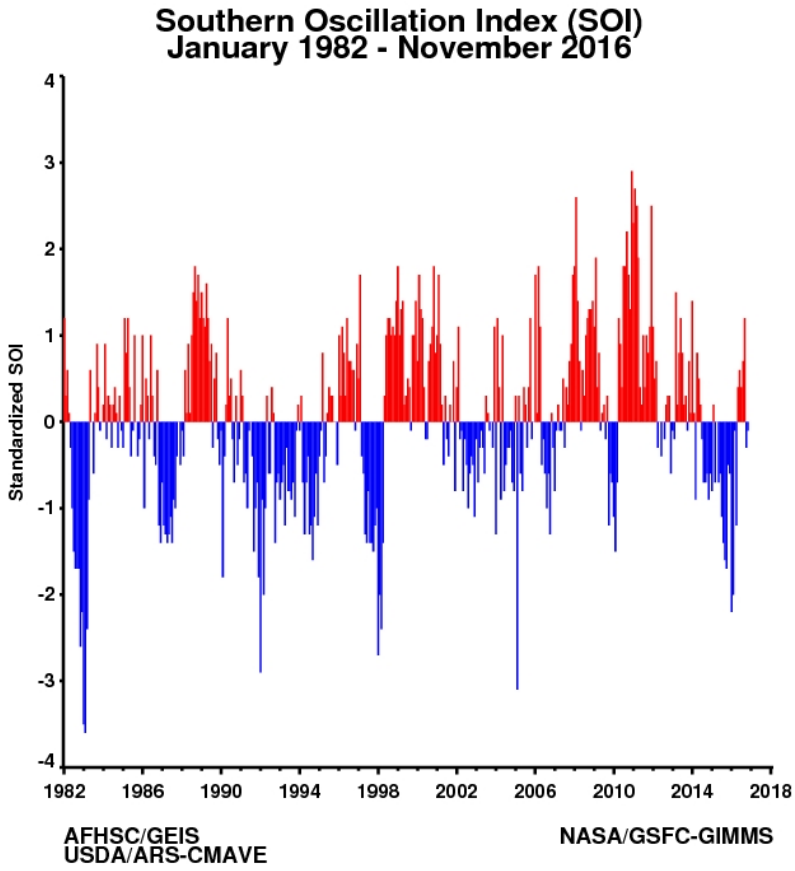
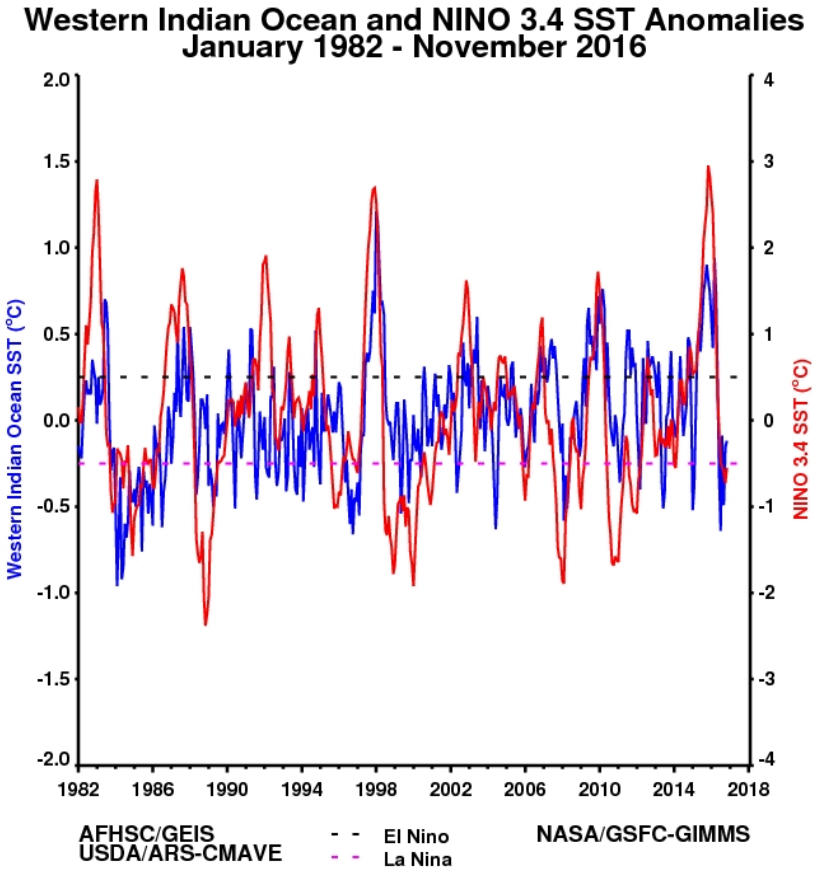
This section of the report will provide a rolling three month update on a monthly basis of the state of the climatic and ecological indicators used in monitoring areas at risk to RVF activity. These indicators include, global SST anomalies patterns, Equatorial Western Indian Ocean (WIO) and Eastern Pacific 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.

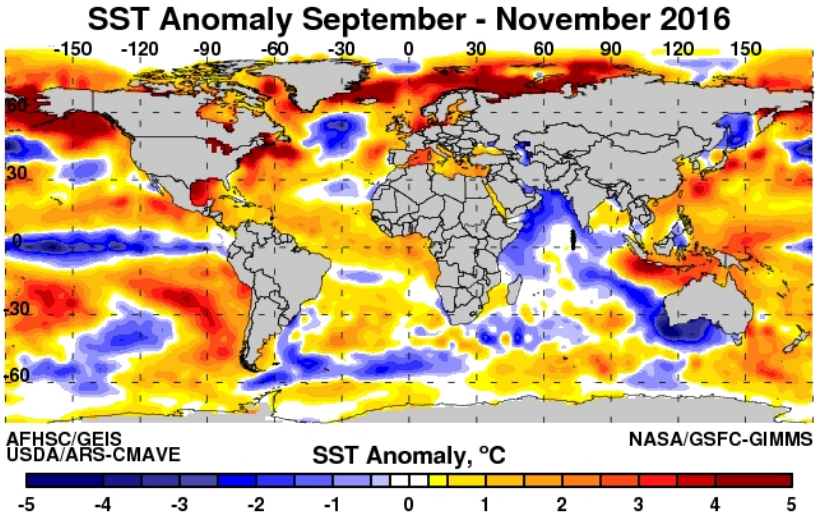
November 2017

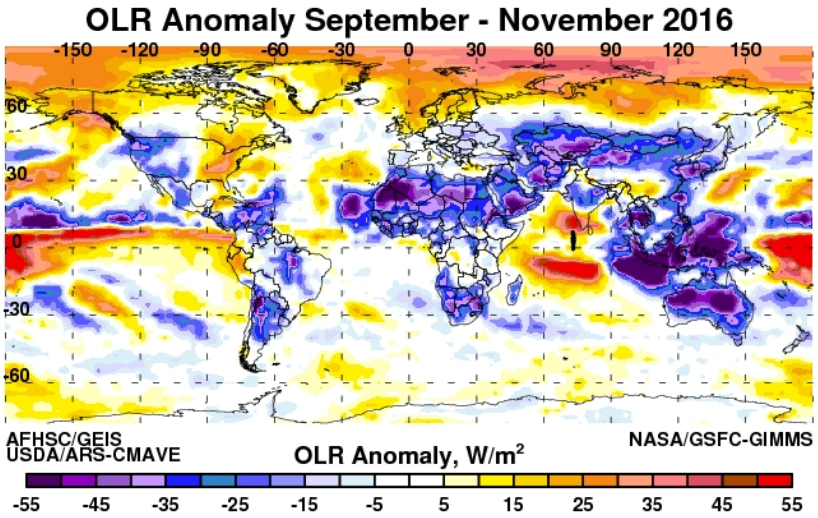
1. SOI and SST Indices





The SOI value has increased slightly to -0.1 in November from -0.3 in October this reflects the month variability in this fall period. The ocean temperature conditions show La Niña conditions are present with negative sea surface temperature (SST) anomalies in November 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 (-0.55°C), NINO 4 (-0.37°C), NINO3 (-0.44°C) and NINO1&2 SST (+0.36°C). Overall all the indicators during the last three months show the development of weak La Niña conditions. The SST anomalies in western Indian Ocean show negative anomalies in concert with the NINO indices at -0.12°C in November. Overall, the coupled ocean-atmosphere system reflects ENSO-cold (La Niña) conditions, with current evidence indicating the persistence these conditions for the next 2-3 months. Overall, the cooling lessened in both the eastern equatorial Pacific and western equatorial Indian Ocean during the month. The multi-model forecasts indicate a continuation of weak La Niña conditions through December-February (DJF) 2016-17, and due to the present cooling the a majority of the models indicate a weak La Niña event to persist with 55% chance through the winter 2016-17 with NIN03.4 SST three month average anomaly values less than or equal to -0.5°C threshold of La Niña events. The conditions are projected to begin transitioning ENSO neutral conditions during January - March 2017.

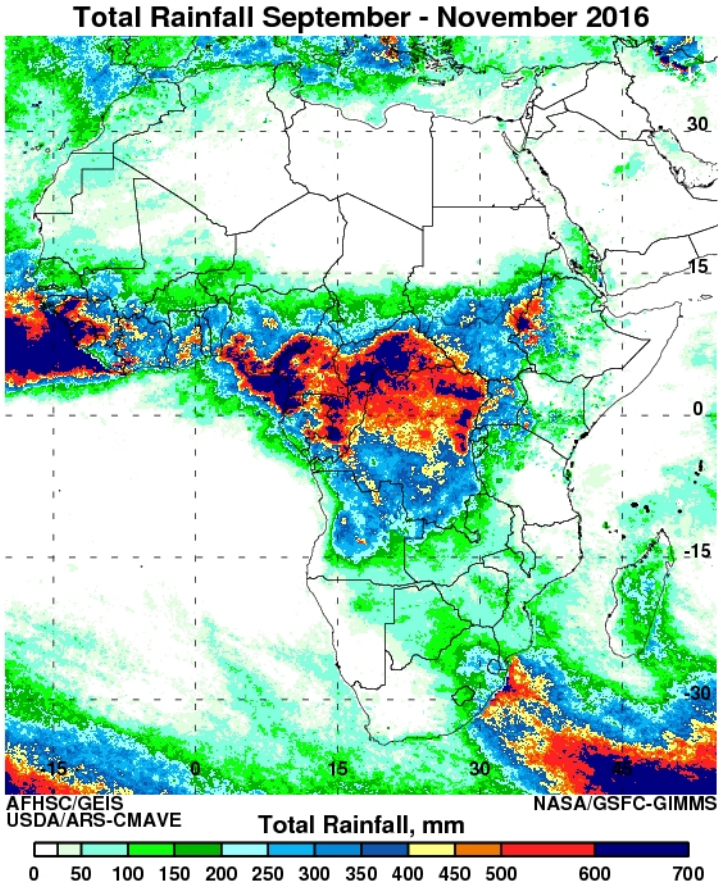


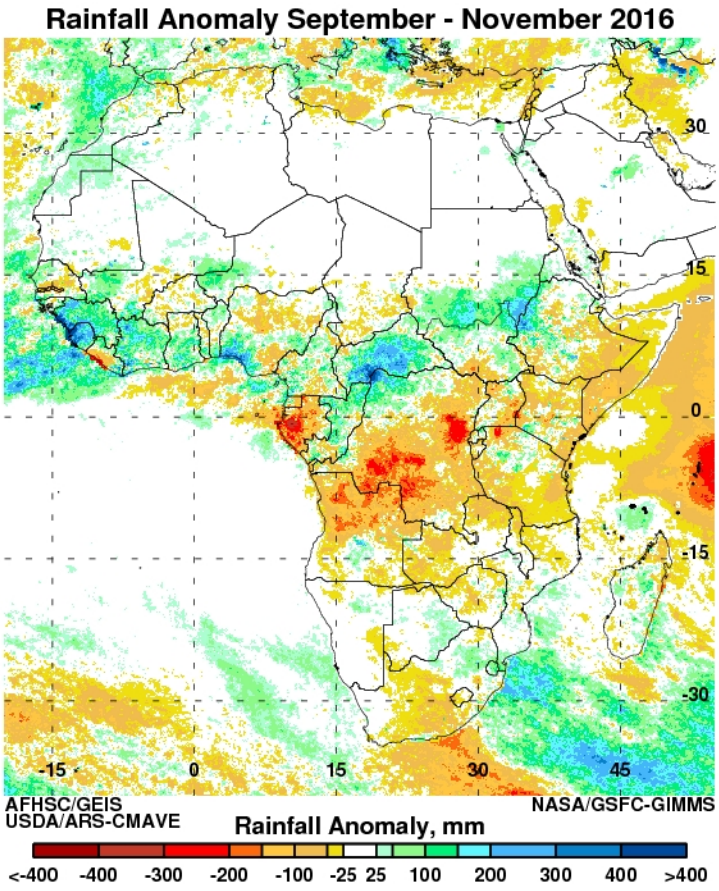


The central equatorial Pacific Ocean seasonal SSTs have continued to decrease (three month values: <-1.0°C) along the equator indicating the emergence of ENSO cold conditions. The region from 30°S to 10°S in the southwestern Pacific Ocean still has below-normal SSTs persisting during September 2016 to November 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 across the equatorial Pacific Ocean. A large portion western equatorial Indian Ocean is now anomalously cold off the East African coast with departures ~ -0.5°C to -2.0°C including in northwestern Indian Ocean extending into southwestern Australia region with a pronounced cold pool. 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 September 2016 to November 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 convective activity. Drier the normal conditions are prevailing over extreme northern hemisphere including Alaska, Canada, and northern Europe with extreme values over northern Russia (>+45W/M2) continue to persist. 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. Negative OLR anomalies continue to dominate North Africa and Middle East and India extending southeastwards into Southeast 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 September 2016 to November 2016 show rainfall concentrated over the northern Congo basin/CAR and the belt to the immediate north of the equator with maximum values of 700mm. Areas of above normal rainfall (+50 to 300 mm) are limited to Central Africa Republic, South Sudan, western Ethiopia and equatorial western Africa with values at +300mm

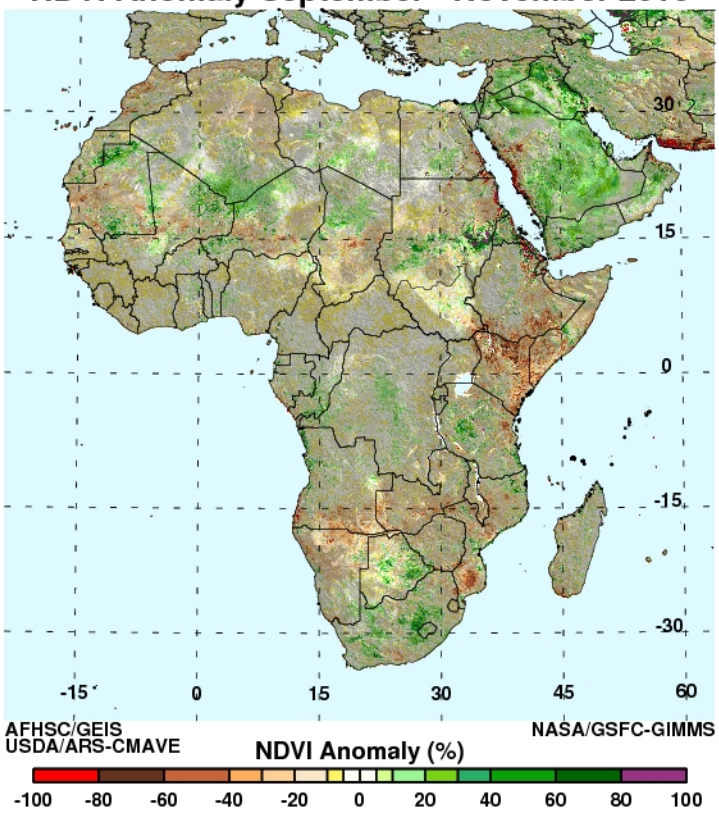
over the three month period. These rainfall patterns are persisting from the August - October period.





Cumulative NDVI anomalies for Africa for September 2016 to November 2016 show a patchwork of positive anomalies concentrated across parts of the Sahel region and western Saudi Arabia and Yemen. 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 September 2016 to November 2016, the RVF persistence model identifies areas at risk in some areas of eastern Sudan and western Saudi Arabia which have received above normal rainfall over the last three months and a limited area of South Africa close to the Lesotho border. Given the elevated rainfall conditions that have prevailed in these countries, continued surveillance is advised in these areas.

NDVI Anomaly September - November 2016



RVF Potential November 2016