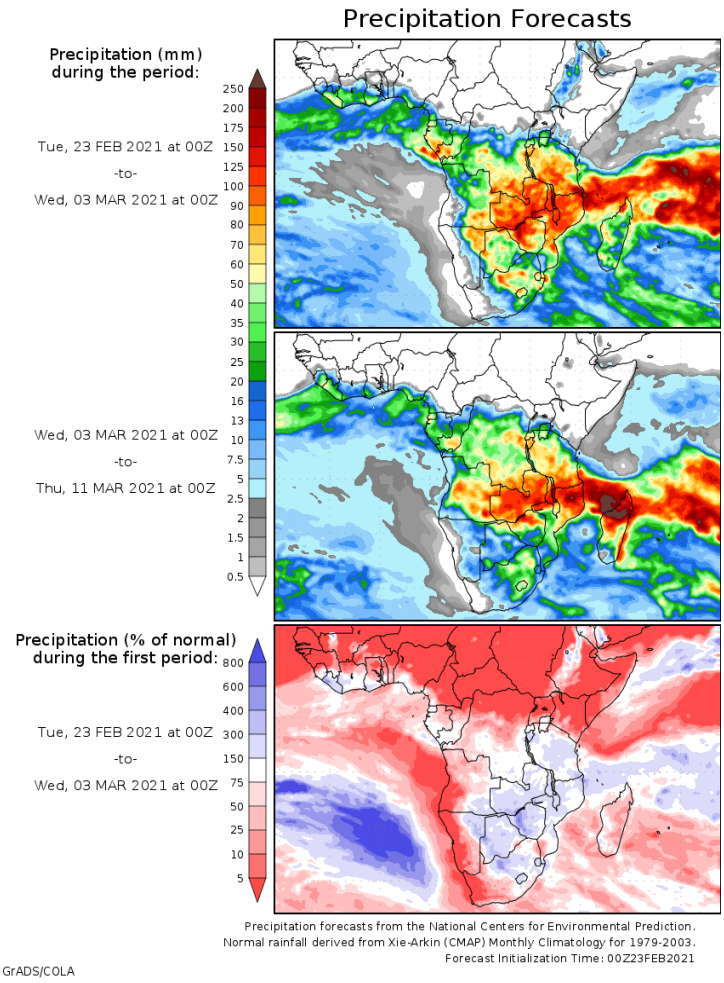
With a persistent high-pressure system to the southwest of the country, upper-air circulation over the country is expected to remain favorable for further precipitation over most of the summer rainfall region during the week. Ridging of the high-pressure system around the country will result in some rainfall over the Garden Route and along the southeastern to eastern coastal areas and adjacent interior as well, while also resulting in cooler conditions over the northeastern parts of the country later in the period. A low-pressure system is expected to develop towards the north of South Africa and may also contribute more moisture and rainfall over the far northern areas by the weekend.

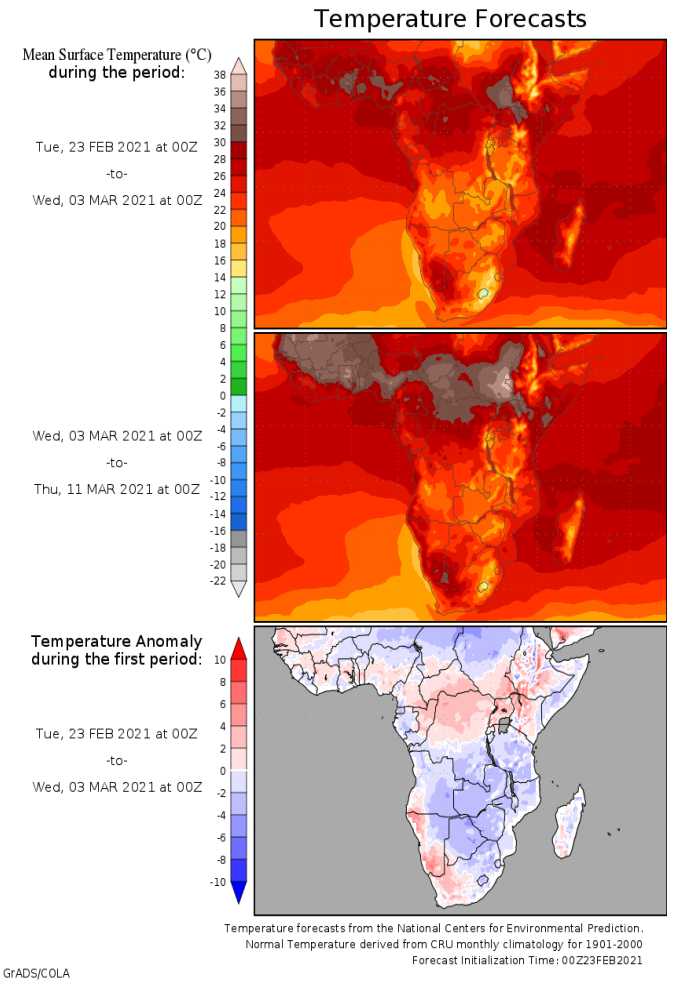
Conditions in main agricultural production regions (23 February – 1 March)

Maize production region: The western to southern parts of this region will start off cool and wet, but it will become partly cloudy and warm during the rest of the week, especially in the west. Thundershowers will spread over the entire region by the weekend again. The eastern areas will start out cloudy to partly cloudy and warm, but it will become cloudy and cooler during the week with scattered thundershowers through most of the period.

Temperatures will on average be somewhat lower than during the previous few days, especially maximum temperatures. The cooler conditions with abundant cloud cover will once again be conducive to the spread of fungal pathogens. Maximum temperatures over the western maize-production areas will be in the order of 18 – 30°C, with cooler, cloudy conditions concentrated towards the beginning of the period and warmest conditions expected later this week. Minimum temperatures will be in the order of 15 – 21°C. Maximum temperatures over the eastern maize-production region will range between 20 and 27°C, with the cooler conditions expected to commence during the week and continue into next week. The southern parts of this region will be cool in the beginning of the period also, with widespread showers. Minimums will be in the order of 10 – 14°C.

Cape Wine Lands and Ruens: Southeasterly winds will dominate and keep the Garden Route cool, with showers from time to time during the week. Strong southeasterlies will occur over the southwestern parts, reaching a maximum around Thursday (25th). It will become hot over the West Coast and Swartland from Thursday (25th) onwards, spreading over the Karoo from Saturday (27th) onwards.





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 23 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:

- Cooler, cloudy and relatively wet conditions over the summer-grain-production areas will be conducive to the spread of fungal pathogens.
- Warm to hot conditions will develop over the western interior and West Coast during the week, spreading into the Karoo during the weekend.
- Fresh to strong south-easterlies are expected over the southwestern parts, reaching a maximum by Thursday (25th). 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
"COLA and IGES make no guarantees about and bear no responsibility or liability concerning the accuracy or timeliness of the images being published on these web pages. All images are generated by COLA and do not represent the actual forecasts issued by the National Weather Service. These products are not a substitute for official forecasts and are not guaranteed to be complete or timely. The underlying data are the direct product of the various operational forecast models.