

CUMULUS



30 September 2020 – by J Malherbe, R Kuschke

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Summary

First significant thundershowers over eastern maize-production areas

Most of the interior received some rain during September. While some parts of the Karoo received relatively high totals, most of the rest of the country received totals not exceeding 10 mm. While this is near normal to above normal rainfall for the month of September over large parts of the interior, the low totals are the result of fairly dry air at the surface as is usual for this time of the year, coupled with a lack of very intense upper-air lows over the interior so far.

The next few days will see a dramatic change in weather patterns and widespread showers or thundershowers over the central to eastern grain-production areas. It will also become cool to cold over the southern and western part at times while the east and northeast should see much more cloud with lower temperatures also dominating there. Strong winds will occur at times along the coast and over the interior. These events will be associated with a deep upper-air cut-off low developing over the central and southern parts, with a strong high-pressure system ridging around the country. Conditions should generally calm down and become drier during next week.

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

- **General:**

- Rainfall will be above normal over the eastern and southern parts of the country.
- The central to eastern parts of the maize-production region should receive rain with totals exceeding 25 mm during the next few days.
- Daily rainfall totals in excess of 50 mm are possible over northern KZN into southern Mpumalanga, according to current forecasts, from Thursday (1st) to Saturday (3rd).
- Some thunderstorms, especially from Wednesday (30th) to Friday (2nd) over the central to eastern parts may become severe – with strong gusts and hail.
- Strong winds are expected over the interior, especially on Wednesday to Friday (30th - 2nd), associated with the deep low developing over the interior.
- Temperatures will on average be below normal for this time of the year.
- Frost may occur in isolated areas over the Northern Cape interior on Thursday (1st) morning.
- Strong to gale-force Southeasterlies will occur over the southwestern Cape from Wednesday to Saturday.

- **Precipitation:**

- Wednesday to Friday (30th- 2nd): Scattered to widespread thundershowers from central North West and Free State (mostly central to eastern parts) northeastwards, covering most of the northeastern half of the country. Widespread showers along the Garden Route and into the Karoo as far north as the central to western Northern Cape, with light snow possible over the high-lying Cape mountains, southern escarpment, Eastern Cape mountains and southern Drakensberg including Lesotho. Rain and showers will also dominate along the southeastern and eastern coast and adjacent interior.
- Saturday and Sunday (3rd, 4th): Overcast, cool and windy with rain and showers over the Highveld, eastern escarpment and KZN with snow possible along the Lesotho Drakensberg. Precipitation will become lighter by Sunday and retreat northwards.
- Cloudy conditions with scattered thundershowers may develop over the central and eastern parts again by Monday (5th), clearing by Tuesday (6th).

- **Temperatures:**

- Temperatures will on average be below normal.
- It will become cool to cold and windy over much of the southern and western parts on Wednesday, lasting until Saturday, with maximum temperatures in the teens and minimum temperatures around 5°C or lower, especially over the Karoo and interior of the Northern Cape where frost may occur in isolated areas on Thursday (1st) morning.
- Partly cloudy to cloudy, wet and windy conditions over the eastern summer-grain-production areas on Saturday and Sunday (3rd and 4th) will see maximum temperatures in the mid-teens over these areas.

- Warm to hot bergwind conditions may develop over the West Coast by Saturday and Sunday (3rd, 4th).
- Maximum temperatures over the western maize production areas will be in the order of 20 – 21°C (somewhat cooler during the weekend). Minimum temperatures will be in the order of 8 – 13°C, also warming though the period.
- Maximum temperatures over the eastern maize-production region will range between 13 and 26°C, with lowest values during the weekend. Minimums will be in the order of 8 – 13°C – with lowest temperatures towards the end of the period.

Seasonal overview

ENSO and seasonal forecasts

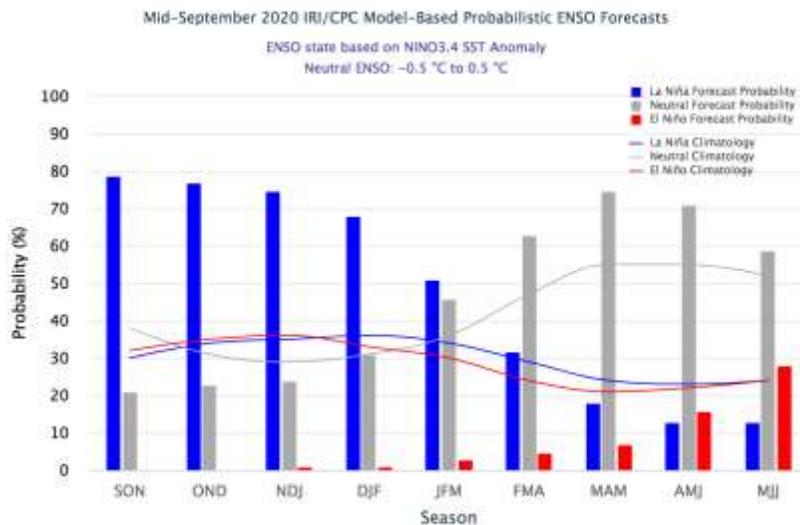
The Australian Bureau of Meteorology notices a neutral to weak negative Indian Ocean Dipole event, expected to become somewhat more negative. They also point out that La Niña conditions may strengthen.

(Updated 15 September): The Bureau's [ENSO Outlook](#) remains at La Niña ALERT. However, further cooling of the surface of the tropical Pacific Ocean is expected. All surveyed international climate models indicate La Niña thresholds will be met from October until at least the end of the year, with most models maintaining these values into early 2021.

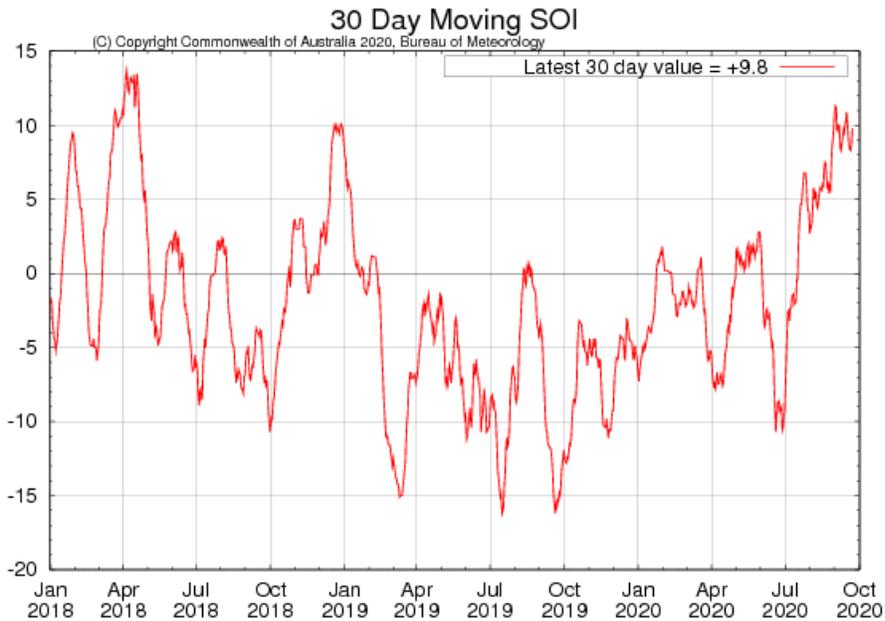
Key indicators of ENSO are currently at or approaching La Niña thresholds, indicating that the atmosphere is responding to the changes in the ocean. If current atmospheric patterns and ocean cooling continue until the end of September, it is highly likely that La Niña conditions will be sustained until at least the end of the year.

In the Indian Ocean, values of the Indian Ocean Dipole (IOD) index have risen back into neutral territory. However, five of the six surveyed models indicate values may drop once again, and that negative IOD thresholds could be met in October. To be considered a negative IOD event, these values would need to be sustained for at least eight weeks.....*Australian Bureau of Meteorology* - <http://www.bom.gov.au>

According to the IRI (Updated 18 September): In mid-September, SSTs in the east-central Pacific are below average, and most of the atmospheric variables are consistent with La Niña conditions. The majority of the model forecasts exceeds the threshold of La Niña SST conditions for fall and winter and implies about an 80% chance for La Niña for fall, 70% for winter. The official CPC/IRI outlook is similar to these model forecasts, calling for a 75% chance of La Niña for Southern Hemisphere spring and summer. A La Niña advisory is posted. *International Research Institute for Climate and Society*- <http://iri.columbia.edu/>



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



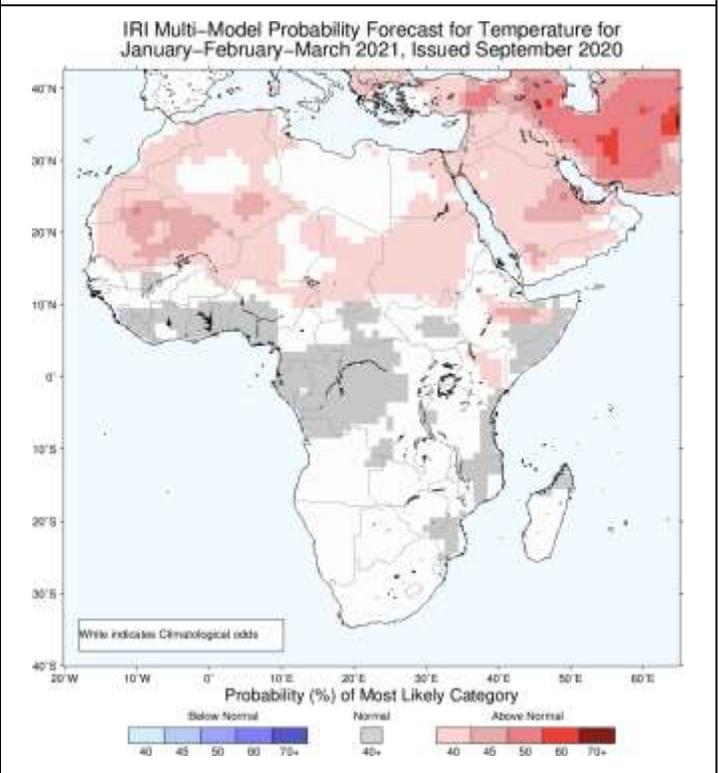
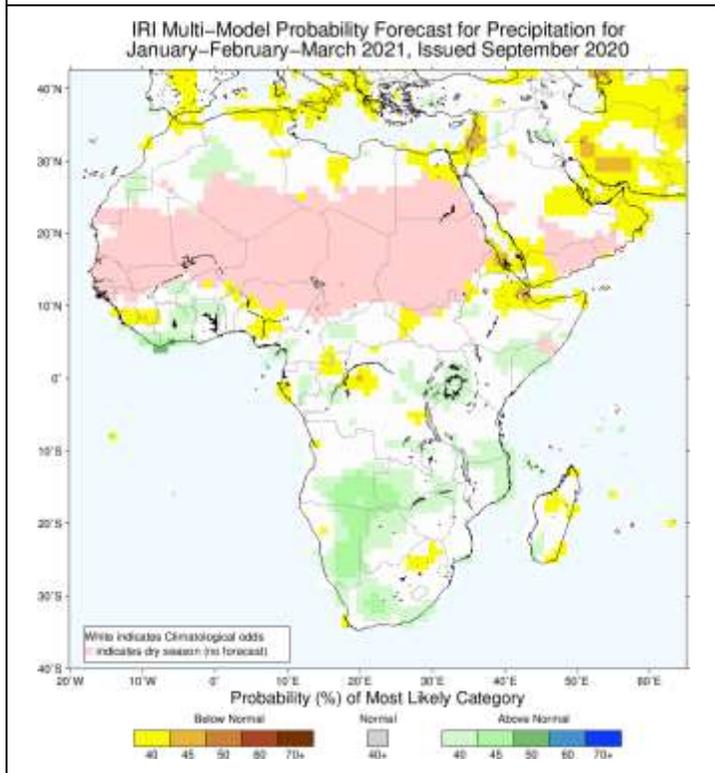
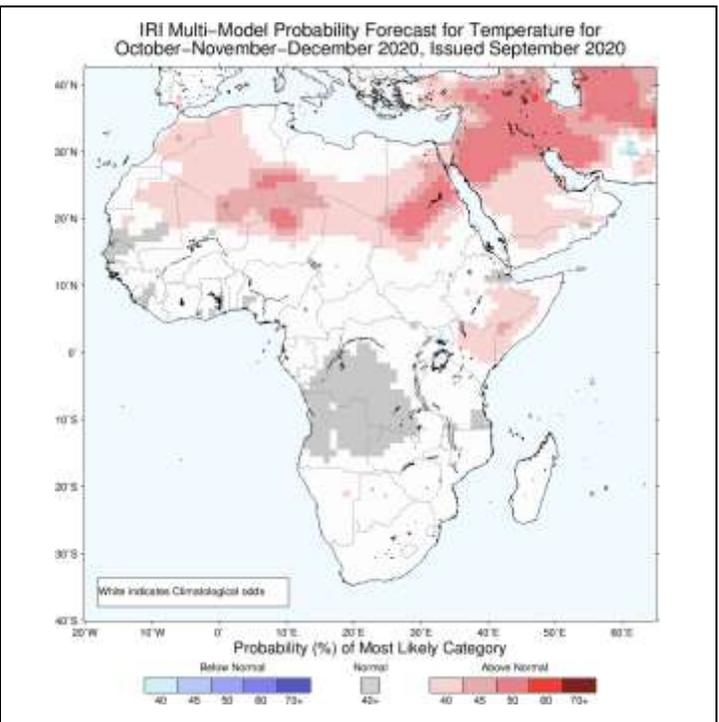
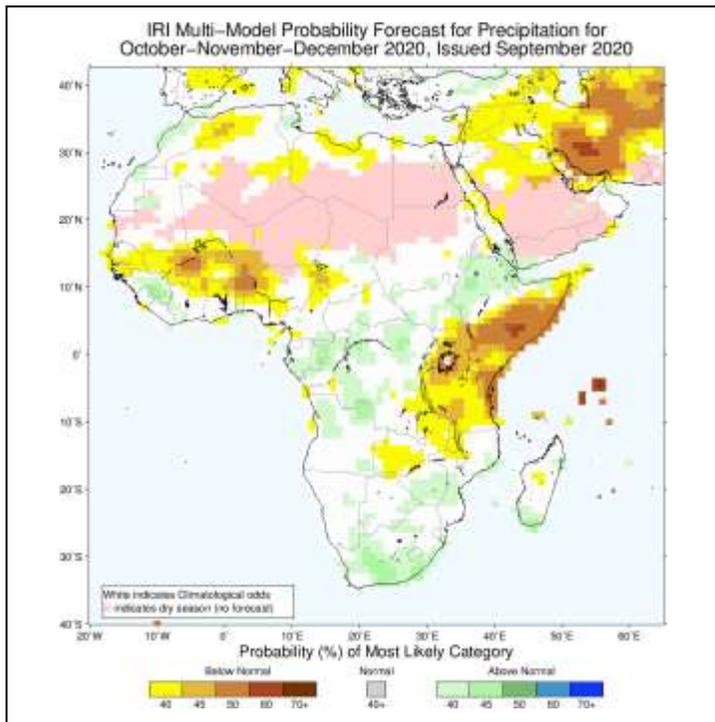
Australian Bureau of Meteorology - <http://www.bom.gov.au>

The Southern Oscillation Index is positive and within the La Niña threshold (larger than +7), indicating atmospheric circulation patterns consistent with La Niña conditions.

Seasonal forecasts issues by various international institutions

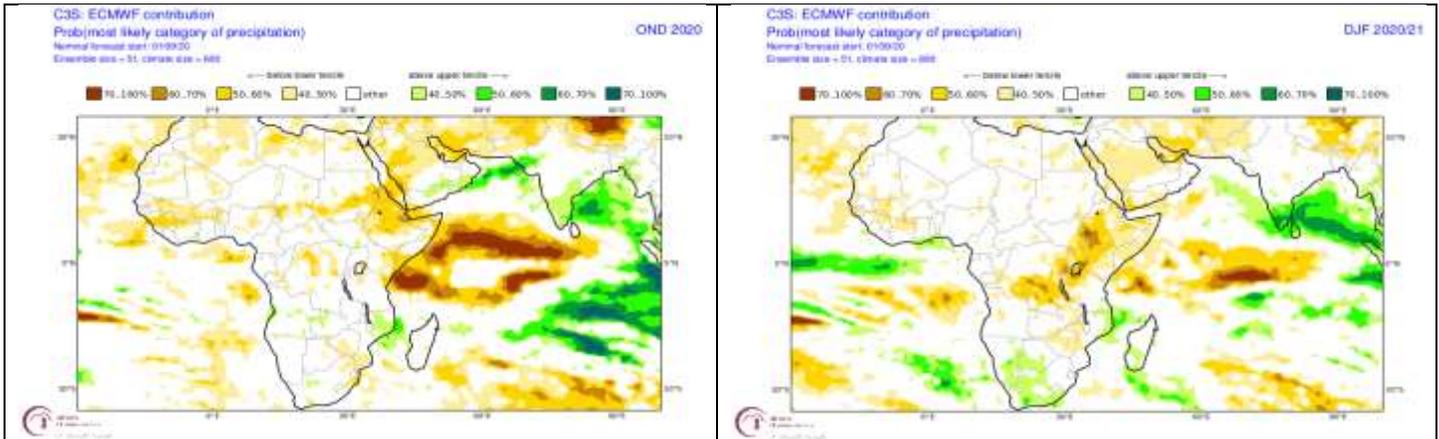
IRI, ECMWF, NCEP, UKMO

The seasonal forecast by the IRI for Africa favours relatively wet conditions for both early and late summer 2020/21 over South Africa. Coupled with the relatively wet conditions expected over the interior, temperatures are expected to remain near normal.

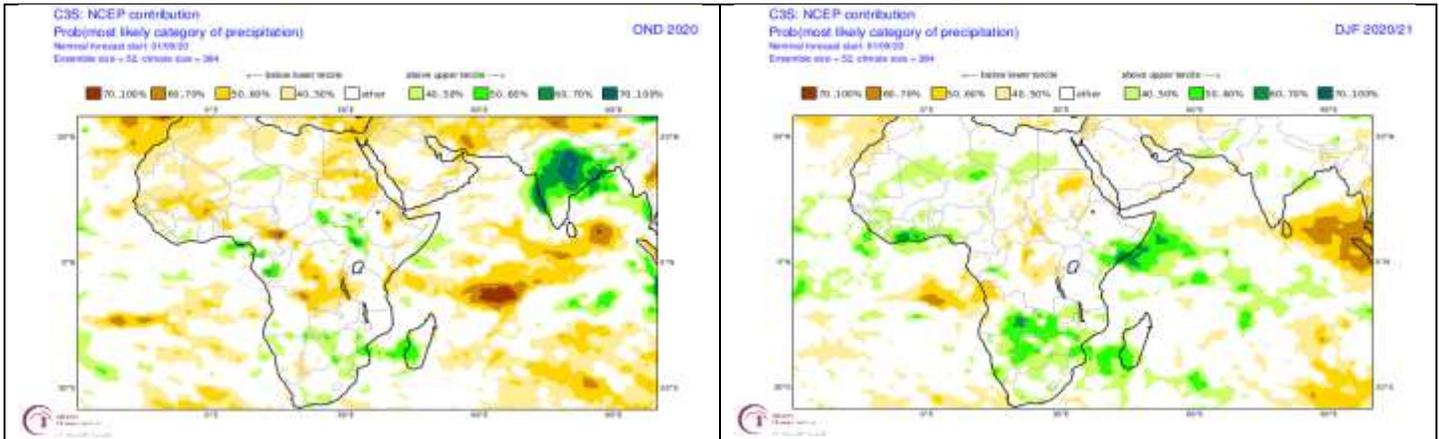


Probabilistic forecasts for rainfall (left) and temperatures (right) for mid-summer (October – December 2020/21; top) and mid-to-late summer (December – February 2020; bottom) (Forecast issued in 2020-09 by the IRI - <http://iri.columbia.edu/>).

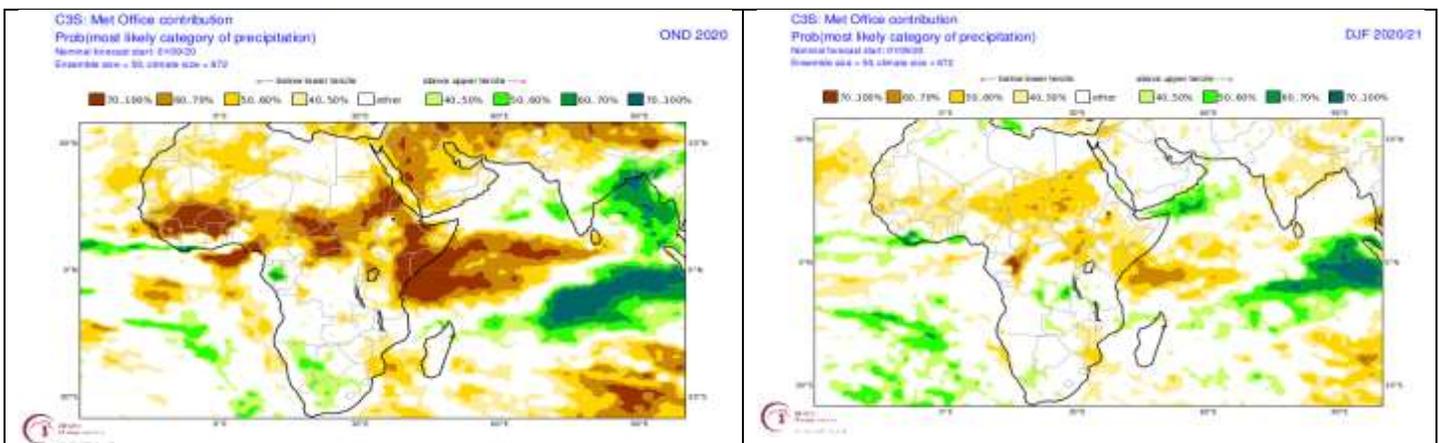
Seasonal forecasts by the ECMWF, NCEP, UKMO, as published by the COPERNICUS Programme (<https://climate.copernicus.eu/seasonal-forecasts>) for both early and mid-summer, reflect similar patterns with regards to rainfall for southern Africa as those by the IRI. The signal for relatively dry conditions over the summer rainfall region of South Africa is somewhat stronger for mid-summer to late summer (DJF) for most of these. This is probably associated with the weak negative Indian Ocean Dipole the developing and expected La-Niña-like conditions.



Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for early-summer (October – December 2020; left) and mid-to late summer (December – February 2020; right) (Forecasts issued in 2020-09).



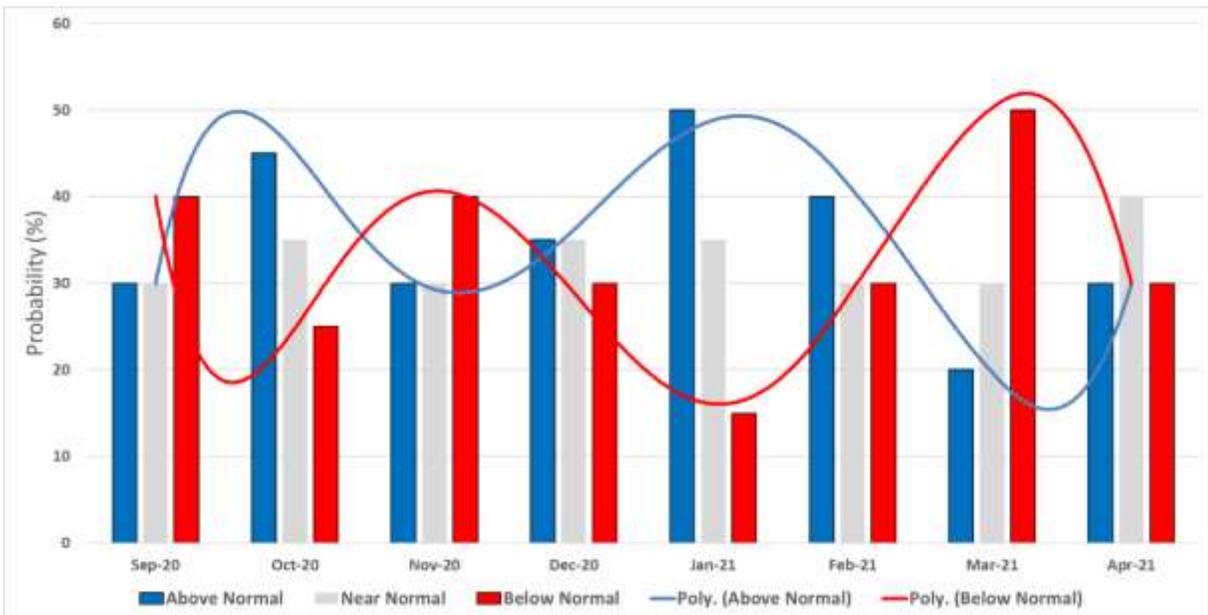
Same as above, but forecasts issued by the National Centres for Environmental Prediction.



Same as above, but forecasts issued by the UK Met Office.

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), 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:

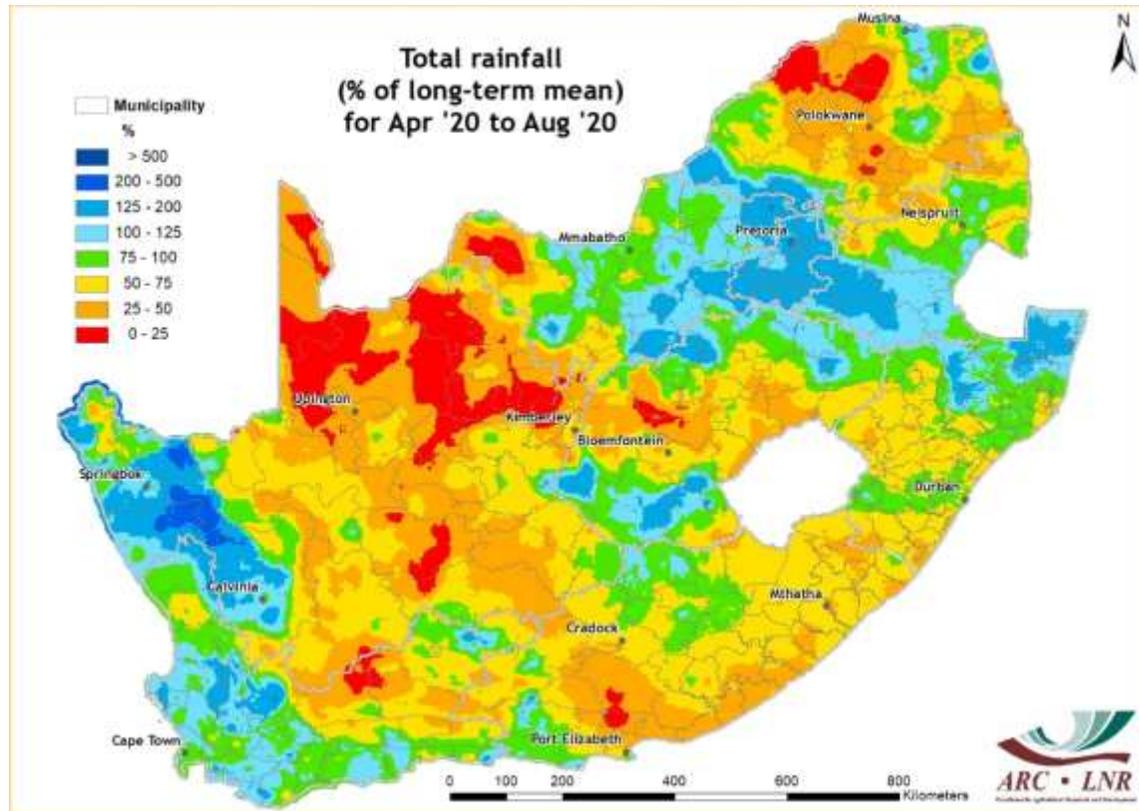


Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2020 – April 2021 (Forecast issued in 2020-09).

Typical patterns during similar summers are:

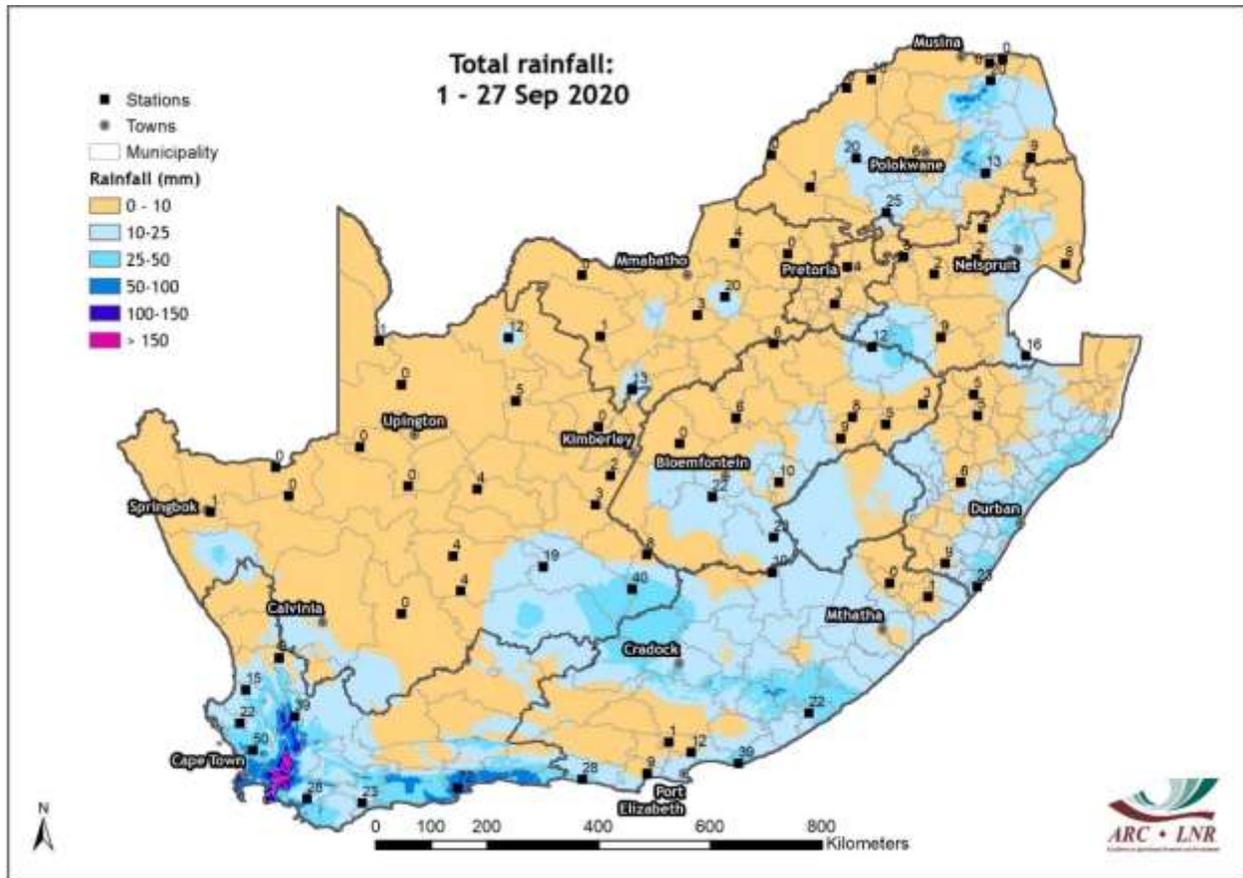
- Late September – 20 October: Relatively wet conditions over the summer rainfall region
- Late October – 20 November: Mostly drier than normal conditions
- Late November - December: Near-normal rainfall over the summer rainfall region
- January – late February: Normal to above-normal rainfall over the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

Rainfall (% of long-term mean): April – August 2020



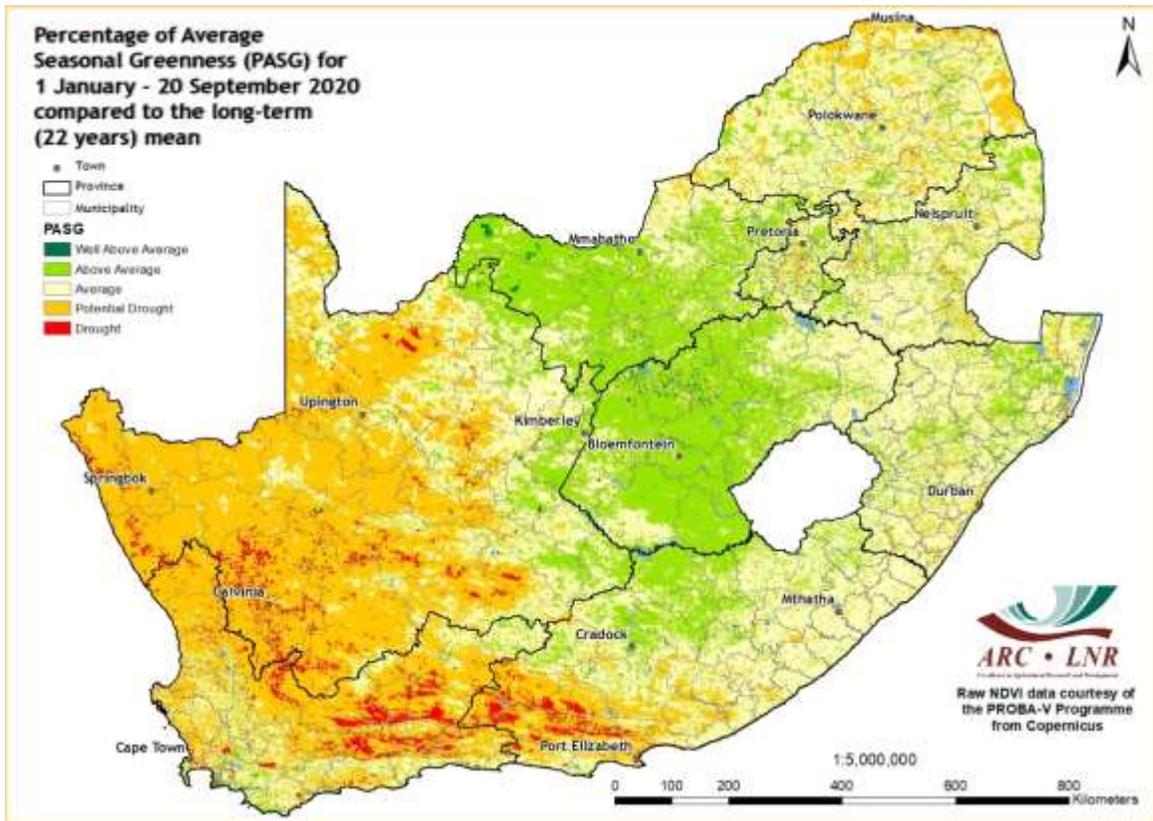
Rainfall during April to August 2020 was above normal over the winter rainfall region and also the Highveld. Most of the rain over the Highveld occurred during April while rainfall over the winter rainfall region was spread over the period late May to August, continuing also into September (not shown).

Rainfall (mm): 1 – 27 September 2020



Until the 27th, most of the grain production areas in the winter rainfall region received between 20 and 50 mm of rain. Totals in the mountainous Boland were higher. Most of the interior received some rain but totals were mostly below 20mm.

Percentage of Average Seasonal Greenness: 1 January – 20 September 2020



Cumulative vegetation activity for 1 January – 20 September still shows the positive effect of above-normal rain during the 2019/20 summer over the central areas as well as the grain-production areas of the Western Cape with above-average cumulative vegetation activity over these areas.

Overview of expected conditions over South Africa during the next few days

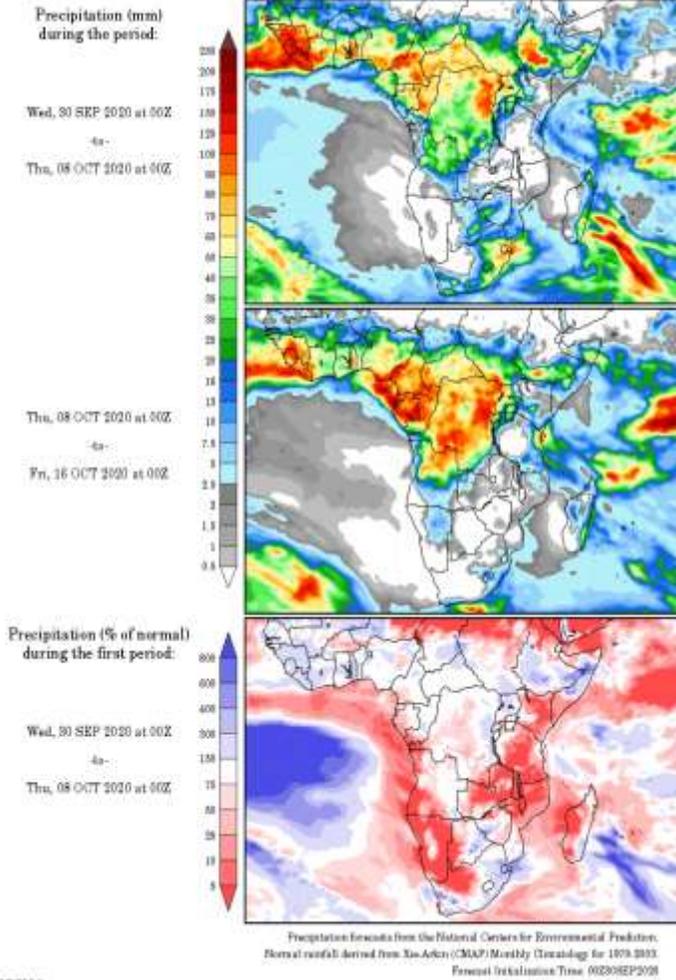
An upper-air cut-off low will develop over the central parts of the country during the next few days. A strong high-pressure system will ridge around the country, feeding cooler, moist air into the interior. The upper-air system together with the ridging high will support widespread showers and thundershowers over the summer grain-production region. Further south, the ridging high will advect cool to cold air from the south. Rain and showers with snow in the mountains are therefore possible along the Garden Route, Karoo, most of the Eastern Cape and southern Drakensberg. The cold air from the south will also result in low temperatures over the western interior, with possible frost over the interior of the Northern Cape in isolated areas on Thursday (1st) morning. The cut-off low will move out during the weekend, followed, according to current forecasts, by another upper-air system that may bring scattered showers and thundershowers on Monday (5th).

Conditions in main agricultural production regions (30 September – 6 October)

Maize production region: It will be partly cloudy, warm and windy over the central to eastern parts (northern half of the Free State, central to eastern North West, Gauteng and Mpumalanga) of this region with scattered thundershowers on Wednesday to Friday (30th to 2nd). Some thundershowers may become severe, with strong wind and hail possible. It will become cloudy, cool and windy over the eastern parts again by Saturday (3rd), with rain and showers lasting until Sunday (4th). By Monday (5th), it will become cloudy to partly cloudy over the entire area with scattered showers and thundershowers according to current forecasts. It is expected to clear and become somewhat warmer by Tuesday (6th). Maximum temperatures over the western maize production areas will be in the order of 20 – 21°C (somewhat cooler during the weekend). Minimum temperatures will be in the order of 5 – 13°C. Maximum temperatures over the eastern maize-production region will range between 13 and 26°C, with lowest values during the weekend. Minimums will be in the order of 6 – 13°C – with lowest temperatures towards the end of the period.

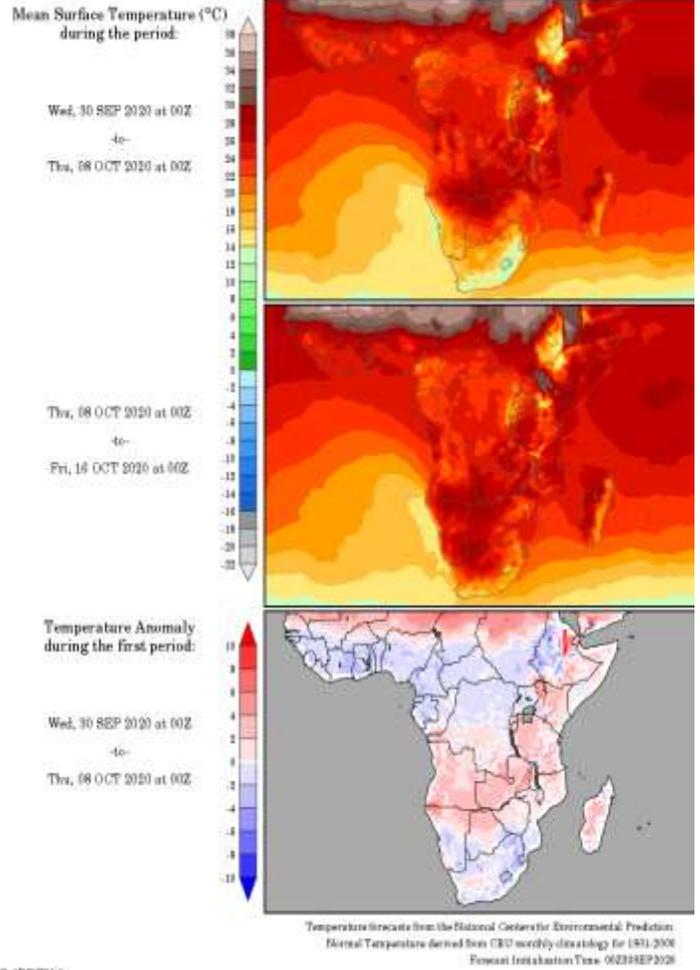
Cape Wine Lands and Ruens: A cold front will bring rain to the region, especially the southern half, starting on Wednesday (30th) lasting until Thursday (1st). More showers and thundershowers can be expected, mostly over the interior and along the Garden Route, by Thursday and Friday – associated with the low pressure system over the interior. The wind will become strong southerly to southeasterly following the front on Wednesday, and remain strong to gale-force until Saturday. Temperatures will be lower with the frontal system later this week, but will increase significantly during the weekend when the easterly wind will result in an off-shore flow, especially along the West Coast.

Precipitation Forecasts



GrADS/COLA

Temperature Forecasts



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 30 September) 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:

- Some thundershowers over Central to eastern North West, western to central Limpopo, northern Free State, Gauteng, Mpumalanga may become severe on Wednesday (30th) to Friday (2nd).
- Cloudy, wet and cool conditions over parts of the eastern summer-grain production areas on Friday to Sunday (2nd to 4th), preceded by wet conditions this week, may favor the occurrence of fungal plant pathogens.
- Cold, wet and windy conditions over the Karoo, Garden Route and southern high-lying areas, interior of the Eastern Cape and southern Drakensberg on Wednesday to Saturday (30th to 3rd) may adversely affect small stock in the region.
- Strong to gale-force southeasterlies will occur from Wednesday (30th) to Friday (2nd) over the southwestern coastal areas.
- Warm to hot bergwind conditions will develop along the West Coast by Sunday (4th).

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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