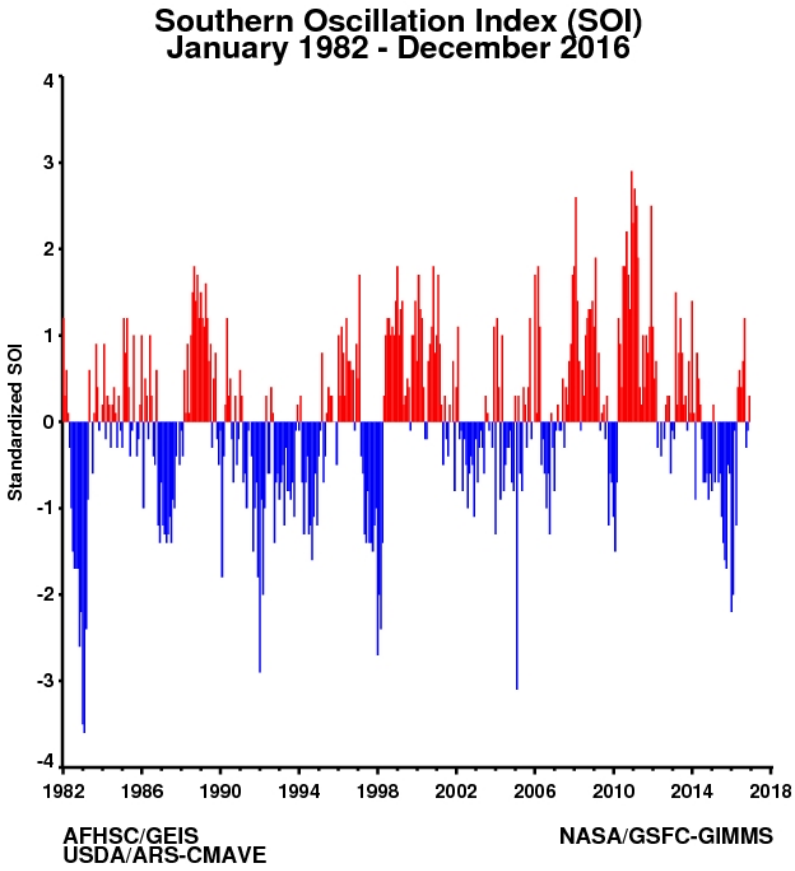
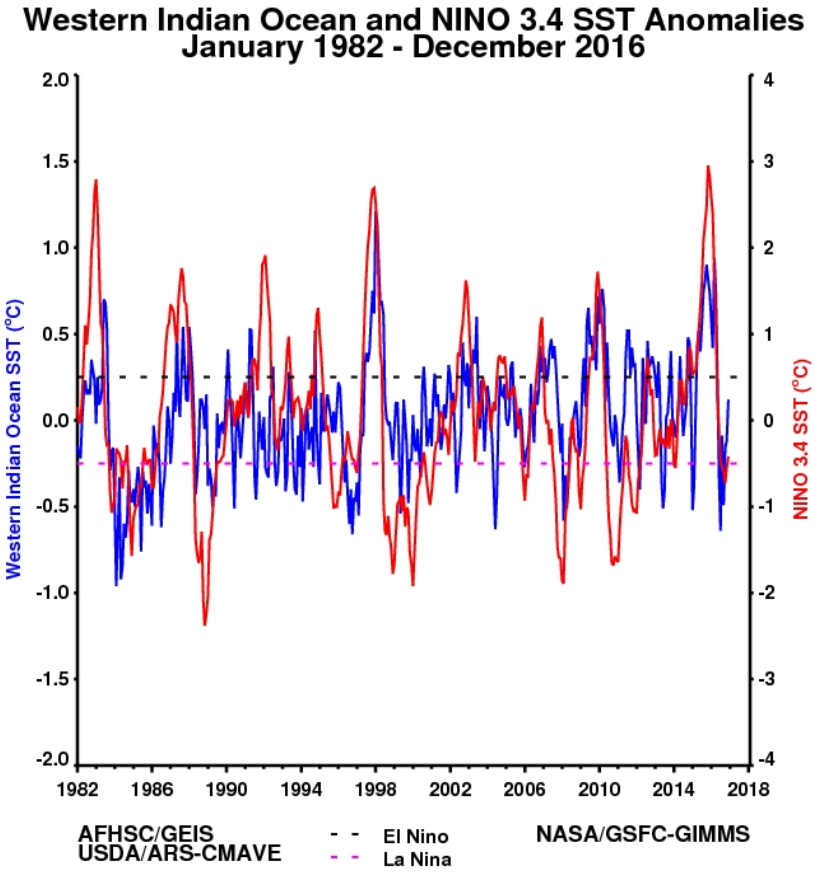
This section of the report will provide a rolling three month update on a monthly basis of the state of the climatic and ecological indicators used in monitoring areas at risk to RVF activity. These indicators include, global SST anomalies patterns, Equatorial Western Indian Ocean (WIO) and Eastern Pacific Ocean (EPO: NINO 3.4) SST anomalies, Southern Oscillation Index (SOI) and Outgoing Longwave Radiation (OLR) anomalies, Rainfall and anomalies, Normalized Difference Vegetation index anomalies and RVF risk map for Africa and the Arabian Peninsula.

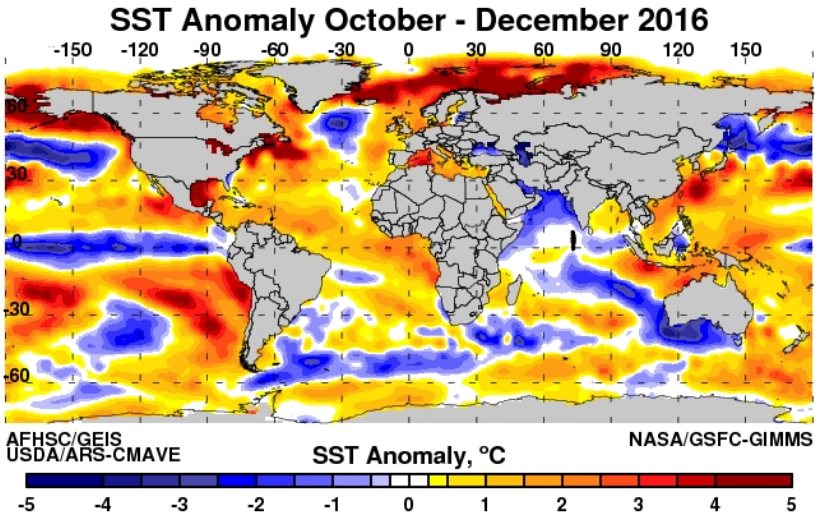
**December 2017**

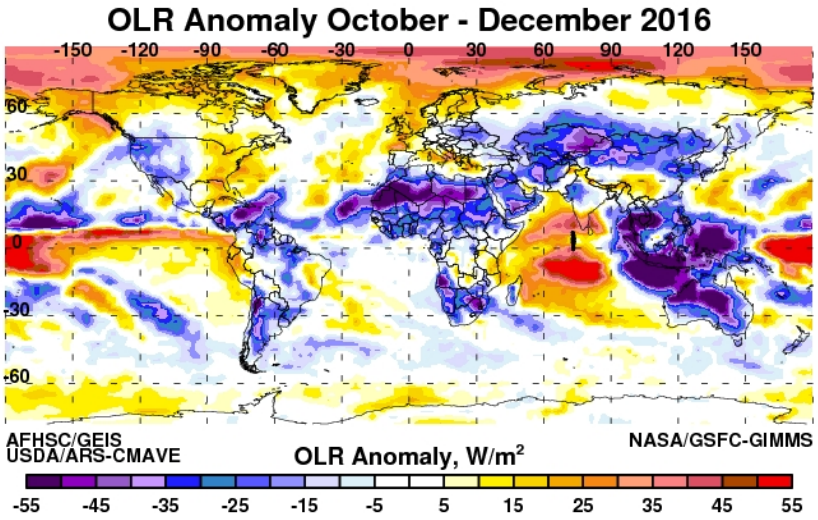
1. SOI and SST Indices






The SOI value has increased to +0.3 in December from -0.1 in November continuing the month to month variability that has been observed in the recent months. The ocean temperature conditions show La Niña conditions are present with negative sea surface temperature (SST) anomalies continuing in December stretching across most of the eastern and central equatorial Pacific Ocean monitoring regions except the eastern most NINO1&2 region where near normal SST persist: NINO 3.4 (-0.42°C), NINO 4 (-0.14°C), NINO3 (-0.39°C) and NINO1&2 SST (+0.43°C). The magnitude of the anomalies has decreased across the board and tending towards normal conditions in December. The SST anomalies in western Indian Ocean are now positive anomalies but near normal in concert with the NINO indices at +0.12°C. Overall, the coupled ocean-atmosphere system reflects weak ENSO-cold (La Niña) conditions, with current evidence indicating a transition to ENSO-neutral conditions in February. The cooling has continued to lessen in both the eastern equatorial Pacific and western equatorial Indian Ocean during the month. The multi-model forecasts indicate the La Niña conditions will decay during the January-March (JFM) 2017 period and transition to near normal or ENSO-neutral conditions lasting through August-October (ASO) 2017.

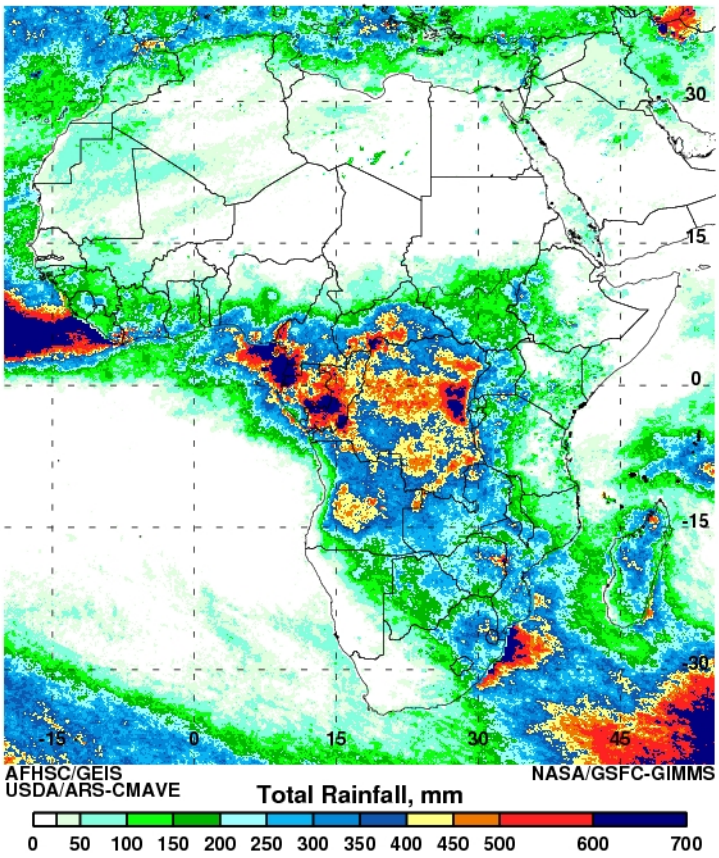


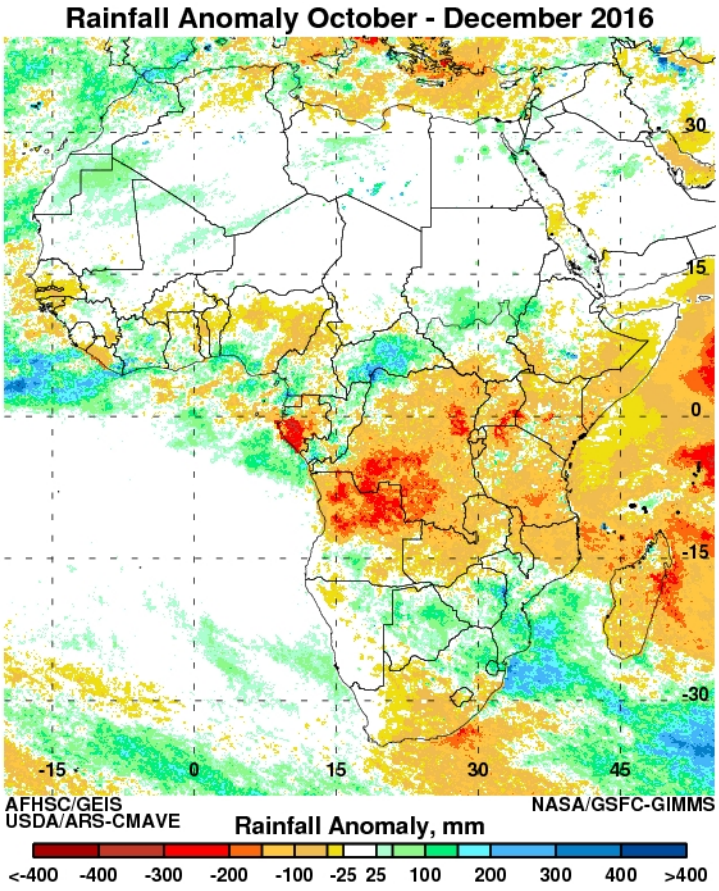




The equatorial Pacific Ocean seasonal SST anomalies shows a signature cold ENSO (La Niña) pattern with three month values: <-1.0°C) from the central to eastern equatorial Pacific, with positive anomalies to the north and south of this belt.. The region from 30°S to 10°S in the southwestern Pacific Ocean still has  below-normal SSTs persisting during October 2016 to December 2016 period. The western Pacific Ocean around the Indonesian basin shows continued widespread above normal SSTs indicating the entrenched reversal of ocean and atmospheric circulation. The area of anomalous cold SSTs off the East African coast including in northwestern Indian Ocean extending into southwestern Australia is beginning to diminish, with the center of the region now showing slight positive anomalies ~ +0.2°C . Other regions of significant anomalies include the north Pacific Ocean, north Atlantic, equatorial Atlantic off the West African coast, the Pacific Ocean off the California coast, southwest Atlantic Ocean off Argentina and Brazil which show significant positive and negative anomalies on the order of -/+1.0°C to -/+2.0°C. In general characteristic pattern of cold ENSO SST anomalies are evident globally. Outgoing Longwave Radiation (OLR) anomalies are used here as a proxy for tropical deep convection (rainfall). Reduced convection is shown in yellow to light brown and brown

shades and increased/intense convection is shown by shades of blue. Some impacts from the current SST anomaly patterns can be observed in the pattern of global convective activity illustrated by the OLR departure patterns here. During the October 2016 to December 2016 period, drier-than-average conditions (>+55W/M2) are prevailing over the central to eastern equatorial Pacific Ocean basin. The entire western Pacific including Australia and the Indonesian basin show large negative OLR anomalies indicative of increased convective activity. Drier the normal conditions are prevailing over extreme northern hemisphere including Alaska, Canada, and northern Europe. Negative departures in OLR north-equatorial eastern Pacific Ocean have now diminished in areas, however Mexico, western and southwestern US show persistent negative OLR anomalies indicative continued convection and precipitation conditions in this region, while the eastern US shows positive OLR anomalies indicative of diminished precipitation. Negative OLR anomalies continue to dominate North Africa and Middle East and extending into central Asia. The western equatorial Indian Ocean basin extending into eastern Africa shows positive OLR anomalies indicating reduced convective activity. Accordingly, southern Africa and the southern half of South America show negative OLR anomalies suggesting enhanced convective activity. These patterns of depressed and enhanced convective activity coincide well with the patterns of SST departures and reveal certain impacts often associated with the early phase of cold ENSO events. Monthly and weekly anomalies can be found here. Rainfall and associated anomalies (below) for Africa from October 2016 to December 2016 show rainfall concentrated over the greater Congo basin region belt to the immediate south with maximum values of 600mm. Areas of above normal rainfall (+50 to 300 mm) are limited to Central Africa and the southern Africa region with values at ~ +300mm over the three month period.

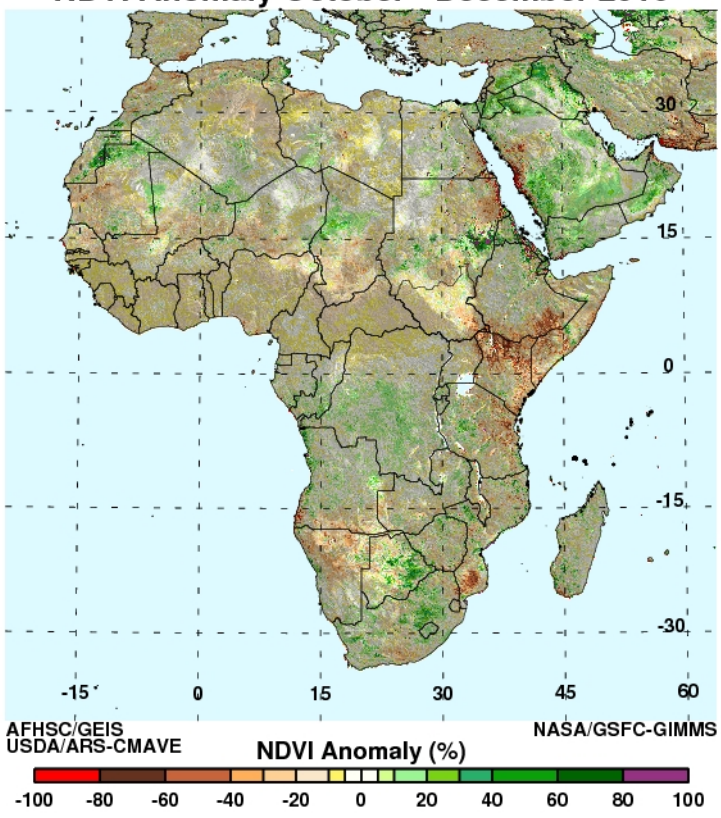
## Total Rainfall October - December 2016






Cumulative NDVI anomalies for Africa for October 2016 to December 2016 show a patchwork of positive anomalies concentrated centered over Western Sahara, eastern Sudan and Botswana/South Africa. The RVF risk map below was derived from thresholding NDVI anomaly data to detect areas persistent of above normal NDVI. Periods of widespread and prolonged heavy rainfall lead to flooding of dambos and anomalous green up in vegetation, creating ideal ecological conditions for the emergence RVF vectors. For the period October 2016 to December 2016, the RVF persistence model identifies areas at risk in some areas of eastern Sudan and South Africa which have received above normal rainfall over the last three months. Given the elevated rainfall conditions that have prevailed in these countries, continued surveillance is advised in these areas.

## NDVI Anomaly October - December 2016



# RVF Potential December 2016