Seasonal Climate Watch

October 2024 to February 2025

Date issued: 03 October 2024

1. Overview

The El Niño-Southern Oscillation (ENSO) is currently still in a Neutral state and is predicted to weaken further. Current predictions indicate the development of a La Niña state during the start of the summer season, however, there is still significant uncertainty in the predictions. It is advised to monitor the ENSO system during the start of the summer season, as it may change the rainfall outlook for the summer rainfall regions if and when the La Niña materializes.

Current predictions focus on the early- and mid-summer seasons and indicate wetter conditions over the interior of the country. The north-eastern parts however at this stage indicate drier conditions extending through to the mid-summer period. These predictions may change if the ENSO predictions become more certain towards a La Niña state, and as such continues monitoring of future seasonal climate watches are advised.

Minimum and maximum temperatures are expected to be mostly above-normal countrywide for the forecast period.

The 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

The 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 the coupling of both the atmosphere and ocean components to form a fully interactive coupled modelling system, named the SAWS Coupled Model (SCM). The SCM is a first of its kind in both South Africa and the region. Below are the first season (OND) predictions for rainfall (Figure 1) and average temperature (Figure 2).

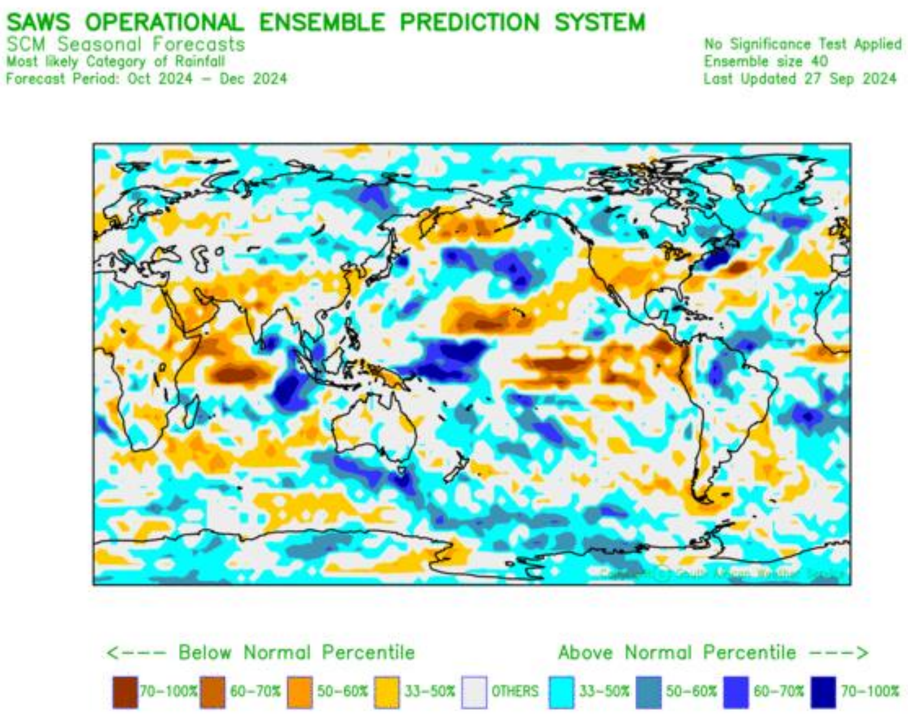

Figure 1: October-November-December, OND (2024) global prediction for total rainfall probabilities

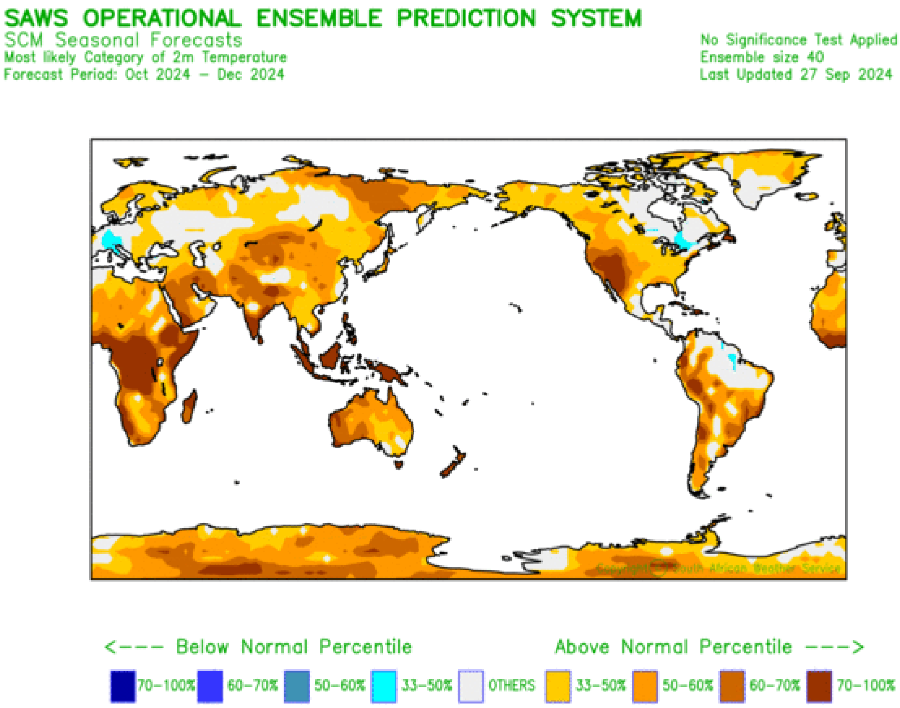

Figure 2: October-November-December, OND (2024) global prediction for average temperature probabilities

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 September 2024 initial conditions, and are presented below (District names can be seen in the appendix indicated in Figure A4):

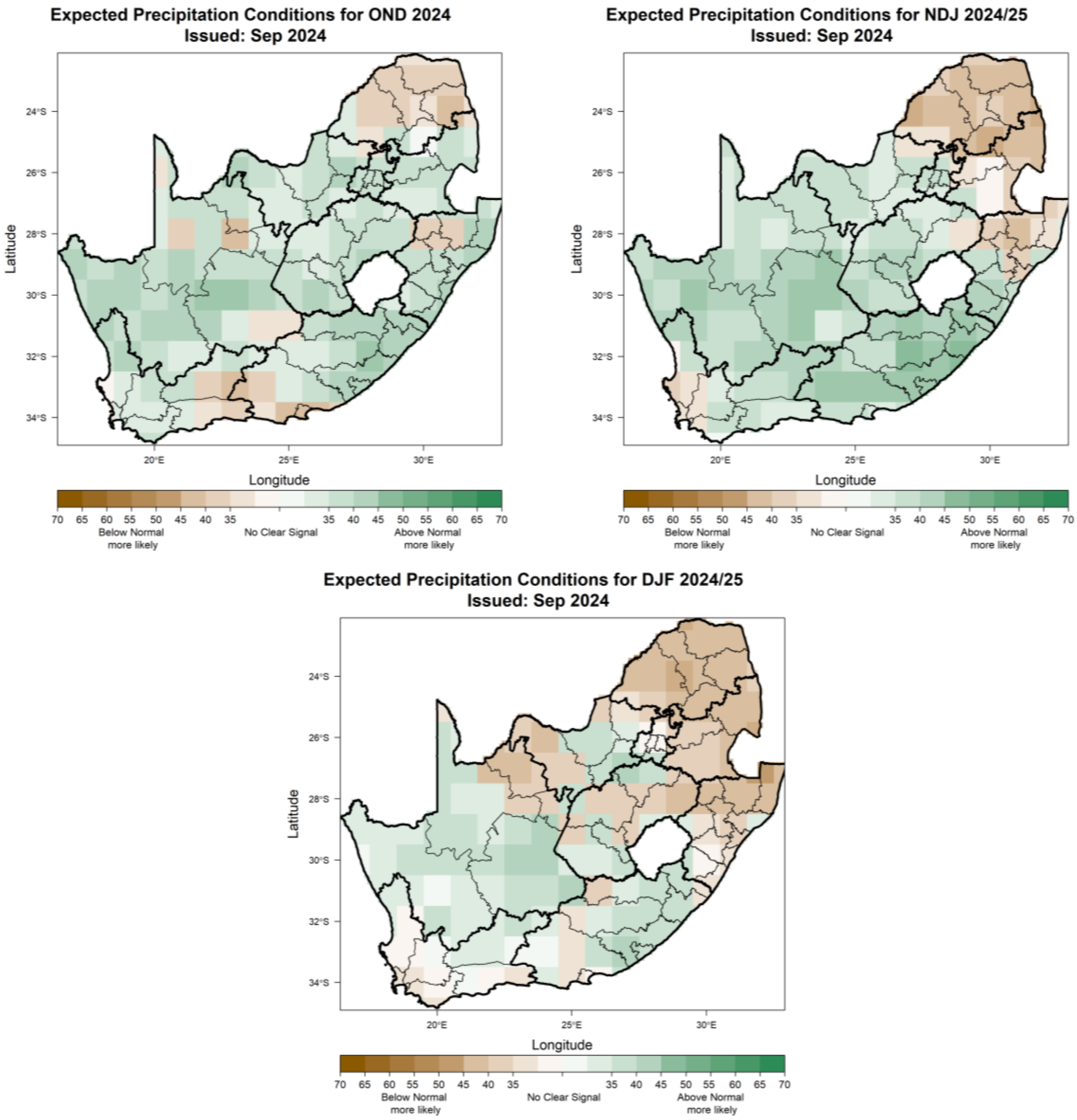

Figure 3: October-November-December 2024 (OND; left), November-December-January 2024/25 (NDJ; right), December-January-February 2024/25 (DJF; bottom) seasonal precipitation prediction. Maps indicate the highest probability of the above-normal and below-normal categories. Please refer to appendix Figure A1 for forecast skill levels.

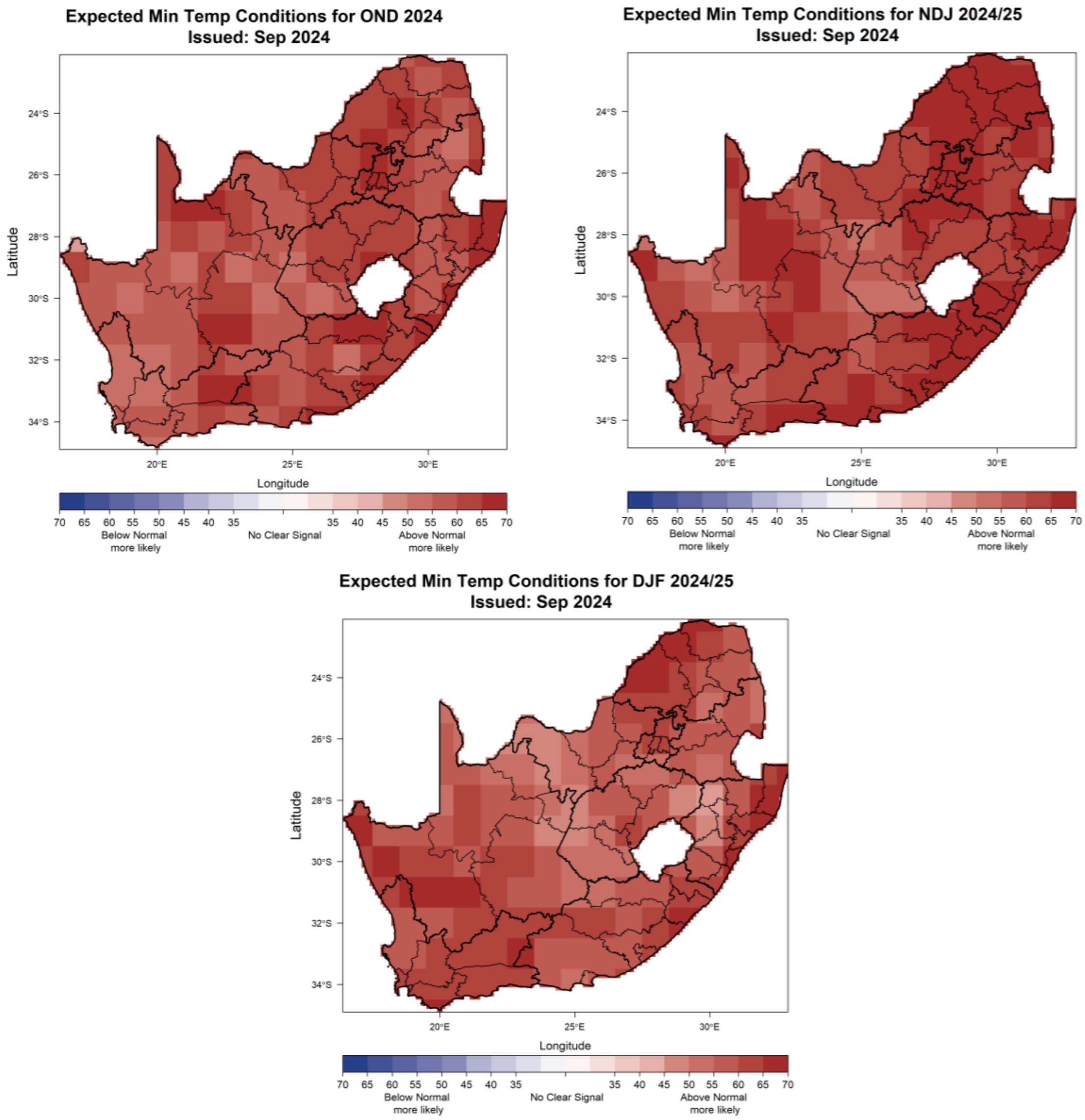

Figure 4: October-November-December 2024 (OND; left), November-December-January 2024/25 (NDJ; right), December-January-February 2024/25 (DJF; bottom) seasonal minimum temperature prediction. Maps indicate the highest probability of the above-normal and below-normal categories. Please refer to appendix Figure A2 for forecast skill levels.

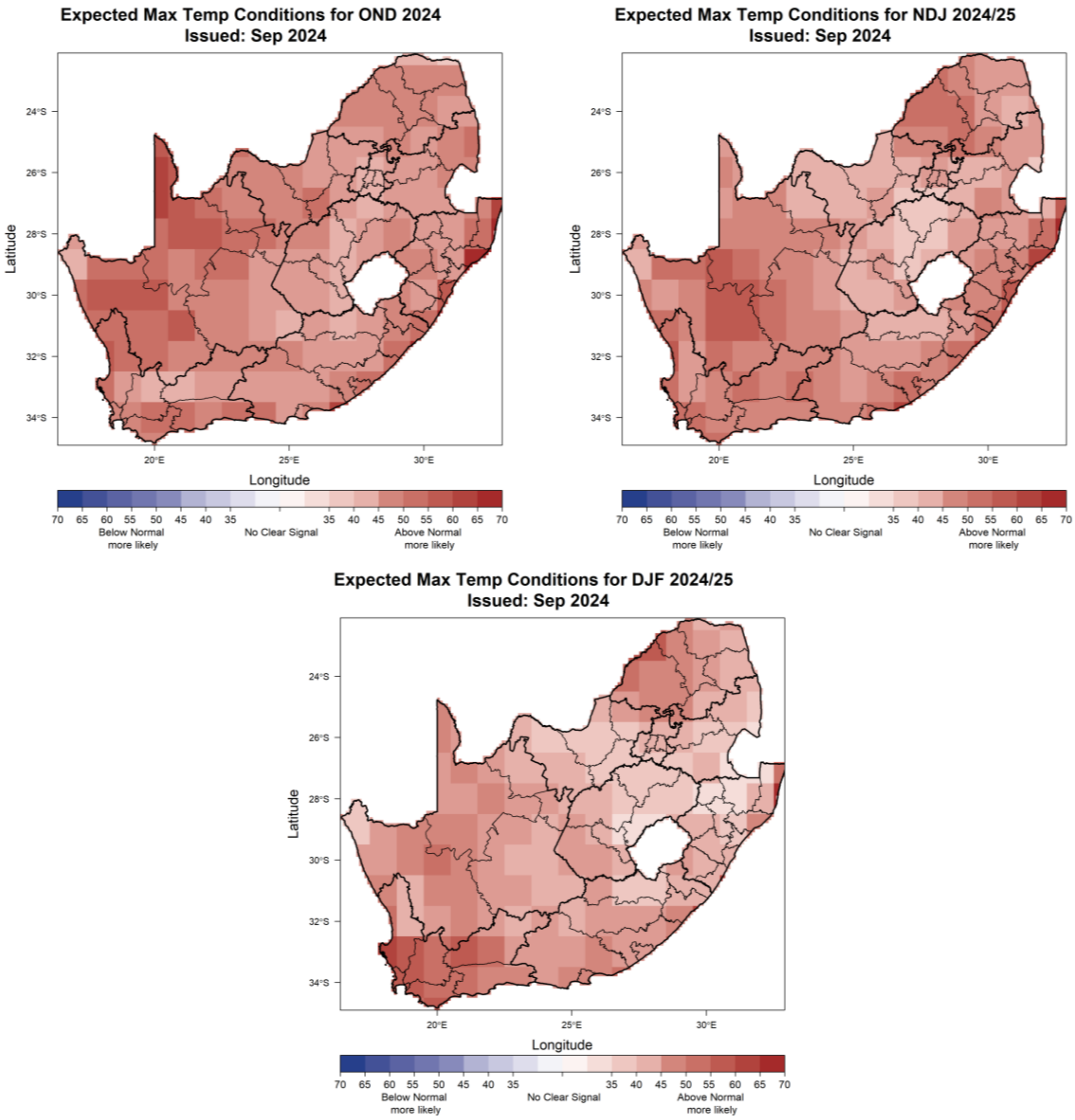

Figure 5: October-November-December 2024 (OND; left), November-December-January 2024/25 (NDJ; right), December-January-February 2024/25 (DJF; bottom) seasonal maximum temperature prediction. Maps indicate the highest probability of the above-normal and below-normal categories. Please refer to appendix Figure A3 for forecast skill levels.

2.3. Climatological Seasonal Totals and Averages

The following maps indicate the rainfall and temperature (minimum and maximum temperature) climatology for the October-November-December, November-December-January and December-January-February seasons. 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.

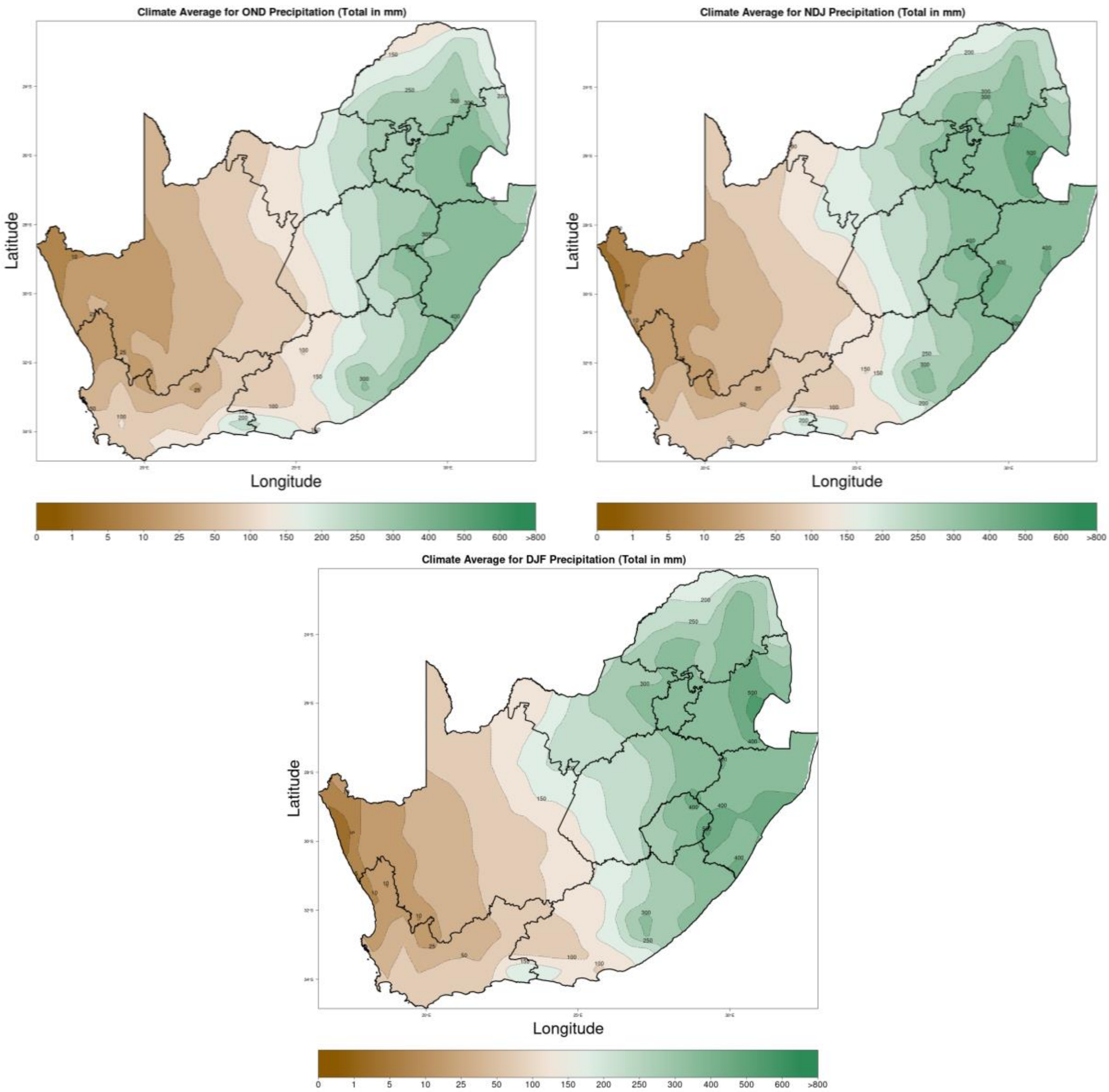

Figure 6: Climatological seasonal totals for precipitation during October-November-December (OND; left), November-December-January (NDJ; right) and December-January-February (DJF; bottom).

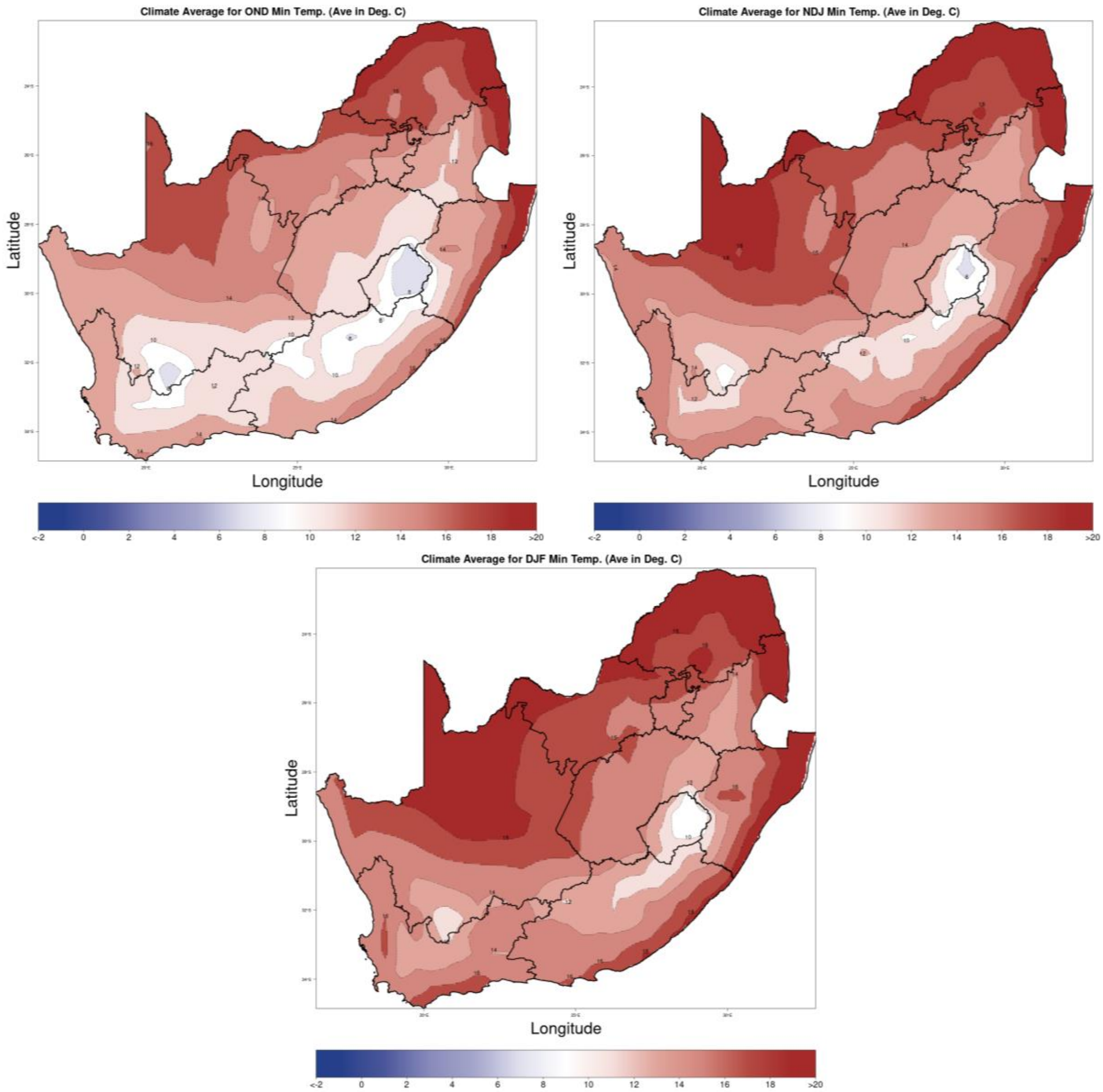

Figure 7: Climatological seasonal averages for minimum temperature during October-November-December (OND; left), November-December-January (NDJ; right) and December-January-February (DJF; bottom).

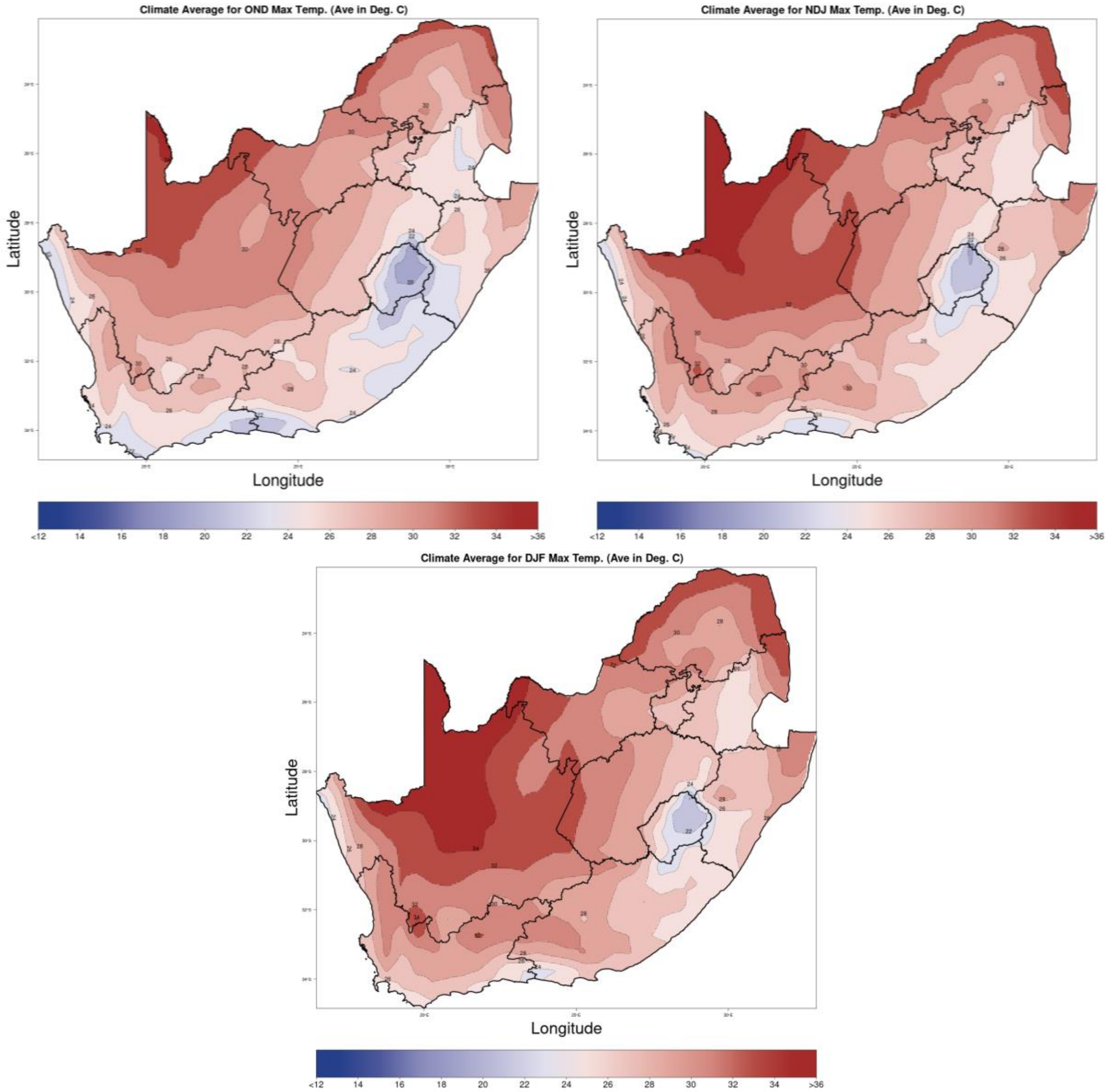

Figure 8: Climatological seasonal averages for maximum temperature during October-November-December (OND; left), November-December-January (NDJ; right) and December-January-February (DJF; bottom).

3. Summary implications to various economic sector decision makers

Water and Energy

The anticipated wetter conditions over the interior of the country during the early- and mid-summer seasons may improve water levels, particularly in regions that receive most of rainfall in summer season. Drier conditions coupled with above-normal temperatures in the north-eastern parts of the country are likely to increase water loss and reduce water storage levels through evapotranspiration and drought, among other factors. Furthermore, maximum and minimum temperatures are expected to be above normal across the country during the forecast period and no significant impact is expected on the energy demand. Relevant decision-makers are encouraged to take note of these possible outcomes and communicate with affected businesses and communities accordingly.

Health

The predicted wetter conditions during early- and mid-summer seasons over the interior of the country are likely to increase the likelihood of flooding in areas with inadequate drainage and posing immediate health risks such as drowning, injuries, and hypothermia. The public is encouraged to take precautionary measures and follow the guidance of local authorities. In response, local authorities should closely monitor these risks, develop effective mitigation strategies, and enhance public health surveillance and response systems. The forecast indicates nationwide temperatures above the average, heightening the risk of prolonged UV exposure, potentially exceeding level 3 on the World Meteorological Organization's UV Index. This elevated UV exposure could result in a greater incidence of sunburn and other UV-related health issues. Moreover, the increased temperatures are expected to heighten pollen levels and heat exposure, enhancing the likelihood of skin and eye allergies and accelerating the growth of food-borne pathogens. This escalation poses a heightened risk of foodborne illnesses. The public is advised to maintain strict food hygiene and adhere to local health guidelines under these conditions.

Agriculture

Above-normal rainfall is forecasted for the central parts and the south-eastern coastal areas of the country during early and mid-summer seasons. This above-normal rainfall forecast for these summer rainfall regions will likely have a positive impact on crop and livestock production. However, below-normal rainfall is expected over most parts of the north-eastern areas of the country including Limpopo, Mpumalanga, and northern parts of KwaZulu-Natal Province. Therefore, it is recommended that the relevant decision-makers advise farmers in these regions to implement soil and water conservation measures, proper water harvesting and storage techniques, establish effective drainage systems, and adopt 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 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 SAWS and two models from the NMME. Other useful links for seasonal forecasts are:

- http://www.weathersa.co.za/home/seasonal (Latest predictions from the 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)

Appendix – Verification

The following three figures show the Relative Operating Characteristic (ROC) scores for the relevant multi-model forecasts in the main document. The ROC scores are commonly used in seasonal forecasts to determine the areas where the forecasts perform well, so that the user can make more informed decisions on using the given forecast. As a general guideline, a score over 0,5 is technically better than chance, however, scores around and higher than 0,6 are considered to have significant skill to add confidence to the forecast.

From the figures there will be two ROC scores per season per variable, which indicate the score when a certain rainfall or temperature category is favoured. For example, if an area is favoured to receive above-normal rainfall, then the ROC score to look at would be the one calculated for the above-normal category (right side of the figures below). Also, make sure to look at the correct corresponding seasons indicated in the title of each map.

The aim of these maps is to add (or remove) confidence of a particular forecast over certain areas for specific seasons. Seasonal model skill over South Africa can be highly variable, highlighting the importance of knowing exactly where the forecasting system generally performs well or where it may struggle. It is important to note that the maps do not indicate where the current forecast will be correct or incorrect, but rather highlights confidence levels in the forecasting system.

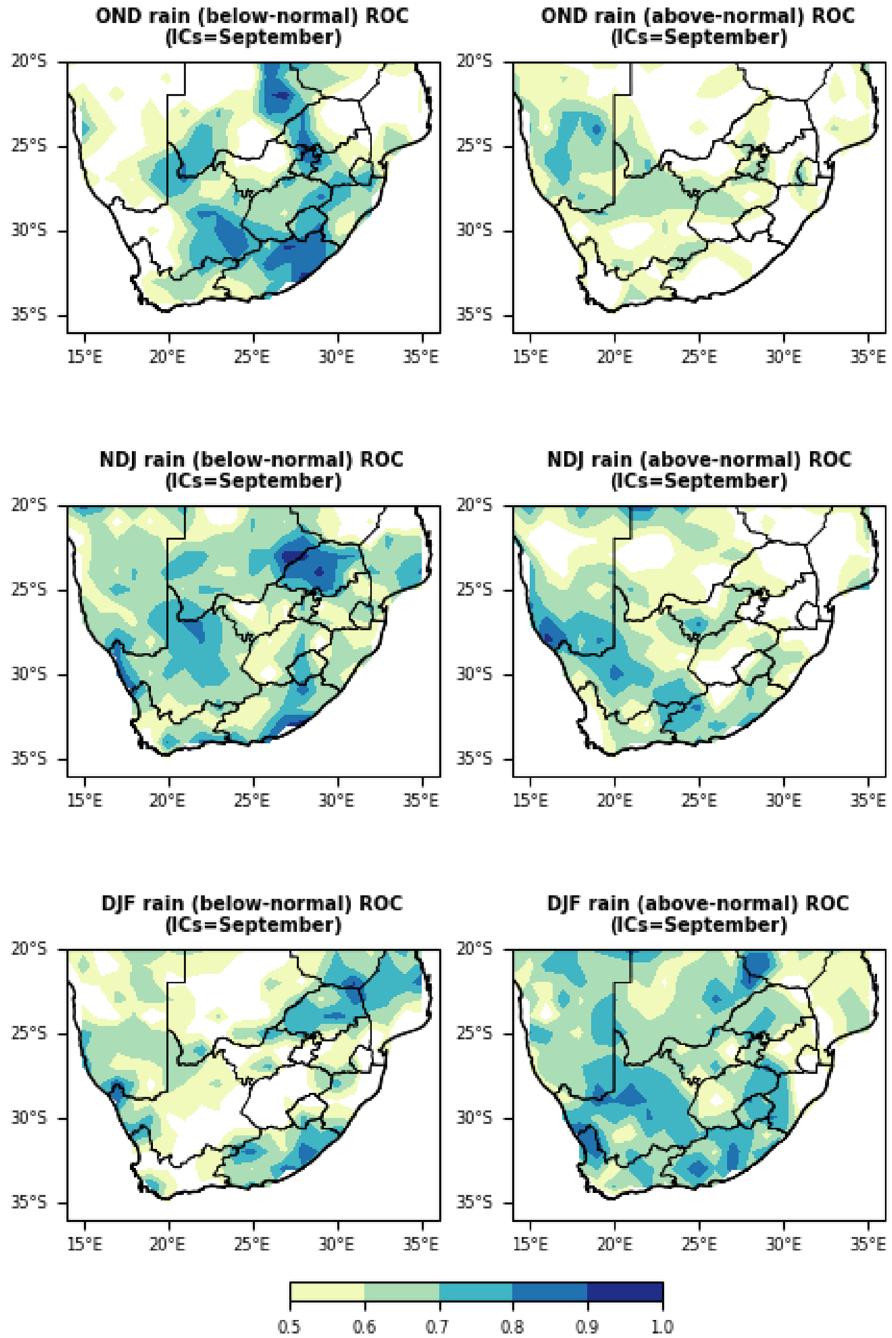

Figure A1: ROC scores for rainfall relevant to the current forecasts in Figure 3.

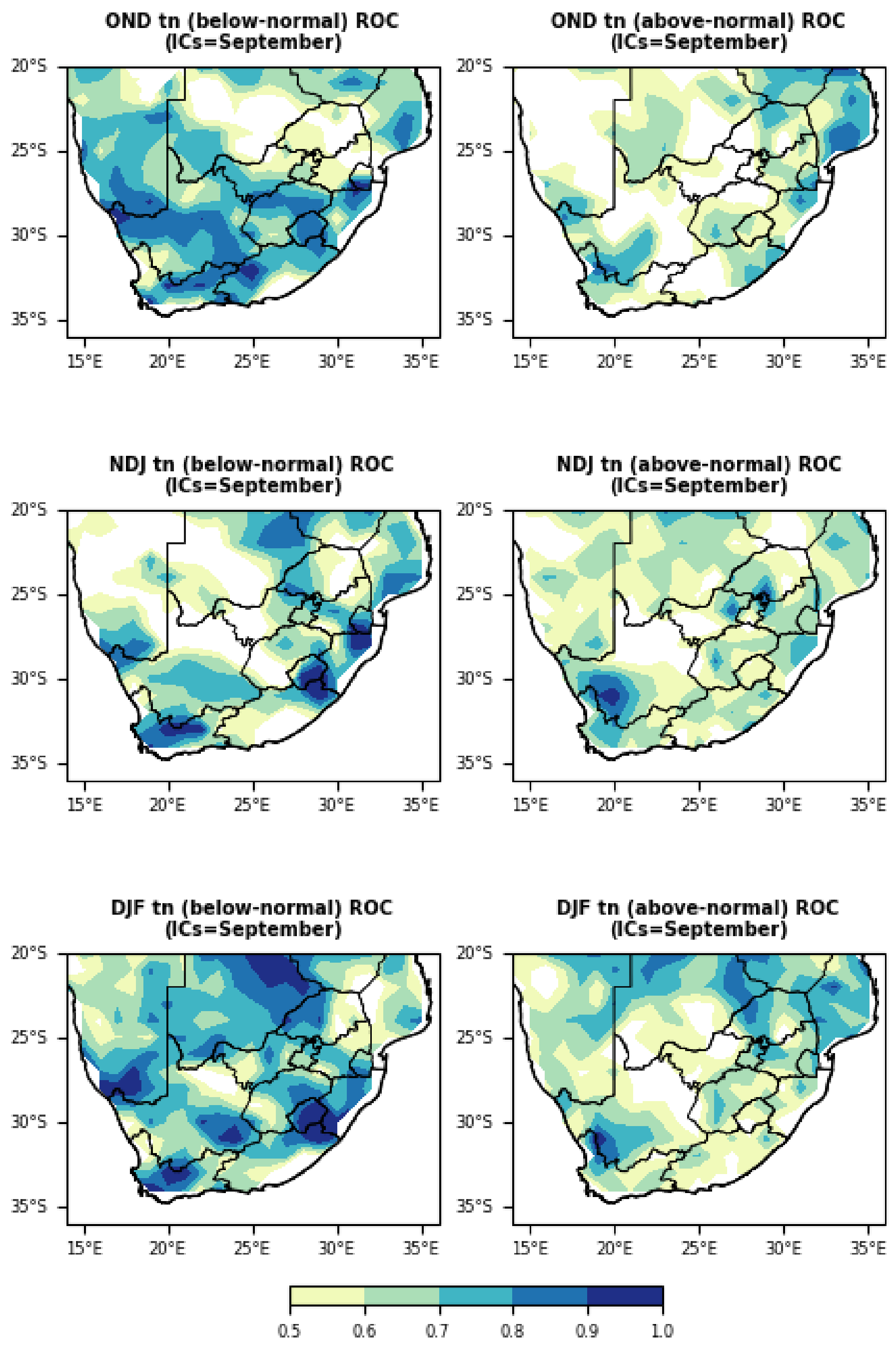

Figure A2: ROC scores for minimum temperatures relevant to the current forecasts in Figure 4.

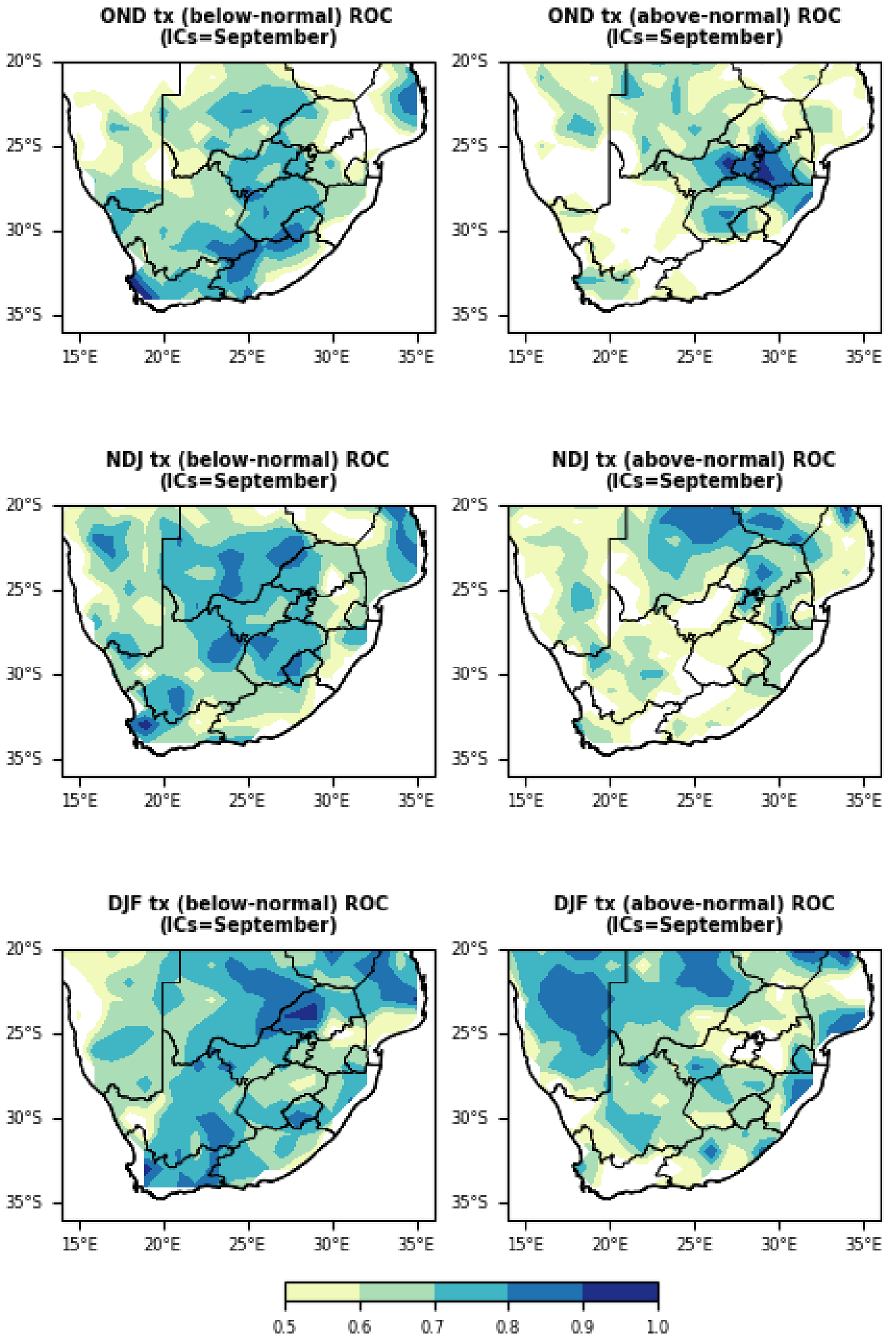

Figure A3: ROC scores for maximum temperatures relevant to the current forecasts in Figure 5.

Appendix – District Information

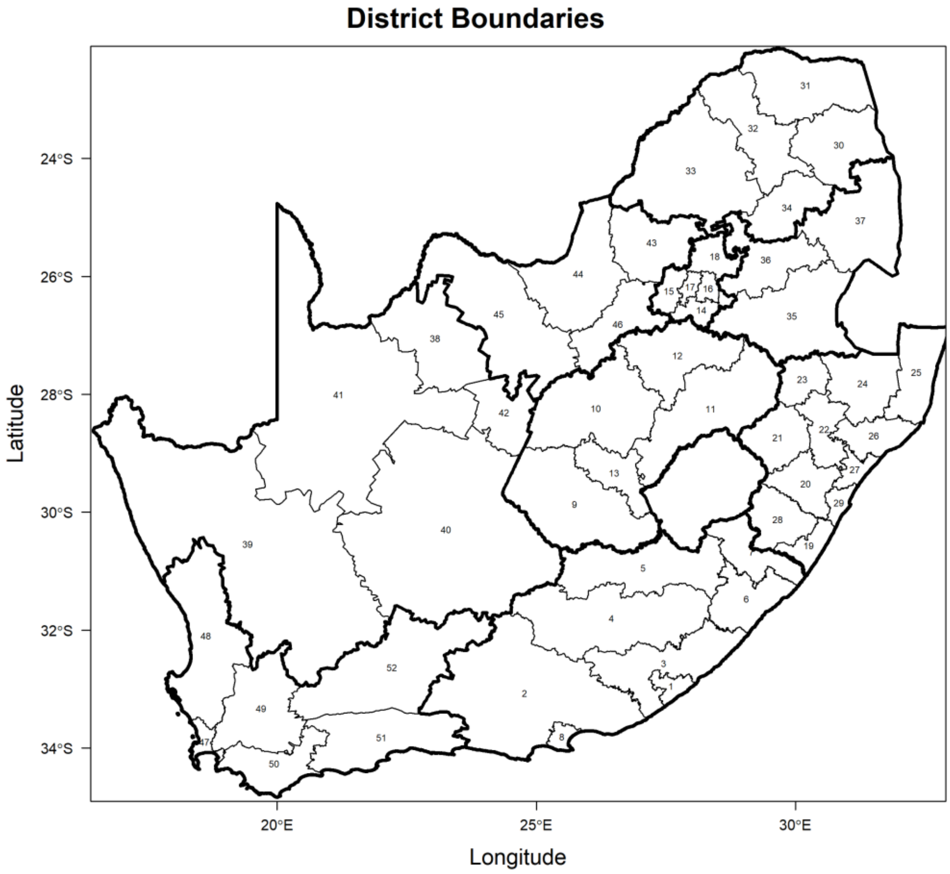

Figure A4: Local District Map with numbers corresponding to the table below with names.

Table with District Names and Numbers

Nr.	District Name	Nr.	District Name	Nr.	District Name	Nr.	District Name
1	Buffalo City	16	Ekurhuleni	31	Vhembe	46	Dr Kenneth Kaunda
2	Sarah Baartman	17	City of Johannesburg	32	Capricorn	47	City of Cape Town
3	Amathole	18	City of Tshwane	33	Waterberg	48	West Coast
4	Chris Hani	19	Ugu	34	Sekhukhune	49	Cape Winelands
5	Joe Gqabi	20	Umgungundlovu	35	Gert Sibande	50	Overberg
6	O.R.Tambo	21	Uthukela	36	Nkangala	51	Garden Route
7	Alfred Nzo	22	Umzinyathi	37	Ehlanzeni	52	Central Karoo
8	Nelson Mandela Bay	23	Amajuba	38	John Taolo Gaetsewe		
9	Xhariep	24	Zululand	39	Namakwa		
10	Lejweleputswa	25	Umkhanyakude	40	Pixley ka Seme		
11	Thabo Mofutsanyane	26	King Cetshwayo	41	Z F Mgcawu		
12	Fezile Dabi	27	iLembe	42	Frances Baard		
13	Mangaung	28	Harry Gwala	43	Bojanala		
14	Sedibeng	29	eThekwini	44	Ngaka Modiri Molema		
15	West Rand	30	Mopani	45	Dr Ruth Segomotsi Mompati		