CUMULUS

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

Contents

LAND BANK INSURANCE (SOC) LIMITED

Agri Seker 'n Seker Toekoms

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Summary

Drier conditions ahead

It is clear that weather patterns have shifted from being conducive to lots of tropical moisture over the interior and above-normal rainfall to a much drier pattern with cooler nights resembling a distinct autumn character. Thundershowers have become more isolated in nature and mostly confined to the northeastern and far southwestern parts.

Mild and dry conditions will continue during the next few days over especially the central interior while some showers and thundershowers will result in near-normal rainfall in the northeast. Large-scale atmospheric circulation patterns will result in more precipitation towards the east of the subcontinent over the southwestern Indian Ocean while upper-air anticyclonic flow over Botswana will keep tropical moisture well to the north. While it will be dry, maximum temperatures are not expected to be high for this time of the year, with both minimum and maximum temperatures expected to remain near normal over the interior. Easterly winds will keep the northeastern parts mild to cool relative to warmer conditions over the western interior where sunny conditions with moderate westerly to northwesterly winds will keep especially maximum temperatures in the near normal to above normal range. Frontal activity will result in some light showers over especially the southern parts of the winter rainfall region at times.

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

- **General:**
    - It will remain partly cloudy and warm over the central interior with little to no rain expected according to current forecasts.
    - Isolated to scattered thundershowers are expected over the northeastern parts, especially by the weekend, according to current forecasts. Some areas in the northeast may receive near-normal rainfall for this time of the year.
    - Showers are expected at times along the Garden Route and up the southeast coast into KZN.
    - Parts of the Eastern Cape and KZN are also expected to receive normal rainfall during the period. Scattered thundershowers are expected over the Eastern Cape (especially central to eastern parts), and will gradually migrate northwards during the week to be confined to KZN and into the Eastern Highveld by Sunday (7th).
    - Temperatures will on average be near normal to above normal over the central to southwestern and western interior where it will be mostly dry, while cooler conditions should dominate in the north and east.
    - Relatively low minimum temperatures (cooler nights and mornings) over the eastern and northeastern parts will generally increase steadily during the period (mild to warmer mornings).
    - Frontal systems will bring windy and cooler conditions with light showers to the southern parts of the winter rainfall region by Wednesday (3rd) and Sunday (7th) according to current forecasts.
    - Strong southeasterlies are expected over the southwestern parts only by early next week according to current forecasts.
    - Temperatures will be near normal for this time of the year over the summer-grain production area – and generally conducive to production:
        - Maximum temperatures over the western maize-production areas will be in the order of 24 – 31°C, with cooler conditions expected early in the period. Minimum temperatures will be in the order of 13 – 21°C, with lower temperatures also early in the period.
        - Maximum temperatures over the eastern maize-production region will range between 24 and 29°C. Minimums will be in the order of 9 – 14°C, generally increasing slightly during the period.

- **Detailed:**
    - Tuesday (2nd): It will be partly cloudy and mild to warm in most areas. Isolated thundershowers are expected only in the northeast and south. It will be warm and windy over the Karoo.
    - Wednesday (3rd): It will remain partly cloudy and mild to warm over most areas. It will again be hot windy over most of the Northern Cape and the Karoo, especially in the afternoon. Isolated to scattered thundershowers will occur over Drakensberg and surrounding areas of the Eastern Cape and KZN.

- Thursday (4th): Dry and warm over most areas. It will be hot and windy over most of the Northern Cape, but the Karoo will be cooler than the previous days. Some showers are possible over the southern winter rainfall region, spreading along the Garden Route during the day. Isolated to scattered thundershowers are possible again along the Drakensberg and surrounding areas of the Eastern Cape and KZN.
- Friday (5th): It will remain dry and warm over most areas, but hot and windy over most of the Northern Cape. Isolated to scattered thundershowers are still possible along the Drakensberg and surrounding areas of the Eastern Cape and KZN. Thundershowers in the east will spread somewhat north, into southern Mpumalanga and possibly further north and west.
- Saturday (6th): It will remain warm and dry over most areas, but hot and windy over the Northern Cape and Karoo. Isolated thundershowers will develop over the eastern and northeastern parts.
- Sunday (7th): Warm and dry conditions are expected to continue across the country, but isolated thundershowers are possible over the eastern and northeastern parts – mostly confined to KZN, Mpumalanga and Limpopo. It will become cloudy, windy and cooler over the southern parts of the winter rainfall region with light showers, spreading east along the Garden Route.
- Monday (8st): It will be windy and cool in the south with rain and showers along the Garden Route and into the southern Karoo. Isolated thundershowers are still possible in the northeast according to current forecasts. The southern interior will become cooler due to the southerly to southeasterly winds in the region, while the rest of the interior will be warm and dry with windy conditions over the central parts.

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 March): The 2020–21 La Niña has passed its peak and is now weakening. Climate model outlooks indicate the El Niño–Southern Oscillation (ENSO) will return to neutral (neither La Niña nor El Niño) during autumn. ..... *(Seasonal forecasts for South Africa continue to lean towards wetter than normal conditions during March to May)*

Tropical Pacific Ocean sea surface temperatures are currently close to La Niña threshold. However, atmospheric indicators such as the Southern Oscillation Index (SOI), cloudiness near the Date Line, and trade winds clearly remain at La Niña levels. Waters beneath the surface remain cooler than average, but the strength of cool anomalies has begun to ease.

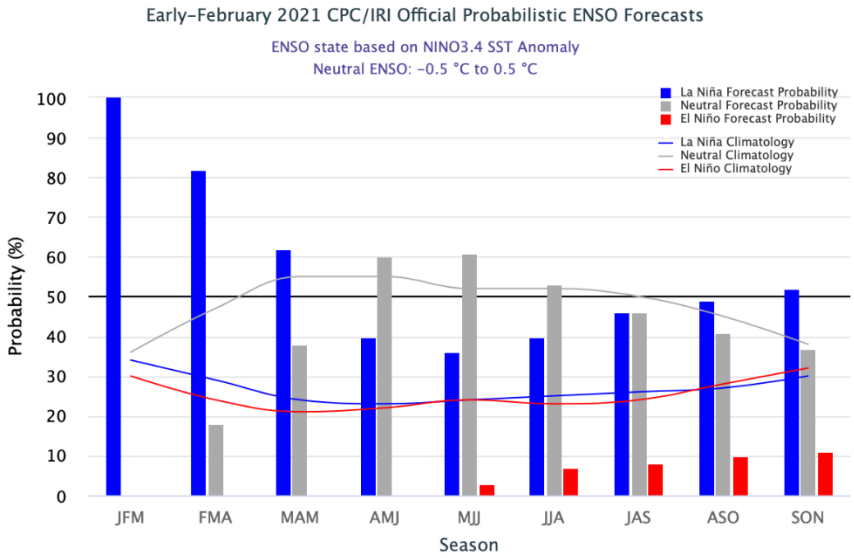
After persisting at positive values for the first half of February, the Southern Annular Mode (SAM) returned to neutral levels. Forecasts indicate neutral SAM values will persist for the coming fortnight..... (*A positive SAM is usually indicative of relatively wet conditions over the summer rainfall region during mid-summer, with drier conditions over the winter rainfall region of South Africa, as witnessed during early February)*

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

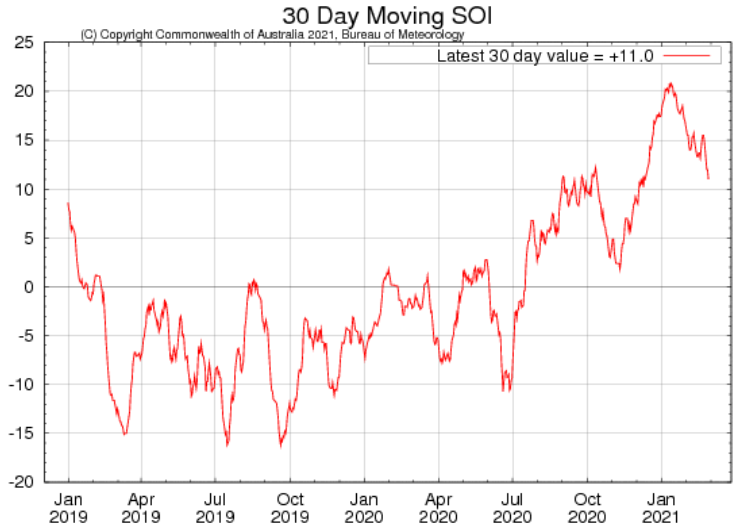
According to the IRI (Updated 11 February): La Niña persisted in January, reflected by below-average sea surface temperatures (SST) anomalies extending from the western to east-central Pacific Ocean. SSTs returned to near average in the eastern Pacific Ocean by the end of the month, as indicated by the 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/



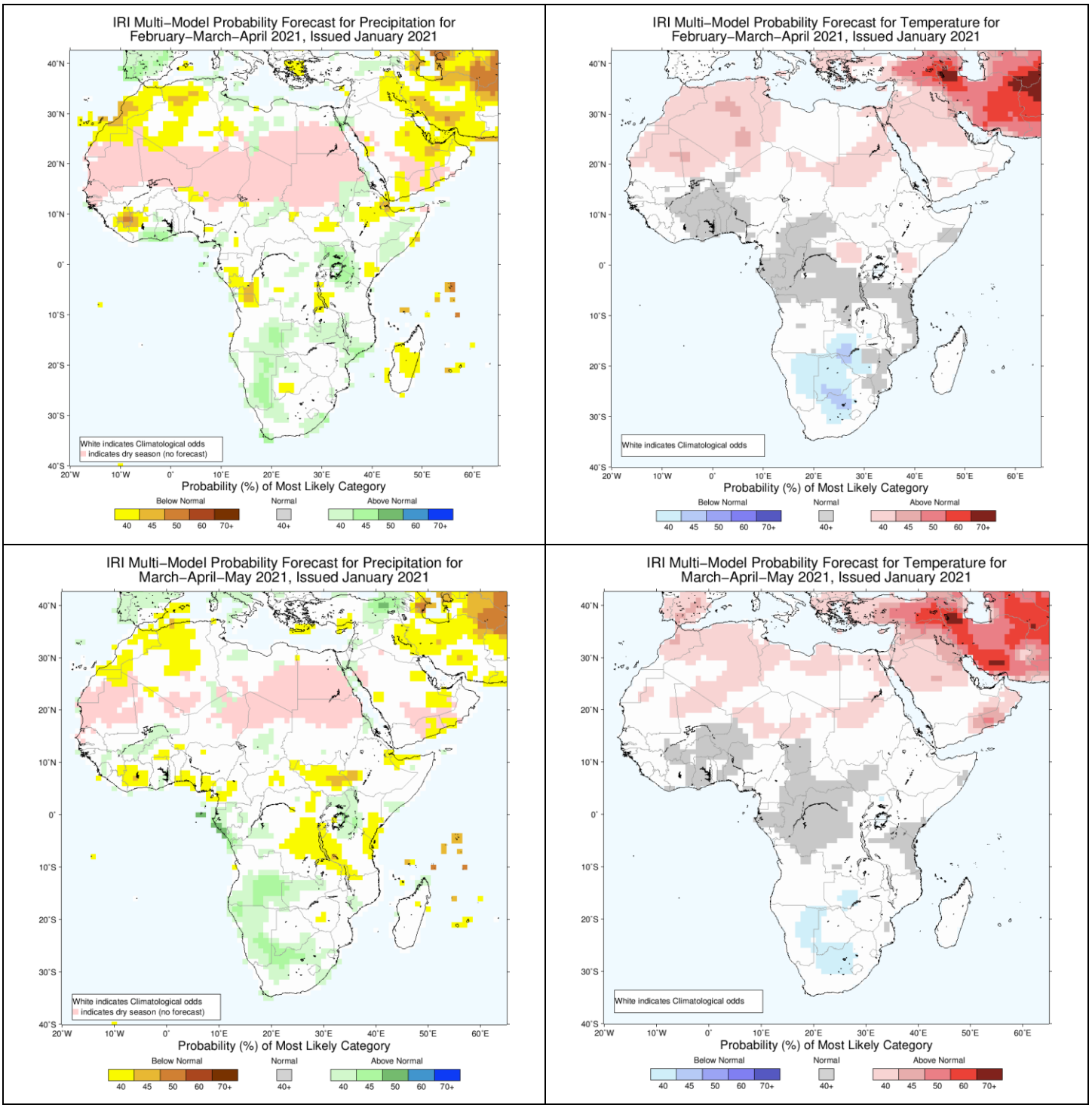
Australian Bureau of Meteorology - http://www.bom.gov.au

The Southern Oscillation Index is still high (+11), 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

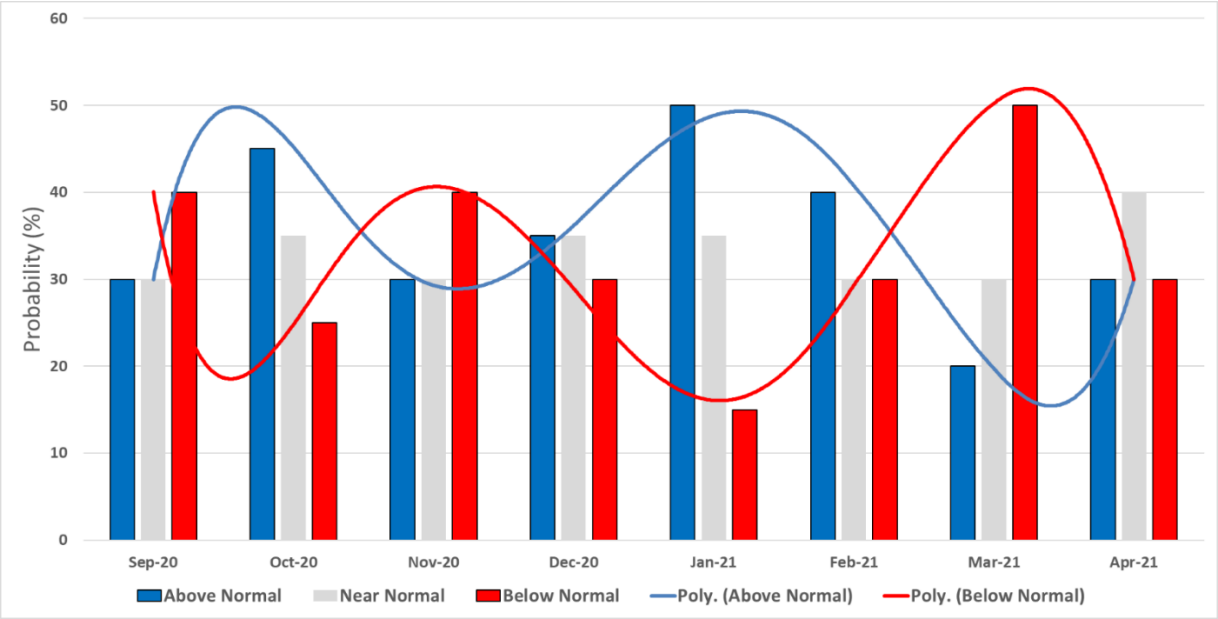
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

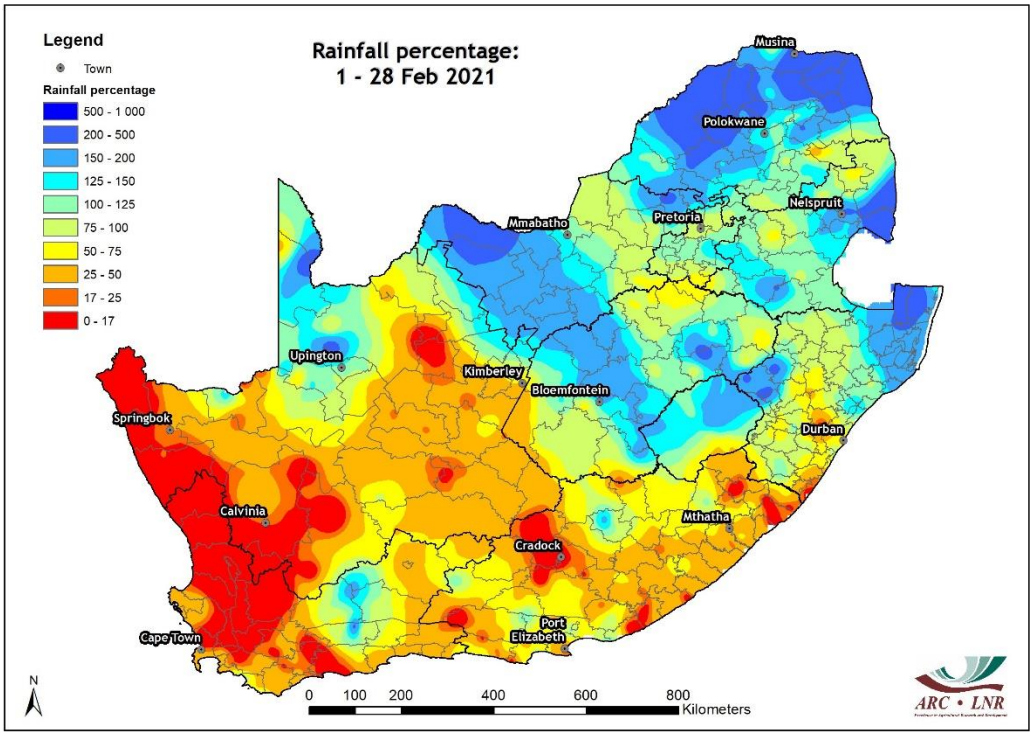


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

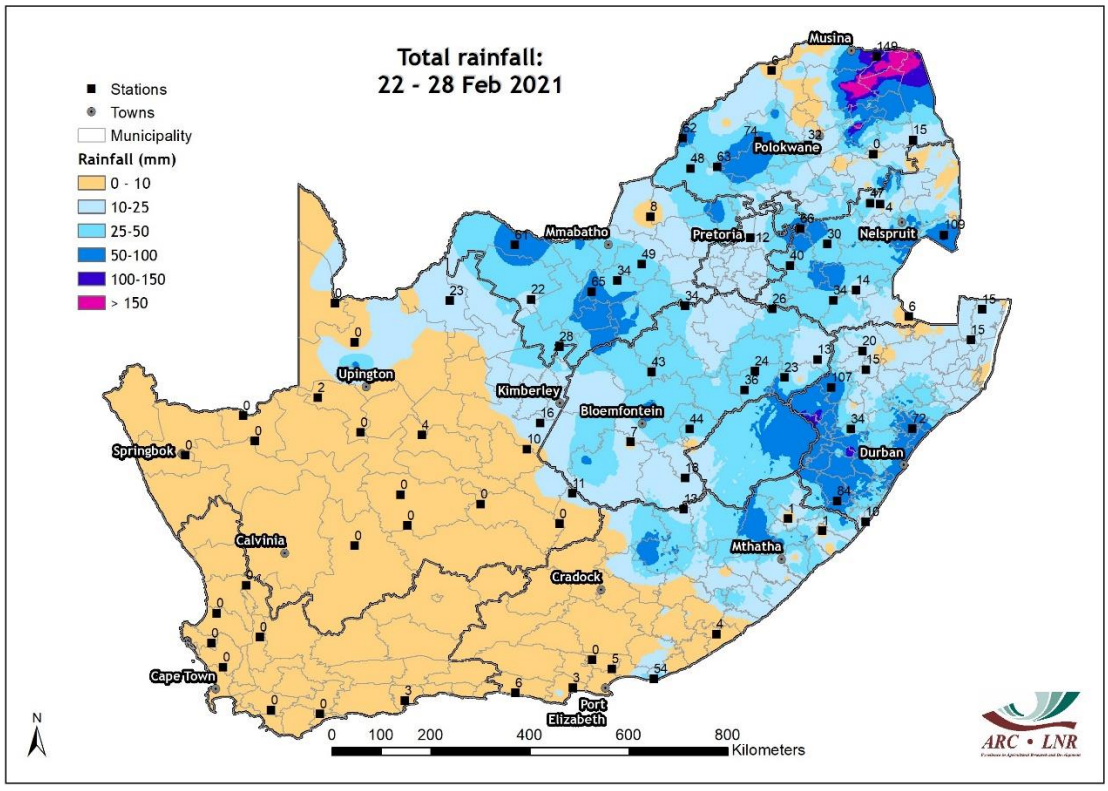
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



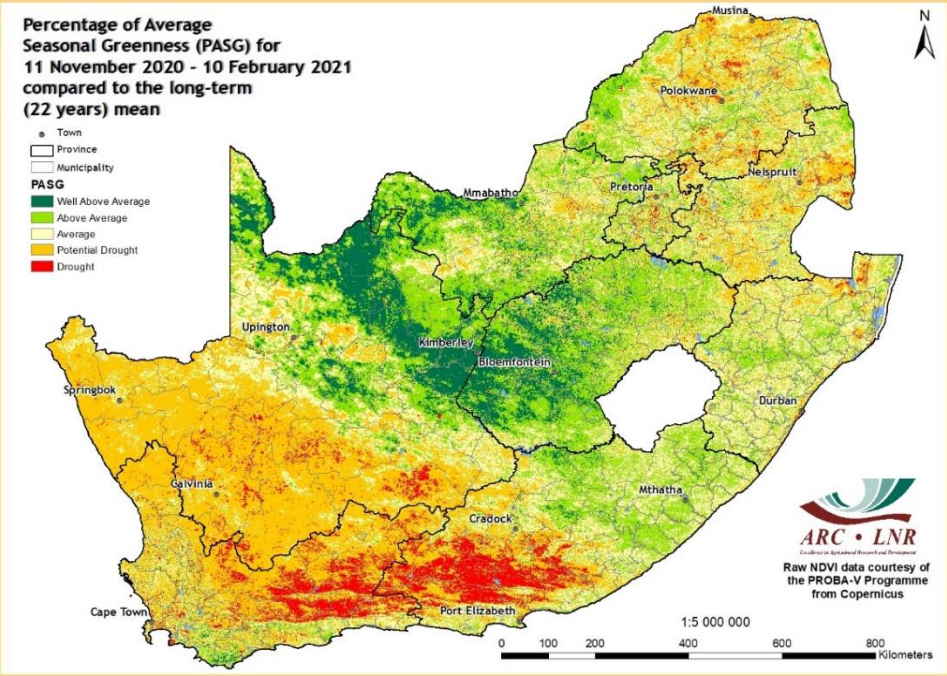
Rainfall during February 2021 was once again above normal over much of the summer rainfall region, but larger areas of the region received normal to below normal rainfall than during January.

Rainfall (mm): 22 – 28 February 2021



The central to northeastern parts received rain during the last few days of February. Most of the rain over the central parts occurred around the 23rd with a general rain situation while much of the rain over the northeastern parts occurred in the form of thundershowers, reaching a maximum by the 26th.

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

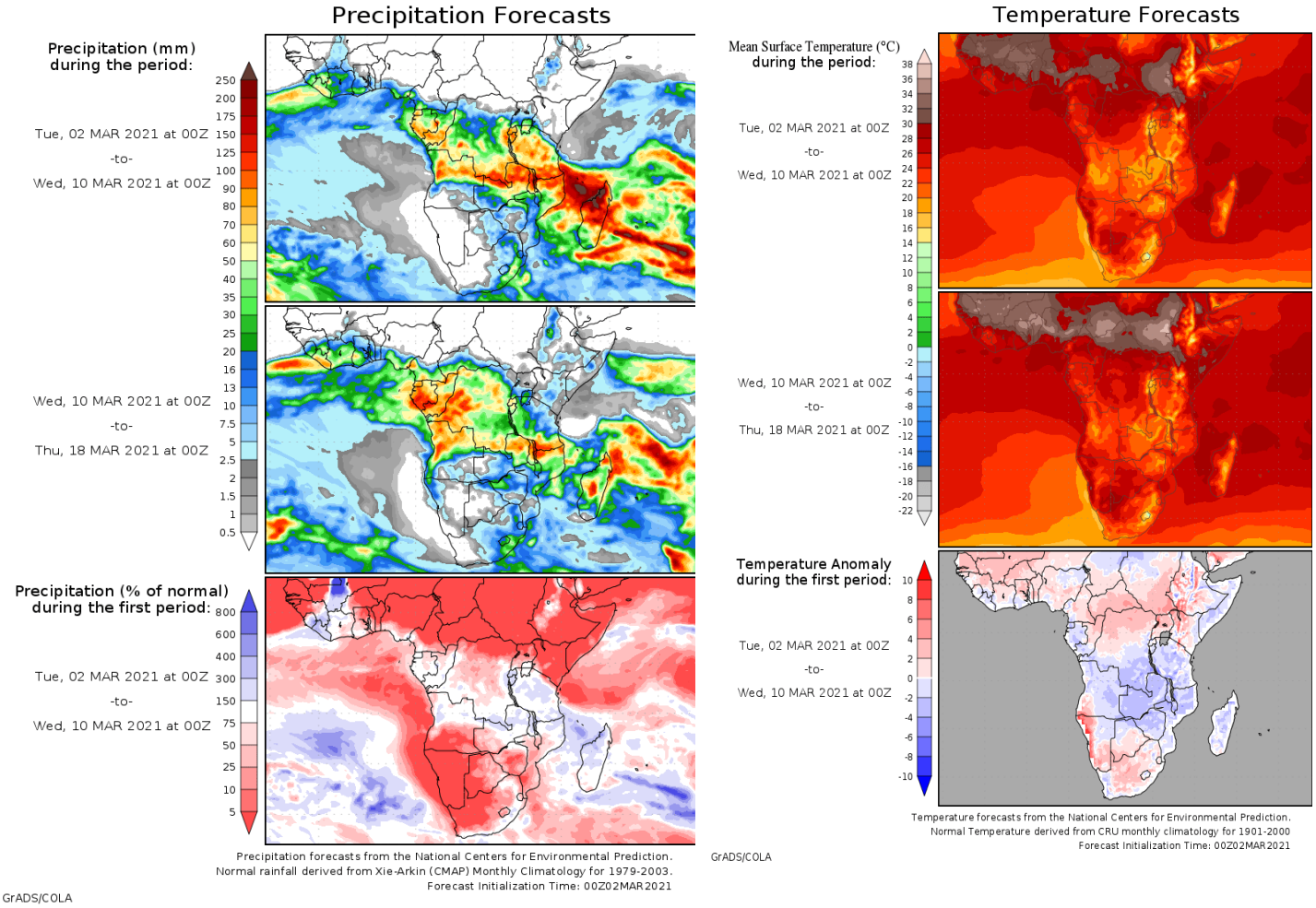
The period will start out with an upper-air trough to the southwest, weakening, with some residual thundershowers early over the southwestern interior. Most of the period will see dry conditions over the interior as the position of upper-air troughs will be such that anticyclonic circulation should dominate. A ridging high-pressure system will bring somewhat more in the way of precipitation to the eastern and northeastern areas by the weekend. The earliest indications for widespread precipitation over the central interior is by next week.

Conditions in main agricultural production regions (2 – 8 March)

Maize production region: The period will be characterised by mostly partly cloudy and warm conditions with little to no rainfall. Isolated thundershowers are possible over especially the central to eastern parts from Friday (5th) onwards.

Temperatures will generally remain in the favourable range for maize production. Maximum temperatures over the western maize-production areas will be in the order of 24 – 31°C, with cooler conditions expected early in the period. Minimum temperatures will be in the order of 13 – 21°C, with lower temperatures also early in the period. Maximum temperatures over the eastern maize-production region will range between 24 and 29°C. Minimums will be in the order of 9 – 14°C, generally increasing slightly during the period.

Cape Wine Lands and Ruens: The region will be partly cloudy and mild for most of the next few days. A cold front will bring light showers to the southern parts by late Wednesday (3rd)/Thursday (4th). A second system will bring cool, showery and windy conditions to the south by Sunday (7th) and Monday (8th) with somewhat more significant showers further east along the Garden Route according to current forecasts. In the southwest, fresh to strong southeasterlies are expected on Thursday (4th) and again by Monday (8th).



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 March) 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:

- Warm to hot and windy conditions over the Northern Cape on several days, spreading into the Karoo regions of the Western and Eastern Cape provinces on Tuesday (2nd), Wednesday (3rd) and Saturday (6th), may be conducive to the development and spread of wild fires.
- Fresh to strong south-easterlies are expected over the southwestern parts by Thursday (4th) and Monday (8th). Where vegetation is dry, this may be conducive to the development and spread of wild fires.
- Thundershowers along the southern to central Drakensberg may become severe from Wednesday (3rd) to Friday (5th).

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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