CUMULUS

23 March 2021 – by J Malherbe, R Kuschke

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Summary

More rain before a drier period

Another spell of widespread showers or thundershowers is expected during the next few days, but it should clear from the west by Thursday /Friday. It should be dry and clear by the weekend across the interior while a cold front may bring some rain over the southern winter rainfall region together with some rain also along the southern to eastern coastal belt.

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

- **General:**
    - Temperatures will be near normal for this time of the year over most of the country, but below normal over the central to eastern summer rainfall region, including the maize-production region where maximum temperatures will be suppressed.
    - Rainfall will be above normal, mainly across the Highveld, with below-normal rainfall expected over the rest of the country.
    - Showers or thundershowers are expected over most of the interior until Thursday, clearing from the west by Friday.
    - Rainfall totals may range between 25 and 50 mm over the maize-production areas according to current forecasts.
    - The cloudy conditions with precipitation will result in lower maximum temperatures over the central to eastern areas until Thursday / Friday (25th / 26th).
    - Very little to no rain is expected over the winter rainfall region.
    - Strong southeasterlies are expected in the southwest on Saturday (27th).
    - Temperatures over the summer-grain production area will be somewhat lower, especially with reference to maximums:
        - Maximum temperatures over the western maize-production areas will be in the order of 17 – 27°C, with cooler conditions expected on Wednesday and Thursday (24th / 25th). Minimum temperatures will be in the order of 12 – 18°C.
        - Maximum temperatures over the eastern maize-production region will range between 17 and 25°C, with lowest temperatures on Wednesday and Thursday (24th / 25th). Minimums will be in the order of 8 – 14°C.

- **Detailed:**
    - Tuesday (23rd): Partly cloudy and mild to warm conditions will dominate, with cloudy conditions and thundershowers moving in from the northwest, into North West, Gauteng, western Free State and Northern Cape. It will become warm to hot over the southwestern parts.
    - Wednesday and Thursday (24th / 25th): It will be cloudy and mild to cool with rain and thundershowers over the eastern parts of the Northern Cape, Free State, North West, southern Limpopo, Gauteng, Mpumalanga, KZN (especially along the Drakenberg), Eastern Cape (also mostly along the Drakensberg). Thundershowers (some severe storms possible) are also possible over the southern parts of the Northern Cape and northern parts of the Western Cape on Wednesday. It will be dry and warm over the southern parts of the Eastern Cape as well as over the Lowveld and Limpopo River Valley. The West Coast and southwestern interior will remain hot until Thursday.
    - Friday (26th): It will be dry over the western parts of the country while isolated thundershowers will remain in place over the central to eastern parts, clearing from the west during the day. A cold front will result in light showers over the southern winter rainfall region. Scattered rain and thundershowers are expected over the southern coastal areas and adjacent interior.

- Saturday (27th): Sunny, mild and dry conditions will dominate across the interior and southwest, with light to moderate southwesterly winds in most areas. Scattered rain and showers are possible along the coast and interior of the Eastern Cape and KZN, moving into the Lowveld later during the day.
- Sunday (28th): Sunny and mild conditions will dominate, becoming warm over the western and southwestern parts. It will be cloudy and cooler over the southern to eastern coastal areas and adjacent interior as well as up north into the Lowveld. It will also become cloudy in the Limpopo River Valley. Isolated showers or thundershowers are possible over the northeastern parts – mainly along the escarpment.
- Monday (29th): It will be sunny to partly cloudy and mild, but warm over the Northern Cape. Isolated thundershowers are possible over the interiors of the Northern Cape and Western Cape while it should remain dry over the rest of the country.

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 March): The 2020–21 La Niña is nearing its end, with most oceanic indicators of the El Niño-Southern Oscillation (ENSO) now at neutral levels. However, a number of atmospheric indicators remain at La Niña levels, meaning La Niña's influence is likely to persist into April…… *(Seasonal forecasts for South Africa continue to lean towards wetter than normal conditions during March to May)*

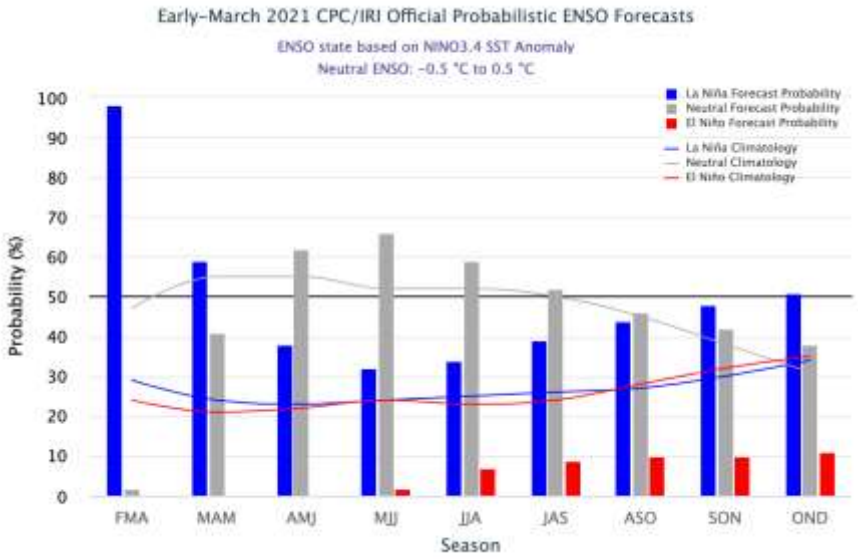
Tropical Pacific Ocean sea surface temperatures have returned to ENSO-neutral values in the past fortnight. Below the surface, waters have also been warming. However, atmospheric indicators such as cloudiness near the Date Line and trade winds persist at La Niña levels. The Southern Oscillation Index (SOI) in recent days has dipped below La Niña thresholds, although this may just be a temporary easing.

These changes in indicators are consistent with climate model outlooks, which for several weeks have indicated a return to ENSO neutral during the southern hemisphere autumn. While around 40% of past La Niña events have re-strengthened for a second year, there are currently no models suggesting that La Niña will return during winter.

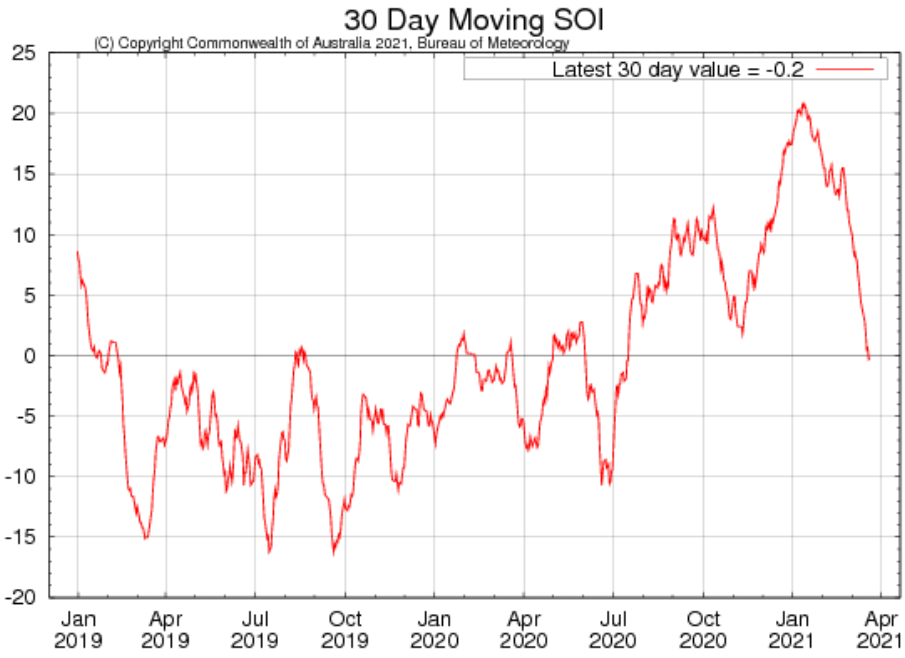
The Southern Annular Mode (SAM) has briefly reached positive levels. However, this is expected to be short-lived, with forecasts indicating neutral SAM values will persist for the coming fortnight…. (*A positive SAM is usually indicative of relatively wet conditions over the summer rainfall region during 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 March): In mid-February, SSTs in the east-central Pacific are roughly 1.1 degree C below average, and most key atmospheric variables are consistent with continued 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 spring. The new official CPC/IRI outlook issued earlier this month is similar to these model forecasts, calling for a 82% chance of La Niña for the Feb-Mar-Apr season, and a likely transition in Apr-may-Jun. A La Niña advisory remains in effect.....***International Research Institute for Climate and Society***- http://iri.columbia.edu/



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



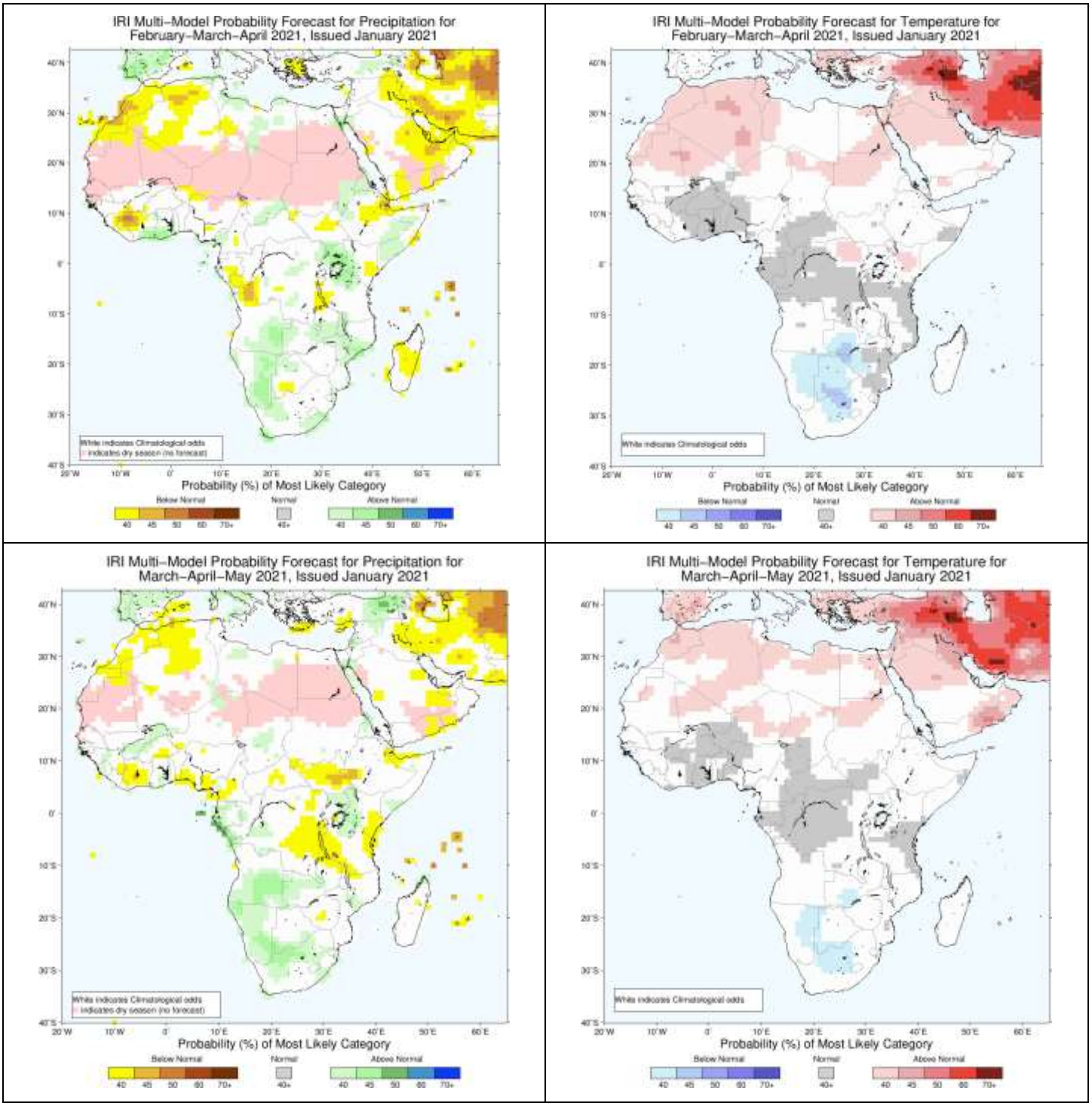
Australian Bureau of Meteorology - http://www.bom.gov.au

The Southern Oscillation Index has recently trended lower, with a negative value (-0.2) for the first time since July 2020. This is indicative of atmospheric circulation patterns moving towards neutral conditions.

Seasonal forecasts issued by various international institutions

IRI

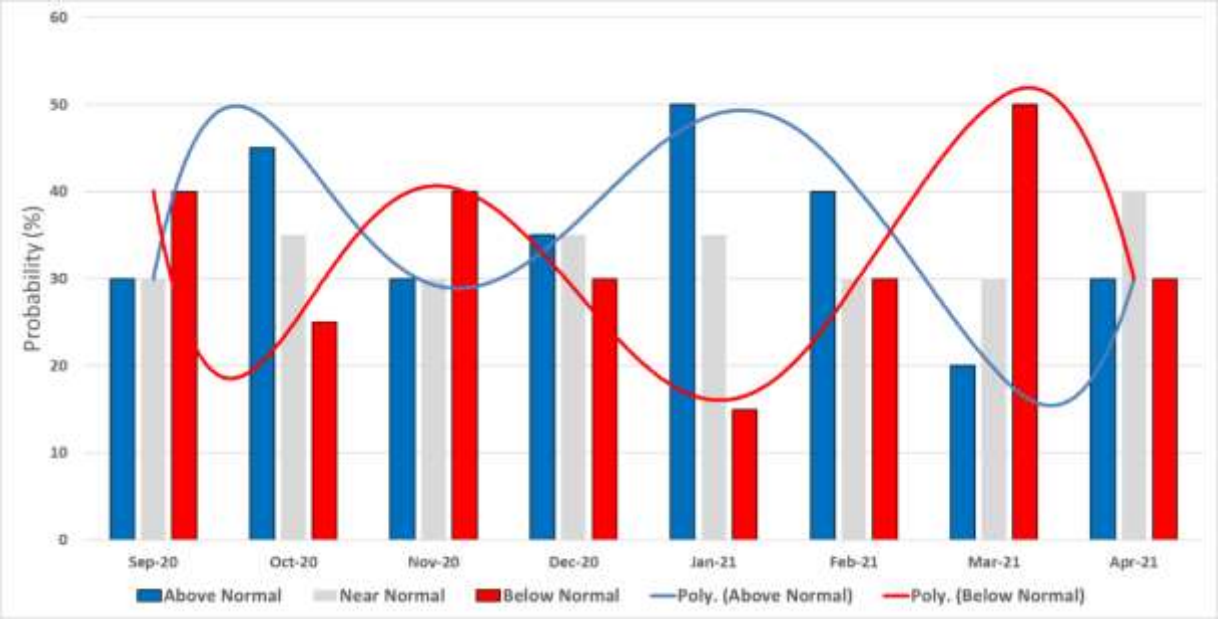
Given the current La Niña conditions, the seasonal forecast by the IRI still favours relatively wet and cool conditions to continue into autumn, with the largest anomalies over the central parts of the country.



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:

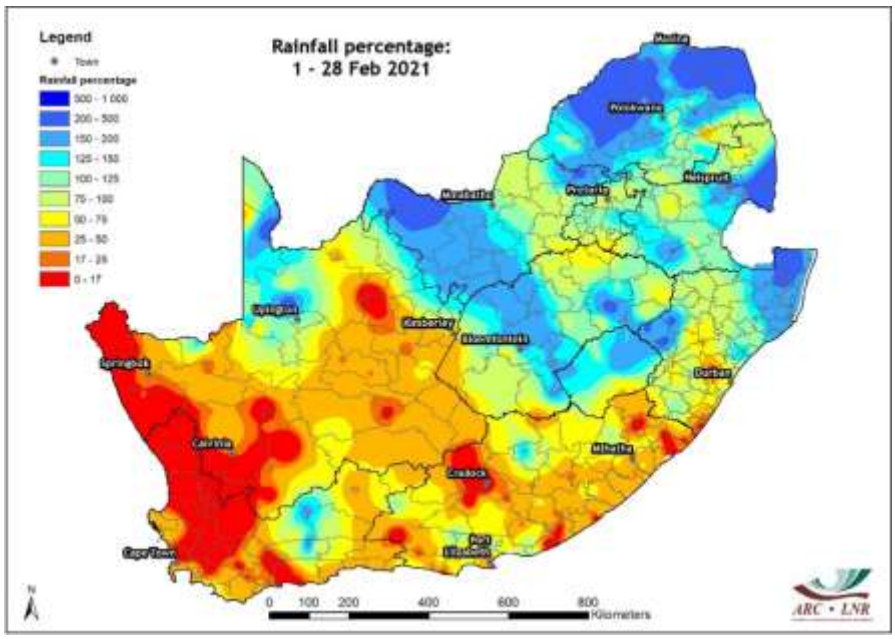


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

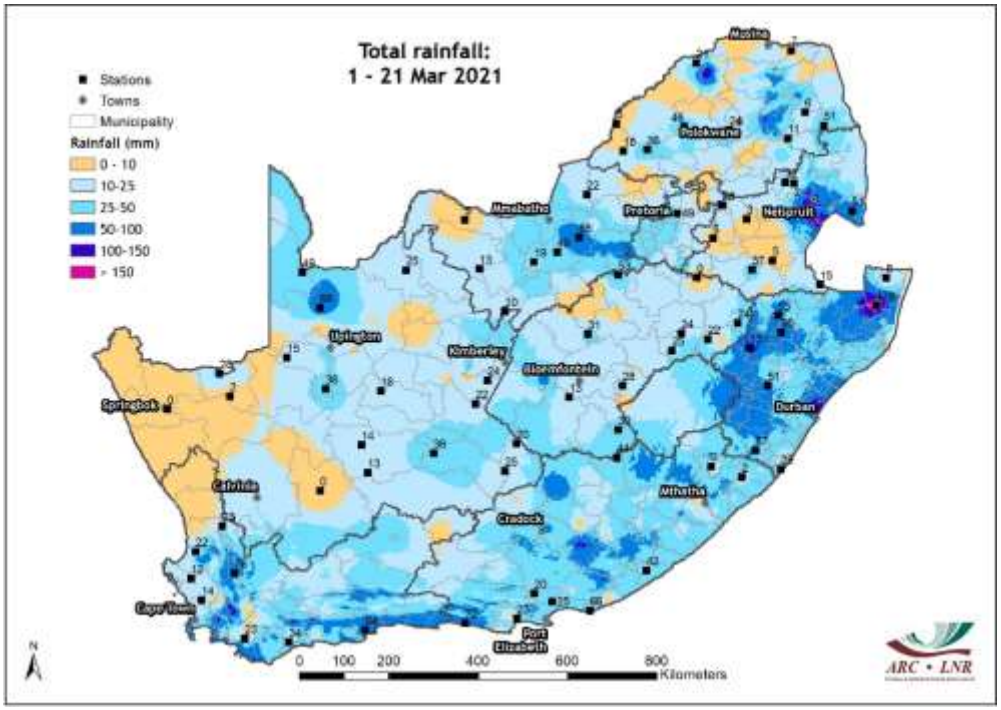
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

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



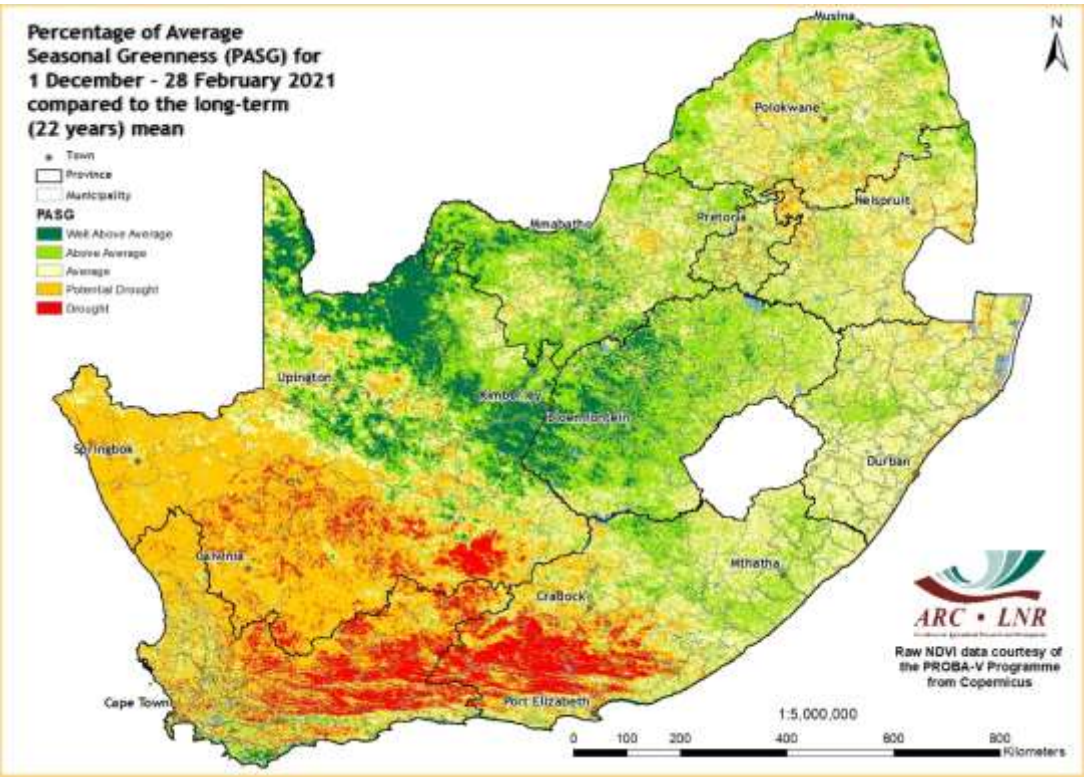
Rainfall during February 2021 was once again above normal over much of the summer rainfall region, but larger areas of the region received normal to below normal rainfall than during January.

Rainfall (mm): 1 – 21 March 2021



Most parts of the country received some rain during the first 3 weeks of March, but totals are mostly on the low side except over the eastern to southern coastal provinces into southern Mpumalanga.

Percentage of Average Seasonal Greenness: 1 December – 28 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

An upper-air low moving across the country will support cloudy conditions with showers and thundershowers over the central to eastern summer rainfall region during the next few days, clearing by Friday as the Low moves out east. Upper-air circulation will become unfavorable for rainfall over the interior from Friday onwards, and temperatures will increase following the initial cloudy and cooler conditions over the central to eastern parts.

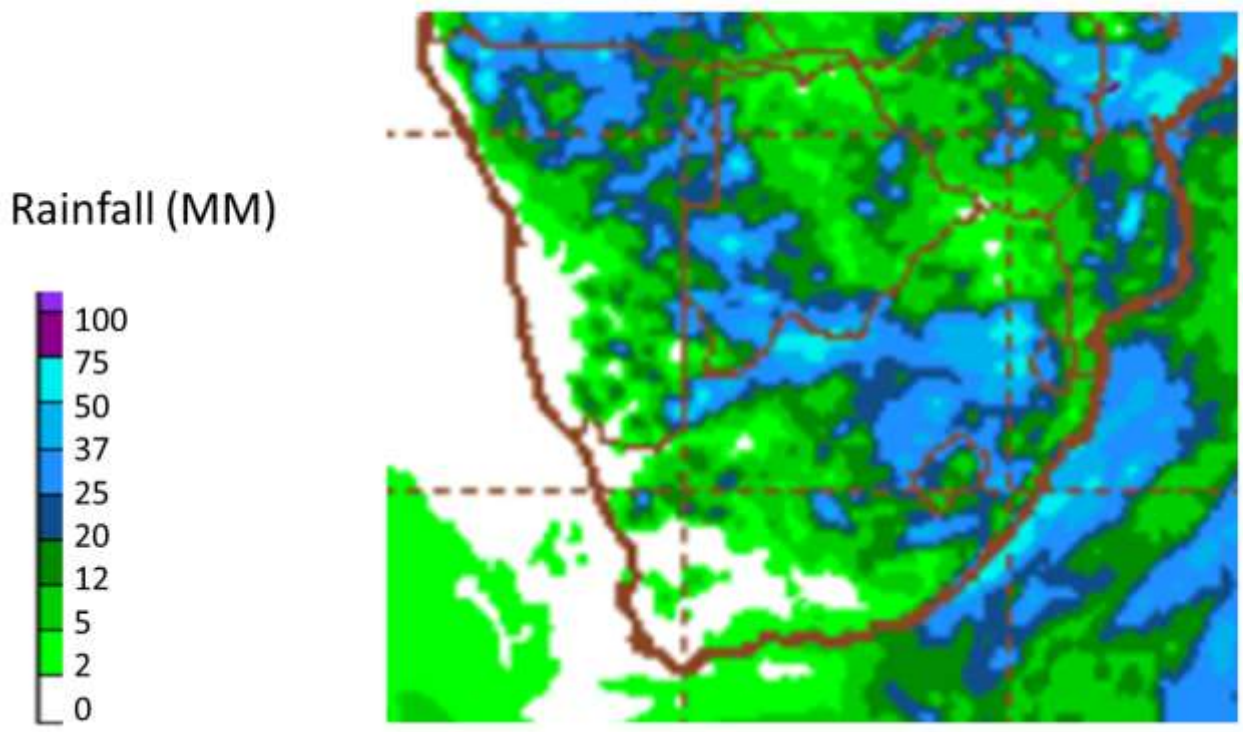
Conditions in main agricultural production regions (23 – 29 March)

Maize production region: It will become cloudy and cool with rain and thundershowers over the entire region until Thursday (25th). Residual thundershowers are still possible by Friday (26th) after which it should be dry for the most part. It will also become somewhat warmer from Friday onwards. Temperatures will be below normal for this time of the year, with cloudy, wet conditions having a negative effect especially on maximum temperatures early in the period. Maximum temperatures over the western maize-production areas will be in the order of 17 – 27°C, with cooler conditions expected on Wednesday and Thursday (24th / 25th). Minimum temperatures will be in the order of 12 – 18°C. Maximum temperatures over the eastern maize-production region will range between 17 and 25°C, with lowest temperatures on Wednesday and Thursday (24th / 25th). Minimums will be in the order of 8 – 14°C. .

Cape Wine Lands and Ruens: It will sunny to partly cloudy and hot until Thursday, especially over the western to northwestern interior and West Coast. Some thundershowers are possible over the mountainous areas on Wednesday (24th). Thundershowers this far west have a tendency to be associated with some hail in places. It will become cooler by

late Thursday (25th), with westerly winds and isolated light showers in places – especially towards the south. It will warm up once again from Saturday onwards, becoming hot along the West Coast and western interior by Sunday (28th).

7-Day rainfall forecast: 23 – 29 March 2021



GFS rainfall forecast – https://mag.ncep.noaa.gov

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 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:

- Strong southeasterly winds are expected over the southwestern parts on Saturday (27th). Where vegetation is dry, these conditions may be conducive to the development and spread of wild fires.
- Cool, cloudy conditions over the maize production areas until Thursday (25th) will be conducive to the spread of fungal pathogens.
- Hot to very hot conditions are expected along the West Coast and the southwestern interior until Thursday (25th).
- Thundershowers over the central to eastern Northern Cape, western Free State and surrounding areas may become severe on Wednesday and Thursday (24th / 25th).
- Thundershowers over the southern interior may become severe on Friday (26th).

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.