Seasonal Climate Watch

December 2022 to April 2023

Date issued: Dec 01, 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. 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 all predicted seasons.

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).

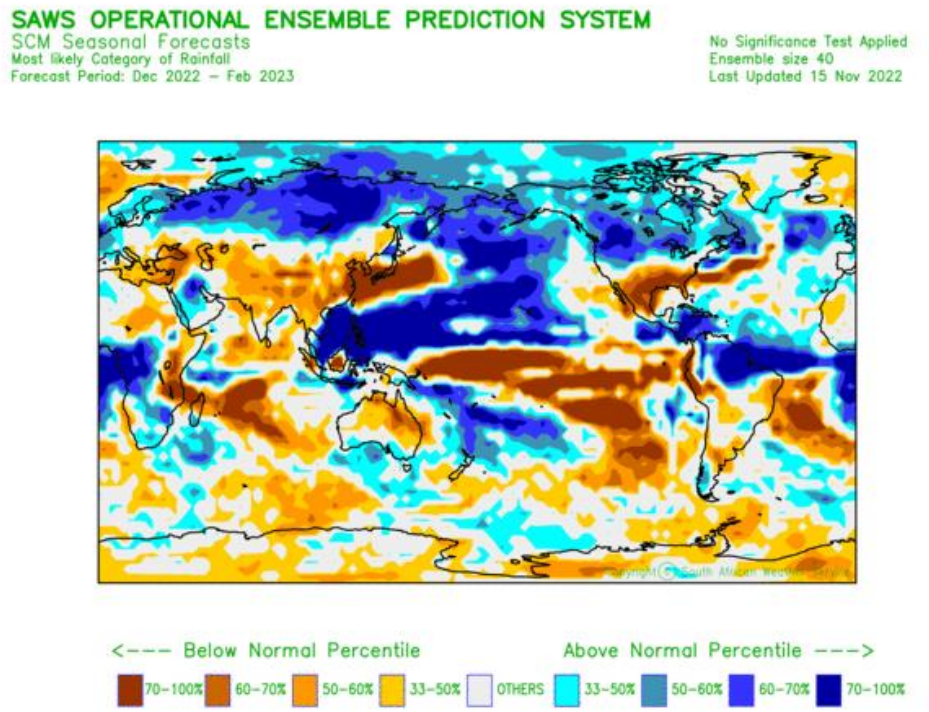

Figure 1: December-January-February, DJF (2023) global prediction for total rainfall probabilities

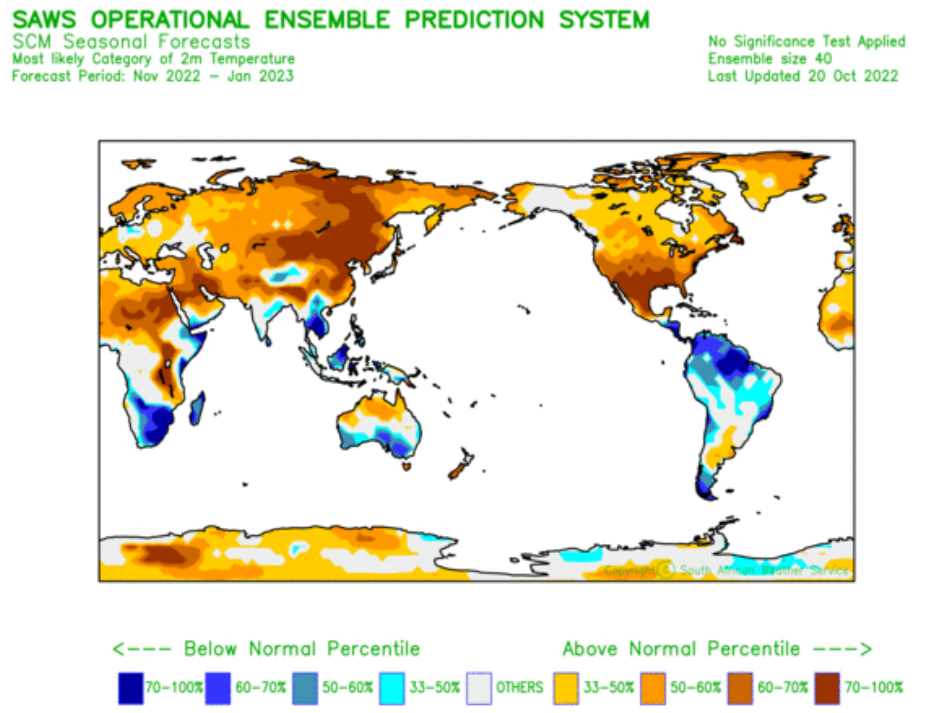

Figure 2: December-January-February, DJF (2023) global prediction for average temperature probabilities

2.2. Seasonal Forecasts for South Africa from the SAWS OAGCM

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 November 2022 initial conditions, and are presented below for South Africa.

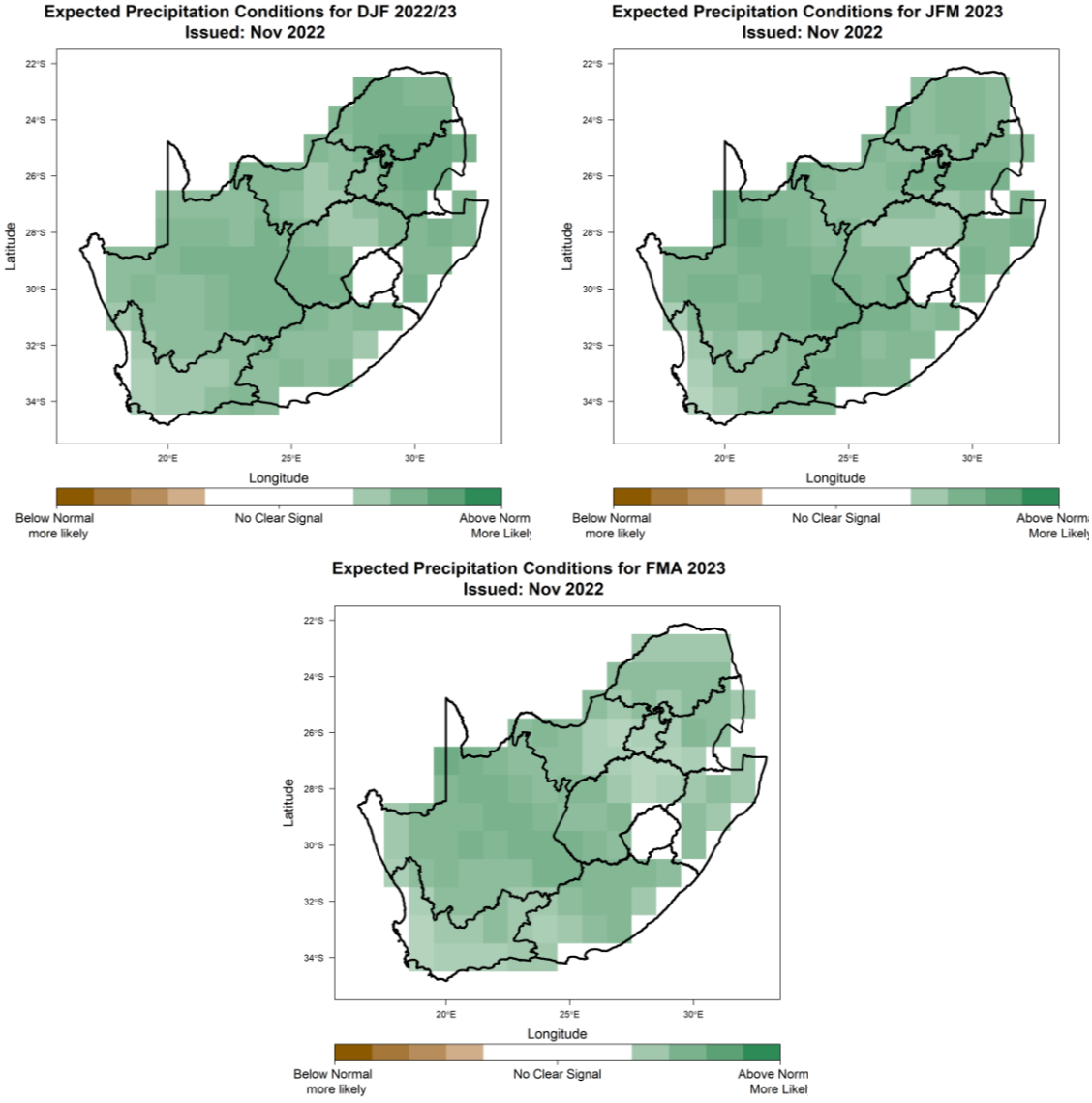

Figure 3: December-January-February 2022/23 (DJF; left), January-February-March 2023 (JFM; right), February-March-April 2023 (FMA; bottom) seasonal precipitation prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

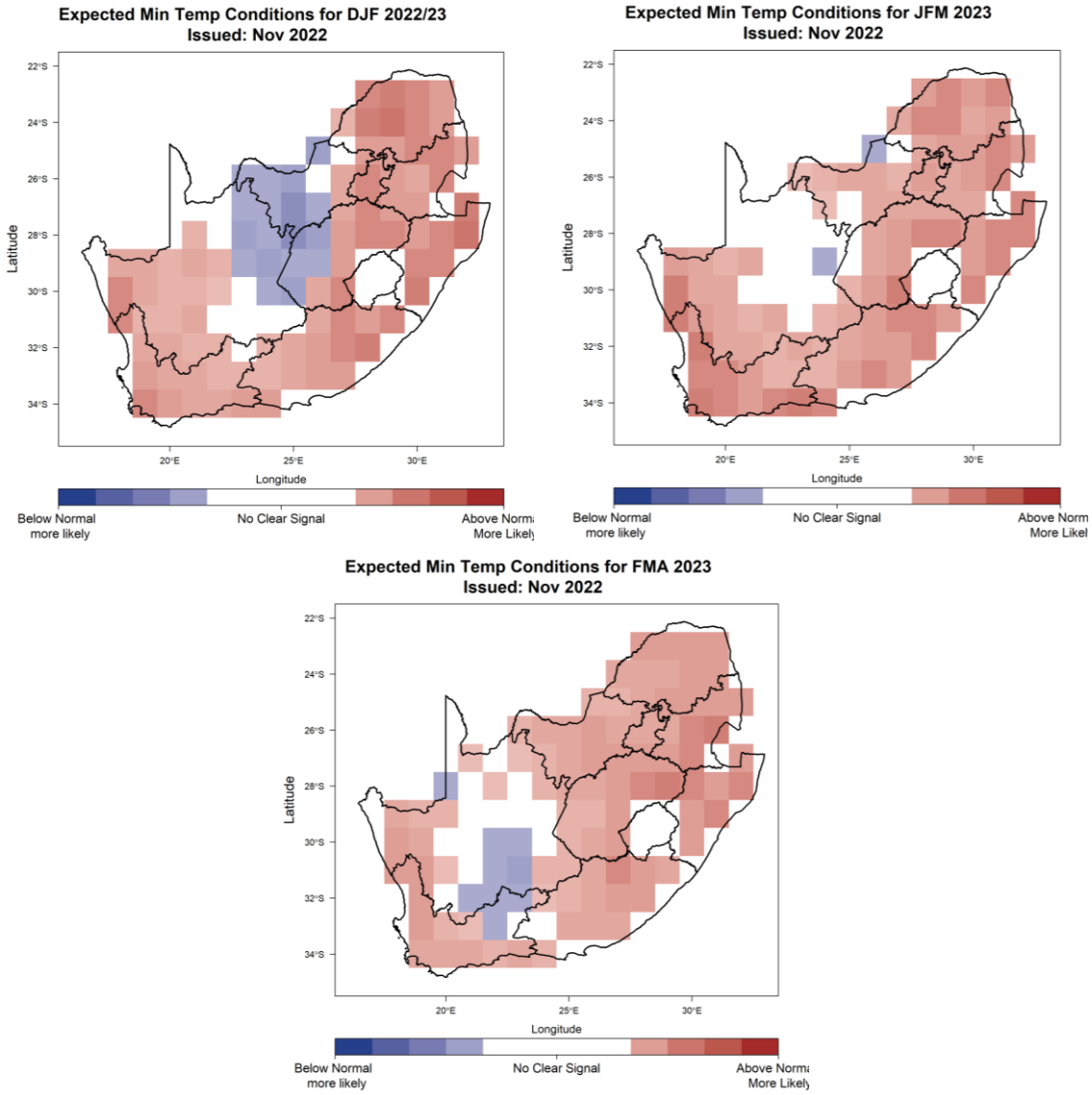

Figure 4: December-January-February 2022/23 (DJF; left), January-February-March 2023 (JFM; right), February-March-April 2023 (FMA; bottom) seasonal minimum temperature prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

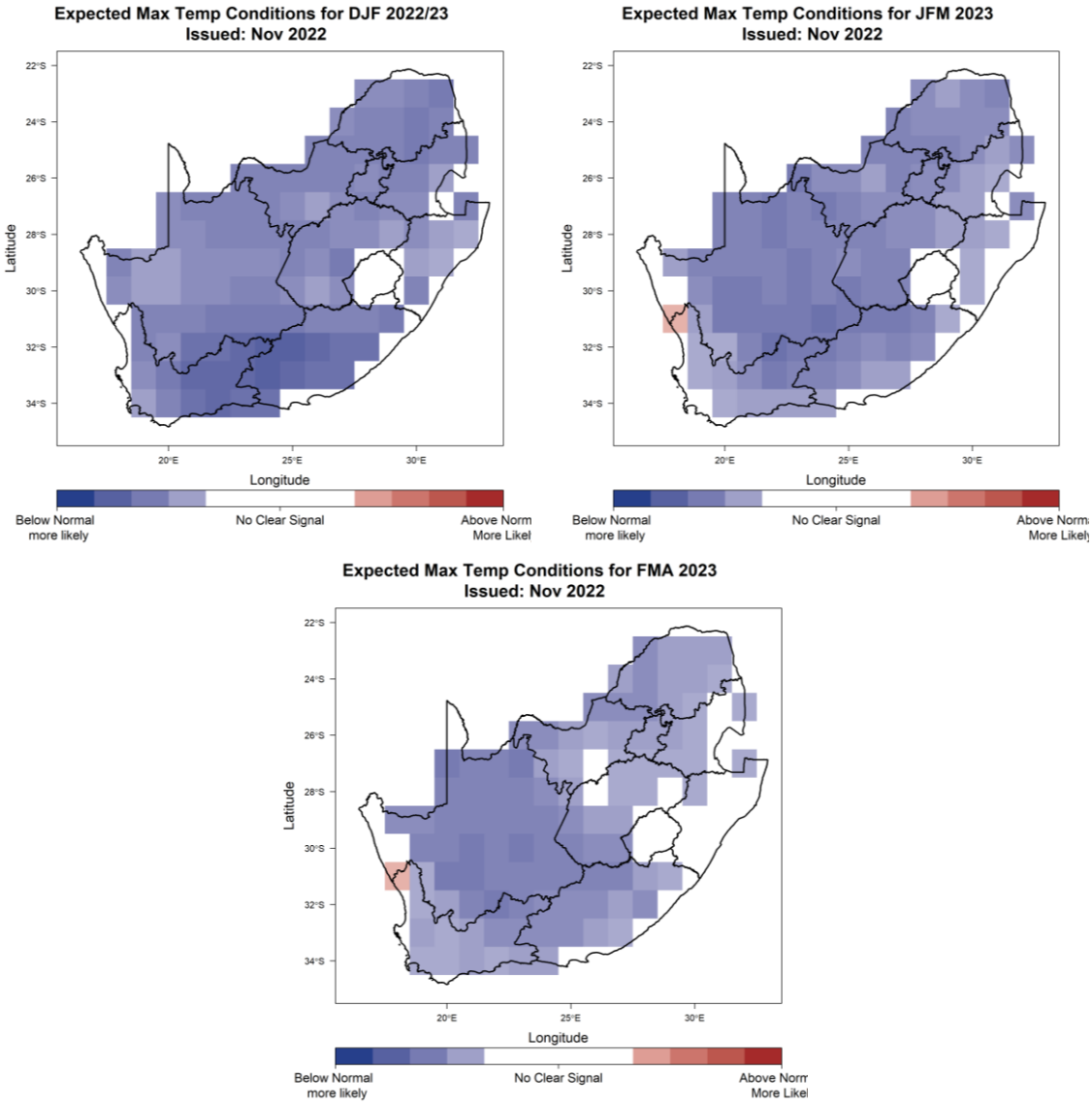

Figure 5: December-January-February 2022/23 (DJF; left), January-February-March 2023 (JFM; right), February-March-April 2023 (FMA; bottom) seasonal maximum temperature prediction. Maps indicate the highest probability from three probabilistic categories namely above-normal, near-normal and below-normal.

2.3. Climatological Seasonal Totals and Averages

The following maps indicate the rainfall and temperature (minimum and maximum temperature) climatology for the mid- (Dec-Jan-Feb), late- (Jan-Feb-Mar) summer and early-autumn (Feb-Mar-April). 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.

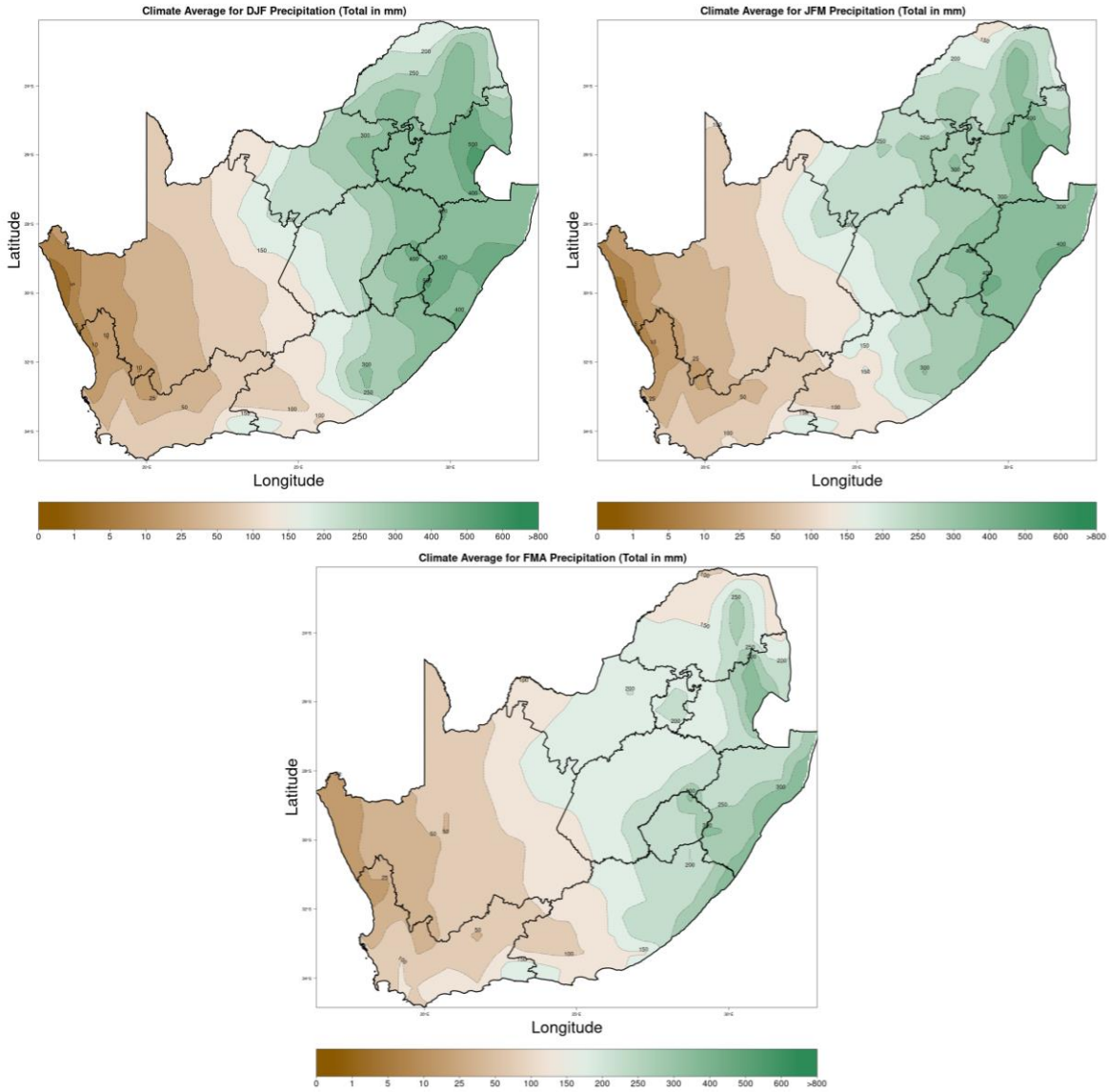

Figure 6: Climatological seasonal totals for precipitation during December-January-February (DJF; left), January-February-March (JFM; right) and February-March-April (FMA; bottom).

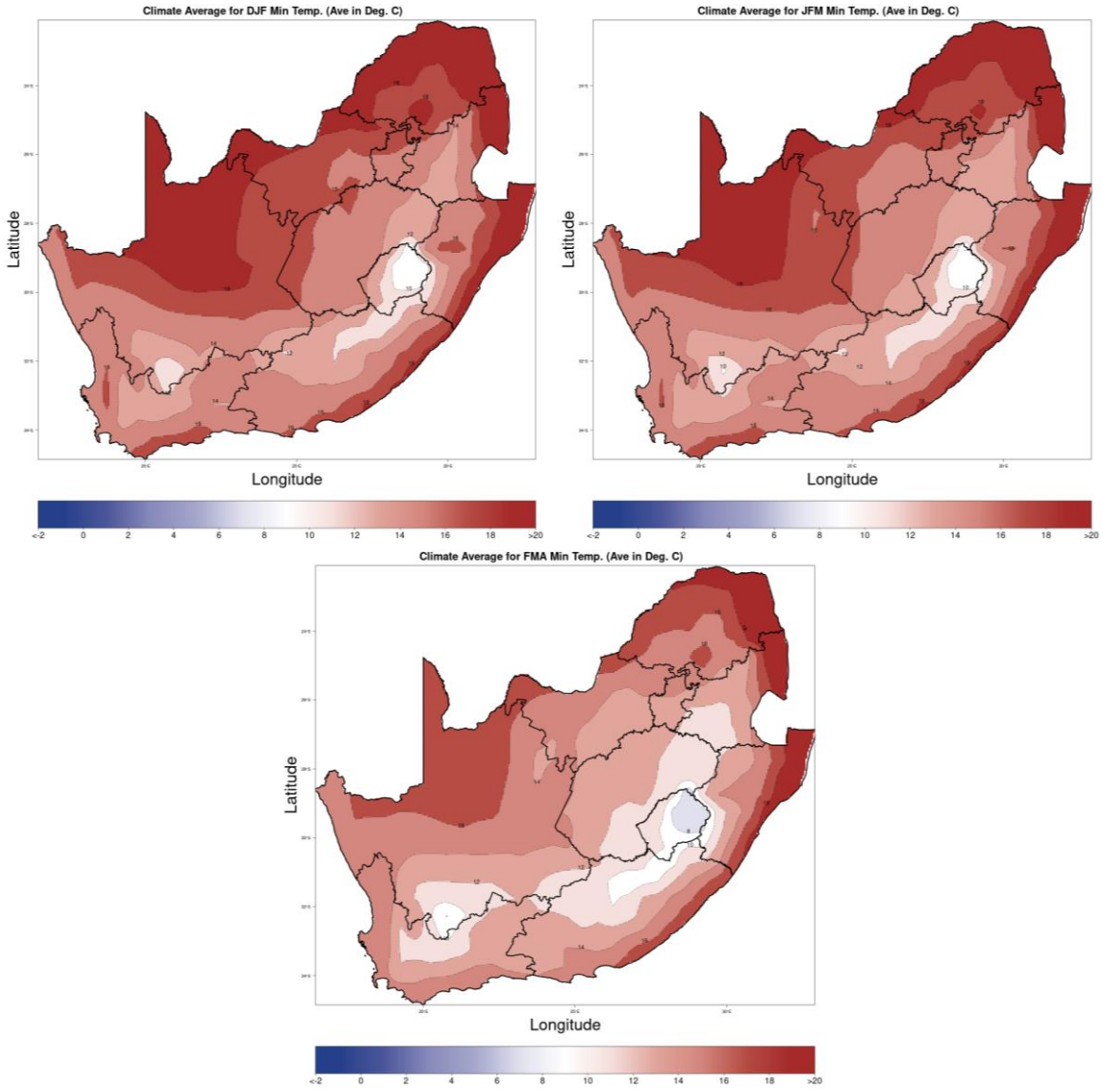

Figure 7: Climatological seasonal averages for minimum temperature during December-January-February (DJF; left), January-February-March (JFM; right) and February-March-April (FMA; bottom).

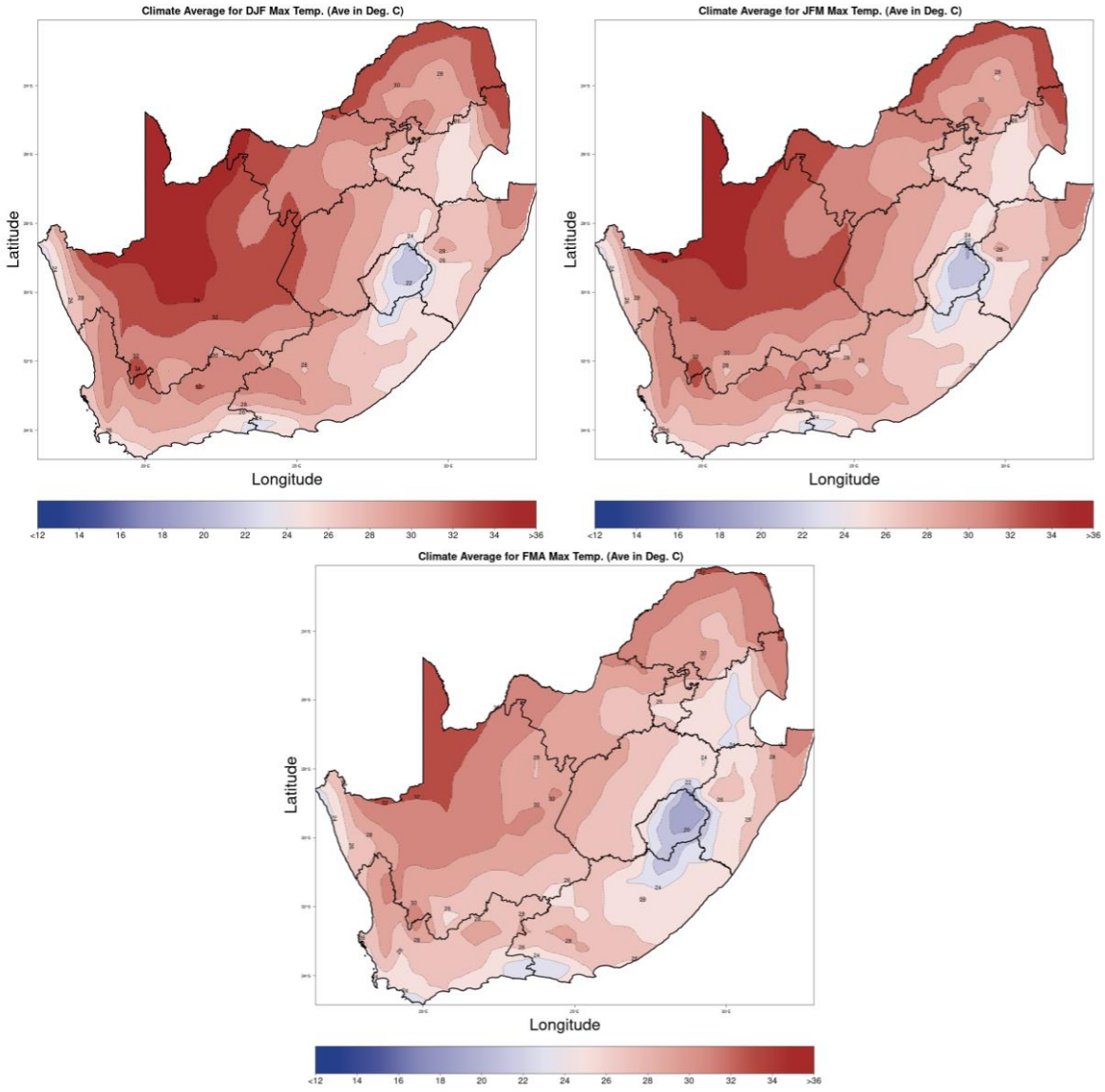

Figure 8: Climatological seasonal averages for maximum temperature during December-January-February (DJF; left), January-February-March (JFM; right) and February-March-April (FMA; bottom).

3. Summary implications to various economic sector decision makers

Water and Energy

The anticipated above-normal rainfall for most parts of the country across the predicted seasons is likely to benefit water reservoirs in most summer rainfall regions. Such conditions may also pose a risk of flash floods in regions prone to floods.

Above-normal minimum temperatures are expected across the country during the predicted seasons except for parts of the Northern Cape, Northwest, and Free State which are expected to experience below-normal minimum temperatures during DJF. Below-normal maximum temperatures are anticipated in most parts of the country during the predicted seasons. The predicted conditions will likely reduce cooling demand. The above-mentioned possible outcomes should be noted by relevant decision-makers and communicated to affected businesses and communities.

Health

The predicted above-normal rainfall may advance the risk of flash floods in some areas, particularly in flood-prone regions with inadequate drainage systems. These wet conditions can exacerbate waterborne illnesses as well as water-related injuries and accidents. It is advised that the general population take precautionary measures and follow the advice and recommendations of local authorities. The projected minimal summer temperatures may result in warmer conditions for the country, particularly at night. The projected below-normal maximum temperatures will have minor implications varying depending on the vulnerability and overall health of individuals. The ultraviolet radiation (UV) levels are very high during this reporting period, consequently, 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.

Agriculture

Above-normal rainfall is expected over most parts of the country throughout the summer season, which is likely to bring positive impacts for crop and livestock production. Therefore, the relevant decision-makers are encouraged to advise farmers to prepare land for planting, to practice measures such as soil and water conservation, establishing good drainage systems, proper water harvesting and storage, 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)