

Seasonal Climate Watch

January to May 2023

Date issued: Dec 30, 2022

1. Overview

The El Niño-Southern Oscillation (ENSO) is currently in a La Niña state, and forecasts indicate that it will likely remain in this state during the remainder of the 2022/23 summer season and return to a neutral state during Autumn. The presence of a La Niña event usually has its strongest impact on rainfall during the mid-summer months. With the continued persistence of the La Niña event, there is a high chance that it will have its usual effect on South Africa, which is generally for above-normal rainfall and below-normal temperatures over the summer rainfall areas.

The multi-model rainfall forecast indicates above-normal rainfall for most parts of the country for all predicted seasons. Minimum temperatures are still expected to be mostly above-normal countrywide, however, maximum temperatures are expected to be below-normal over most of the country during late-summer (Jan-Feb-Mar) and early-autumn (Feb-Mar-Apr).

The South African Weather Service (SAWS) will continue to monitor the weather and climate conditions and provide updates on any future assessments that may provide more clarity on the current expectations for the coming season.

2. South African Weather Service Prediction System

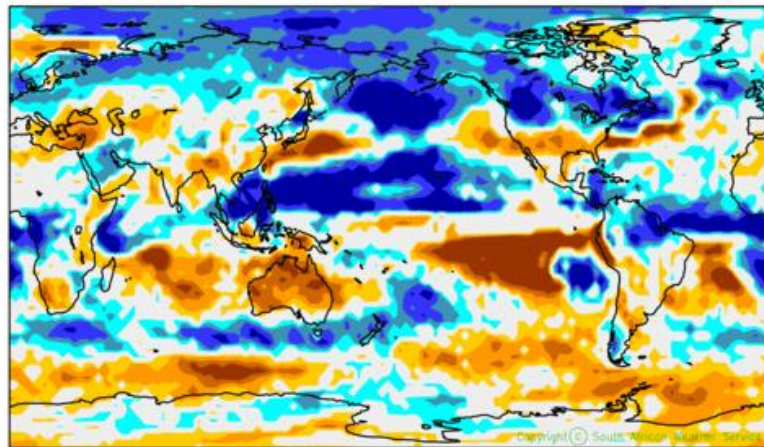
2.1. Ocean-Atmosphere Global Climate Model

SAWS is currently recognised by the World Meteorological Organization (WMO) as a Global Producing Centre (GPC) for Long-Range Forecasts (LRF). This is owing to its local numerical modelling efforts, which involve coupling of both the atmosphere and ocean components to form a fully interactive coupled modelling system, named the SAWS Coupled Model (SCM), the first of its kind in both South Africa and the region. Below are the first season (December-January-February) predictions for rainfall (Figure 1) and average temperature (Figure 2).

SAWS OPERATIONAL ENSEMBLE PREDICTION SYSTEM

SCM Seasonal Forecasts
Most likely Category of Rainfall
Forecast Period: Jan 2023 – Mar 2023

No Significance Test Applied
Ensemble size 40
Last Updated 21 Dec 2022



<--- Below Normal Percentile Above Normal Percentile --->

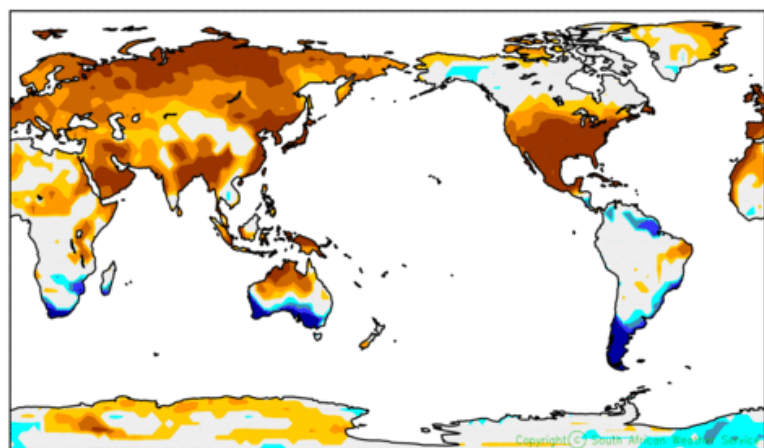
70-100%	60-70%	50-60%	33-50%	OTHERS	33-50%	50-60%	60-70%	70-100%
---------	--------	--------	--------	--------	--------	--------	--------	---------

Figure 1: January-February-March, JFM (2023) global prediction for total rainfall probabilities

SAWS OPERATIONAL ENSEMBLE PREDICTION SYSTEM

SCM Seasonal Forecasts
Most likely Category of 2m Temperature
Forecast Period: Jan 2023 – Mar 2023

No Significance Test Applied
Ensemble size 40
Last Updated 21 Dec 2022



<--- Below Normal Percentile Above Normal Percentile --->

70-100%	60-70%	50-60%	33-50%	OTHERS	33-50%	50-60%	60-70%	70-100%
---------	--------	--------	--------	--------	--------	--------	--------	---------

Figure 2: January-February-March, JFM (2023) global prediction for average temperature probabilities

2.2. Seasonal Forecasts for South Africa from the SAWS seasonal prediction system

The above-mentioned global forecasting systems' forecasts are combined with the GFDL-SPEAR and COLA-RSMAS-CCSM4 systems (part of the North American Multi-Model Ensemble System) for South Africa, as issued with the December 2022 initial conditions, and are presented below for South Africa.

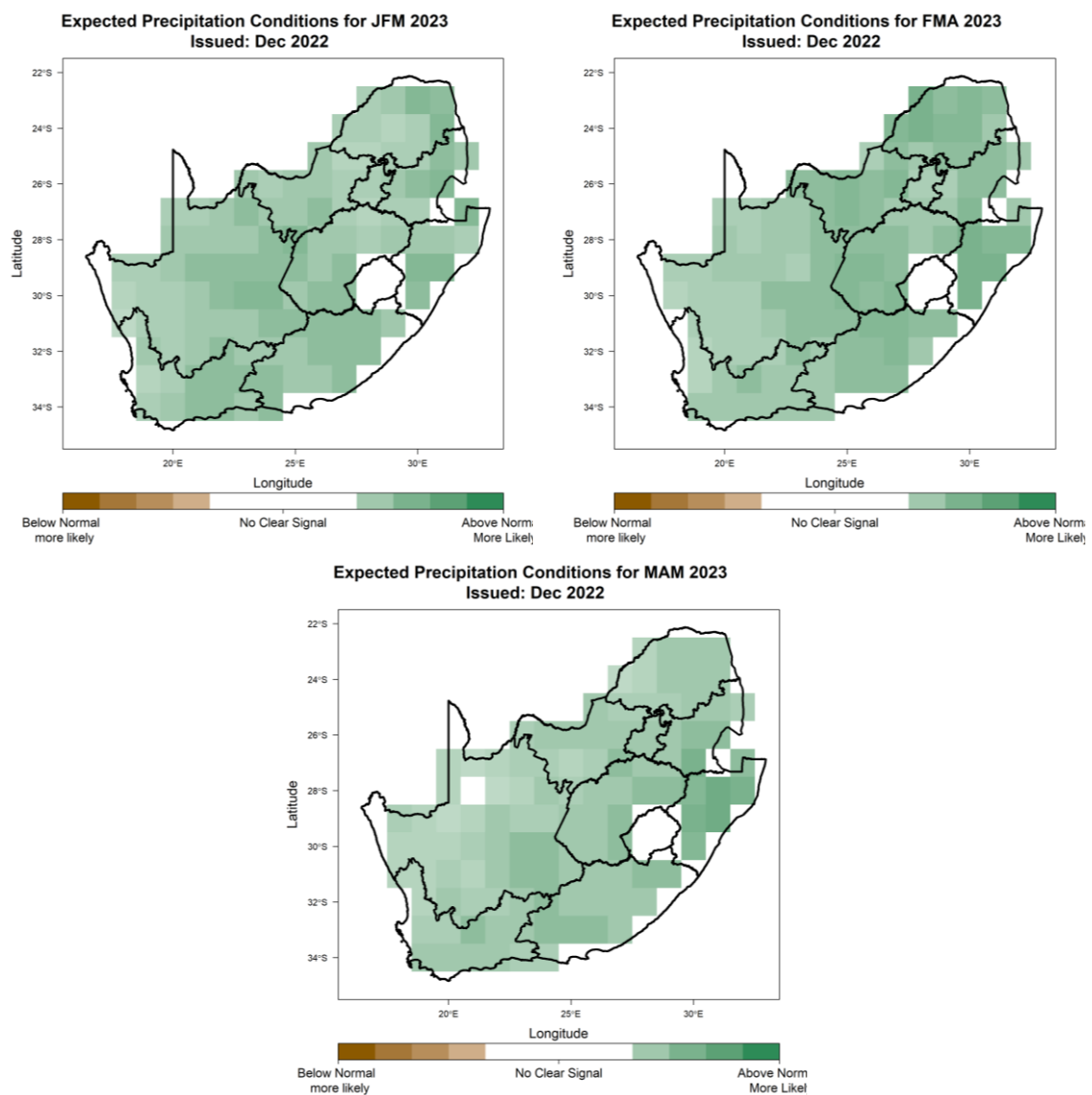


Figure 3: January-February-March 2023 (JFM; left), February-March-April 2023 (FMA; right), March-April-May 2023 (MAM; bottom) seasonal precipitation prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

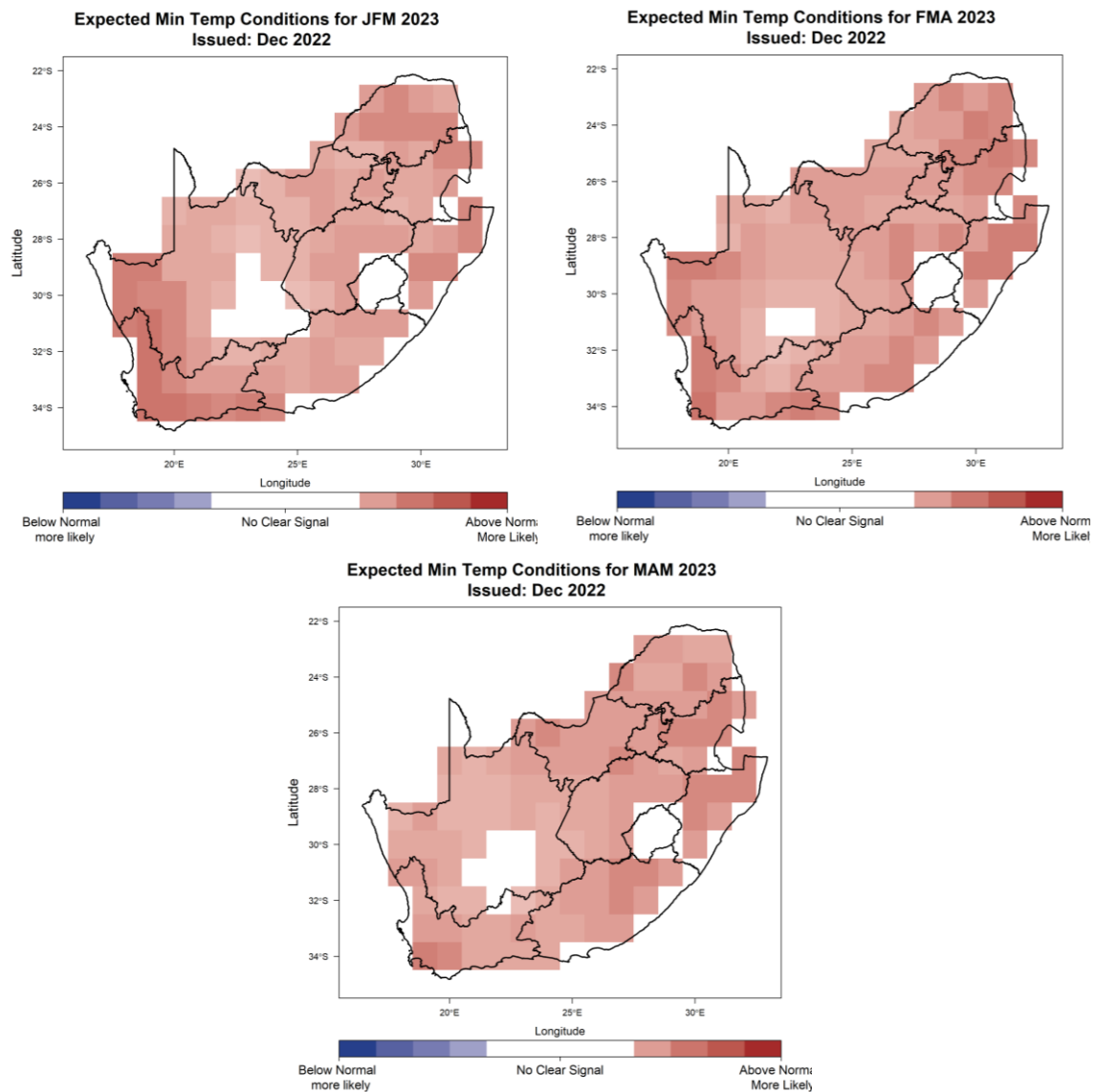


Figure 4: January-February-March 2023 (JFM; left), February-March-April 2023 (FMA; right), March-April-May 2023 (MAM; bottom) seasonal minimum temperature prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

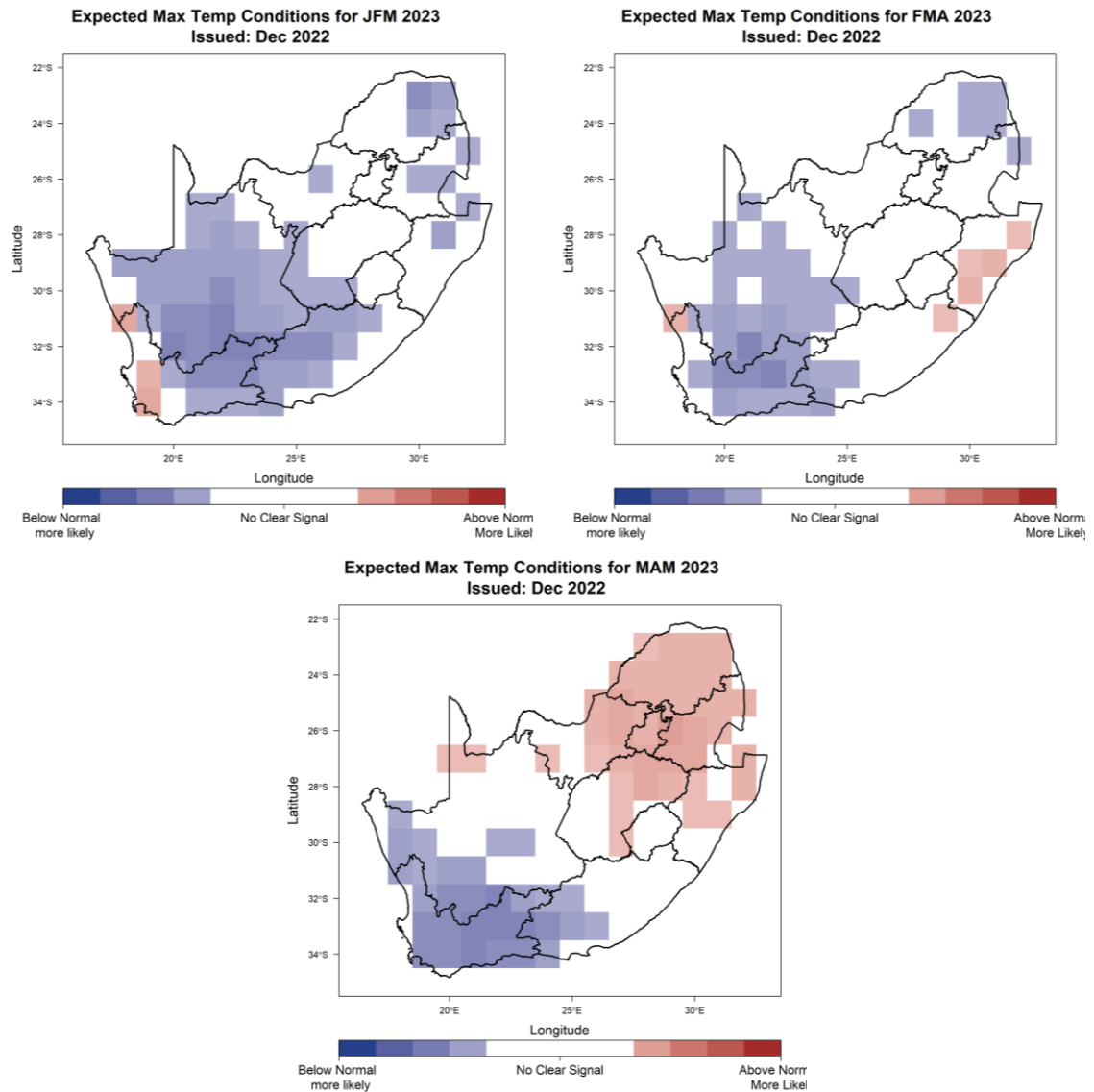


Figure 5: January-February-March 2023 (JFM; left), February-March-April 2023 (FMA; right), March-April-May 2023 (MAM; bottom) seasonal maximum temperature prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

2.3. Climatological Seasonal Totals and Averages

The following maps indicate the rainfall and temperature (minimum and maximum temperature) climatology for the late-summer (Jan-Feb-Mar), early-autumn (Feb-Mar-Apr) and mid-autumn (Mar-April-May). The rainfall and temperature climates are representative of the average rainfall and temperature conditions over a long period of time for the relevant 3-month seasons presented here.

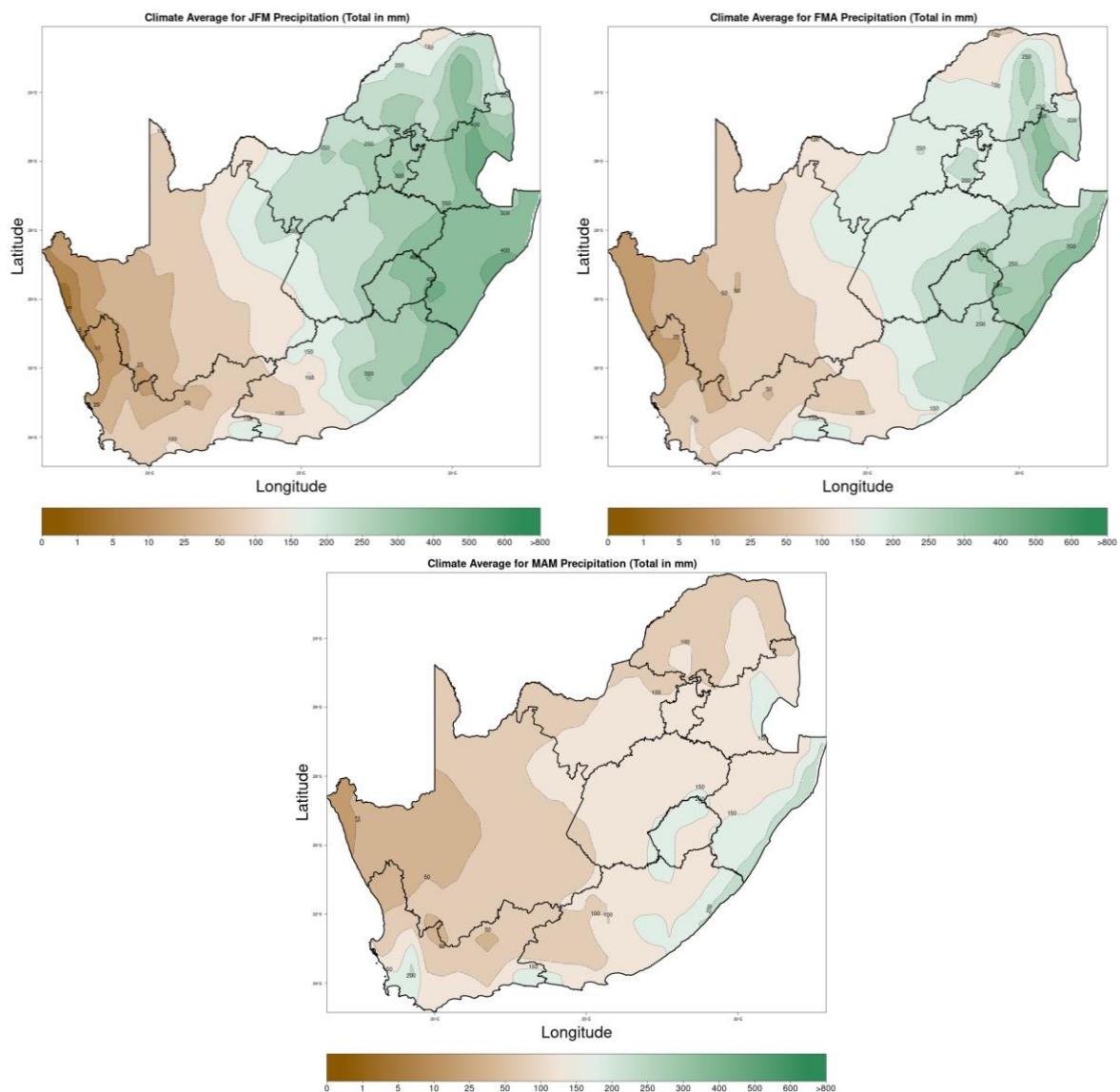


Figure 6: Climatological seasonal totals for precipitation during January-February-March (JFM; left), February-March-April (FMA; right) and March-April-May (MAM; bottom).

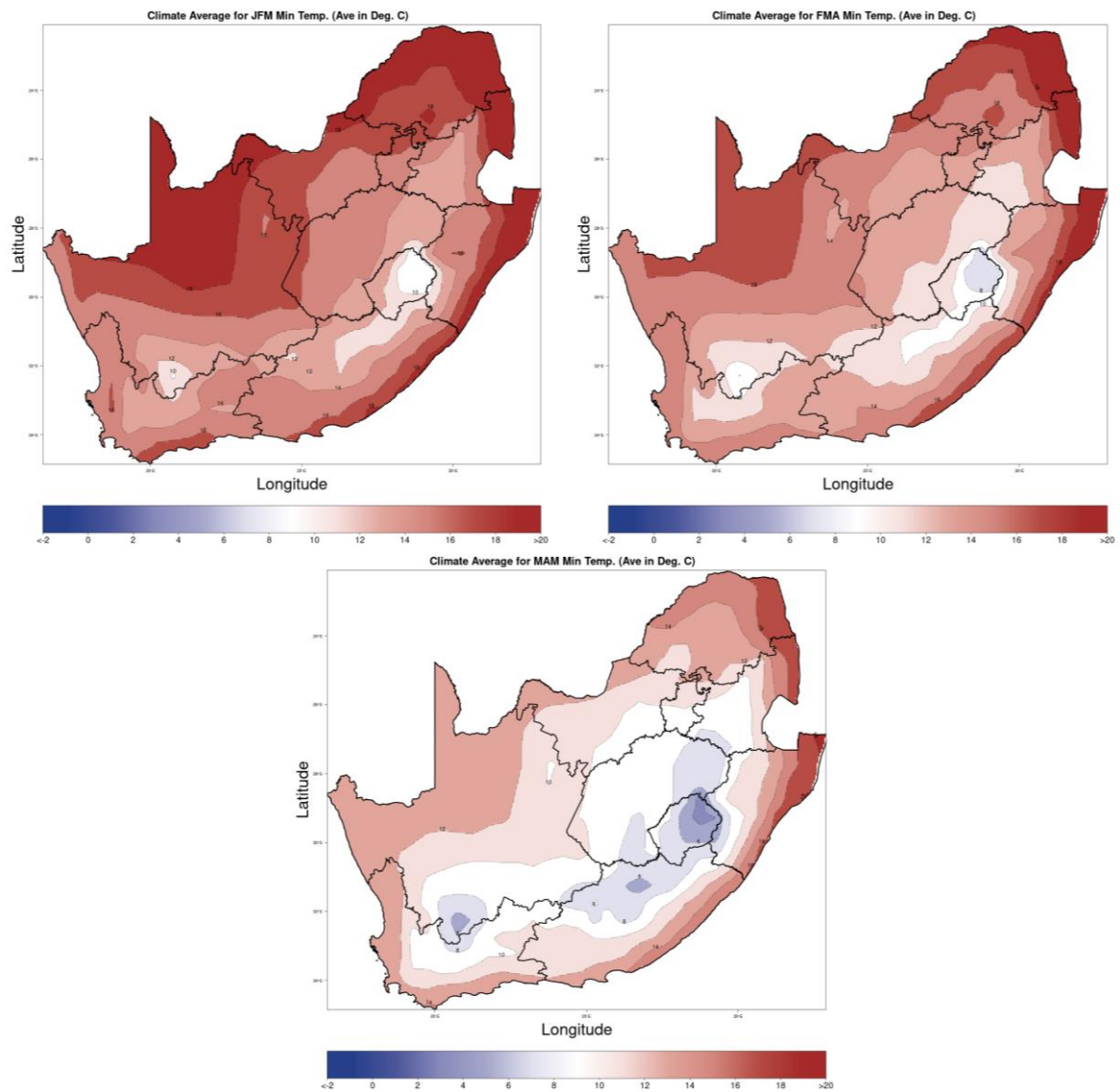


Figure 7: Climatological seasonal averages for minimum temperature during January-February-March (JFM; left), February-March-April (FMA; right) and March-April-May (MAM; bottom).

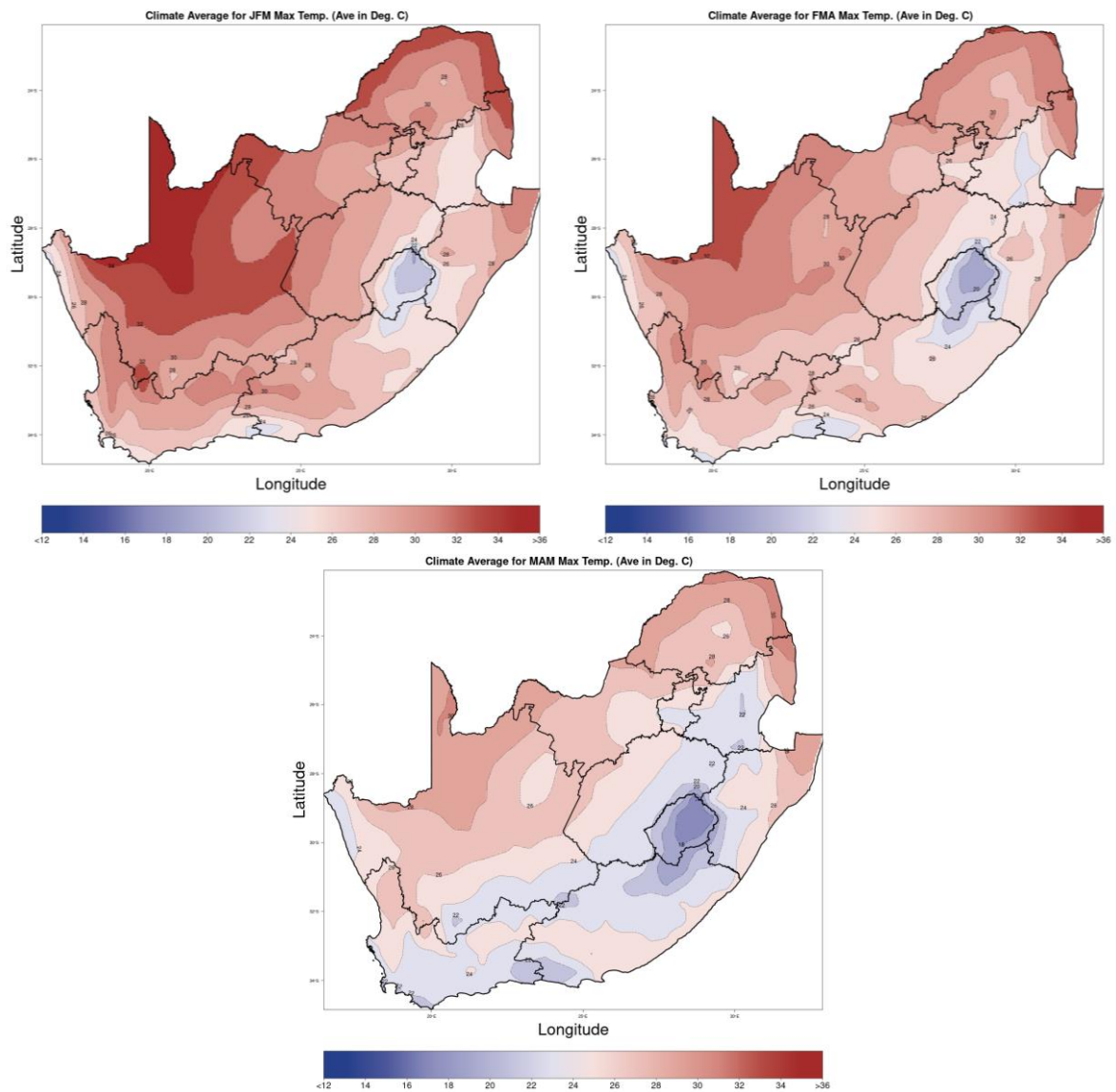


Figure 8: Climatological seasonal averages for maximum temperature during January-February-March (JFM; left), February-March-April (FMA; right) and March-April-May (MAM; bottom).

3. Summary implications to various economic sector decision makers

Water and Energy

The expected above-normal rainfall for most parts of the country predicted across the three seasons is likely to enhance dam levels and benefit other water reservoirs particularly in summer rainfall regions. Such conditions may also pose flooding risks in regions prone to floods. The anticipated below-normal maximum temperatures countrywide across the seasons are likely to reduce cooling demand. Relevant decision-makers are encouraged to take note of these possible outcomes and communicate to affected businesses and communities.

Health

The expected above-normal minimum temperatures may result in warmer conditions across the country, particularly at night during late-summer (Jan-Feb-Mar) and early-autumn (Feb-Mar-Apr). The projected below-normal maximum temperatures will have a minor impact on the population's health, with implications varying depending on individuals' vulnerability and general health. The ultraviolet radiation (UV) levels are very high during this reporting period, indicating that the risk of UV-related health effects is imminent, necessitating the public to take appropriate sun protection measures such as seeking shade, wearing clothing that covers the body, and applying sunscreen, particularly at midday. The public is encouraged to take precautions and follow the guidelines and recommendations of local authorities. The predicted above-normal rainfall across the country for all predicted seasons may increase the likelihood of flash floods in some regions, notably in flood-prone areas and areas with inadequate drainage systems. These wet conditions can exacerbate waterborne diseases as well as water-related injuries and accidents. It is advised that the general population take precautions and adhere to the recommendations and guidance of local authorities.

Agriculture

Above-normal rainfall is expected over most parts of the country during late-summer and early-autumn seasons, which is likely to bring positive impacts for crop and livestock production. However, there is an increased risk for water logging that can cause crop damage in areas receiving excessive rainfall. Therefore, the relevant decision-makers may advise farmers to establish good drainage systems, practice soil and water conservation, and other appropriate farming practices.

This forecast is updated monthly, and users are advised to monitor the updated forecasts as there is a possibility for them to change, especially the longer lead-time forecasts. Moreover, farmers are advised to keep monitoring the weekly and monthly forecasts issued by the South African Weather Service (SAWS). Farmers are also advised to keep on monitoring advisories from the Department of Agriculture and make changes as required.

4. Contributing Institutions and Useful Links

All the forecasts presented here are a result of the probabilistic prediction based on the ensemble members from the coupled climate model from the South African Weather Service and two models from the NMME. Other useful links for seasonal forecasts are:

- <http://www.weathersa.co.za/home/seasonal> (Latest predictions from SAWS for the whole of SADC)
- <https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/> (ENSO predictions from various centres)
- <https://iri.columbia.edu/our-expertise/climate/forecasts/seasonal-climate-forecasts/> (Copernicus Global forecasts)

