CUMULUS

20 October 2022

by J Malherbe, R Kuschke

WE GET
AGRICULTURE'S *heartbeat*

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Contents

Photo credit: Stefni Kuschke

Summary

More thundershowers, especially in the east

Weather patterns have changed and unlike the first few days of October, when sunny, heat-wave conditions occurred over many areas, maximum temperatures have come down substantially, associated with widespread cloud cover and thundershowers in places. While totals were generally low, most areas received some rain and more can be expected during the next few days, especially over the eastern parts of the country where cumulative totals may exceed 25 mm over most of the eastern maize-production region and generally across the Eastern Highveld. As can be expected during periods with normal to above-normal rainfall over parts of the summer rainfall region, fresh to strong south-easterlies will occur on several days in the southwestern parts of the Western Cape. As we progress into summer, and with dry conditions over the winter rainfall region, the main focus area of wild fires will also start shifting to this region from the interior.

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

- **General:**
  - Temperatures will on average be above normal over the western to southern interior, but near normal over the central to eastern interior and along the coastal belt.
  - It will in general be cooler than early this month over most areas.
  - Rainfall will be above normal over the eastern parts, but normal to below normal over the rest of the country, including the winter rainfall region.
  - Isolated to scattered thundershowers are possible over the eastern parts until early next week.
  - Isolated to scattered thundershowers are also possible over the western interior according to current forecasts on Friday and Saturday.
  - Rainfall totals over the western to central parts will mostly remain low.
  - Cumulative rainfall totals may exceed 25 mm over the Eastern Highveld and surrounding areas.
  - There will be several cloudy and cool days with light showers along the southeastern to eastern coastal belt.
  - While most of the country is expected to receive some rain during the next few days, current forecasts indicate drier conditions setting in from the west later this weekend and early next week.
  - The winter rainfall area is expected to receive little to no rain during the period.
  - While there isn't a particularly strong indication for widespread severe storms over the country, some thundershowers may produce hail and strong winds given the time of year, occasional intrusion of dry air from the west as well as atmospheric wind and temperature profiles supportive of thunderstorm development.
  - The western to central interior will remain windy on certain days, especially in the afternoons.
  - Strong south-easterlies are expected in the southwest from time to time.
  - **There are some early indications of a more intense weather system that may develop by the middle of next week and which may bring stormy conditions over the eastern parts of the summer rainfall region including also the Eastern Cape. These forecasts are still quite uncertain given the long lead time.**
  - Thundershowers will occur on a daily basis over the summer-grain production region, but these are expected to clear over the western parts by early next week where it will become warmer to hot:
    - Maximum temperatures over the eastern maize-production areas will be in the order of 21 – 27°C, with lowest temperatures expected Friday and Saturday. Minimum temperatures will be in the order of 11 – 17°C.
    - Maximum temperatures over the western maize-production region will range between 26 and 33°C, with the higher temperatures expected early next week and mostly in the far west. Minimums will be in the order of 15 – 19°C.

Overview of expected conditions over the main agricultural production areas

The upper-air will be unstable on several days as perturbations are expected to move especially over the eastern parts. Frequent ridging of the Atlantic Ocean High-pressure system around the country will support rainfall over the central to eastern parts by contributing surface moisture from the east. This will also result in cooler conditions over the southern parts of the country on several days, associated with southerly winds as the system ridge around the country. As is typical for thunderstorm producing systems in spring, some thunderstorms may at times become severe, producing strong winds and hail. However, the intensity and distribution of these are not indicated to be above the norm for this time of the year. According to current forecasts, the thundershowers should clear over the western to central parts towards early next week.

Maize production region: It will be partly cloudy and warm, with scattered thundershowers over the eastern parts. The western parts should also receive thundershowers, but these will be more isolated in nature and should clear early next week according to current forecasts, when it will also become warmer:

- Maximum temperatures over the eastern maize-production areas will be in the order of 21 – 27°C, with lowest temperatures expected Friday and Saturday. Minimum temperatures will be in the order of 11 – 17°C.
- Maximum temperatures over the western maize-production region will range between 26 and 33°C, with the higher temperatures expected early next week and mostly in the far west. Minimums will be in the order of 15 – 19°C.

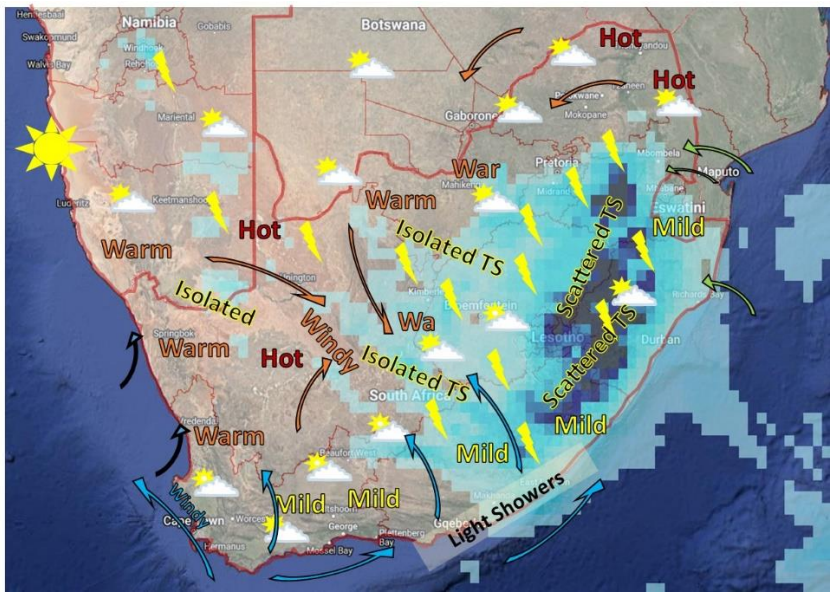
- **Wednesday (19th) to Friday (21st)**: Partly cloudy and warm with isolated thundershowers over the western parts. Scattered thundershowers are expected over the eastern parts.
- **Saturday (22nd)**: Mild in the east with scattered to widespread thundershowers. It will be warm and relatively windy in the west with isolated falls.
- **Sunday to Monday (23rd to 24th):** Partly cloudy to cloudy and mild with scattered thundershowers over the central to eastern parts, but isolated in the west where it will be relatively warm and windy.
- **Tuesday (25th)**: Partly cloudy and warm. Isolated to scattered thundershowers are possible over the eastern parts, but little to no rain is expected over the western parts where it will be relatively warm and windy.

Cape Wine Lands and Ruens: This regions should remain dry during this period, except for possible light showers over the extreme southwestern parts early on Thursday. It will be mild to warm for the most part, but warm to hot over between the West Coast and western escarpment as well as the Swartland from Friday to Monday. Strong south-easterlies are possible over the southwestern parts, especially from Thursday to Monday.

Daily summary of expected conditions

(GFS forecasted rainfall for indicated periods shown in shades of blue, with darkest shading > 50mm)

Thursday and Friday, 20 - 21 October



It will be partly cloudy with isolated thundershowers over the western to central interior.

Scattered thundershowers over the eastern parts, but more widespread over the Eastern Highveld and along the Drakensberg.

Light showers over the southeastern coastal belt.

Light showers over the southwestern parts of the Western Cape early Thursday.

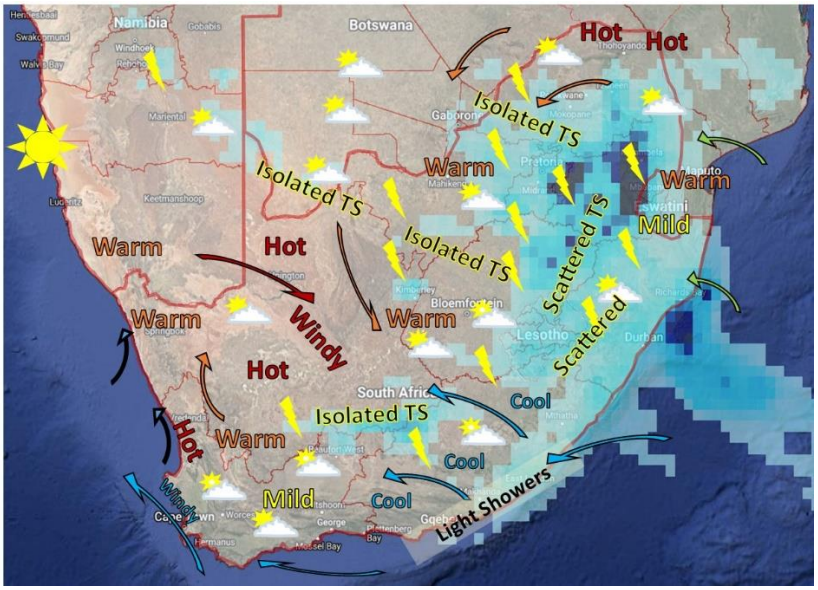
Warm to hot and windy over the interior of the Northern Cape.

Hot over the Limpopo River Valley and Lowveld.

Mild over the southern parts.

Strong south-easterlies are possible over the southwestern parts of the Western Cape, especially on Friday.

Saturday, 22 October



It will be warm with isolated thundershowers over the central parts and northeast.

Partly cloudy and warm with scattered thundershowers over the eastern parts.

Cloudy and cool with light showers over Eastern Cape coast and adjacent interior, spreading along the KZN coast.

Partly cloudy and mild with isolated to scattered thundershowers over the southern escarpment and surrounding Karoo areas.

Cool over the southeastern parts.

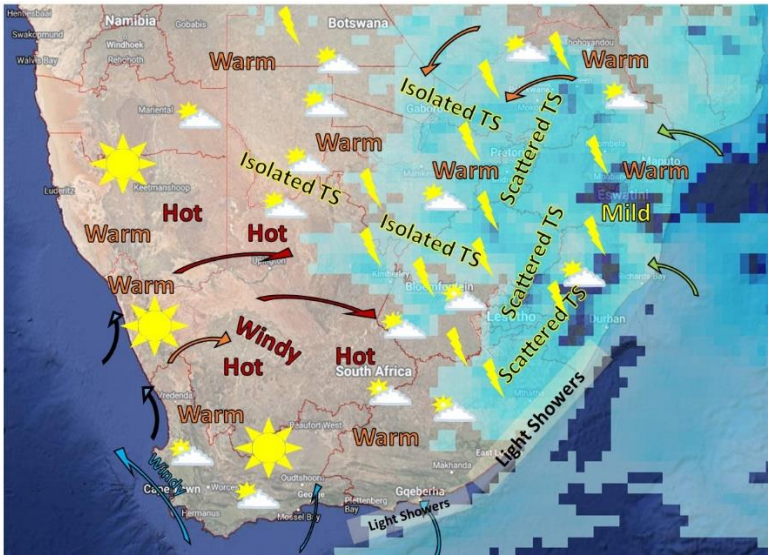
Hot and humid over the Limpopo River Valley and northern Lowveld.

Hot and windy over the central interior.

Hot over the Swartland.

Fresh to strong south-easterlies in the southwest.

Sunday to Tuesday, 23 – 25 October



It will be partly cloudy and mild to warm with scattered thundershowers over the eastern to northeastern parts, but isolated over the central parts where it should clear by Tuesday according to current forecasts.

Hot and windy over the western interior, spreading into the central parts by Tuesday where it will become sunny.

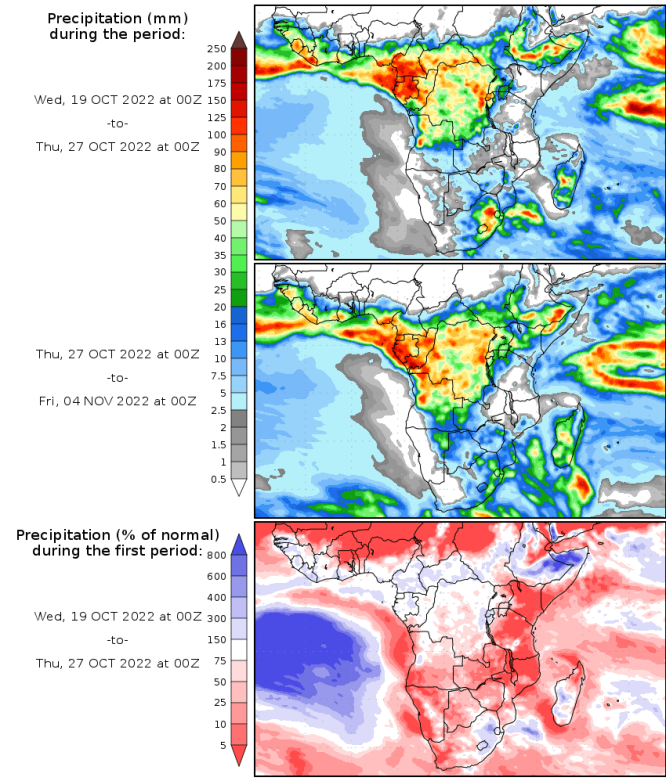
Light showers at times over the Garden Route on **Monday** and further up the coast of the eastern Cape, moving up the coast to the southern KZN coast.

Little to no rain expected over the western parts.

Windy on Monday over the western to southwestern interior.

Medium term rainfall and temperature summary

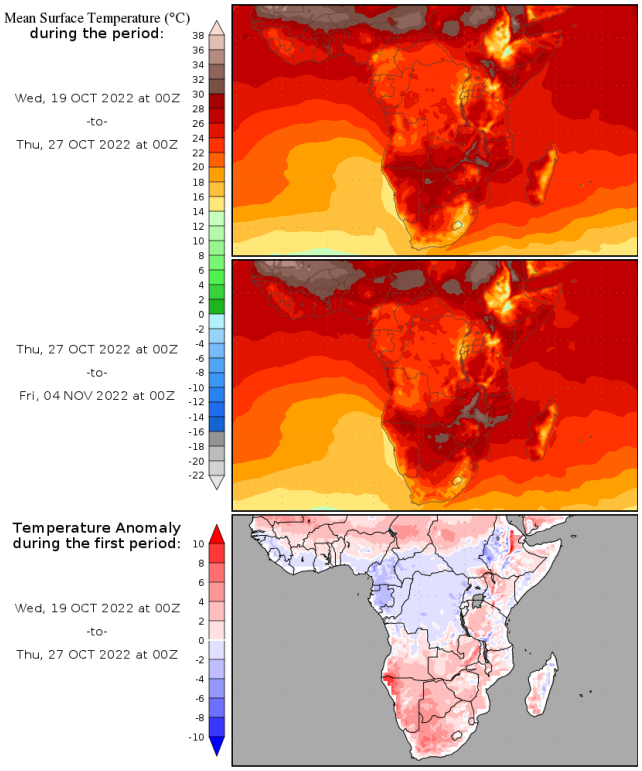
Precipitation Forecasts



Precipitation forecasts from the National Centers for Environmental Prediction.
Normal rainfall derived from Xie-Arkin (CMAP) Monthly Climatology for 1979-2003.
Forecast Initialization Time: 00Z19OCT2022

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: 00Z19OCT2022

GrADS/COLA

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 19 October) 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:

- **Hot and windy conditions could enhance the fire danger where vegetation is dry:**
  - Northern to central Northern Cape: **Thursday (20th).**
- **Windy conditions could enhance the fire danger where vegetation is dry:**
  - Southwestern parts of the Western Cape: **Thursday (20th) to Monday (24th).**
- **It will be hot and humid:**
  - Over the northern Lowveld: **Thursday to Monday (20th – 24th).**
- **As is typical for thunderstorm producing systems in spring, some thunderstorms may at times become severe, producing strong winds and hail. However, the intensity and distribution of these are not indicated to be above the norm for this time of the year. Somewhat more unstable conditions may result in an elevated chance for severe storm formation:**
  - Central to western Mpumalanga, northeastern Free State, southern Limpopo and eastern Gauteng: **Saturday to Monday (22nd – 24th).**
  - Eastern North West: **Monday (24th)**
  - Southern parts of the Northern Cape and surrounding areas along the southern escarpment**: Saturday (22nd).**
  - Eastern parts of the summer rainfall region, including the Eastern Cape: **Wednesday (26th). Given the long lead time, it is still uncertain if and where exactly these will occur.**

Seasonal forecast

Seasonal forecasts for spring and summer over South Africa favor wetter conditions over the summer rainfall region, with a bias towards drier conditions over the winter rainfall region in the southwest. A summary of expected conditions over South Africa will be given in the next edition.

ENSO forecasts indicate enhanced probabilities for La Niña remaining in place into our summer, as opposed to earlier forecasts that indicated an earlier transition towards neutral or El Niño conditions.

The Australian Bureau of Meteorology points out that the La Niña continues in the tropical Pacific

(Updated 11 October): La Niña continues in the tropical Pacific, and is likely to persist into early 2023.

Both atmospheric and oceanic indicators of the El Niño–Southern Oscillation (ENSO) are consistent with an established La Niña, including tropical Pacific sea surface temperatures, the Southern Oscillation Index (SOI), trade wind strength, and equatorial cloudiness.

Models indicate the La Niña is likely to decline over spring, with a return to ENSO-neutral conditions (neither La Niña nor El Niño) early in 2023. Sea surface temperatures in the tropical Pacific remain similar, compared to two weeks ago. The SOI remains well above La Niña thresholds.

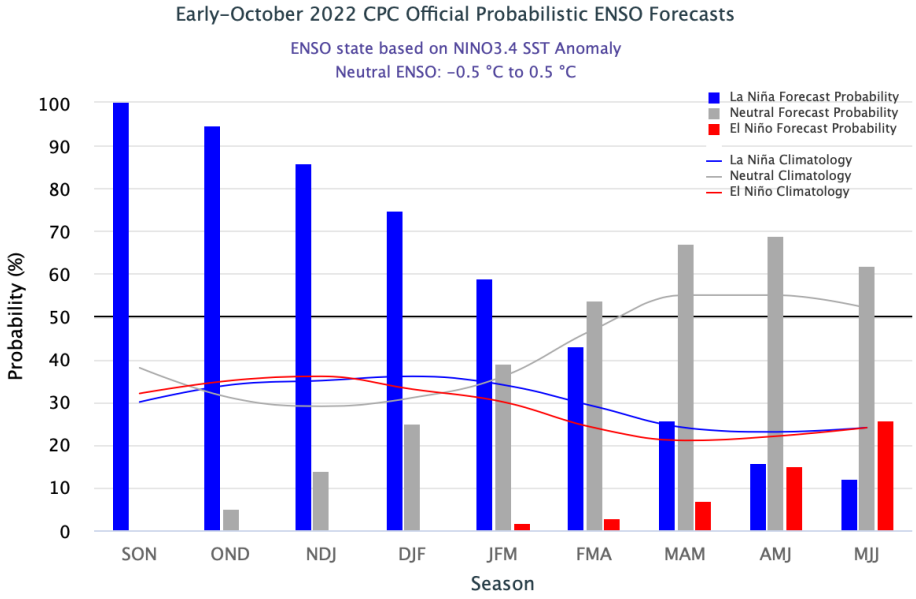
The Southern Annular Mode (SAM) is currently in a positive phase and is likely to remain generally positive throughout spring into early summer.

The MJO is moving into the western Pacific Ocean and is forecast to strengthen further in the coming fortnight as it tracks further east. Its influence at this time of the year may …..briefly reduce the strength of equatorial trade winds west of the Date Line……..*Australian Bureau of Meteorology* - http://www.bom.gov.au

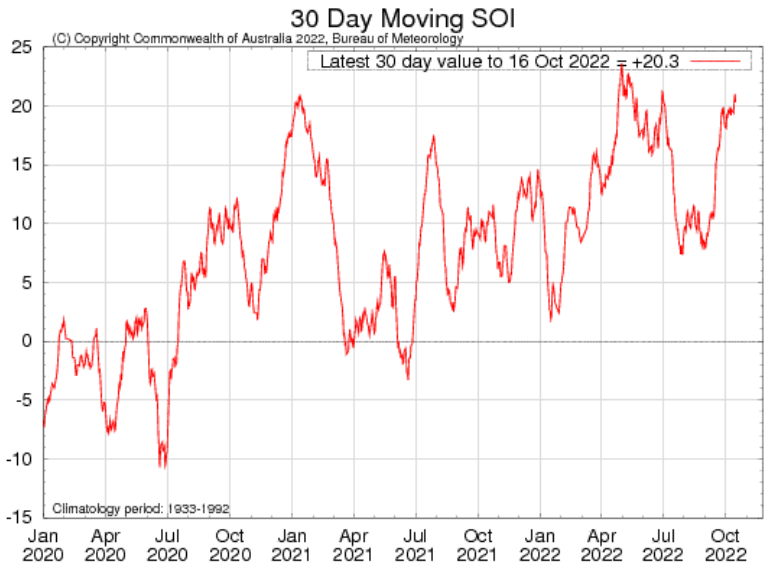
While La Niña conditions are associated with wetter than normal conditions over the summer rainfall region of South Africa, a positive SAM is associated with above-normal rainfall over the eastern parts during mid to late summer only.

The International Research Institute for Climate and Society (IRI) also expects La Niña conditions to persist into summer

According to the IRI (Updated 19 October): In mid-October, sea surface temperatures in the central-eastern equatorial Pacific remain below-average. Key oceanic and atmospheric variables have remained consistent with La Niña conditions. A CPC La Niña Advisory still remains in place for October 2022. A large majority of the models in the plume predict SSTs to remain below-normal at the level of a La Niña until at least Jan-Mar 2023. Similar to the most-recent official CPC ENSO Outlook issued on October 13, 2022, the objective model-based ENSO outlook forecasts a continuation of the La Niña event with high probability during Nov-Jan, Dec-Feb, and Jan-Mar 2023. Based on objective ENSO forecasts, La Niña is expected to transition into ENSO-neutral during Feb-Apr 2023, which remains the most likely category thereafter……*International Research Institute for Climate and Society*- http://iri.columbia.edu/



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

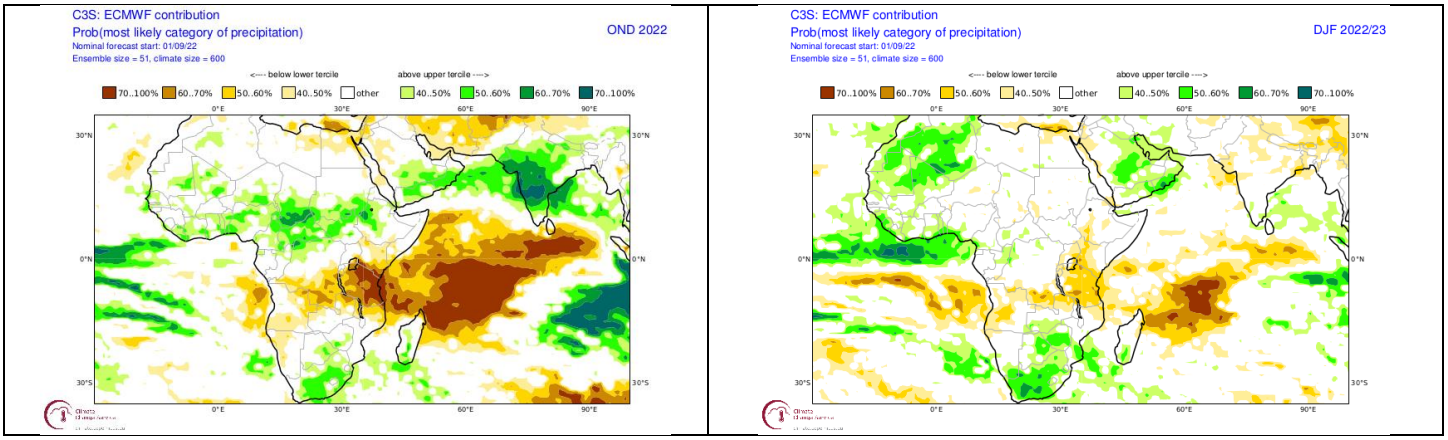


Australian Bureau of Meteorology - http://www.bom.gov.au

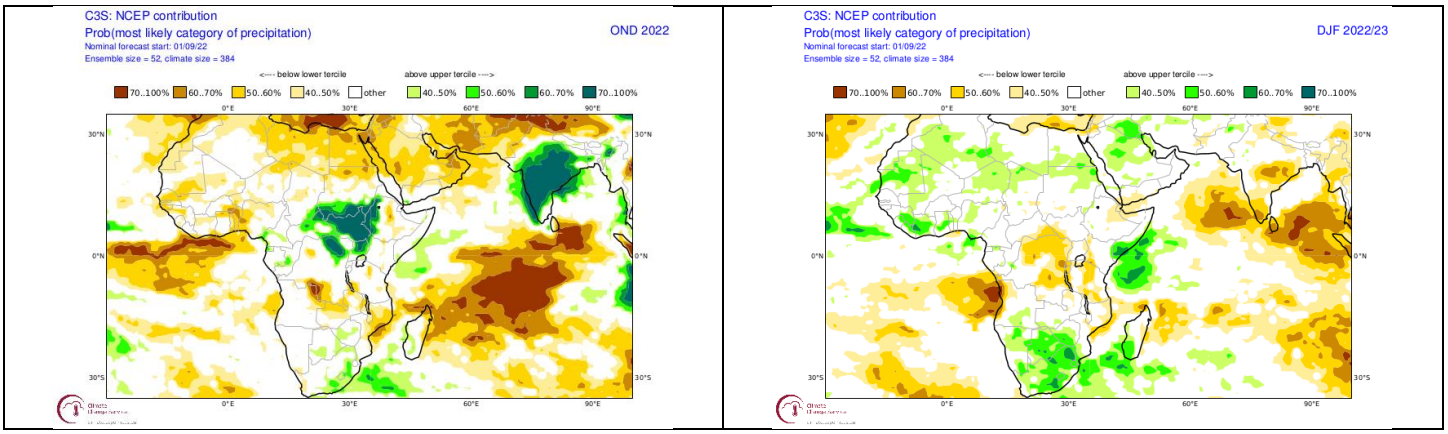
The Southern Oscillation Index is in positive territory (+20.3). This is indicative of atmospheric circulation patterns reflecting La Niña conditions.

Seasonal forecasts issued by various international institutions

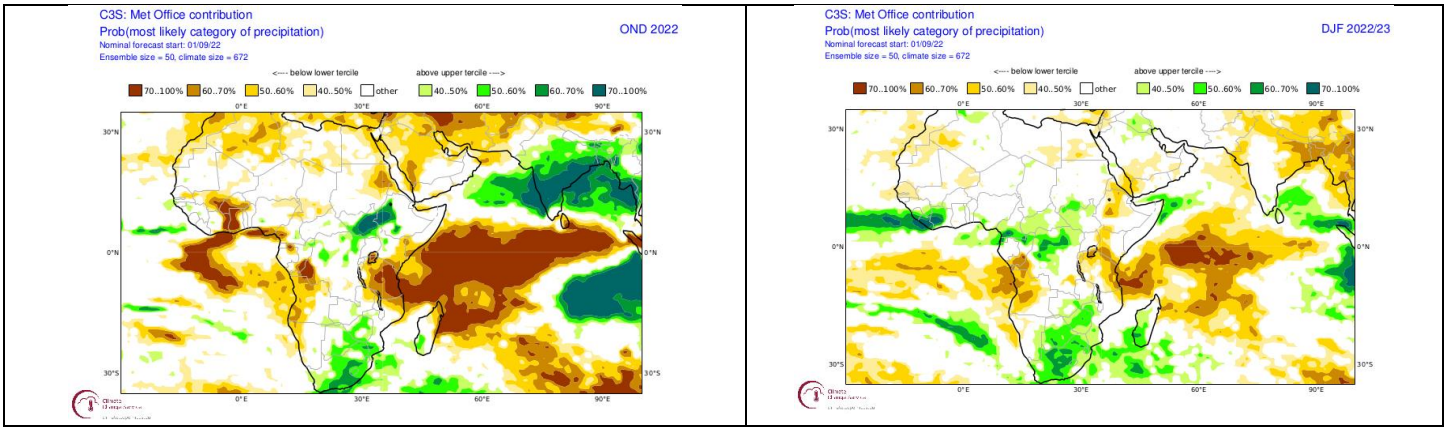
Seasonal forecasts by these institutions, as published by the COPERNICUS Programme (***https://climate.copernicus.eu/seasonal-forecasts***) for both early summer and mid-summer, reflect an expectation for a relatively wet summer over the interior. The signal for relatively wet conditions over the summer rainfall region of South Africa is somewhat stronger for mid-summer (DJF) than early summer (OND) according to most of these institutions. This is partly associated with the observed moderate La-Niña. Similar tendencies are also present in the IRI seasonal forecasts (not shown).



Probabilistic forecasts by the European Centre for Medium-Range Weather Forecasts for rainfall for mid-to-late-summer (December - February 2021/22; left) and late summer (February-April 2022; right) (Forecasts issued in 2021-11).



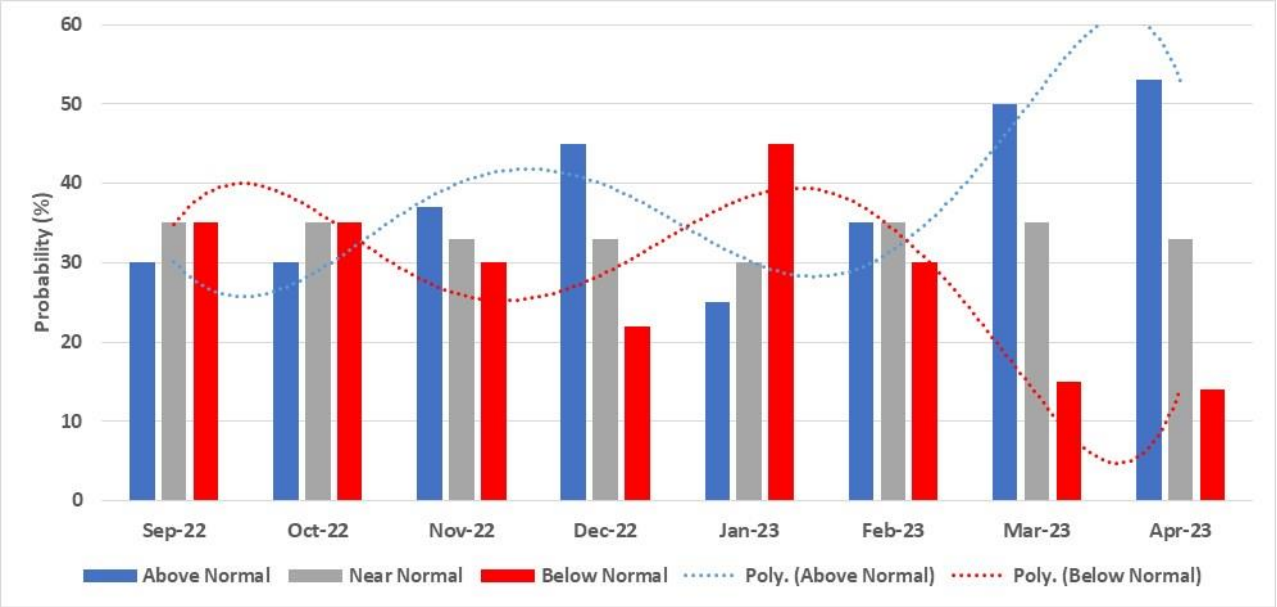
Same as above, but forecasts issued by the National Centres for Environmental Prediction.



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

CUMULUS seasonal outlook

This outlook is based on the typical observed rainfall patterns over the ***north-eastern half*** of the country (including most of the summer grain production region), as associated with the cyclic variability of the global climate system. Summers that are similar to 2022/23 more often experience a seasonal rainfall curve that compares to normal conditions as indicated in the bar graph below, with wetter conditions focussing on November to December and again from mid-February to April while drier than normal conditions focus on October and January to mid-February:



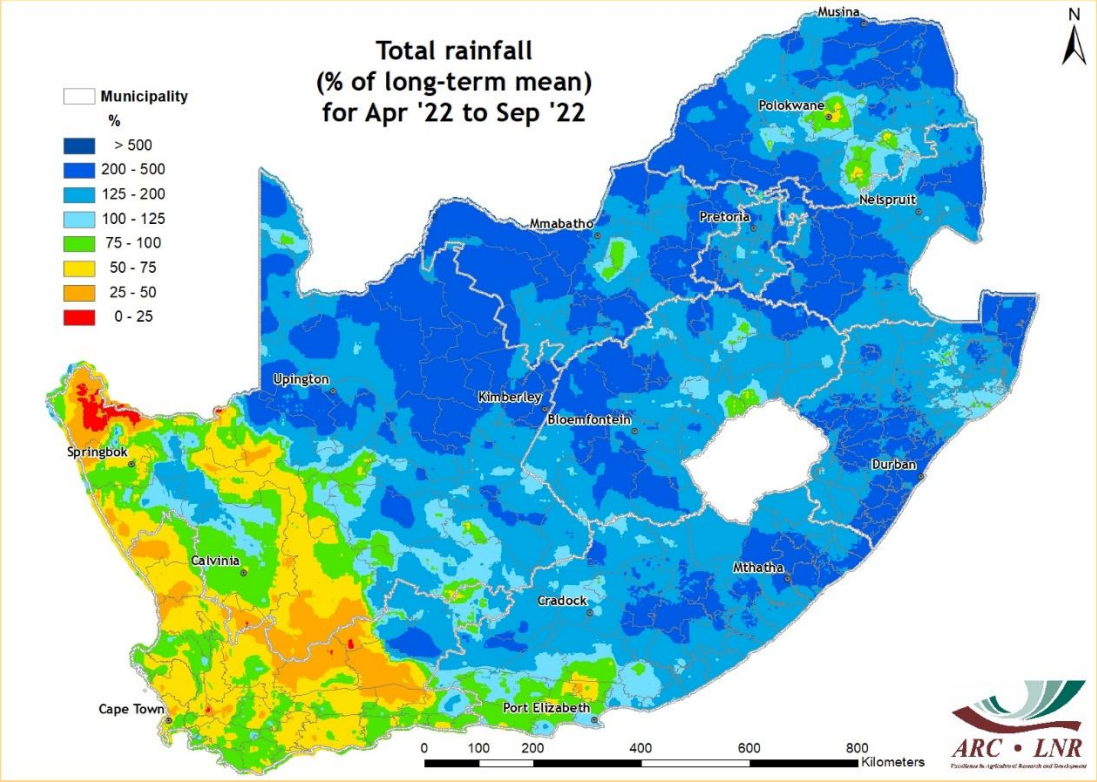
Probabilistic forecast for rainfall over the summer rainfall region, based on the natural cyclic nature of the climate system as seen in decadal variability, per month for the period September 2022 – April 2023 (Forecast issued in 2022-10).

Typical patterns during similar summers, over the north-eastern half of the summer rainfall region, are:

- September – 9 October: Relatively dry conditions over the north-eastern half of the summer rainfall region
- 10 October – 10 November: Near-normal rainfall over the north-eastern half of the summer rainfall region
- 10 November – end of December: Near-normal to above-normal rainfall over the north-eastern half of the summer rainfall region
- January – mid-February: Below-normal rainfall over the north-eastern half of the summer rainfall region
- Mid-February - April: Above-normal rainfall over the north-eastern half of the summer rainfall region

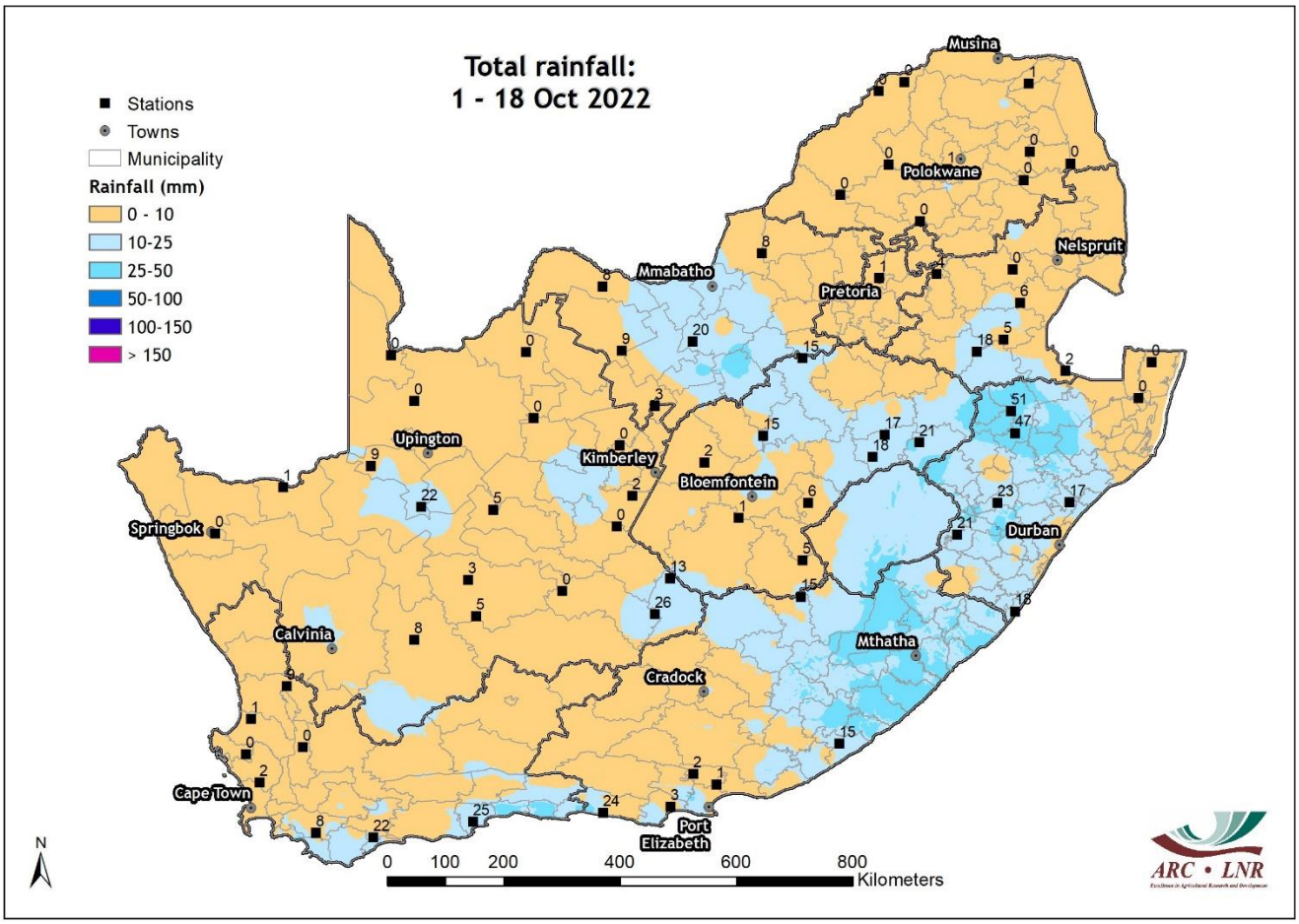
Observed conditions

Rainfall (% of long-term mean): April to September 2022



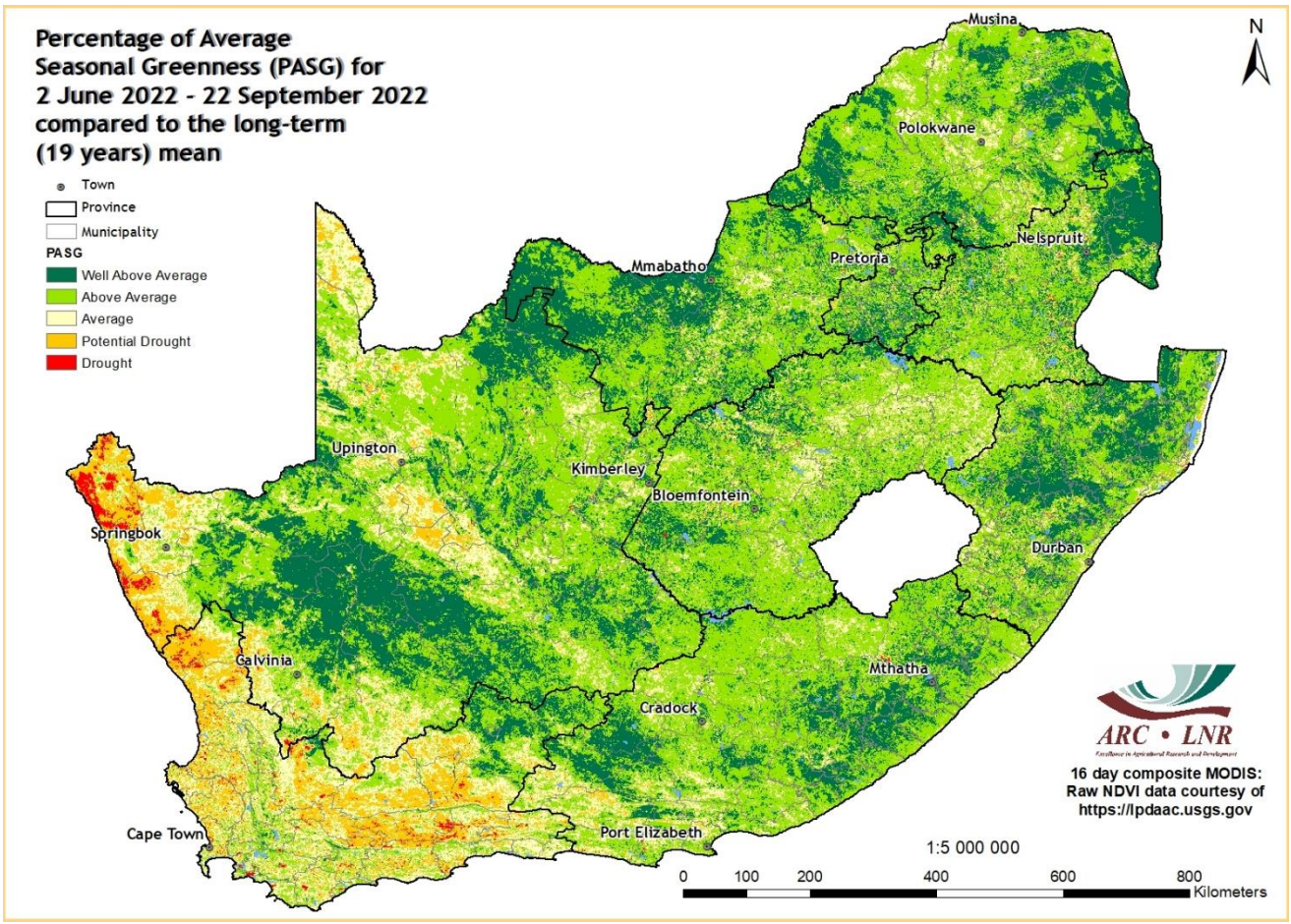
Rainfall was above average over most of the country during April to September, but below normal over large parts of the winter rainfall region.

Rainfall (mm): 1 to 18 October 2022



Some rain occurred over large parts during the last few days, but total up to the 18th remain relatively low. Thundershowers occurred relatively far west for this time of the year.

Percentage of Average Seasonal Greenness: June – September 2022



Recent cumulative vegetation activity remains above average over much of the interior, related to wet conditions during autumn and relatively warm conditions during winter. Cumulative vegetation activity is below average over the winter rainfall region, reflecting mostly below-normal rainfall throughout the winter.

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:
Accumulations of GFS 6-hourly rainfall fields, done in Google Earth Engine

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.

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The way in which **young people see the future** speaks of a positive attitude – and of the choice to be relevant in a new era. AgriSeker shares this excitement about the future of agriculture in South Africa. Our motto is **'A certain future'**, after all.

AgriSeker is motivated to make a contribution to the future of our country with a dedicated focus on agriculture through knowledge, understanding and participation in this sector. Our focus is on producers and young people, because for agriculture to survive, we need you.

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