

Highlights

- **ENSO Neutral Season.**
- **Un-evenly distributed rainfall with below normal seasonal total.**
- **Large portion of Eswatini had a normal rainfall, with Mbabane being wet and Siphofaneni and surrounding areas dry.**

1.0 State of the Climate Drivers.

The 2019-20 rainfall season was an **El-Nino Southern Oscillation (ENSO) neutral season**, meaning neither El-Nino or La-Nina sea surface temperature patterns were evident in the tropical pacific. In an ENSO neutral season, seasonal rainfall predictions become very difficult to make as other climate drivers tend to influence the intra-seasonal rainfall trends. These drivers which influence our climate include the Sea Surface Temperatures in the South Western Indian ocean, Indian Ocean Dipole (IOD), Position of the upper level Jet Stream and the Outgoing Longwave Radiation (OLR) over Eswatini amongst others.

Significant rains enough to start ploughing were received in the last week of October. The delay may be contributed to relative northward position of the Sub-tropical **upper level jet** stream, which when in this position, reduces the *unstable air advection to our sub-continent effect* of the temperate troughs over central Africa. This may also delay the southward migration of the Inter-tropical Convergence Zone. This Jet Shifted southwards towards end of November and the country saw a significant improvements in the rainfall received. The **IOD** was positive October and November but began to weaken in late December becoming neutral in January and early February. By the end of February and early March it had decreased to negative values returning to positive early April. A Positive IOD event is usually associated with favourable rain forming conditions over Eswatini. The negative **Sea Surface Temperatures** on the South-Western Indian Ocean from October until February contributed to the country receiving less rainfall even when other climate drivers were favourable. The **OLR** was neutral for the better part of the season except for early October and mid-late December where it was positive. A positive OLR is normally associated with suppressed convection and less rainfall.

2.0 Temporal Distribution of Rainfall.

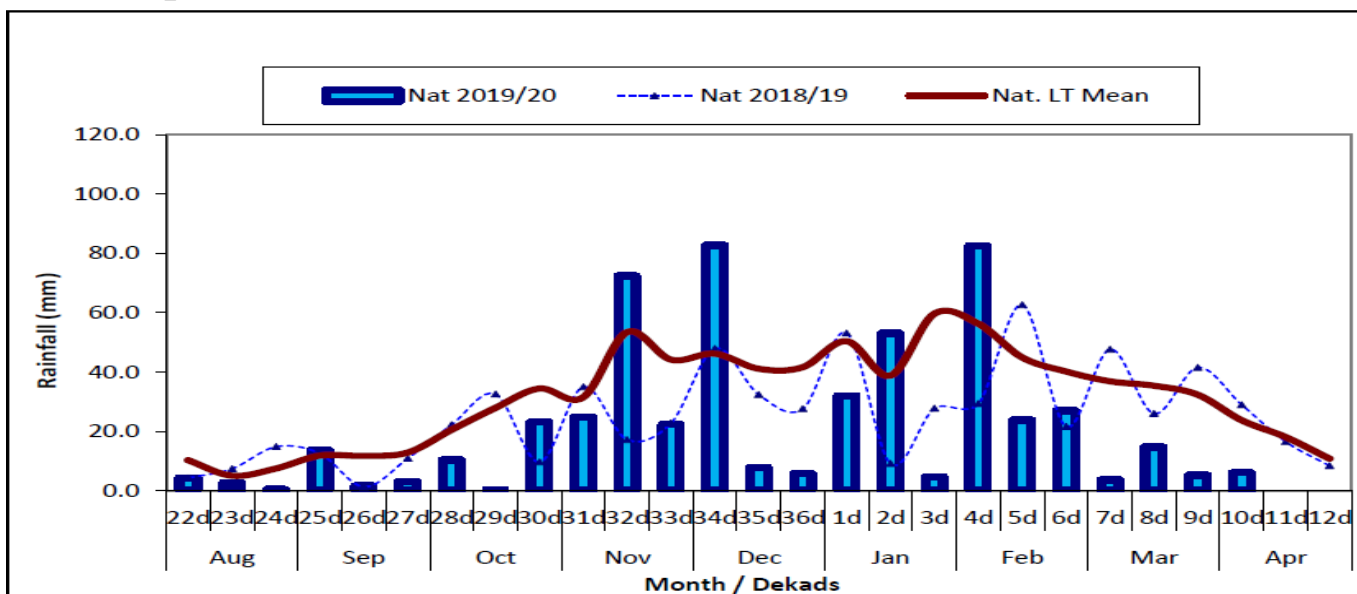


Fig1. Decadal (10 days) rainfall for the 2019-20 season. This graph shows the country average 10 day total of rainfall from August 2019 to April 2020. A below average rainfall is observed in most of the dekads except for 4 dekads in November, December and February where the country received significantly above average rainfall.

3.0 Seasonal Accumulation of Rainfall.

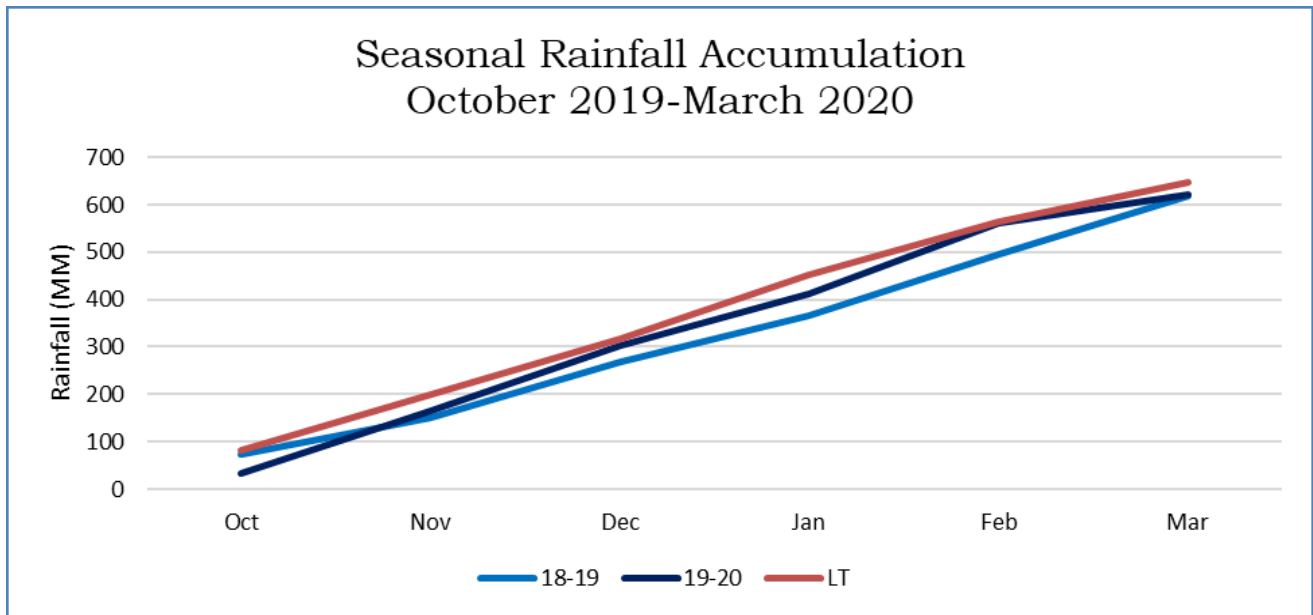


Fig 2 Accumulated Rainfall.

The figure above shows the monthly accumulated rainfall in the previous season. Evident is the poor rainfall received in the country in October as compared to the long term mean and the 2018/19 season. Although the rains picked up significantly in November exceeding those received last year, the annual total accumulated rainfall still fell short of the long term mean. The 2019/20 was ranked **19th** wettest year in a record spanning from 1981 to 2020 with a seasonal accumulation of 621 mm. The wettest year on record was a country average total of 1095 mm recorded in the 1983/84 season.

4.0 Spatial Distribution of Rainfall.

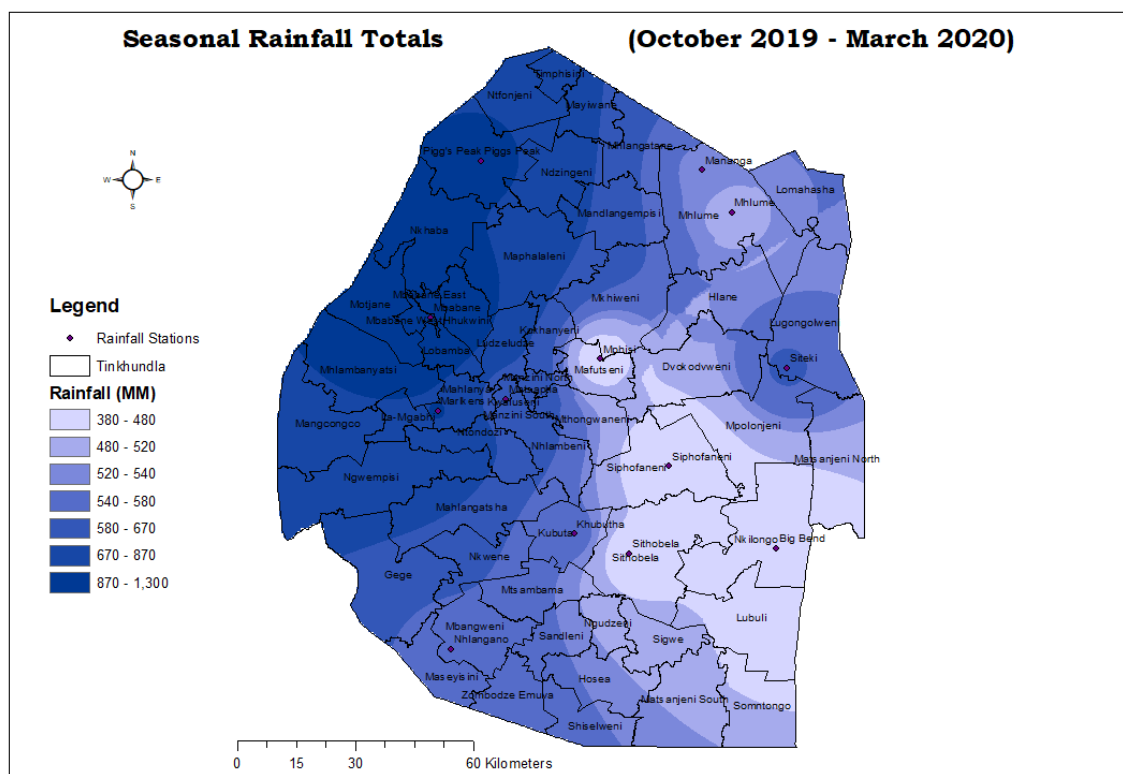
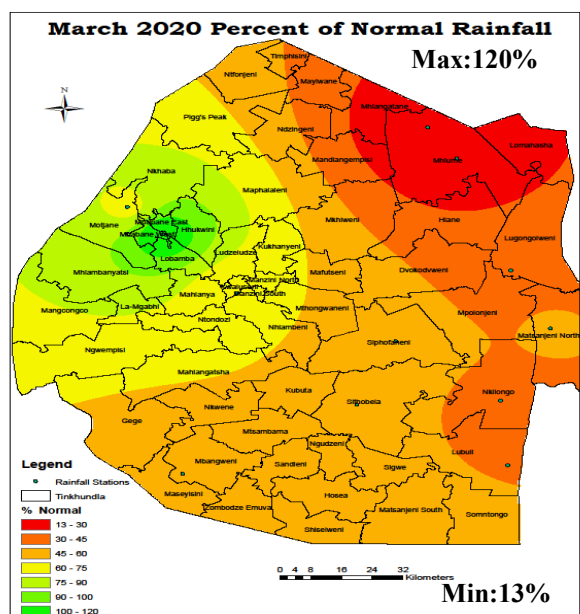
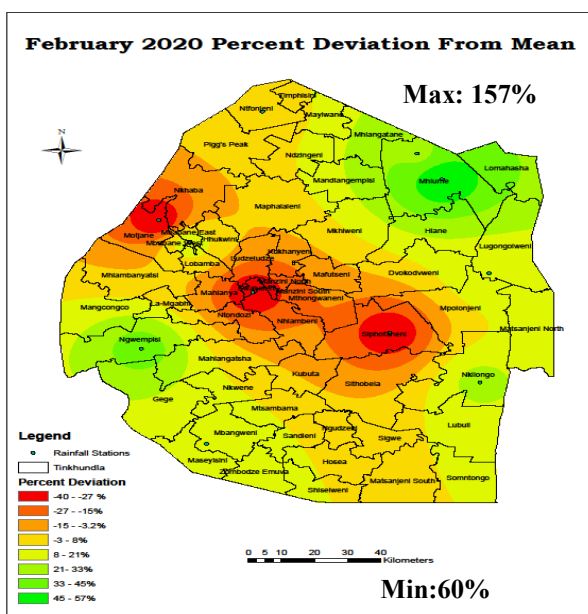
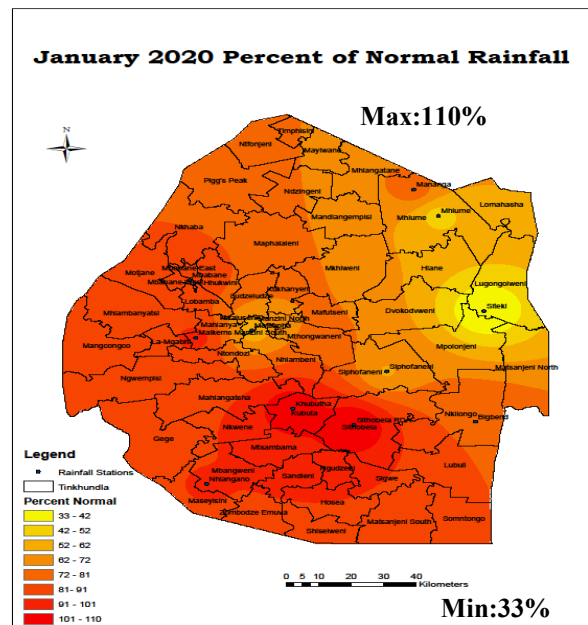
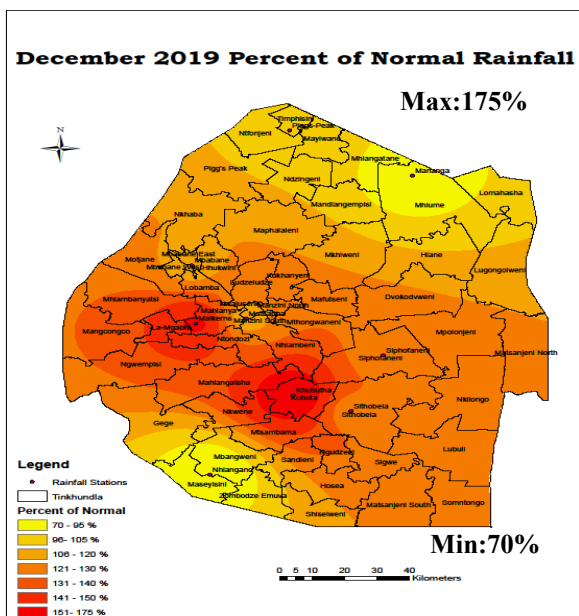
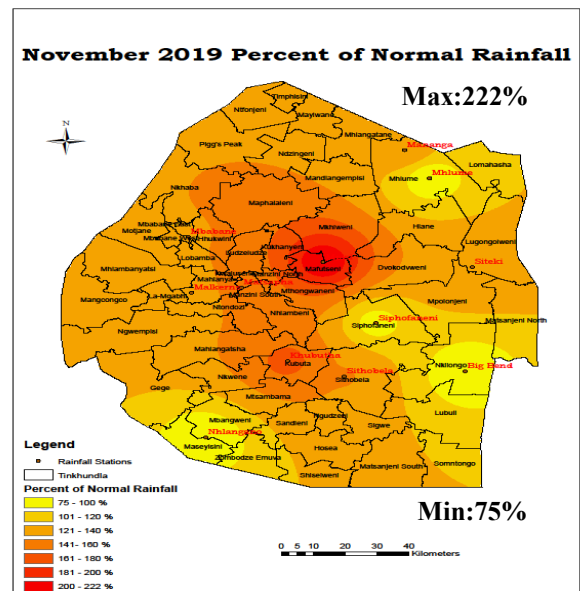
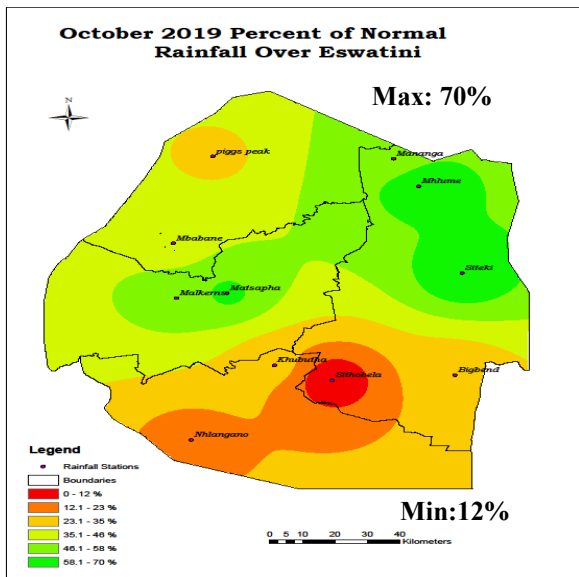


Fig 3. Spatial Distribution of Rainfall in Eswatini. South Central to South Eastern (Sithobela, Siphofaneni, Lubulini and Nkilongo) received the least rainfall and the Highveld areas comprising of Mbabane, Motshane, Nkhamba, Mhlambanyatsi and Piggs Peak all receiving above 600mm.

5. Monthly Percentages of Normal Rainfall



6.0 Drought Indices (Rainfall Anomaly index)

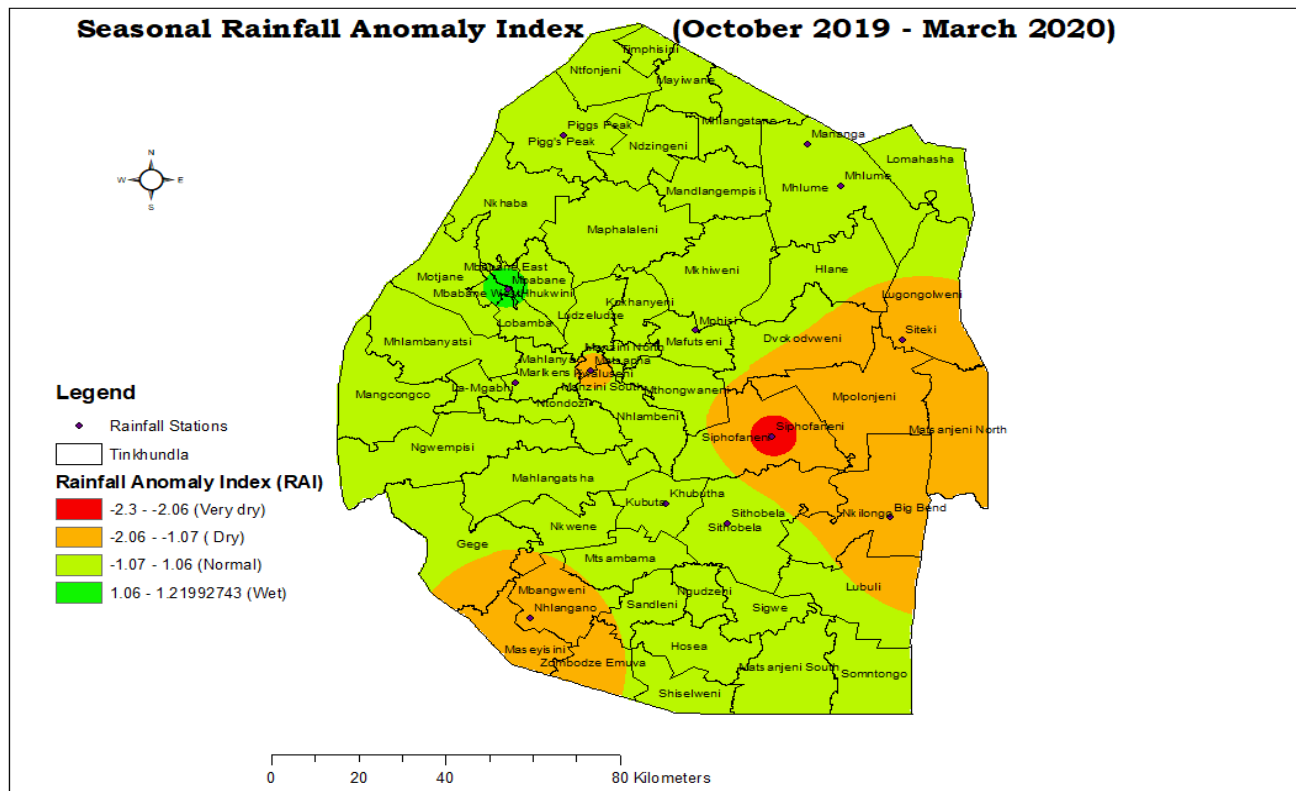


Fig 4. The Rainfall Anomaly Index.

This index is obtained by using the average rainfall in record together with averages for the 10 driest and wettest years on record with the current seasonal mean. It gives the general picture of how dry or wet the season was by using only rainfall records. On a scale of $RAI > 3$, $3 \leq RAI > 2$, $2 \leq RAI > 1$, $1 \leq RAI > -1$, $-1 \leq RAI > -2$, $-2 \leq RAI > -3$ and $RAI \leq -3$ indicating extremely wet, very wet, wet, Normal, Dry, Very dry, and extremely dry respectively. This indicator shows that the most parts of the country received rainfall in the normal category. There were, however, pockets of the eastern Lowveld and Shiselweni which were dry with Siphofaneni and surrounding areas being very dry. Only Mbabane had an index indicating wet seasonal conditions.

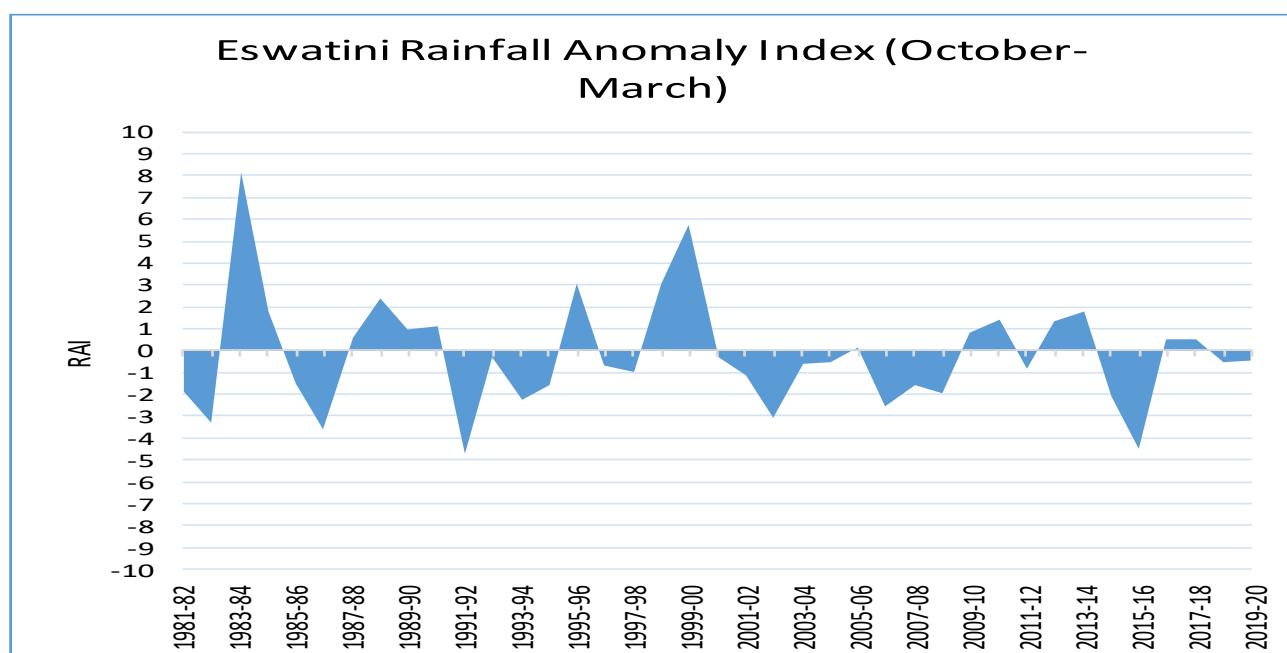


Fig 5. Time series of the Rainfall Anomaly Index. Since the 2015-16 El-Nino induced drought episode, we have not had a season where the country total seasonal rainfall could have been classified as a wet/dry year according to this index. This does not mean the country did not have some areas which were wet or dry as shown by figure 5 in the distribution of the index country-wide

© **Eswatini Meteorological Services**
Ministry of tourism and Environmental
Affairs
P.O. Box 2652
Mbabane
Phone (+268) 24046274/24048859
Fax (+268) 24041530
E-mail: weather@swazimet.gov.sz
<http://www.swazimet.gov.sz>

Additional ENSO information obtained from:
***Bureau of Meteorology in Australia, [Http://www.bom.gov.au](http://www.bom.gov.au)**
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