Seasonal Climate Watch

August to December 2018

Date issued: Jul 24, 2018

1. Overview

The El Niño-Southern Oscillation (ENSO) is still in a neutral phase and is expected to rise towards an El Niño phase through the spring period. The likelihood of an El Niño event occurring is increasing as we move towards spring, when confidence in ENSO forecasts also starts increasing. It is still too early to determine the potential impact of the predicted El Niño event; however, the typical effects are drier and warmer conditions for the summer rainfall areas during summer.

The forecasting system indicates confident forecasts for above-normal rainfall over the western coastal regions during early spring (Aug-Sep-Oct). Rainfall totals for these regions are however substantially lower than the mid-winter (Jun-Jul-Aug) seasons. There is some concern for the southern coastal regions as there has been below-normal forecasts with confidence since last month for spring (Sep-Oct-Nov). This area usually still receives significant rainfall during spring and has also been affected by a drought the past few years.

Late spring (Oct-Nov-Dec) forecasts show confident forecasts for above-normal rainfall over the eastern coastal areas, which is also supported by the forecast for an increased number of rainfall days in the area.

Overall higher temperatures are still expected moving towards the spring period. There is a particularly confident forecast for above-normal temperatures over the northern parts of the country.

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 (Aug-Sep-Oct) predictions for rainfall (Figure 1) and average temperature (Figure 2).

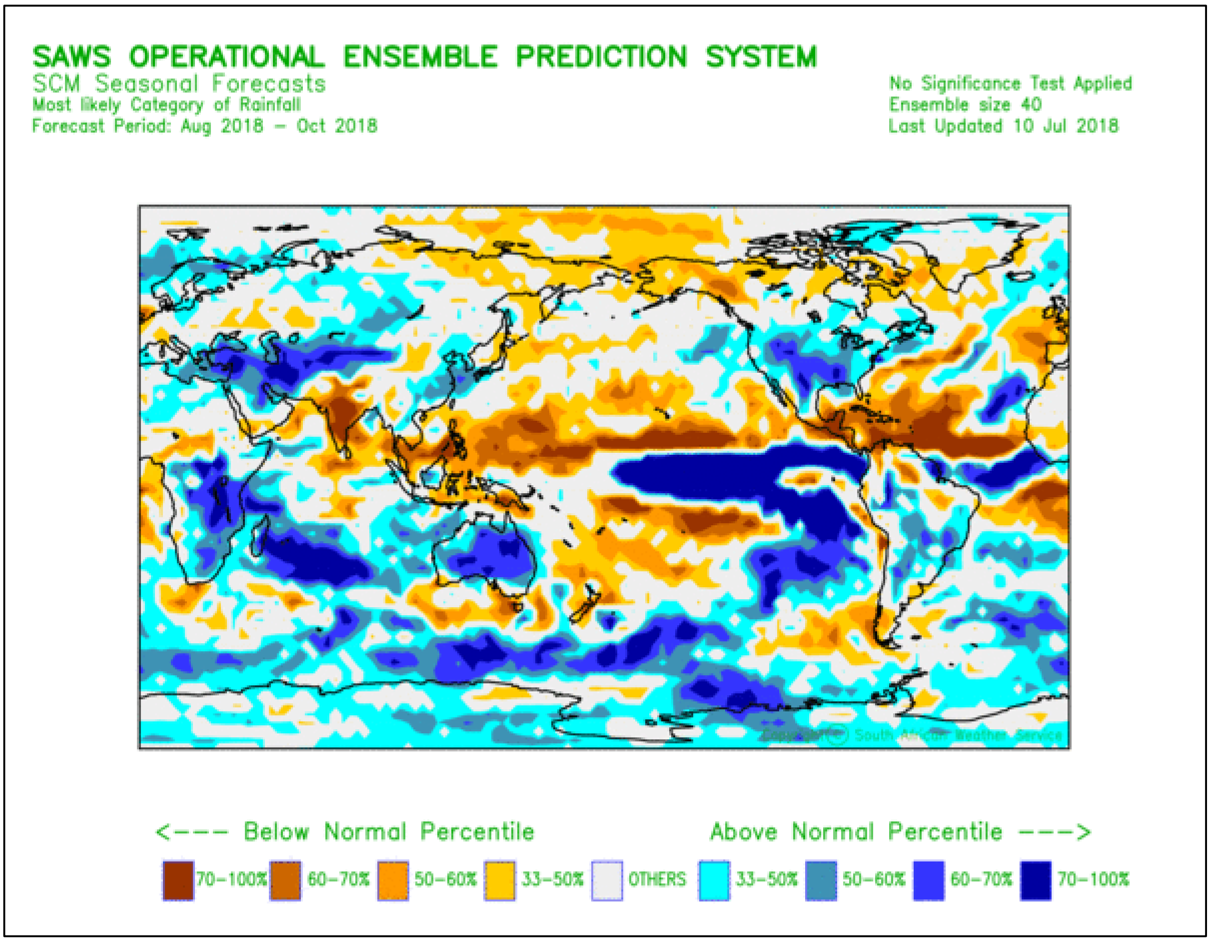

Figure 1: August-September-October global prediction for total rainfall probabilities.

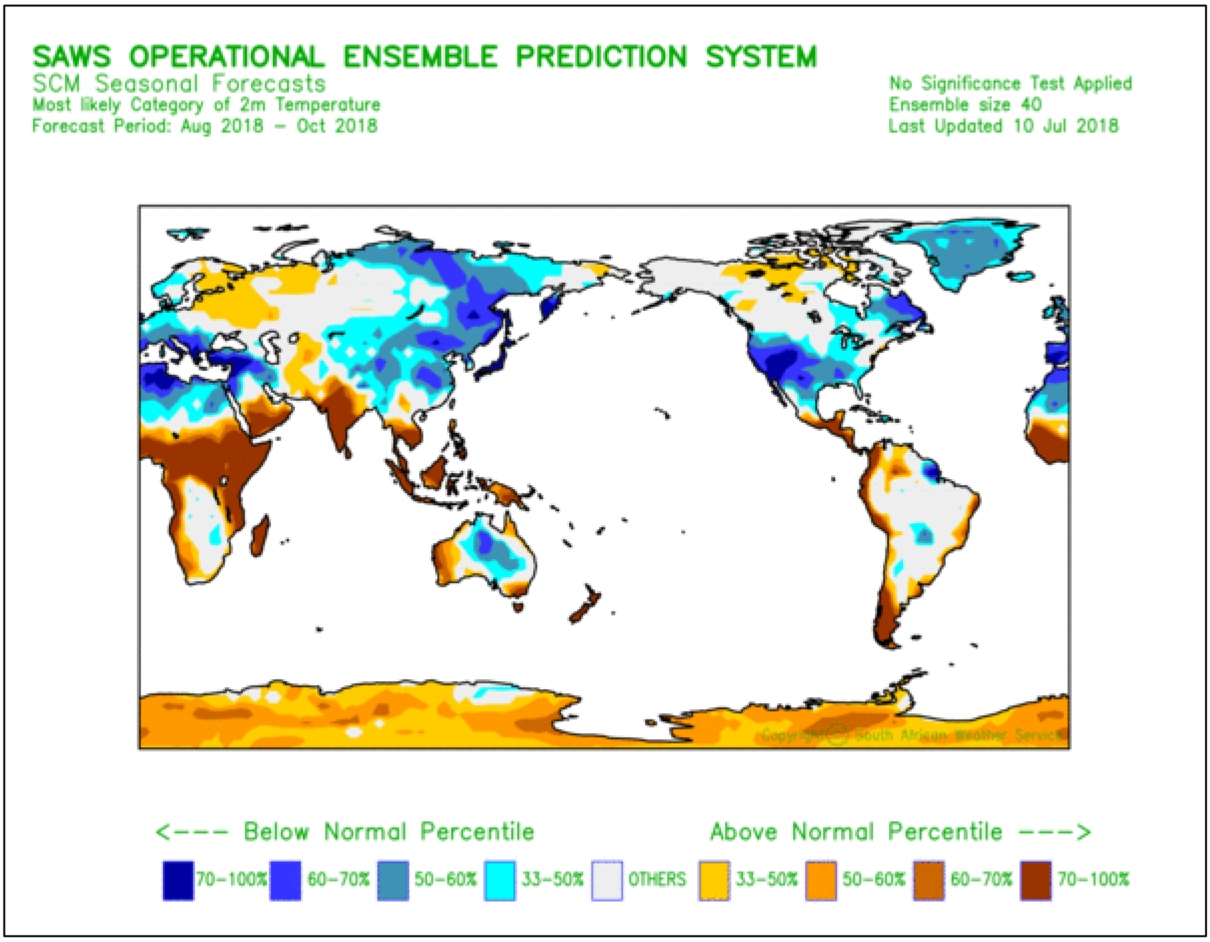

Figure 2: August-September-October global prediction for average temperature probabilities.

It is worth mentioning that the SCM levels of skill for the Niño 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.

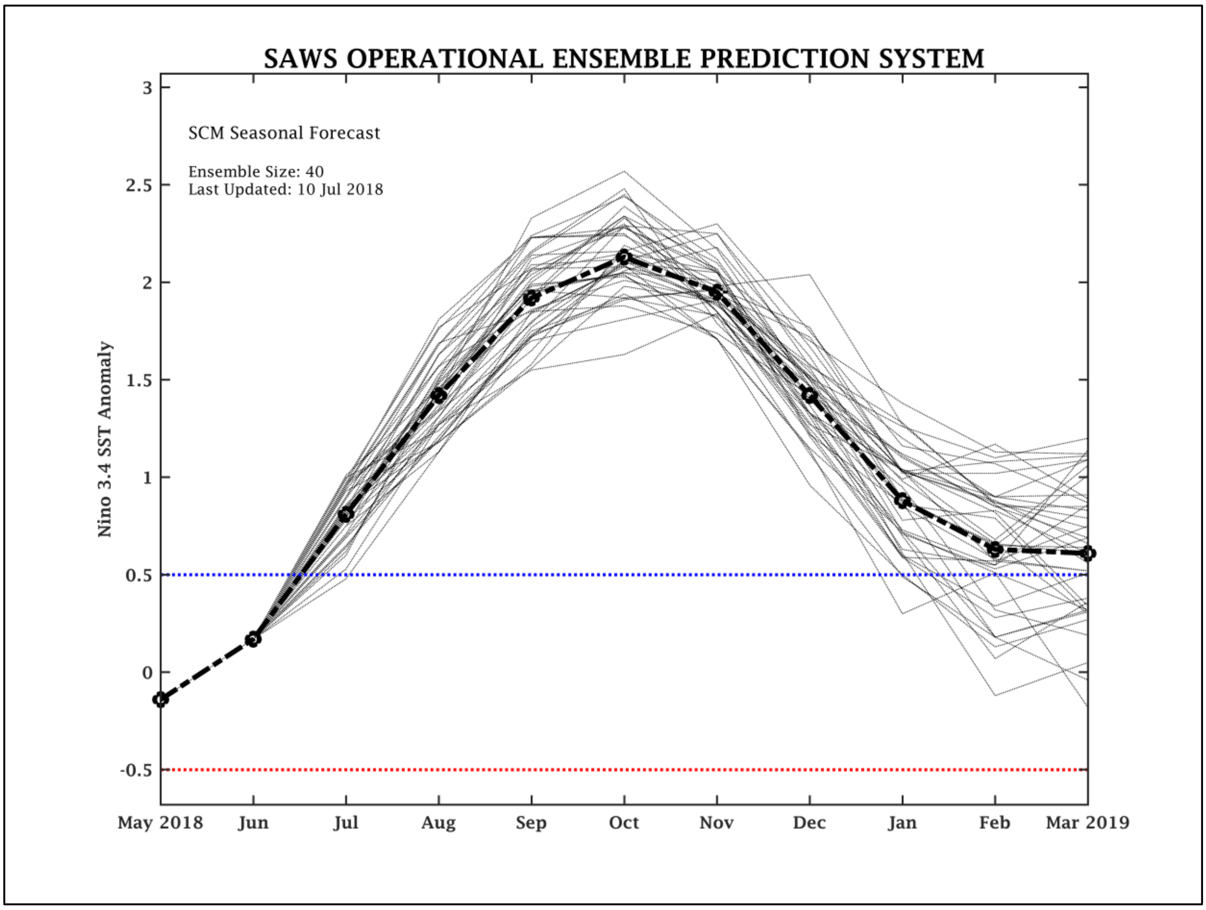

Figure 3: Niño3.4 SST anomaly forecasts produced by the SST forecast system administered by the SAWS. It comprises 40 ensemble members (marked in grey colour). The mean of the ensemble is marked in black.

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 temperature 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 July 2018. Three maps are shown for each season which include the raw MMS probabilistic prediction (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.*

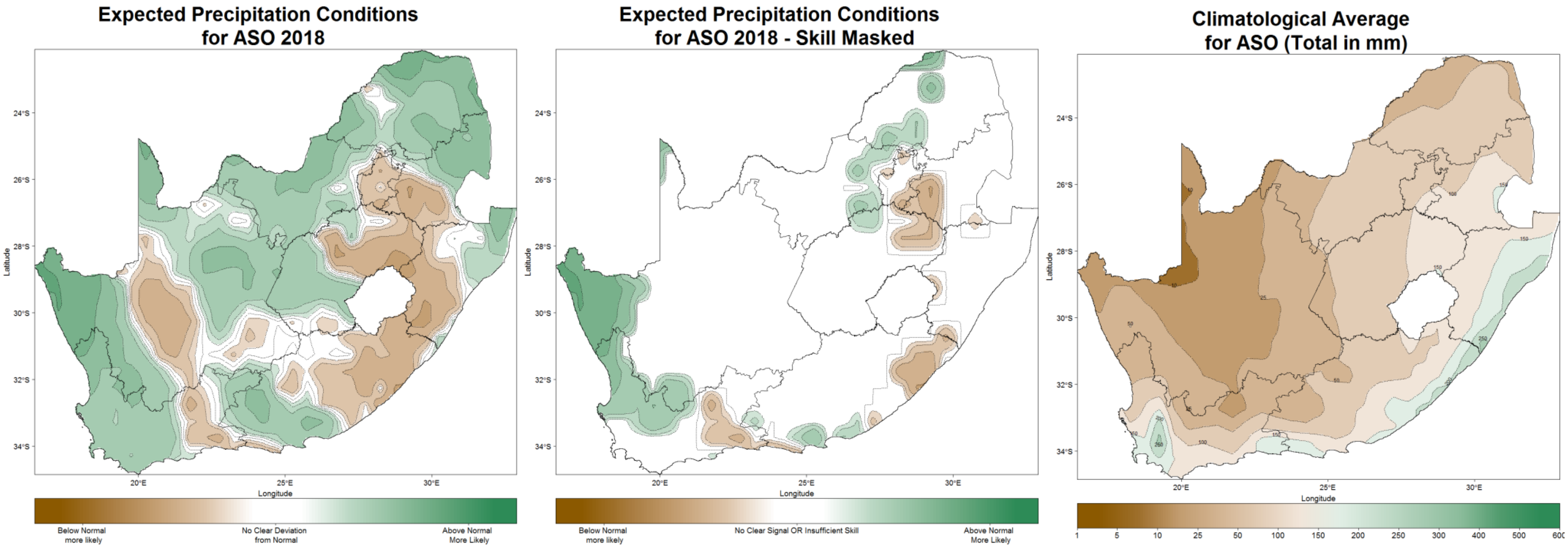

Figure 4: August-September-October (ASO) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right, in mm) calculated over the period 1979-2009.

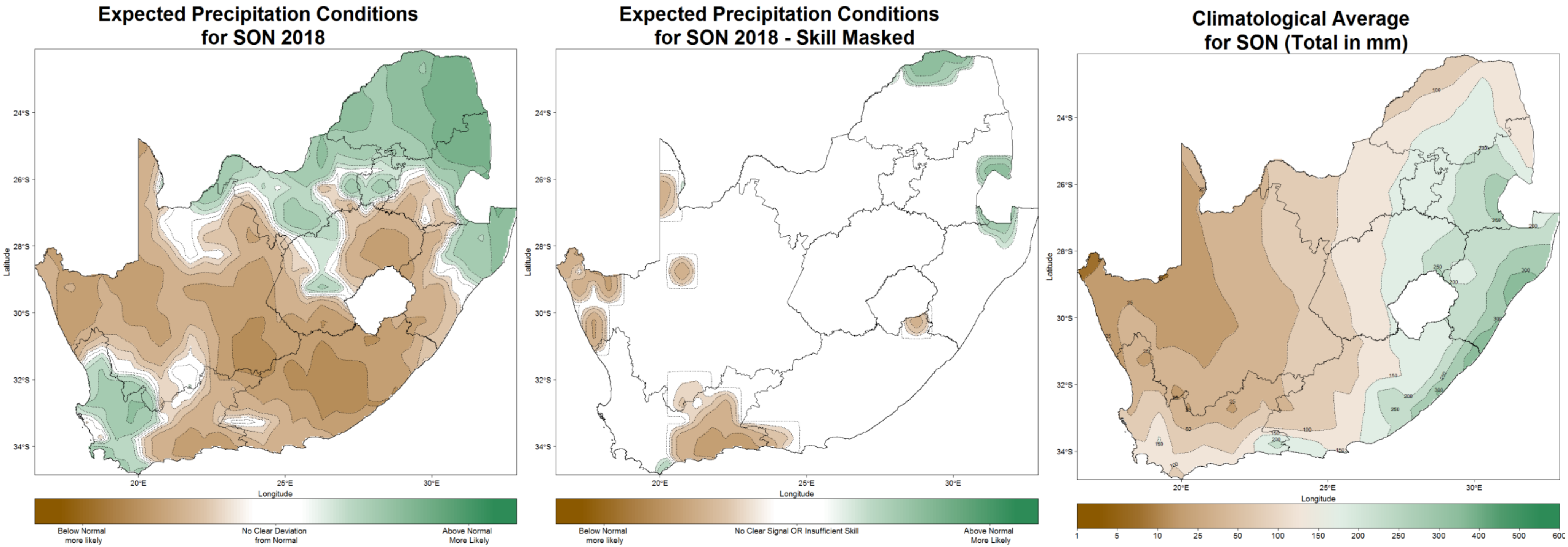

Figure 5: *September-October-November (SON) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right, in mm) calculated over the period 1979-2009.*

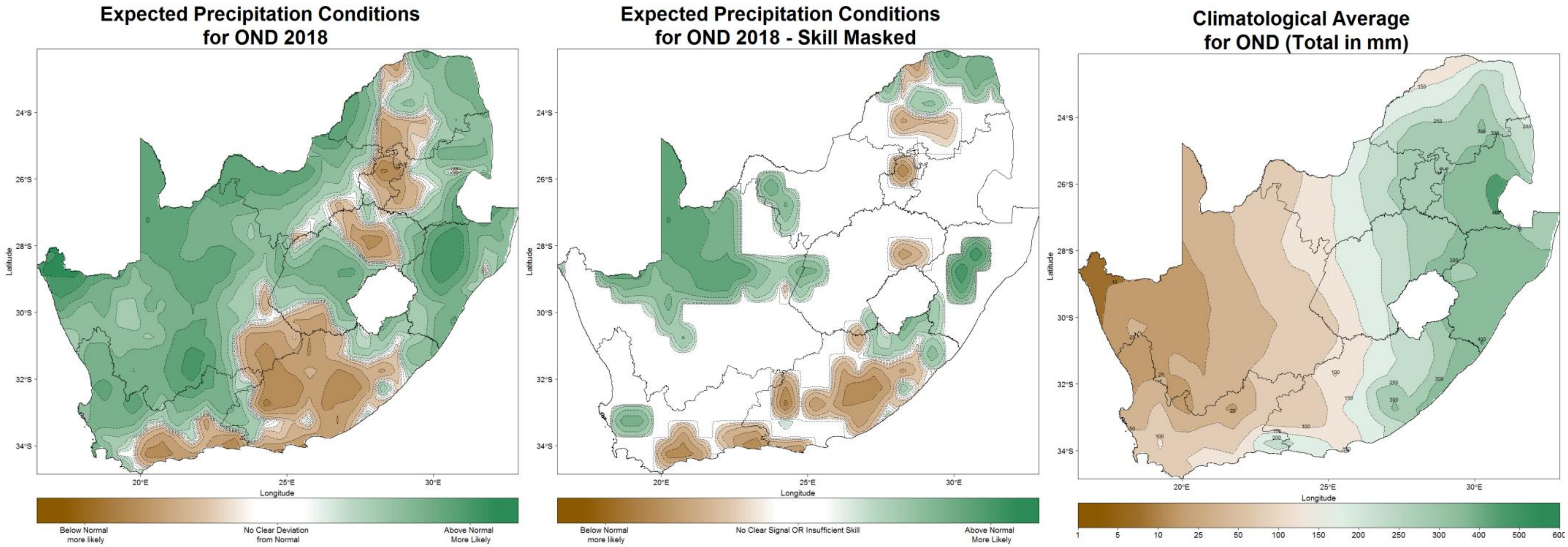

Figure 6: *October-November-December (OND) 2018 seasonal precipitation prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right, in mm) calculated over the period 1979-2009.*

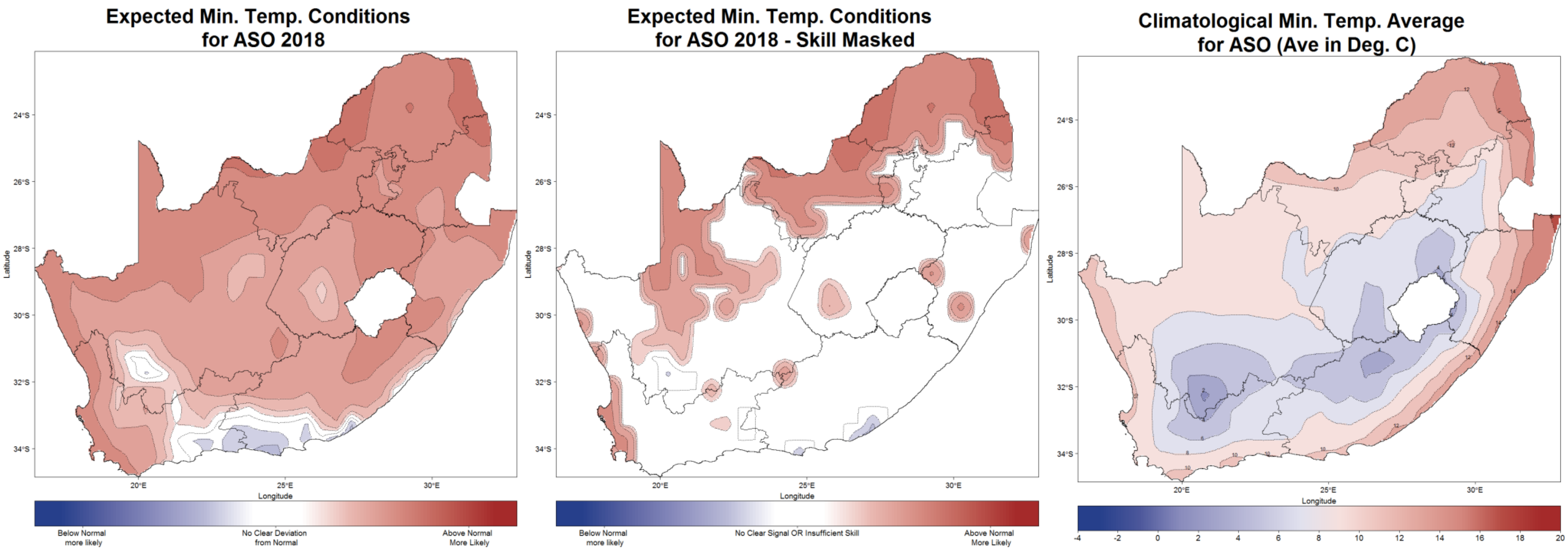

Figure 7: August-September-October (ASO) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right) calculated over the period 1979-2009.

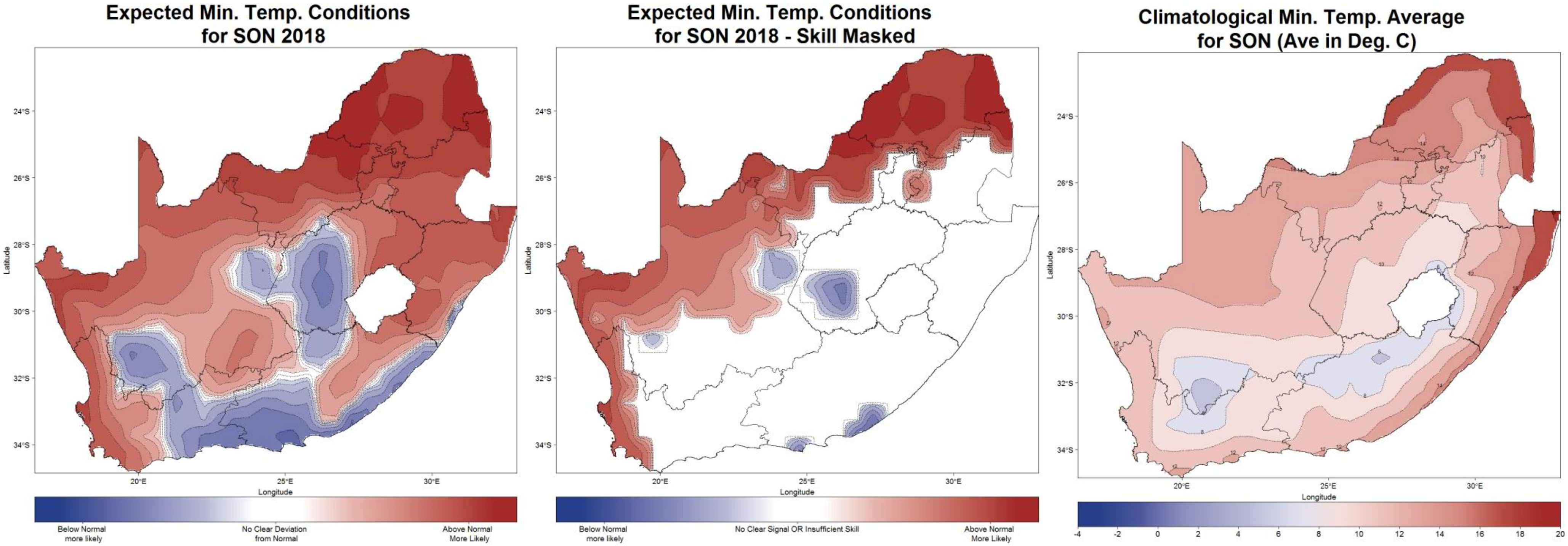

Figure 8: *September-October-November (SON) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right) calculated over the period 1979-2009.*

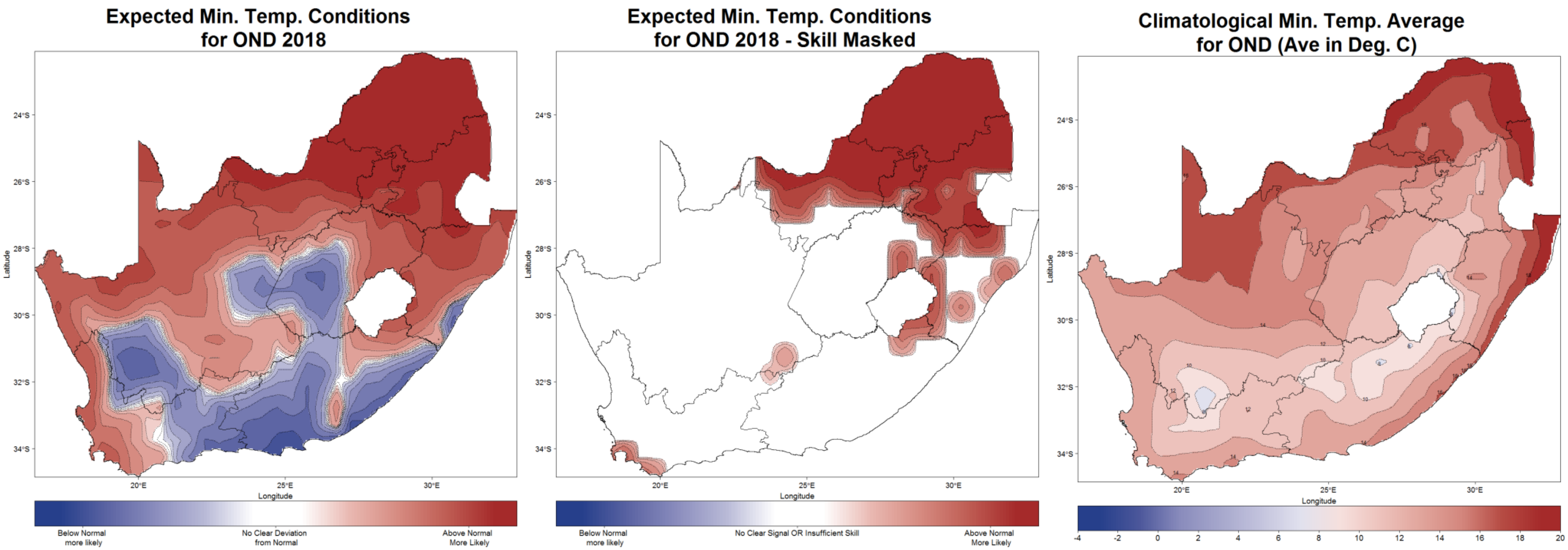

Figure 9: October-November-December (OND) 2018 seasonal minimum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right) calculated over the period 1979-2009.

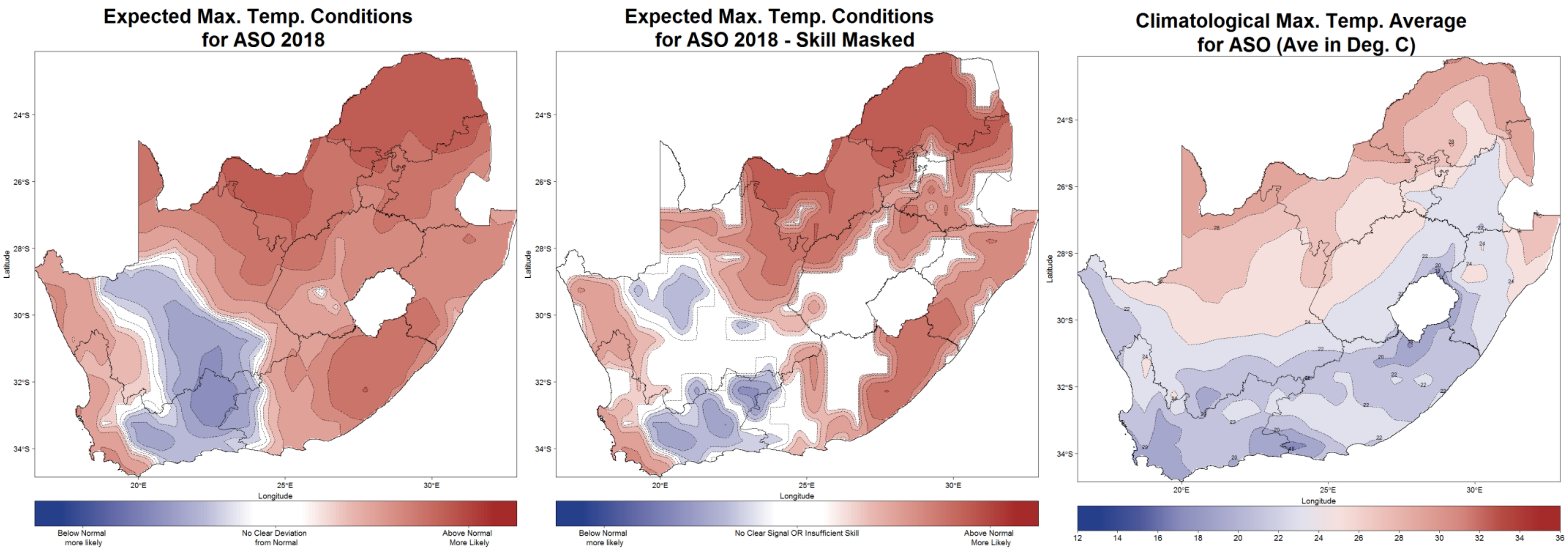

Figure 10: *August-September-October (ASO) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for ASO (right) calculated over the period 1979-2009.*

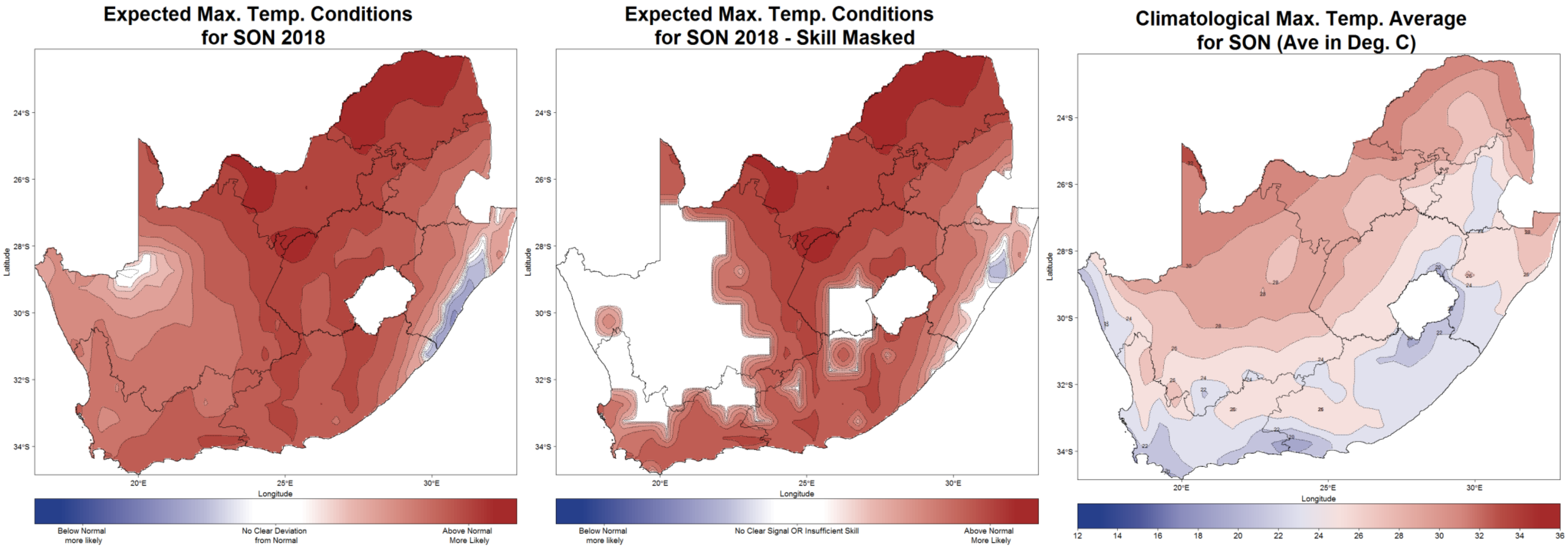

Figure 11: *September-October-November (SON) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for SON (right) calculated over the period 1979-2009.*

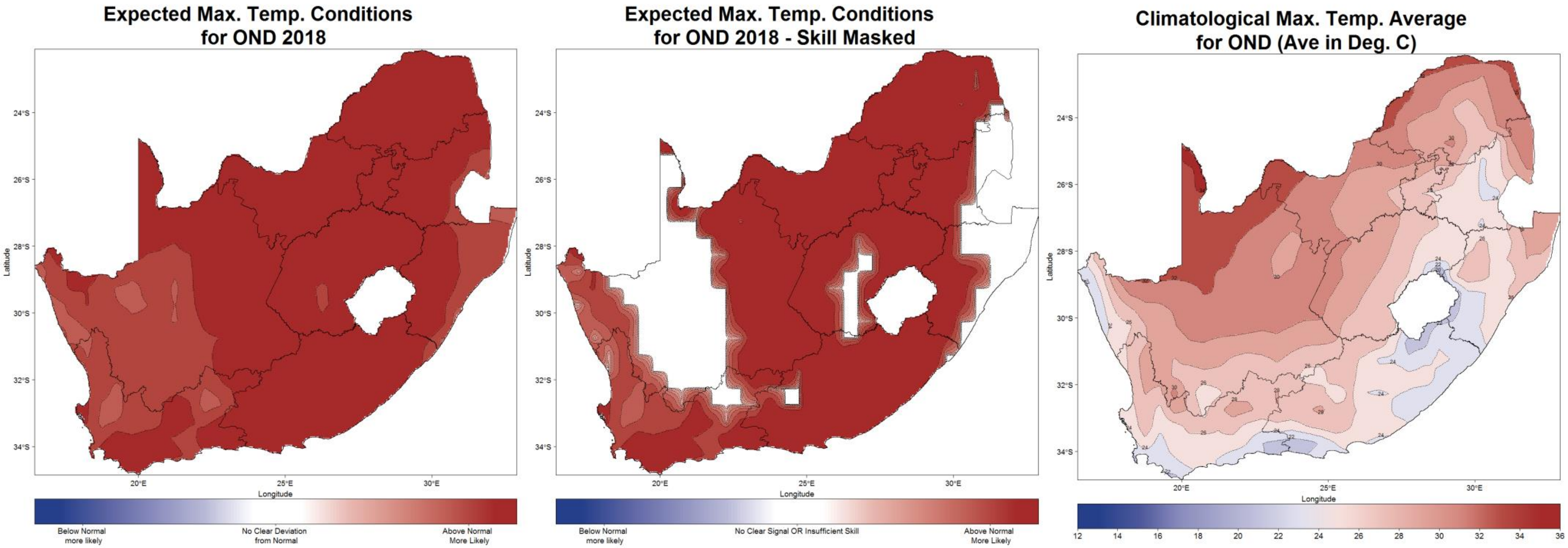

Figure 12: October-November-December (OND) 2018 seasonal maximum-temperature prediction without skill taken into account (left), as well as skill masked out (middle). Also included is the climatological average for OND (right) calculated over the period 1979-2009.

2.2.2. Rainfall Frequency Predictions

This product is a result of the SAWS operational multi-model system (MMS) where the 850-hPa 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 (MOS). The 850-hPa 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 expect below- or above-normal conditions.

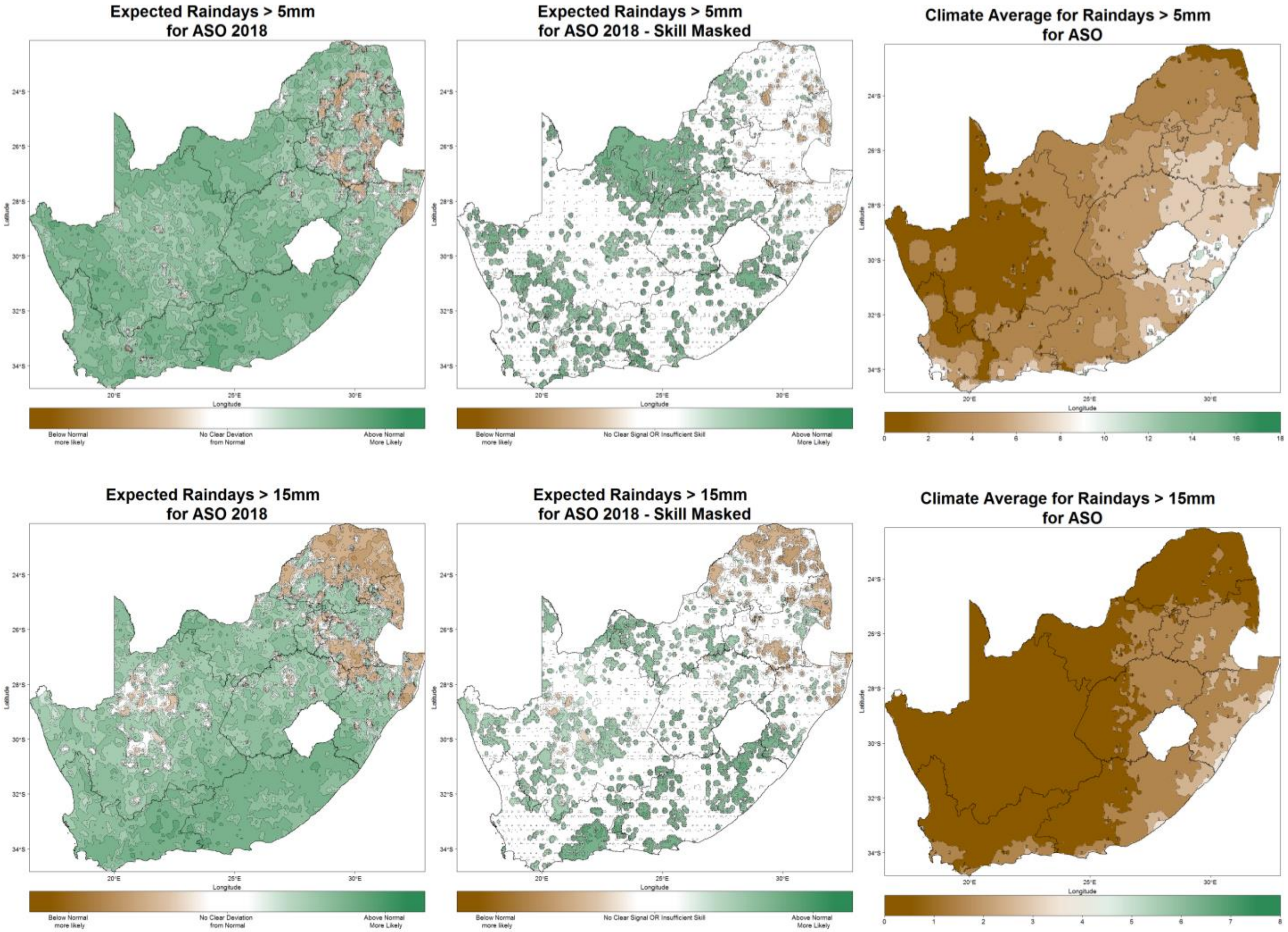

Figure 13: August-September-October 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm calculated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

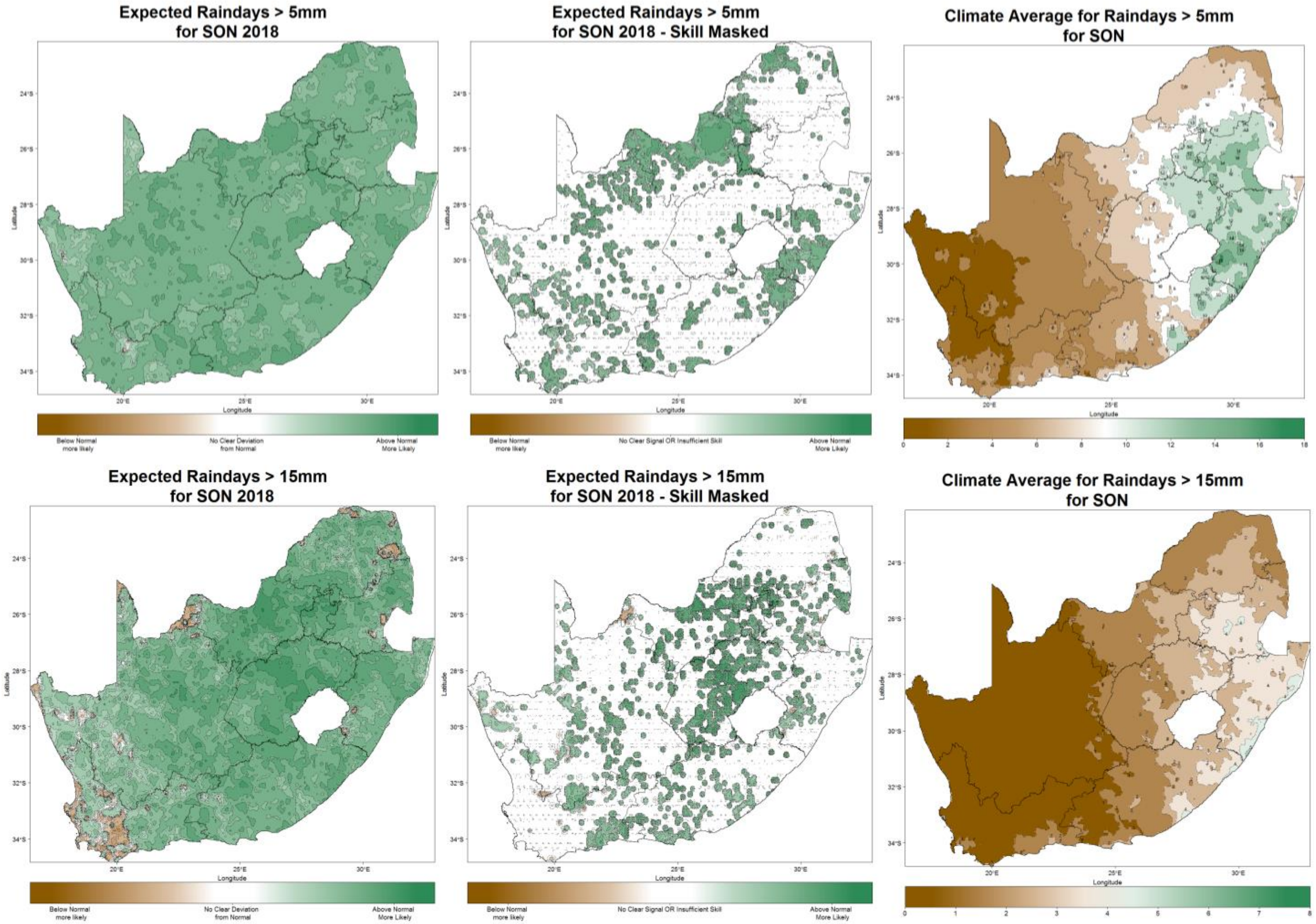

Figure 14: *September-October-November 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm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

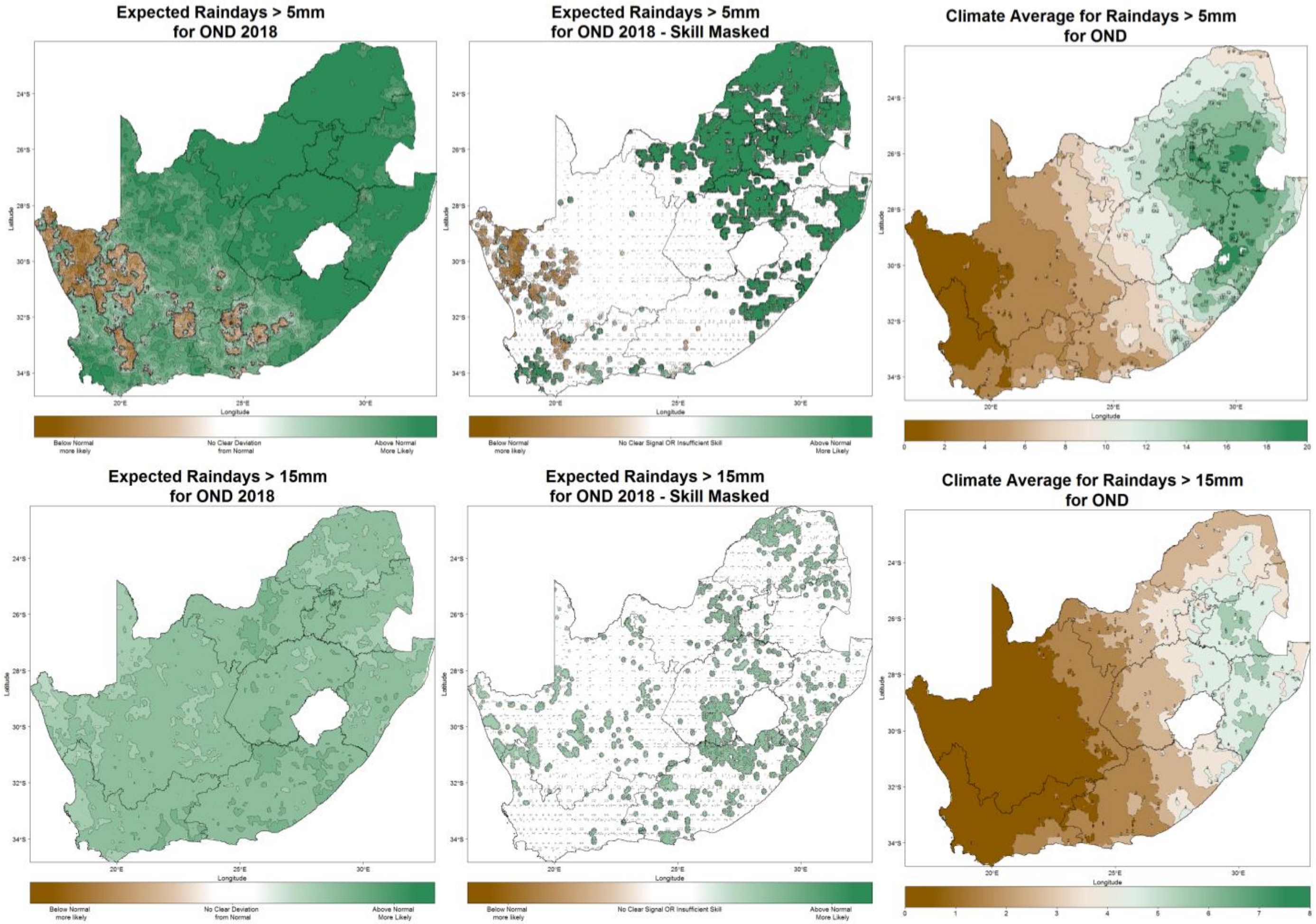

Figure 15: October-November-December 2018 rainfall-days forecast. Forecast for high and low number of rainfall days exceeding 5 and 15mm without skill taken into account (left) and with skill taken into account (middle). Also included is the climatology for rainfall days (right) exceeding 5 and 15mm 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)