Seasonal Climate Watch

May to September 2018

Date issued: May 04, 2018

1. Overview

The El Niño-Southern Oscillation (ENSO) is expected to weaken from a moderate La Niña phase to a neutral phase through to early spring (Aug-Sep-Oct). Forecasts currently suggest that there is a high likelihood of an El Niño developing for early summer (Nov-Dec-Jan), however these forecasts tend to be less accurate during periods leading up to summer and it is advised that no drastic planning be made for the summer rainfall areas until such a time as there is more certainty in the forecast (usually during Sep/Oct).

There are still indications for above-normal rainfall during early winter (May-Jun-Jul) through to late winter (Jul-Aug-Sep), however late winter does not indicate sufficient confidence in the forecasting system and thus remains very uncertain.

Number of rainfall days are expected to be higher than normal for the winter rainfall areas. This increase in rainfall days are only expected to be more frequent rather than extremely high rainfall amounts. It should be noted however that there is not sufficient confidence in the forecasting system for these forecasts, thus there is very high uncertainty in the rainfall intensity for the winter rainfall areas.

Temperatures generally still indicate lower temperatures during early-, mid- and late-winter for the north-eastern parts of the country, and higher temperatures for the south-western parts of the country during the same period.

The South African Weather Service will continue to monitor and provide updates of any future assessments that may provide more clarity on the current expectations for the coming seasons.

2. South African Weather Service Prediction Systems

2.1. Ocean-Atmosphere Global Climate Model

The South African Weather Service (SAWS) is currently recognised by the World Meteorological Organization (WMO) as the 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 (Mar-Apr-May) predictions for rainfall (Figure 1) and average temperature (Figure 2).

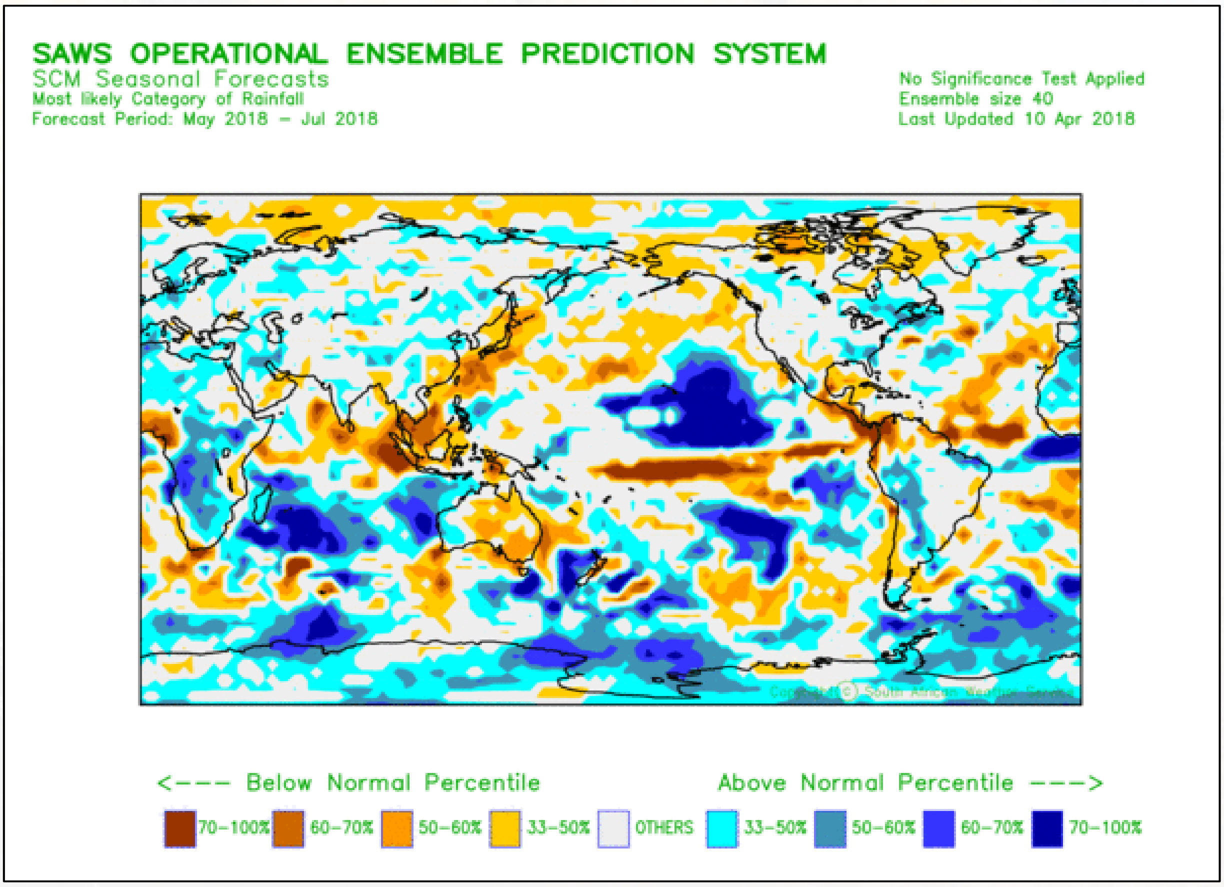

Figure 1: May-June-July global prediction for total rainfall probabilities.

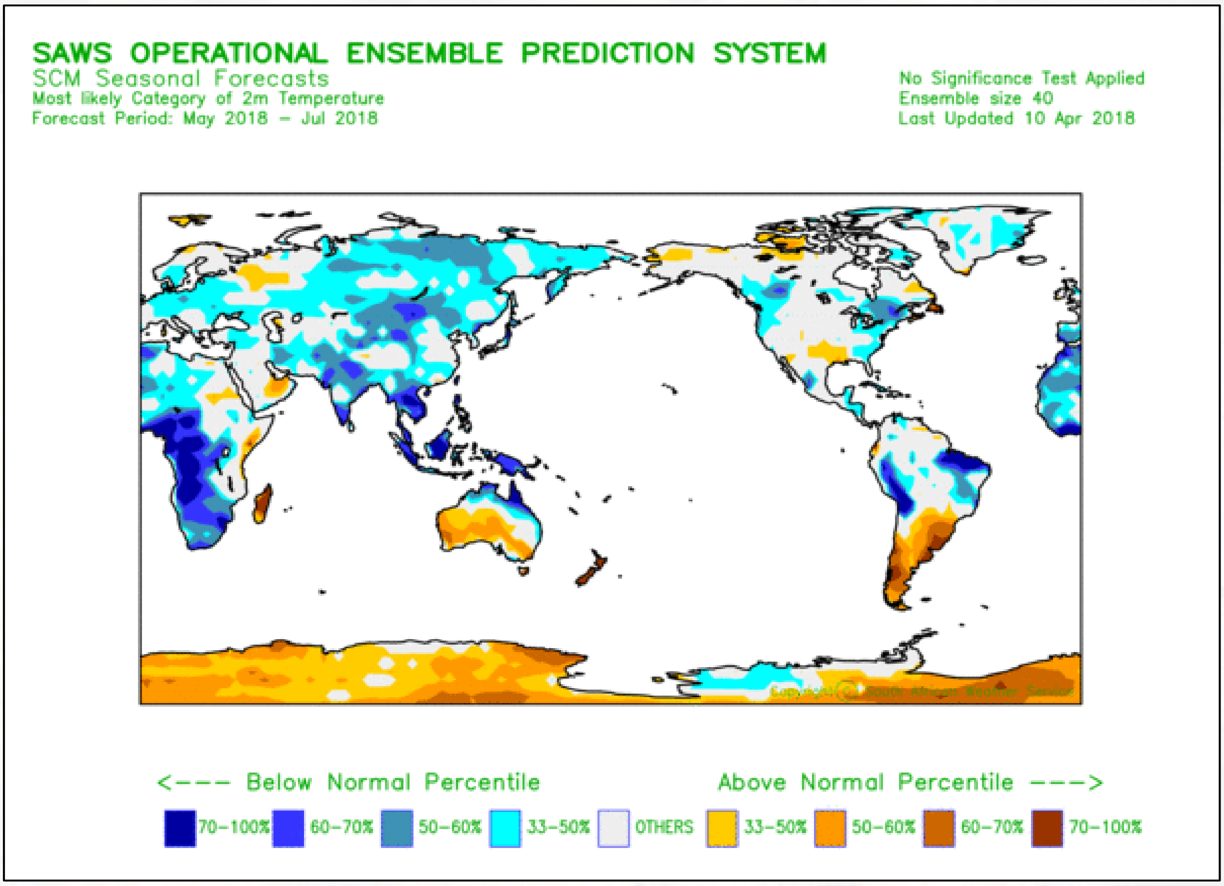

Figure 2: May-June-July global prediction for average temperature probabilities.

It is worth mentioning that the SCM levels of skill for the Nino 3.4 region (where ENSO information is sourced) are very much comparable to other state-of-the-art coupled models which are administered by other international centres. Therefore the following Sea-Surface Temperature (SST) forecast (Figure 3) emanates from the SST Prediction System which is purely based on the SCM.

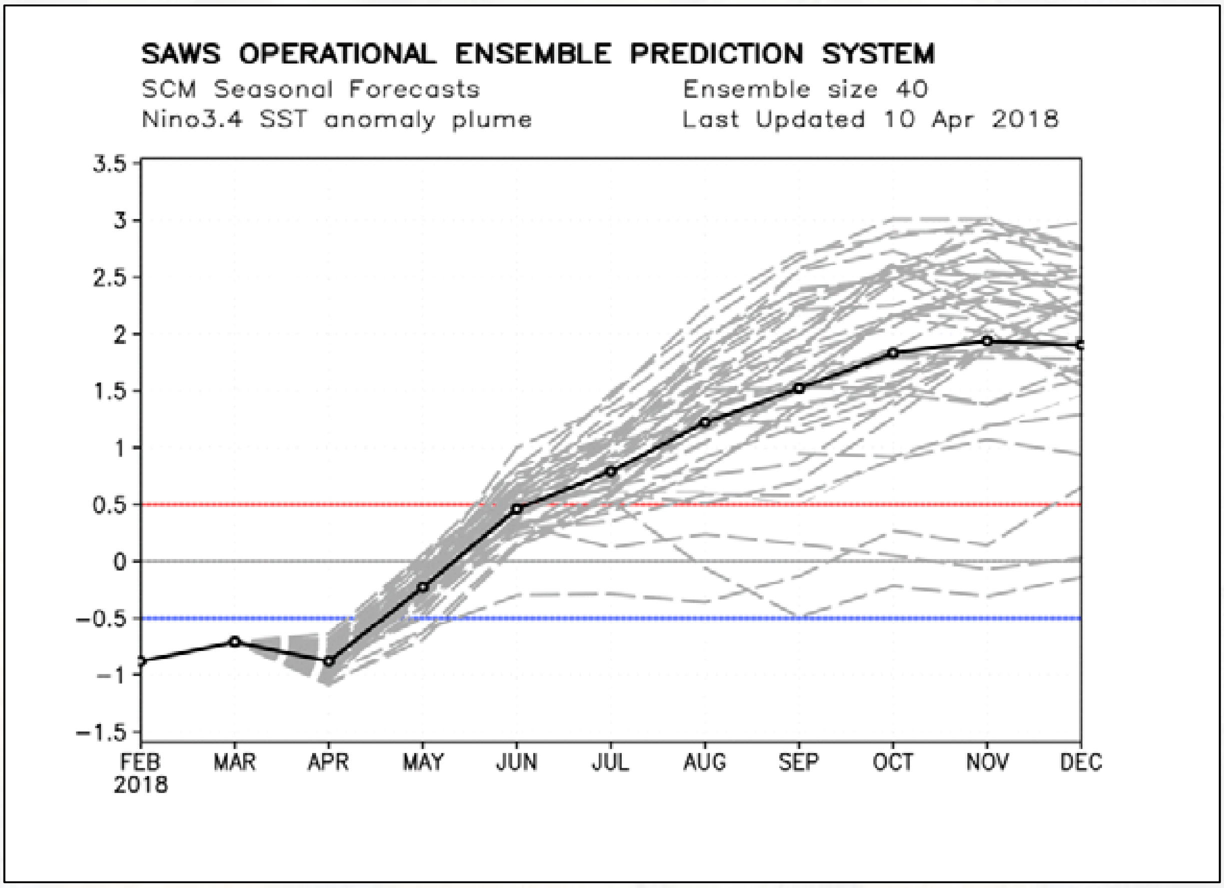

Figure 3: Niño3.4 SST anomaly forecasts produced by the SST forecast system administered by the SAWS. It comprises 40 ensemble members (marked in grey colour). The mean of the ensemble is marked in black.

2.2. Multi-Model Statistical Downscaling System

2.2.1. Seasonal Totals and Averages

In an effort to improve the predictions made by the SCM, which struggles to produce reliable rainfall and temperatures forecasts at a local scale, the Multi-Model System (MMS) has been implemented to statistically downscale various global forecasts, including the SCM and the Climate Forecasting System version 2 (CFSv2) administered by the National Oceanographic and Atmospheric Administration (NOAA).

Below are the current three season forecasts issued in Feb 2018. Three maps are shown for each season which includes the raw probabilistic prediction from the MMS (left), the probabilistic prediction with skill masked out (middle) and the climatological average (right) for the specific season. *The user is advised to consider the skill masked map (middle) as the official SAWS forecast, however the two additional maps may be used as tools in such a case where skill for a specific area is deemed insufficient.*

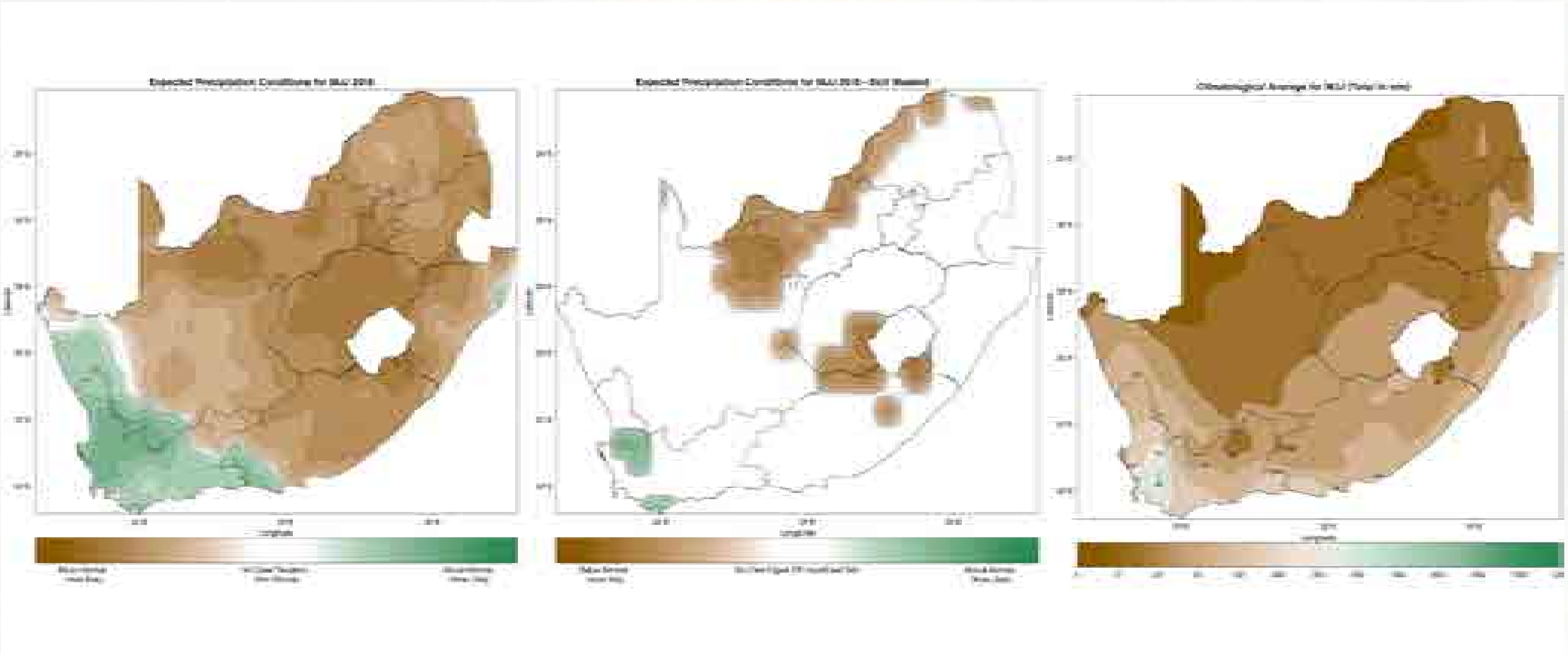

Figure 4: *May-June-July (MJJ) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for MJJ (right, in mm) calculated over the period 1979-2009.*

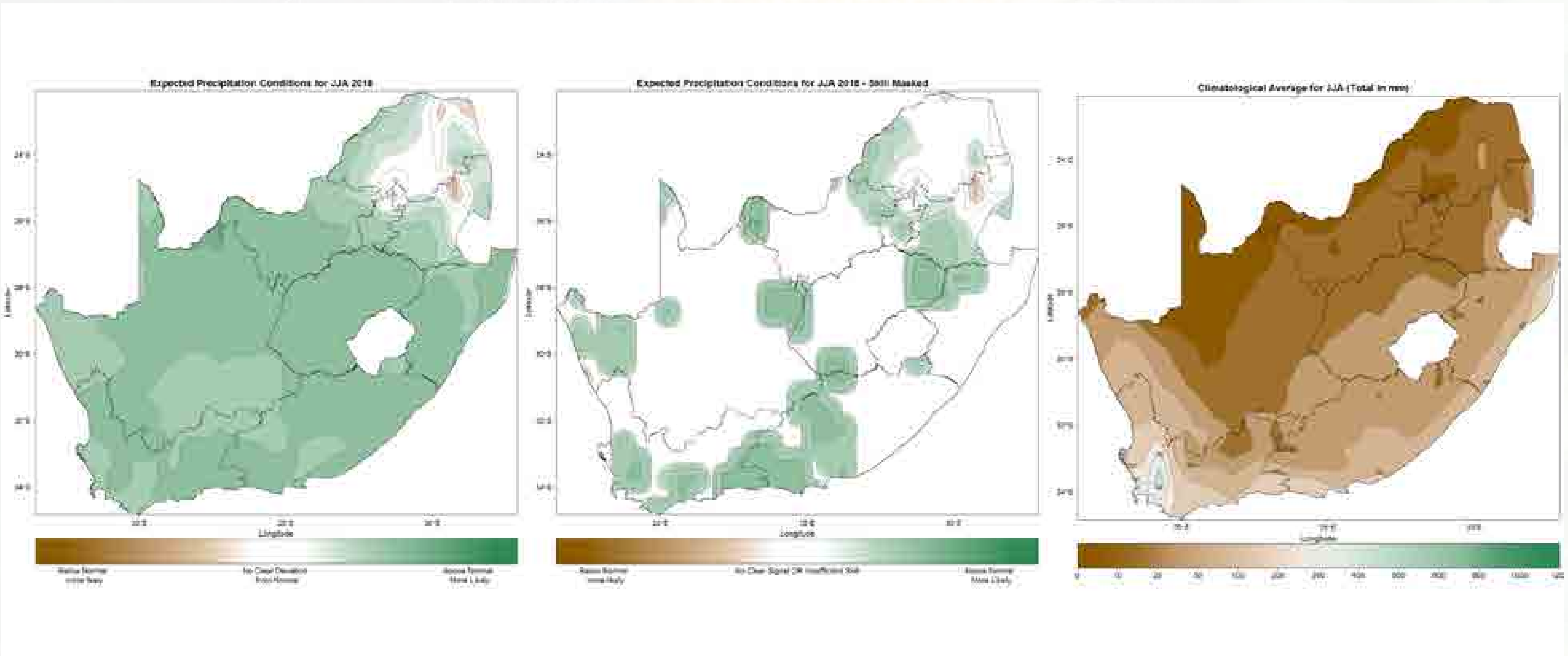

Figure 5: *June-July-August (JJA) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JJA (right, in mm) calculated over the period 1979-2009.*

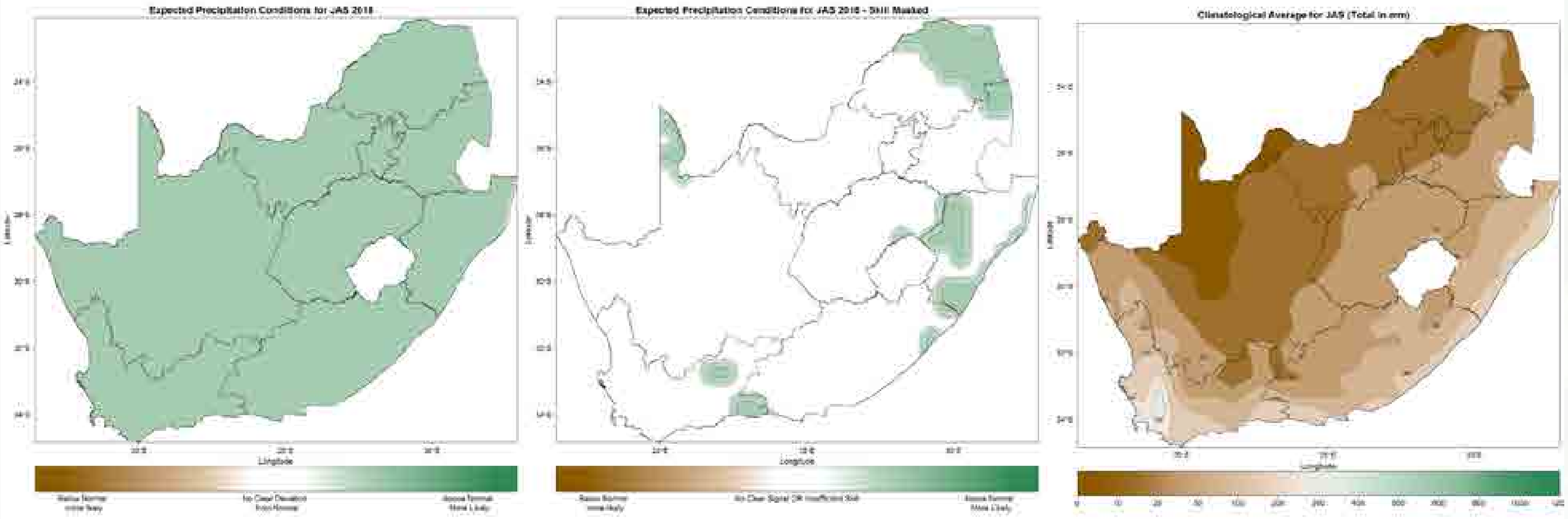

Figure 6: *July-August-September (JAS) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JAS (right, in mm) calculated over the period 1979-2009.*

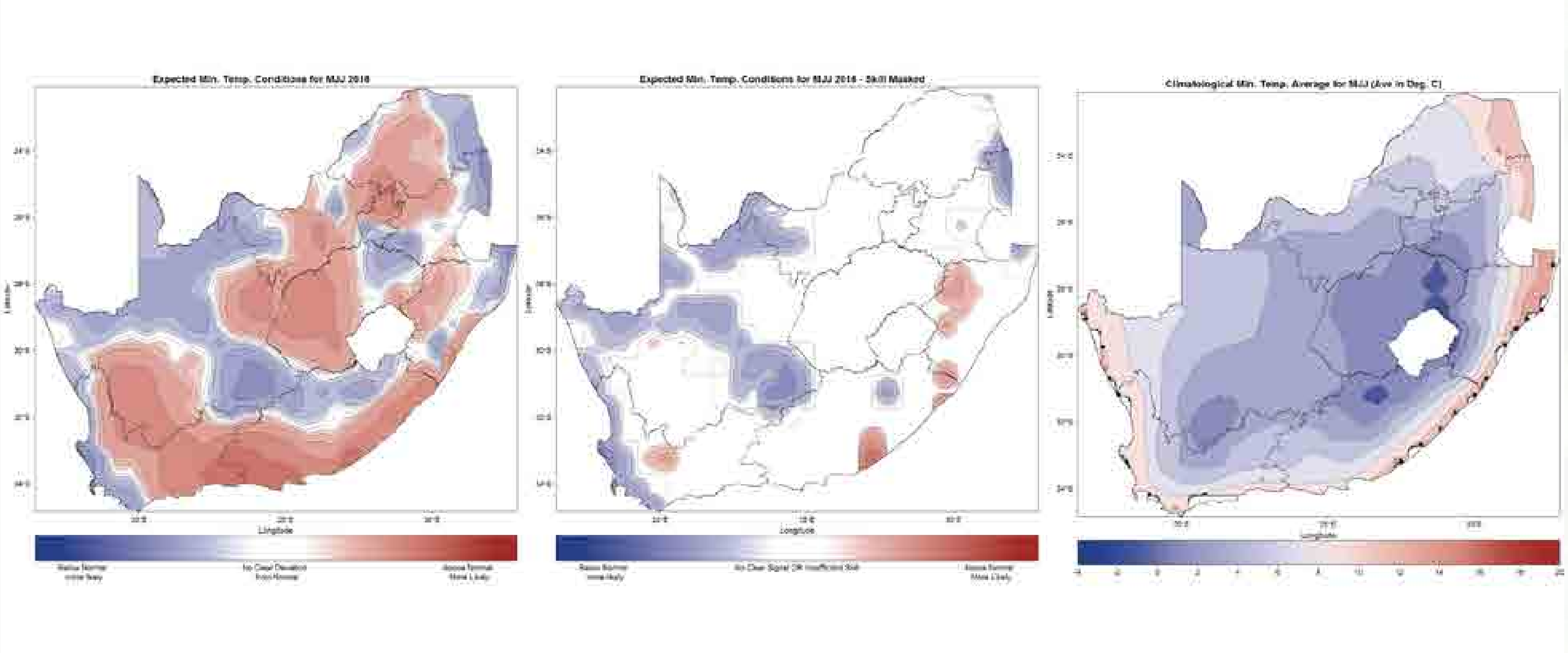

Figure 7: *May-June-June (MJJ) 2018 seasonal minimum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for MJJ (right) calculated over the period 1979-2009.*

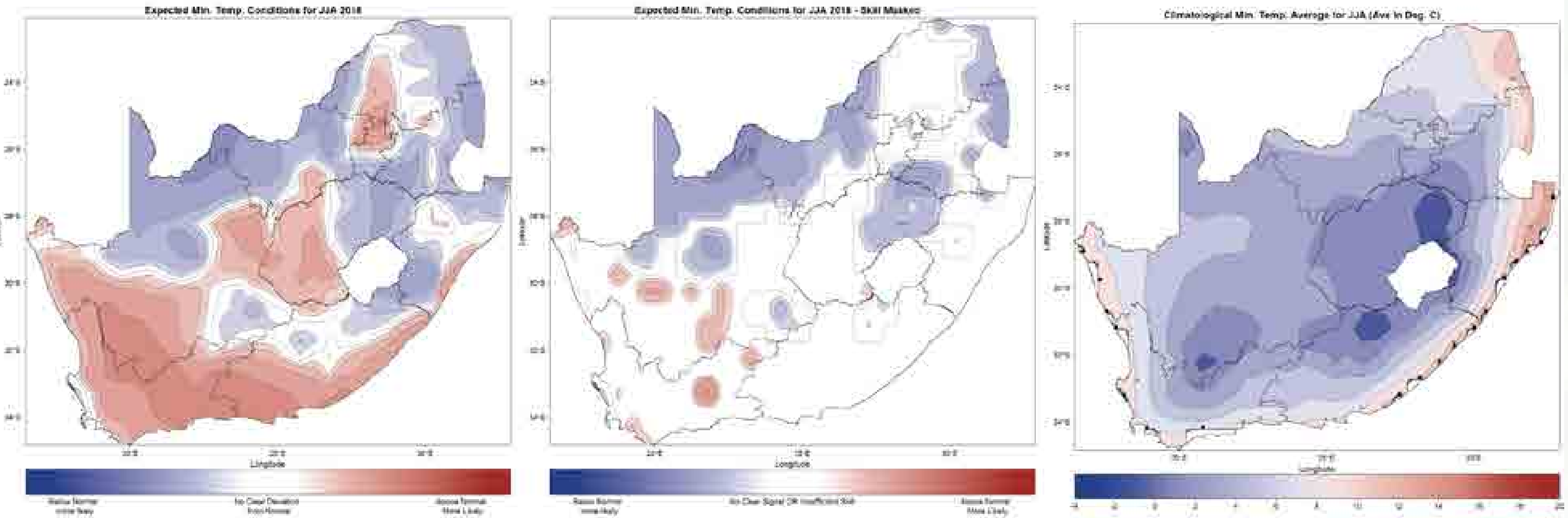

Figure 8: *June-July-August (JJA) 2018 seasonal minimum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JJA (right) calculated over the period 1979-2009.*

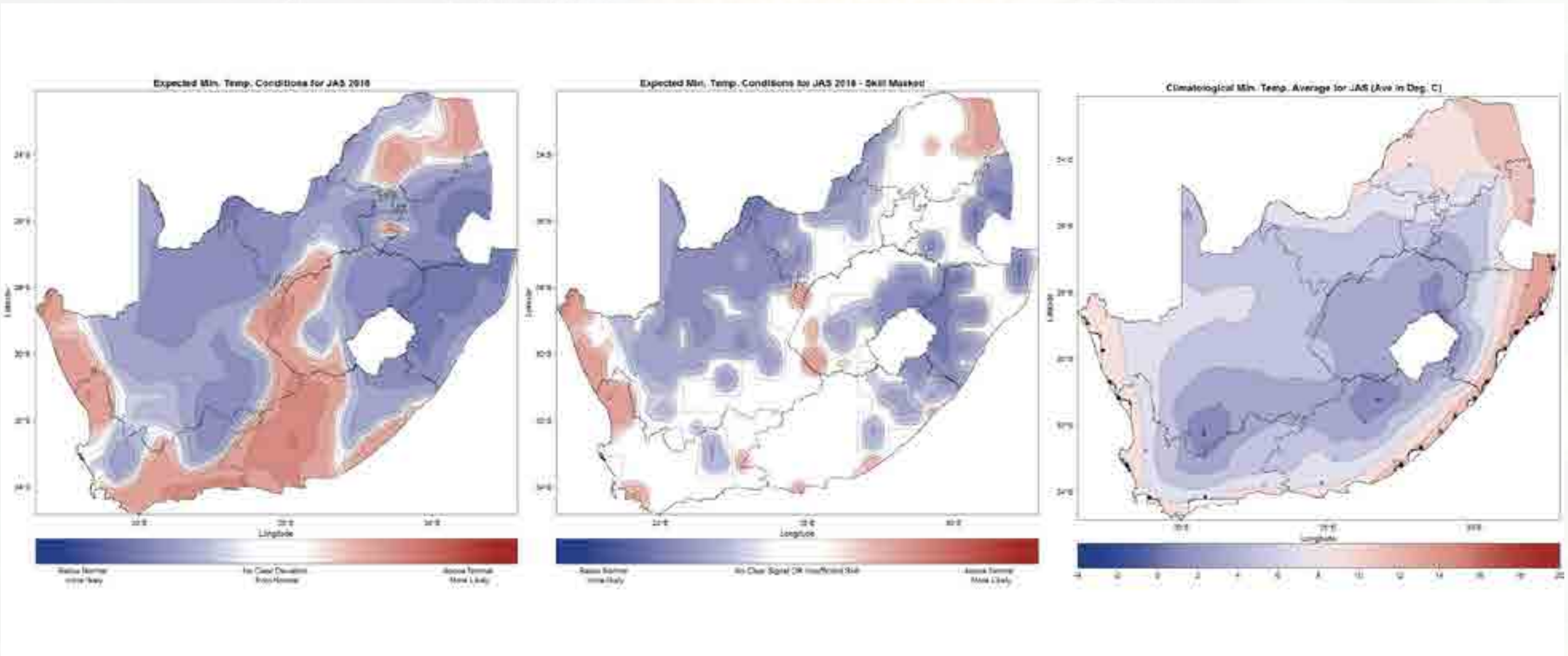

Figure 9: *July-August-September (JAS) 2018 seasonal minimum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JAS (right) calculated over the period 1979-2009.*

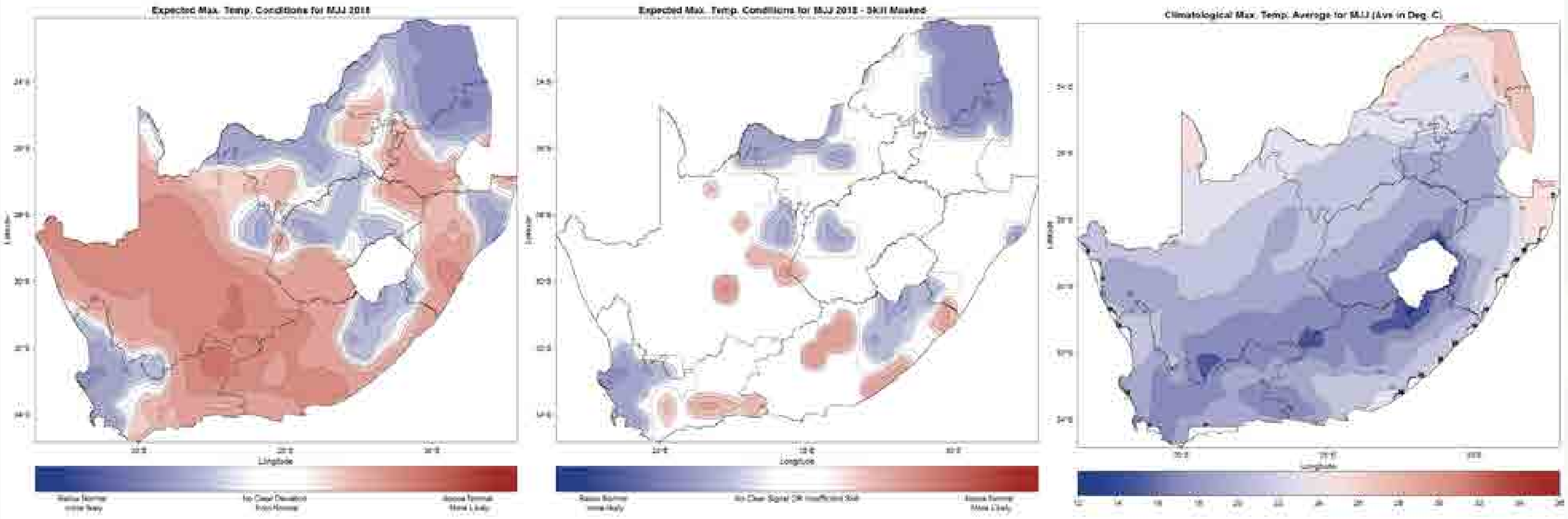

Figure 10: *May-June-July (MJJ) 2018 seasonal maximum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for MJJ (right) calculated over the period 1979-2009.*

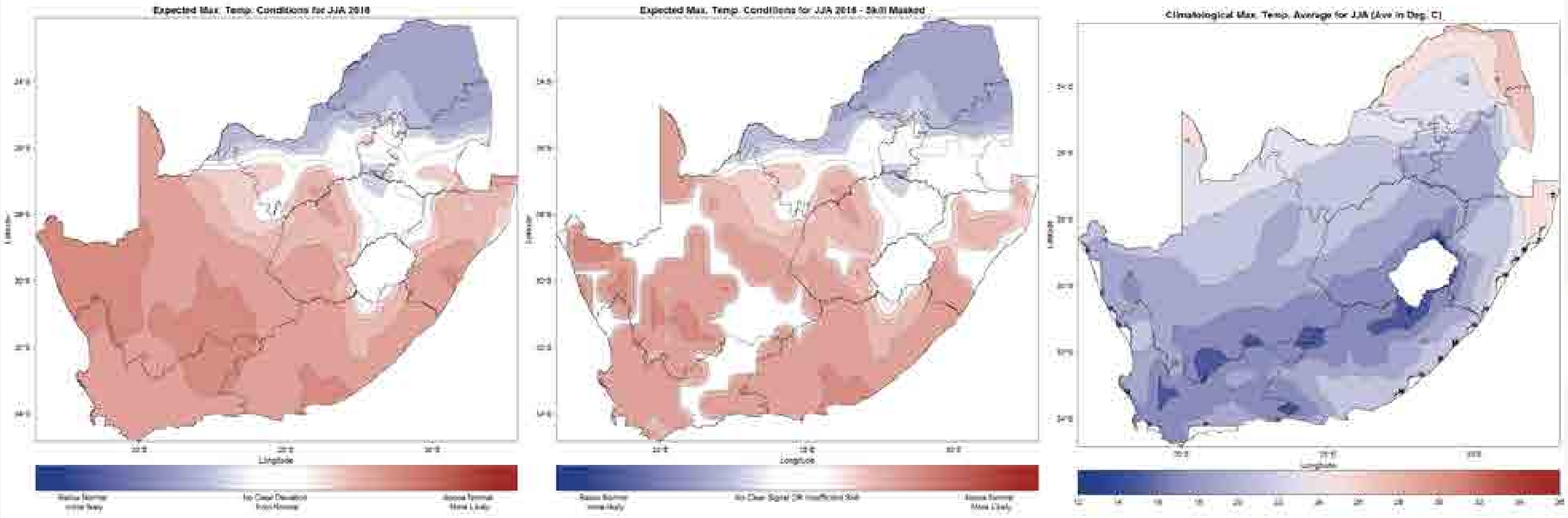

Figure 11: June-July-August (JJA) 2018 seasonal maximum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JJA (right) calculated over the period 1979-2009.

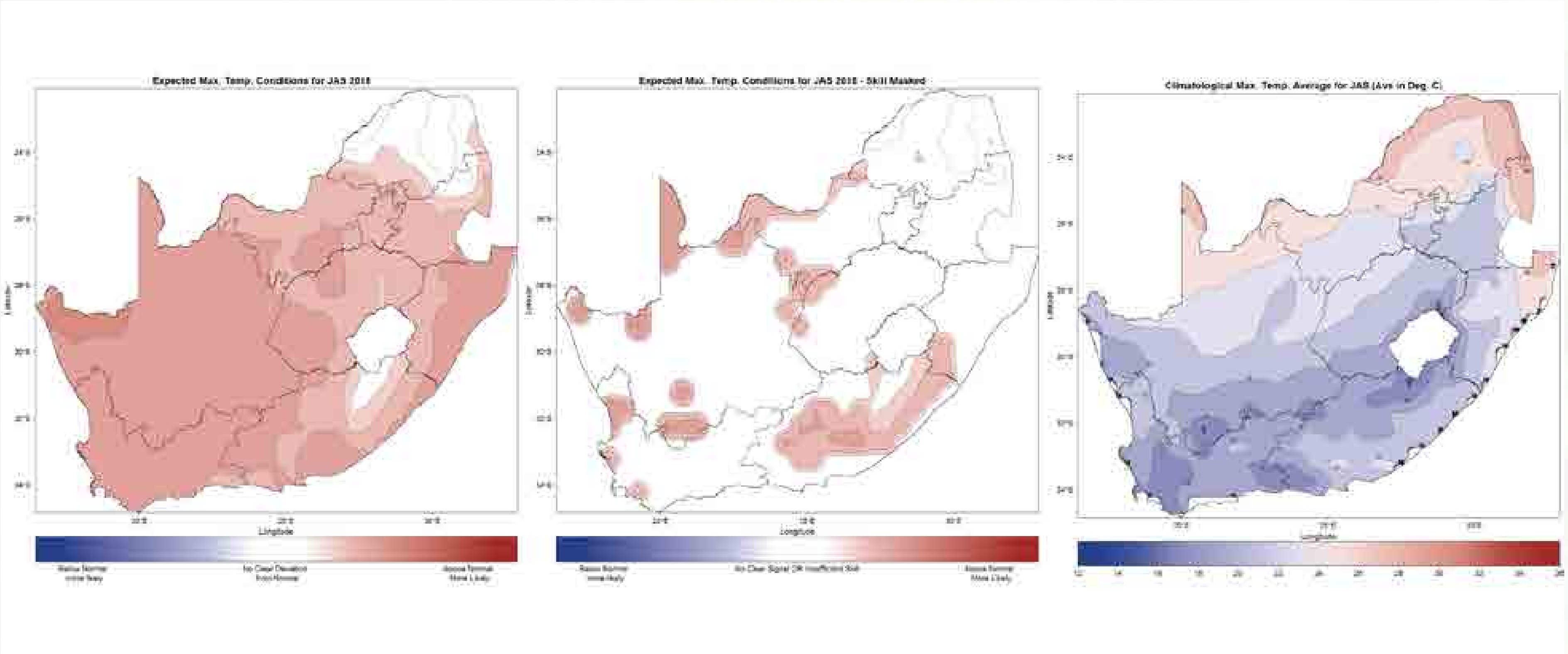

Figure 12: *July-August-September (JAS) 2018 seasonal maximum temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for JAS (right) calculated over the period 1979-2009.*

2.2.2. Rainfall Frequency Predictions

This product is a result of the SAWS operational multi-model system (MMS) where the 850hPa geopotential heights hindcast outputs are first statistically recalibrated and downscaled to observed number of rainfall days exceeding desired thresholds (derived from high resolution 0.1 X 0.1 degree (ARCv2) African Rainfall Climatology version 2 rainfall dataset) within seasons of interest over southern Africa by using model output statistics. The 850hPa geopotential heights are used here because they are found to be the best predictor of rainfall over southern Africa.

These forecasts can be used together with the traditional seasonal rainfall total forecasts in that it can indicate the frequency of rainfall days where seasonal rainfall forecast areas expects below- or above-normal conditions.

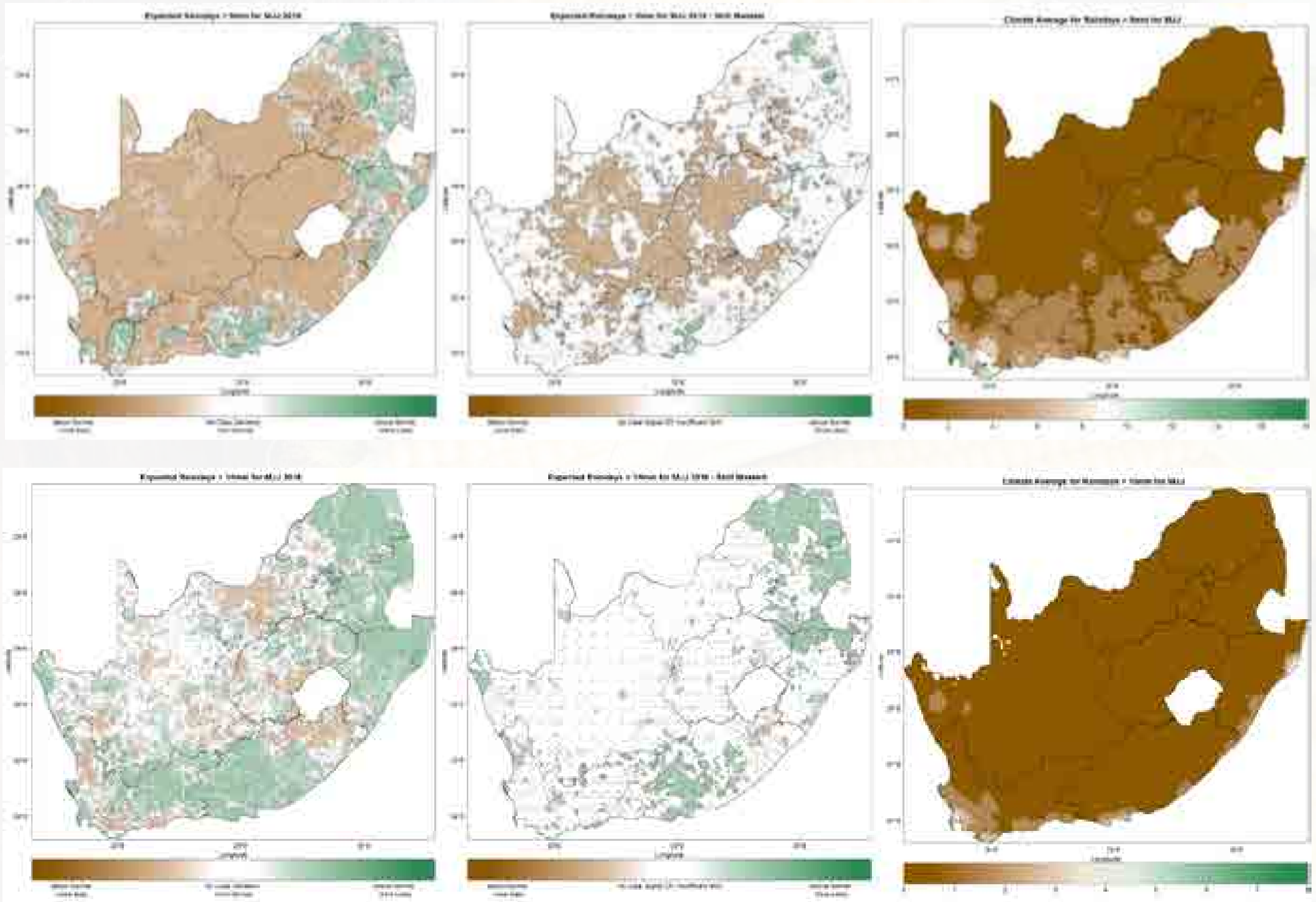

Figure 13: *May-June-July 2018 rainfall days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for high and low number of rainfall days exceeding 5 and 15mm calculated over the period 1983-2009.*

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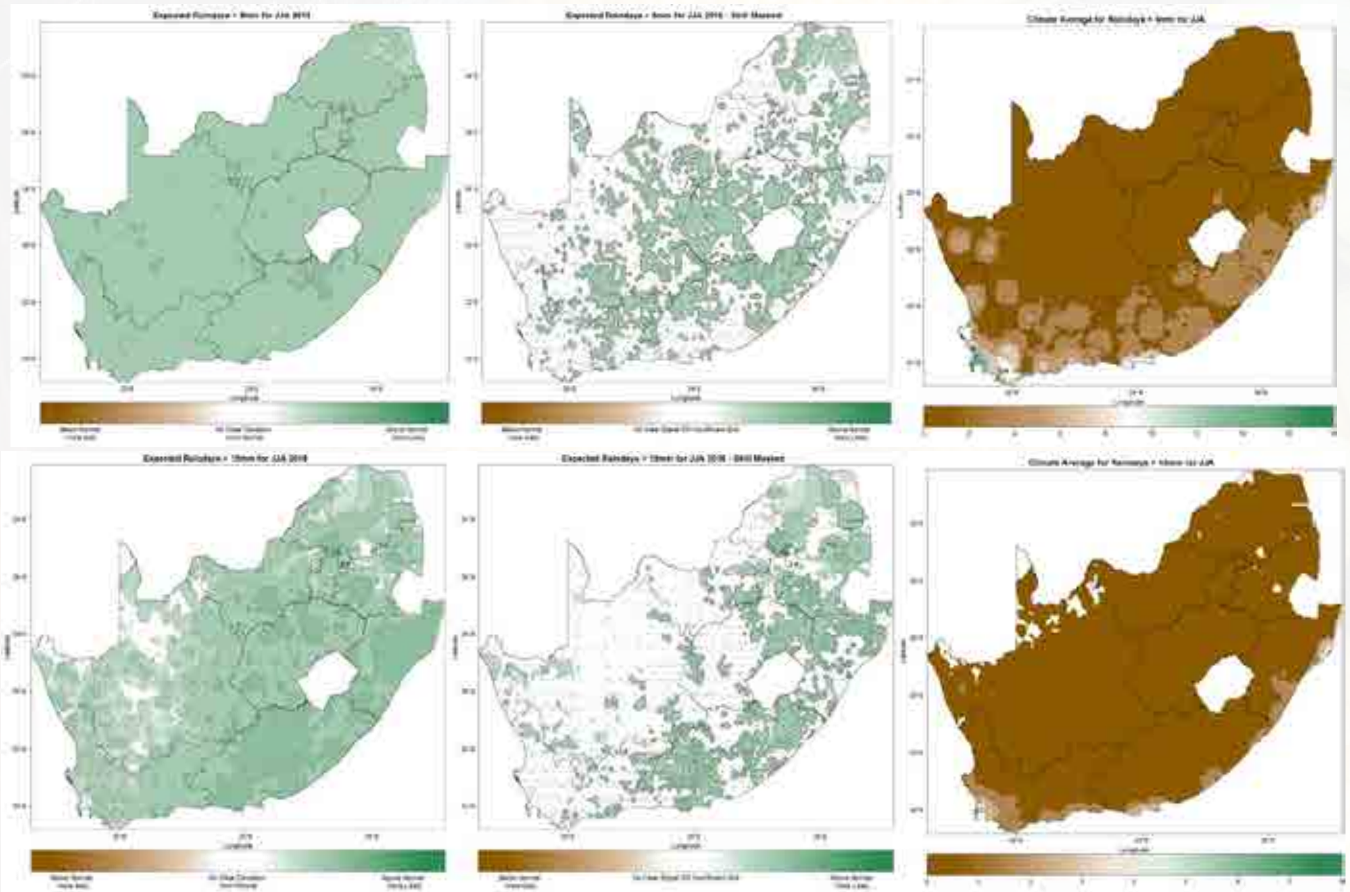

Figure 14: *June-July-August 2018 rainfall days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for high and low number of rainfall days exceeding 5 and 15mm calculated over the period 1983-2009.*

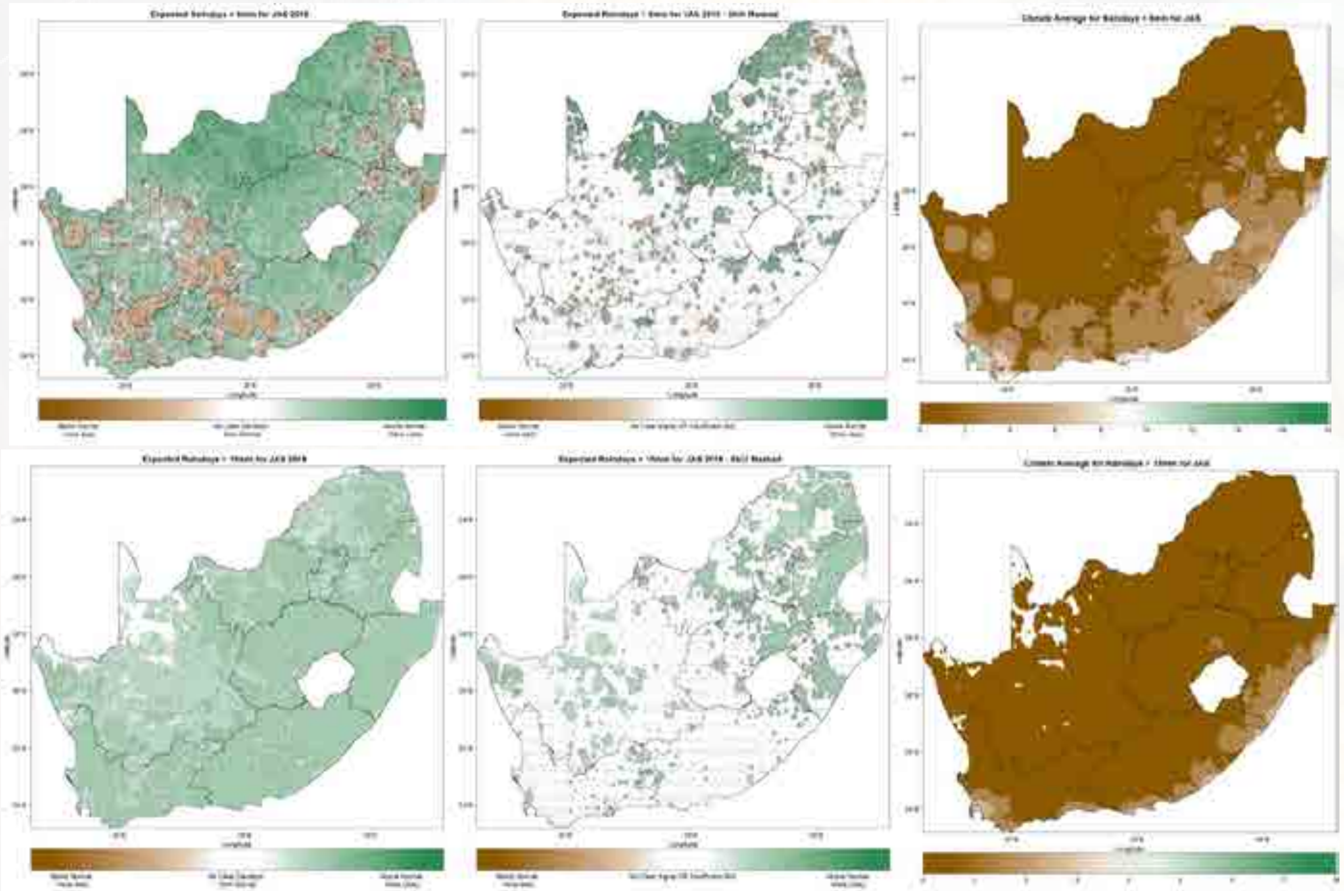

Figure 15: *July-August-September 2018 rainfall days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for high and low number of rainfall days exceeding 5 and 15mm calculated over the period 1983-2009.*

3. Contributing Institutions and Useful links

All the forecasts are a result of an objective multi-model prediction system developed at the South African Weather Service. This system consists of long-range forecasts produced by the following institutions:

http://www.weathersa.co.za/home/seasonal (Latest predictions including maps for the whole of SADC)

https://iri.columbia.edu/our-expertise/climate/forecasts/enso/current/ (ENSO predictions from various centres)