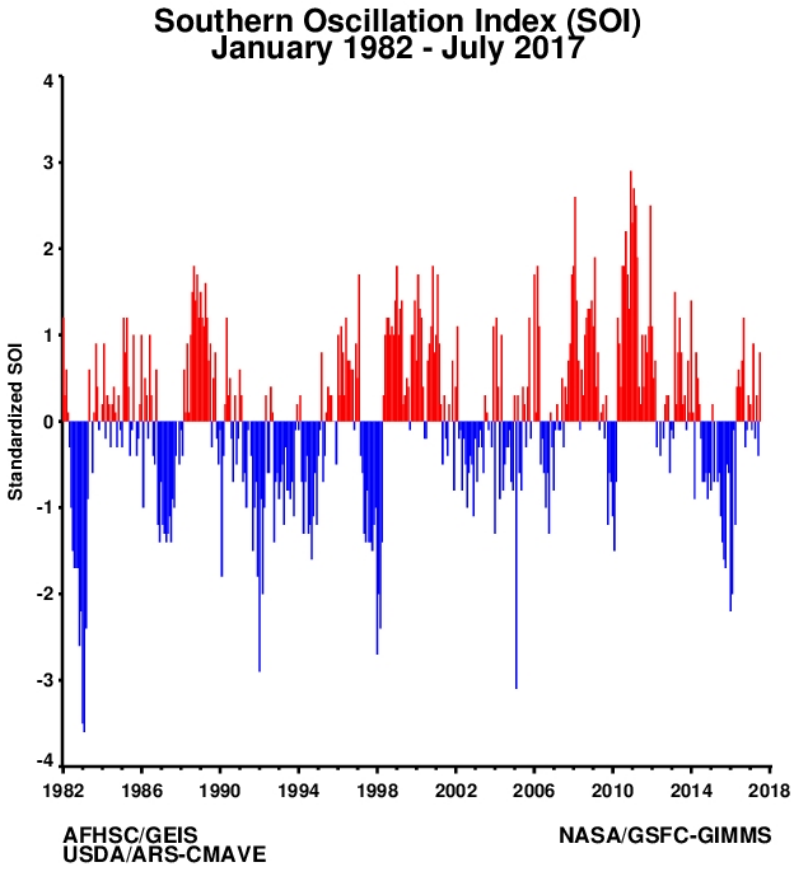
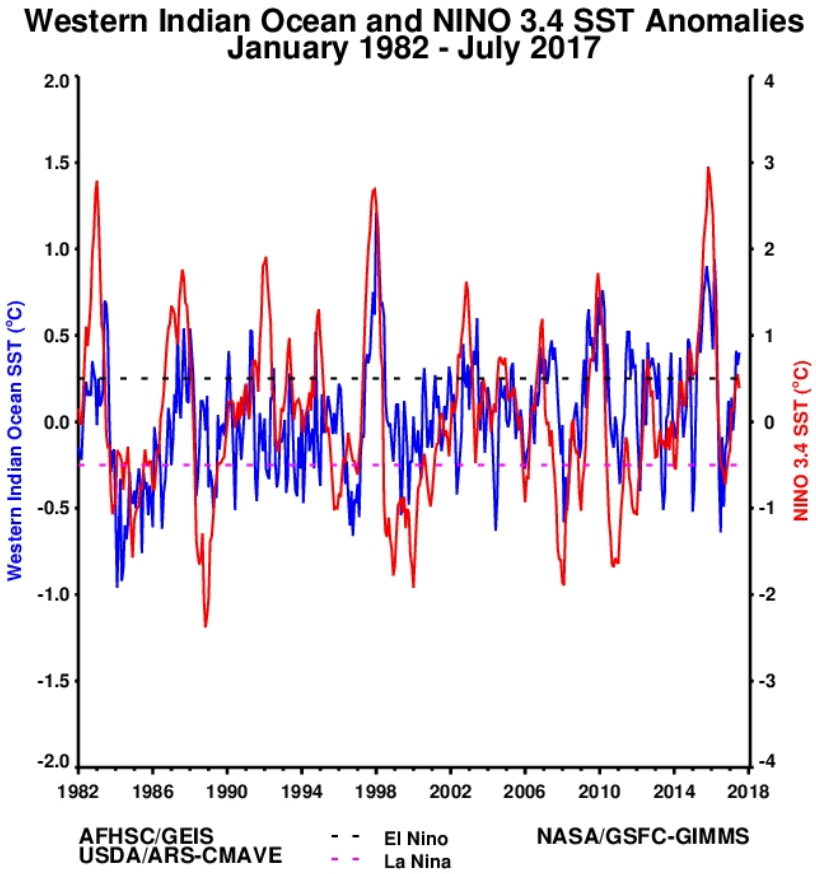
This section of the report will provide a rolling three month update on a monthly basis of the state of the climatic and ecological indicators used in monitoring areas at risk to RVF activity. These indicators include, global SST anomalies patterns, Equatorial Western Indian Ocean (WIO) and Eastern Pacific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

July 2017

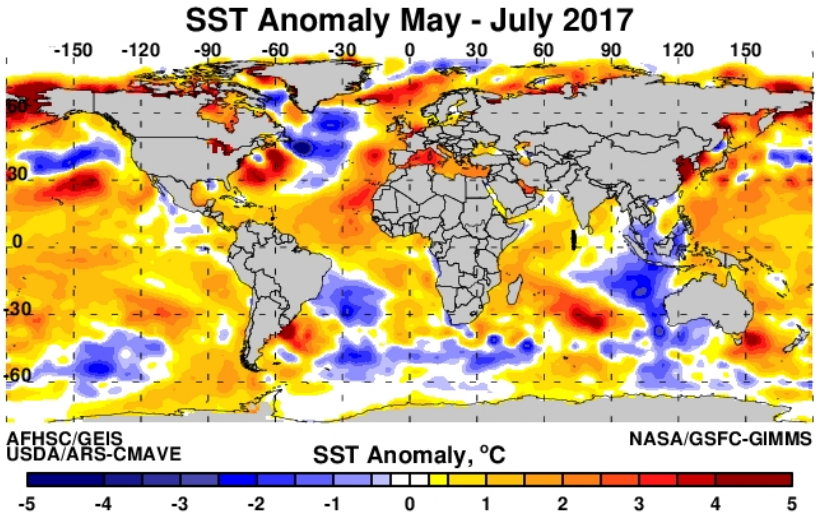
1. SOI and SST Indices

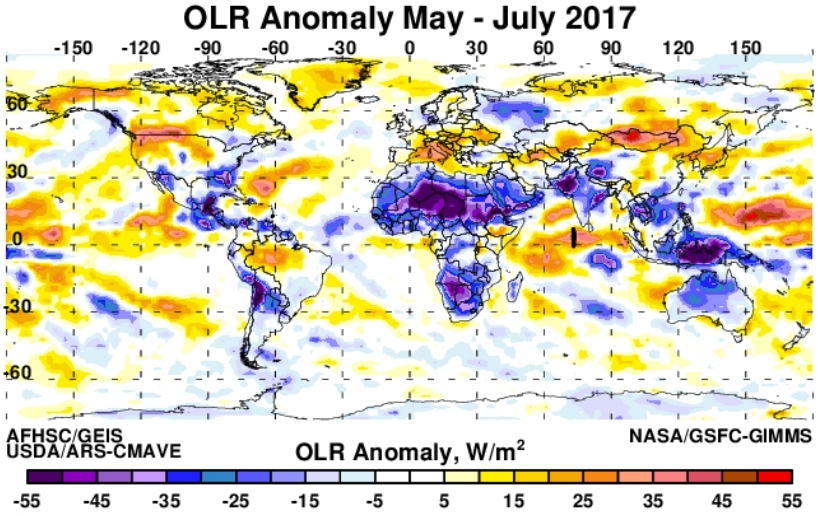




The SOI value remains near normal values with a positive value of 0.8 in July from -0.4 in June continuing the month to month variability that has been observed in the recent months associated with neutral conditions. The ocean temperature conditions continue to indicate that ENSO-neutral conditions are persisting with sea surface temperature (SST) anomalies in most NINO regions showing near-normal to positive values: NINO 3.4 (+0.34°C), NINO 4 (+0.4°C), NINO3 (+0.23°C) and NINO1&2 SST (-0.007°C). The positive SST anomalies in western Indian Ocean show a slight increase from +0.33°C in June to +0.40°C in July in concert SST patterns in the NINO regions. Overall, the coupled ocean-atmosphere system reflects ENSO neutral conditions that are projected to last through 2017/18 winter season with 3-month average Niño-3.4 index between -0.5°C and +0.5°C. Other forecast models predict the onset of El Niño (~30-45%) during the Northern Summer with (3-month average Niño-3.4 index at or greater than +0.5Â°C). However, more than half of the prediction models favor ENSO-neutral conditions to persist for

the rest of 2017 with a 50-55% chance.

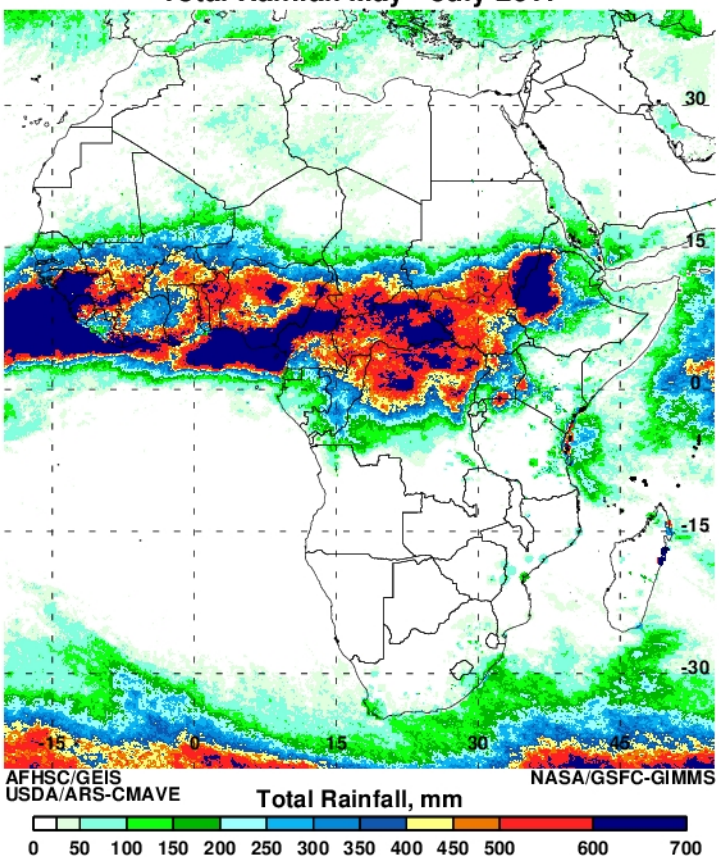


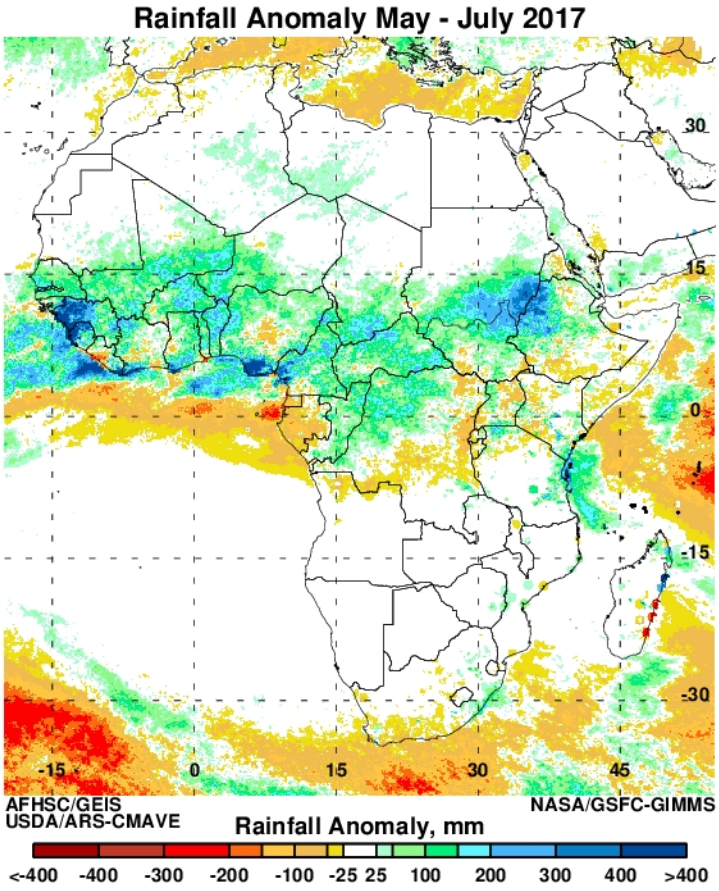


The equatorial Pacific Ocean seasonal (MJJ 2017) SST anomalies show elevated positive SST anomalies from the central equatorial Pacific to the extreme eastern equatorial Pacific region, centered just south of the equator along the South America coast. The western Pacific Ocean around the Indonesian basin shows weakened above normal SSTs and development of a cold anomaly pool west and southwest of this region. This cold pool covers most of the southeastern Indian Ocean basin extending towards southwestern Australia. 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 lingering effects of La Niña 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

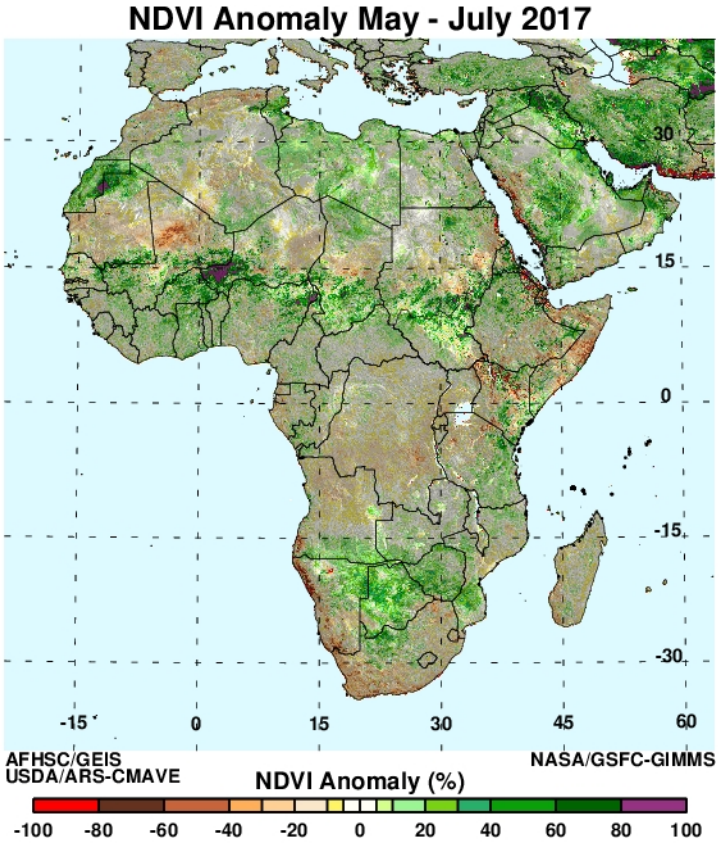
OLR departure patterns here. During the May - July 2017 period, drier-than-average conditions (>+55W/M2) are prevailing over the central equatorial Pacific - just north of the equator northeastwards towards coastal Mexico while the western Pacific just east of Indonesia shows negative OLR anomalies (>-40W/M2) coinciding the region positive SSTs. The negative OLR anomalies extend southwards into Australia indicative of continued deep convective activity, while the Indian Ocean shows positive OLR anomalies in the region of colder than normal SSTs extending into East Africa particularly Kenya and Somalia. Drier the normal conditions continue to persist over extreme northern hemisphere including coastal Alaska, Western Europe, eastern Russia and now northwestern US. Some parts of southwestern US now show negative OLR anomalies extending into southern/southeastern US indicative of increasing precipitation which could help the alleviate dry conditions that have persisted over this region in the last several months. Negative OLR anomalies continue to dominate North Africa and Middle East and extending into India and central Asia. Accordingly, southern Africa and the southern half of South America show negative OLR anomalies suggesting continued 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 cold ENSO events. Monthly and weekly anomalies can be found here. Rainfall and associated anomalies (below) for Africa from May - July 2017 show rainfall now concentrated just north of the equator, maximum values of 700mm over the northern Congo basin and Gulf of Guinea coast. Areas of above normal rainfall (+50 to 400 mm) are limited to the northern Congo basin, Central Africa Republic, Gulf of Guinea countries and the Sudan/Ethiopia region with values at ~ +300mm over the last three month period.

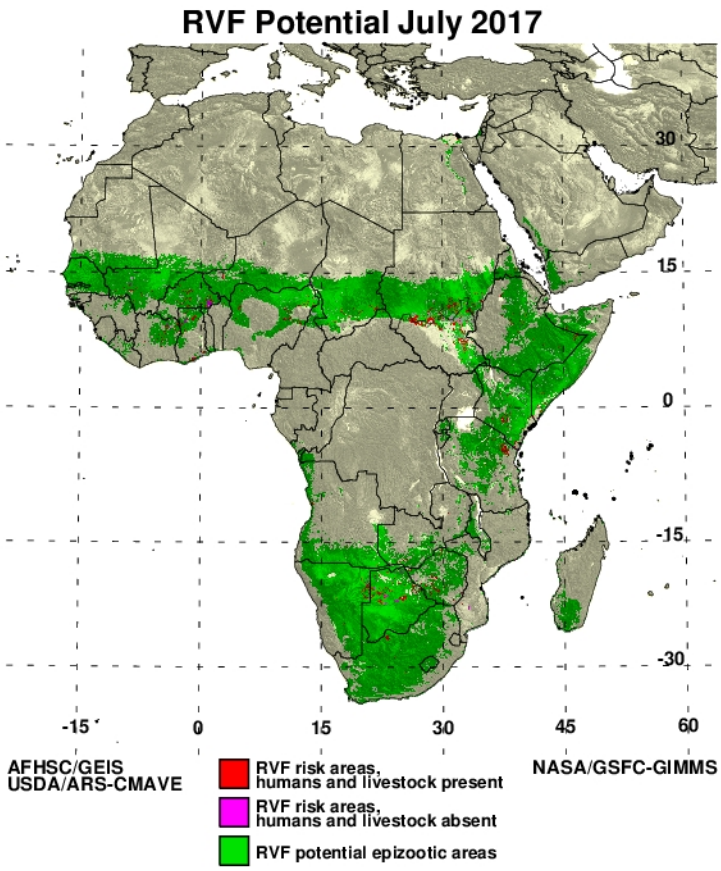
Total Rainfall May - July 2017





Cumulative NDVI anomalies for Africa for May - July 2017 show positive anomalies concentrated centered over Western Sahara, the Sahel belt from Niger to Sudan and residual positive anomalies covering Botswana, eastern Namibia, NW South Africa and southern Zimbabwe. 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 May - July 2017, the RVF persistence model identifies areas at risk areas primarily in Botswana, eastern Namibia and southern Zimbabwe and additional areas in Niger, Sudan and Southern Sudan which have received above normal rainfall over the last several months. Given the elevated rainfall conditions that have prevailed in these countries, continued surveillance is advised in these areas.


NDVI Anomaly May - July 2017
30
15
0
-15
-30
-15
0
15
30
45
60
AFHSC/GEIS
USDA/ARS-CMAVE
NASA/GSFC-GIMMS
NDVI Anomaly (%)
-100
-80
-60
-40
-20
0
20
40
60
80
100


RVF Potential July 2017
30
15
0
-15
-30
-15
0
15
30
45
60
AFHSC/GEIS
USDA/ARS-CMAVE
RVF risk areas,
humans and livestock present
RVF risk areas,
humans and livestock absent
RVF potential epizootic areas
NASA/GSFC-GIMMS