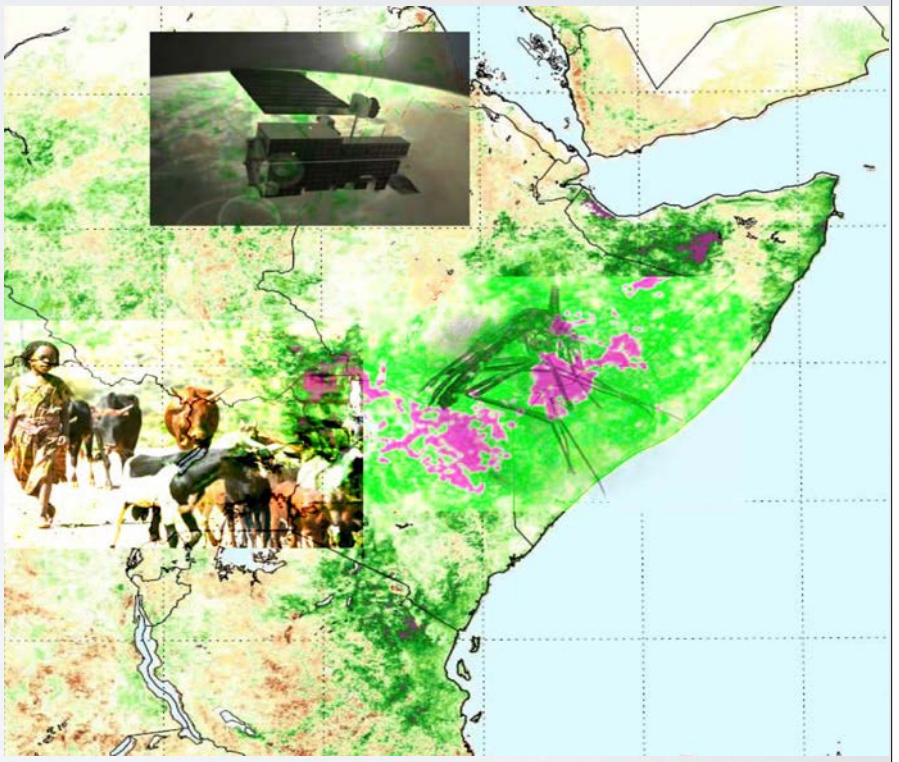
RIFT VALLEY FEVER PREDICTION AND RISK MAPPING: 2014-2015 SEASON

Inter-Regional Conference
Rift Valley fever: new options for trade, prevention and control
Djibouti City, Djibouti, 21 – 23 April 2015



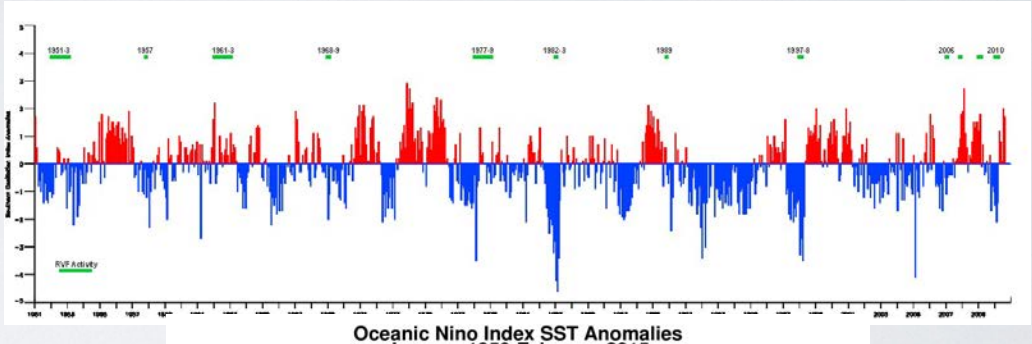
Assaf Anyamba
NASA Goddard Space Flight Center
Biospheric Sciences Brach & USRA

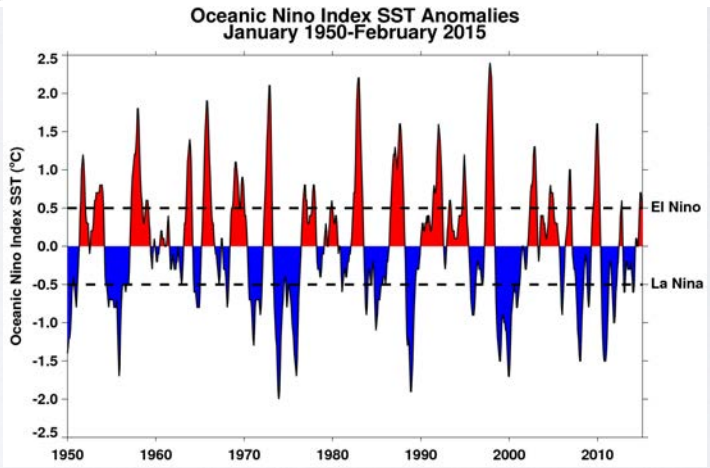
GIMMS
Global Inventory Monitoring and Mapping Studies

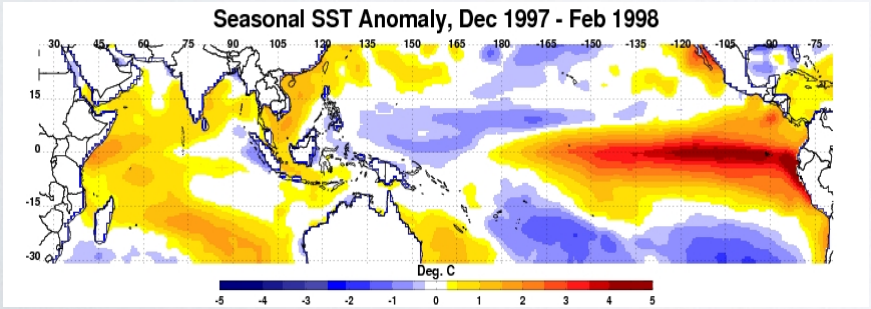
USDA ARS United States Department Of Agriculture Agricultural Research Service

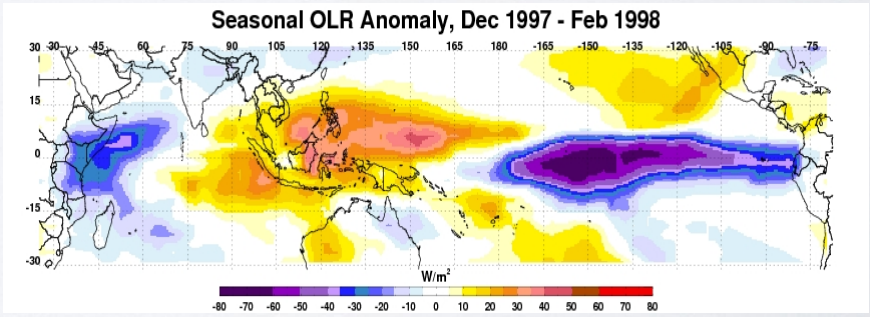
El Niño SOUTHERN OSCILLATION AND RIFT VALLEY FEVER ACTIVITY

- Influences the patterns of floods and drought on an interannual time scale.
- extremes have an impact on the emergence, propagation and survival of disease vectors/pathogens
- Results in episodic patterns of disease outbreaks as they dance in tune with climate variability

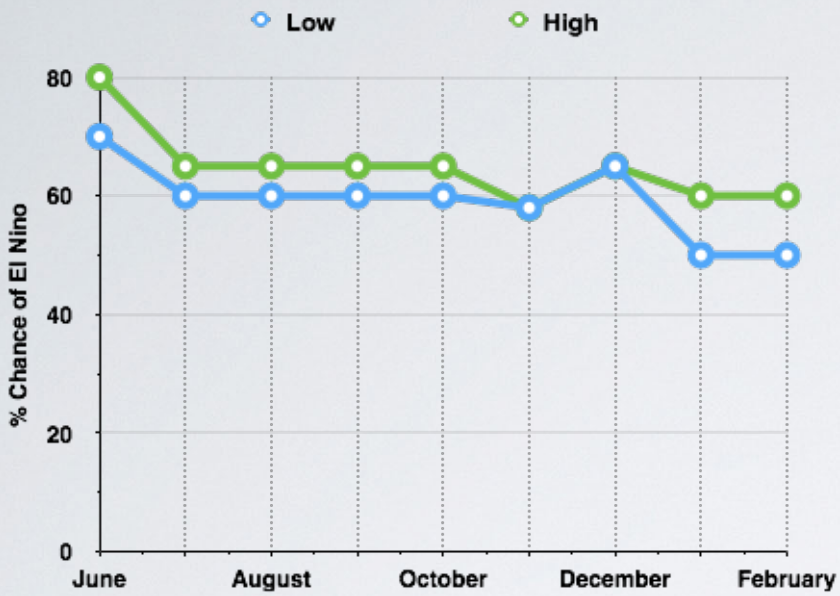


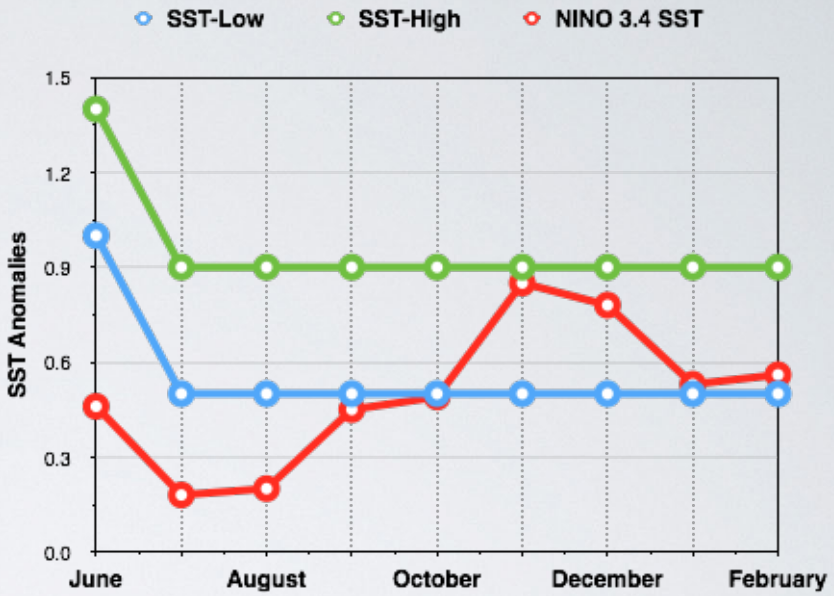




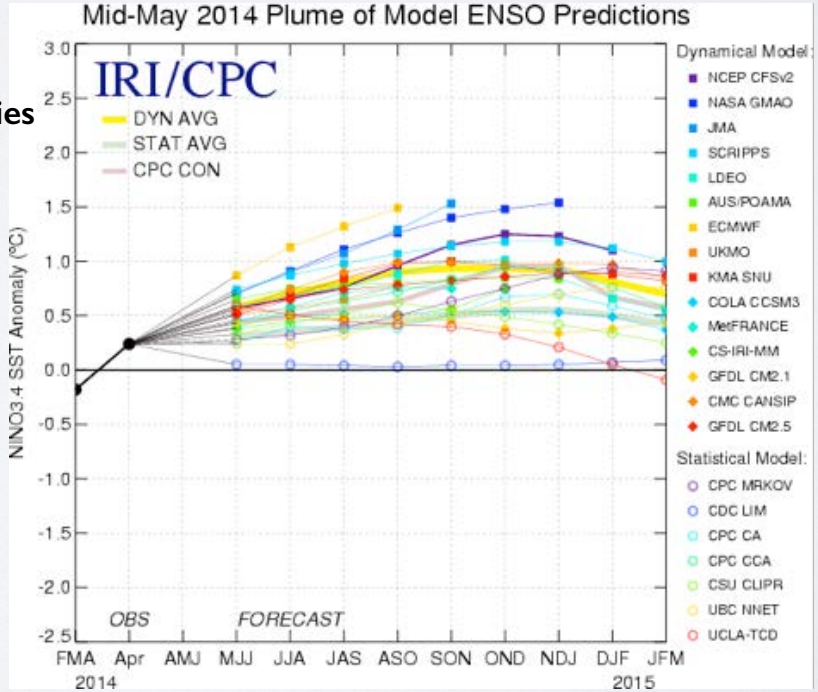


ENSO PREDICTIONS: 2014-2015



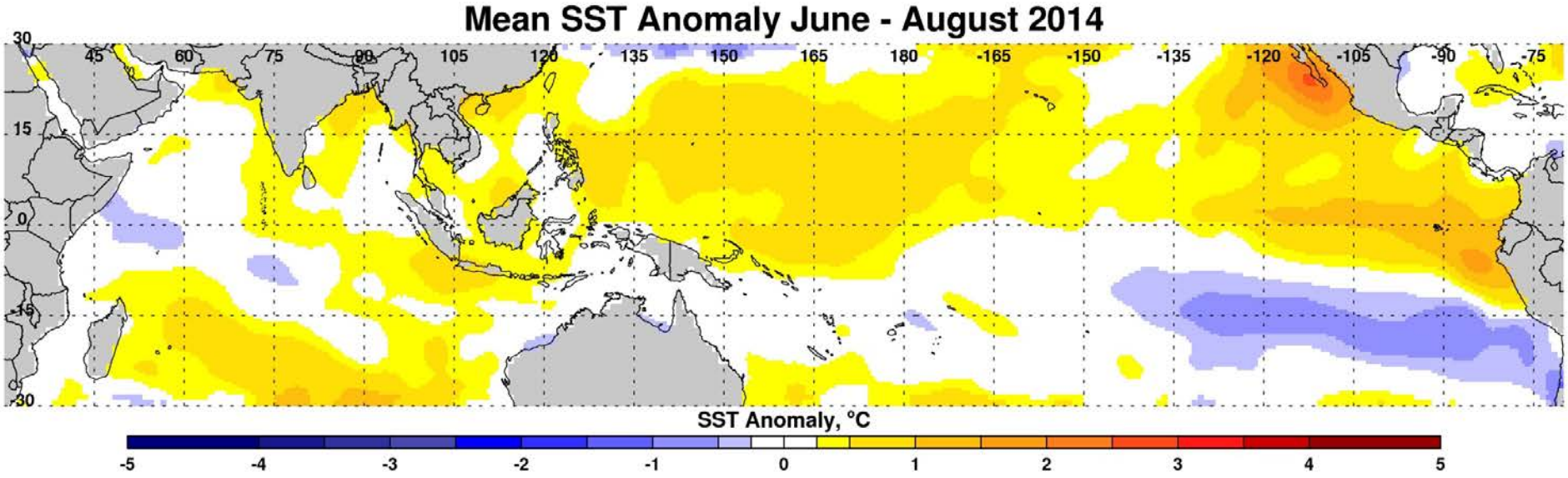


Forecasts of sea surface temperature (SST) anomalies for the Niño 3.4 region (5°N-5°S, 120°W-170°W).

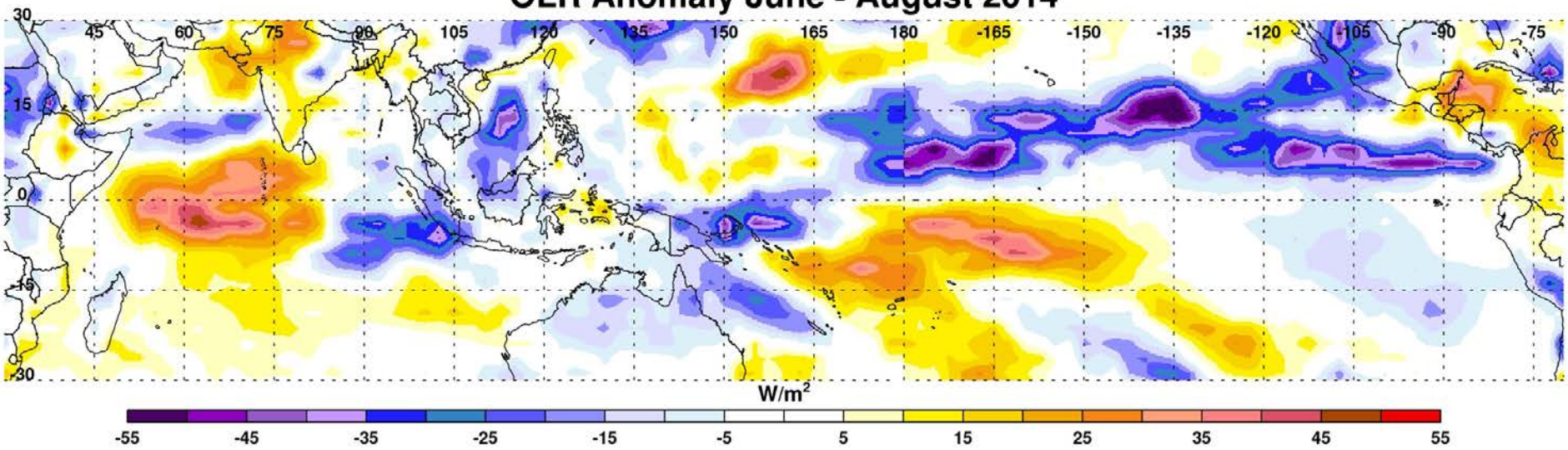


JJA 2014

SSTa JJA

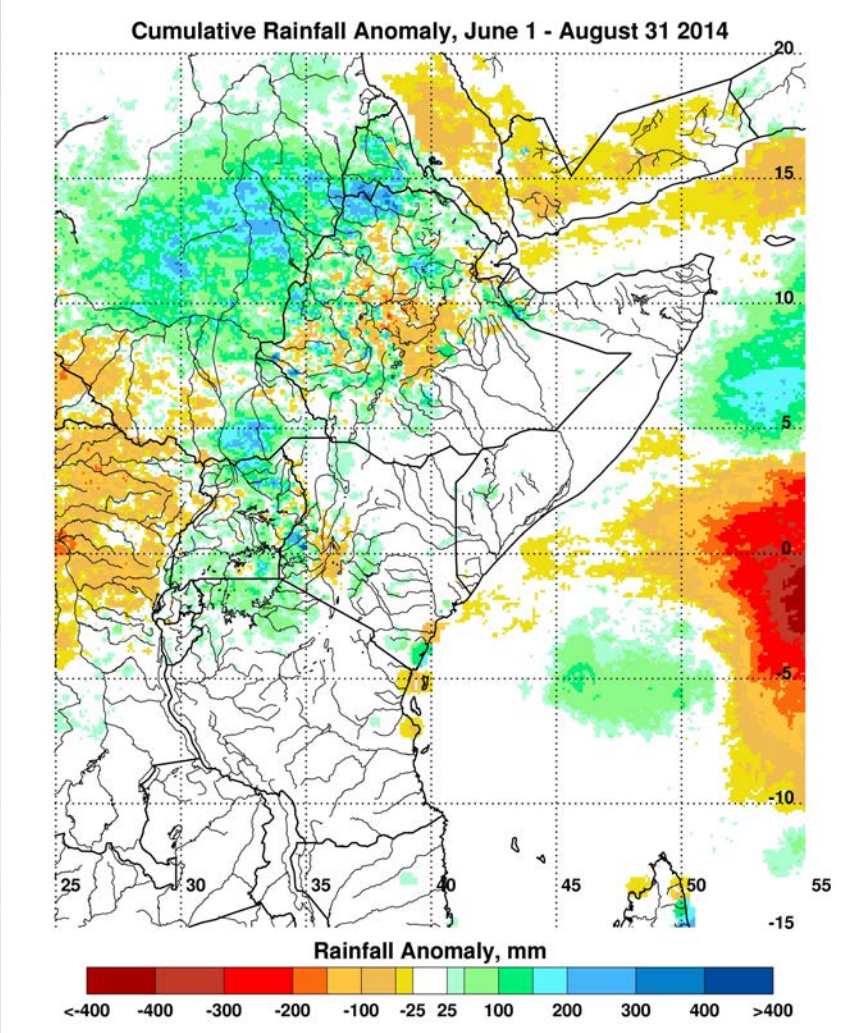


OLRa JJA

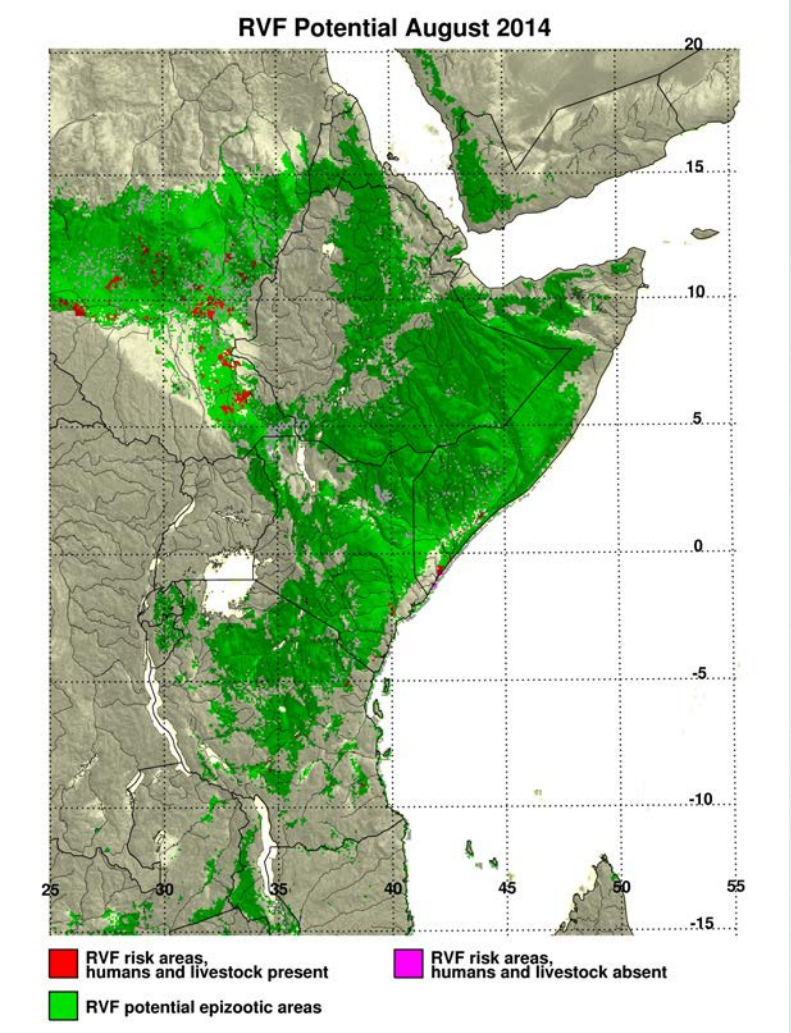


JJA AUG

PRECIPa JJA

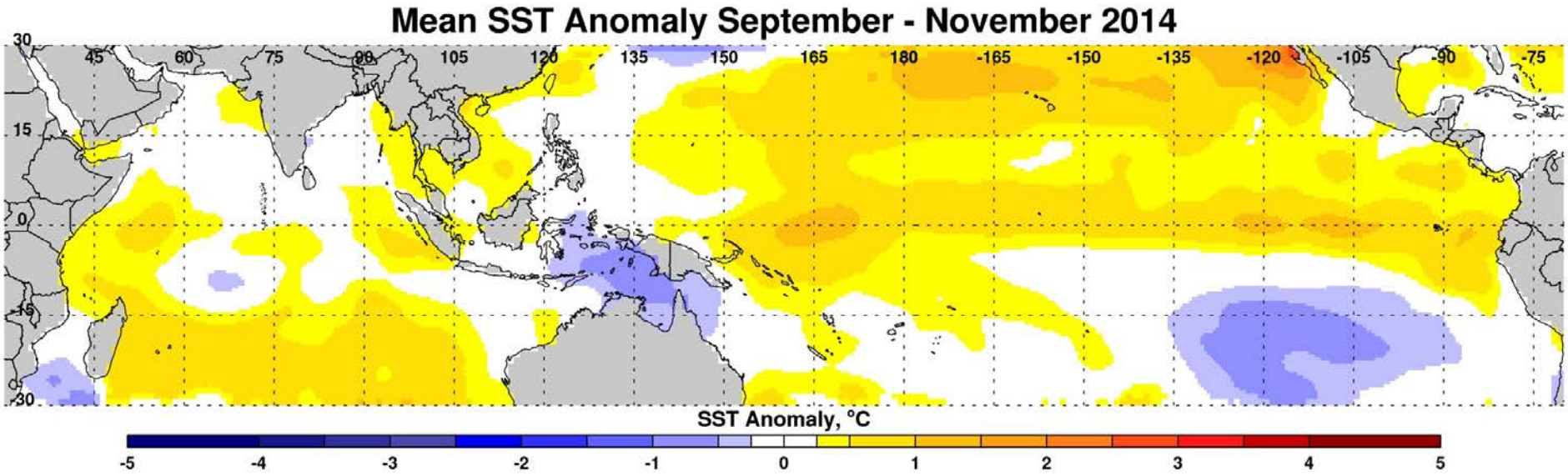


RVF RISK MAP JJA 2014

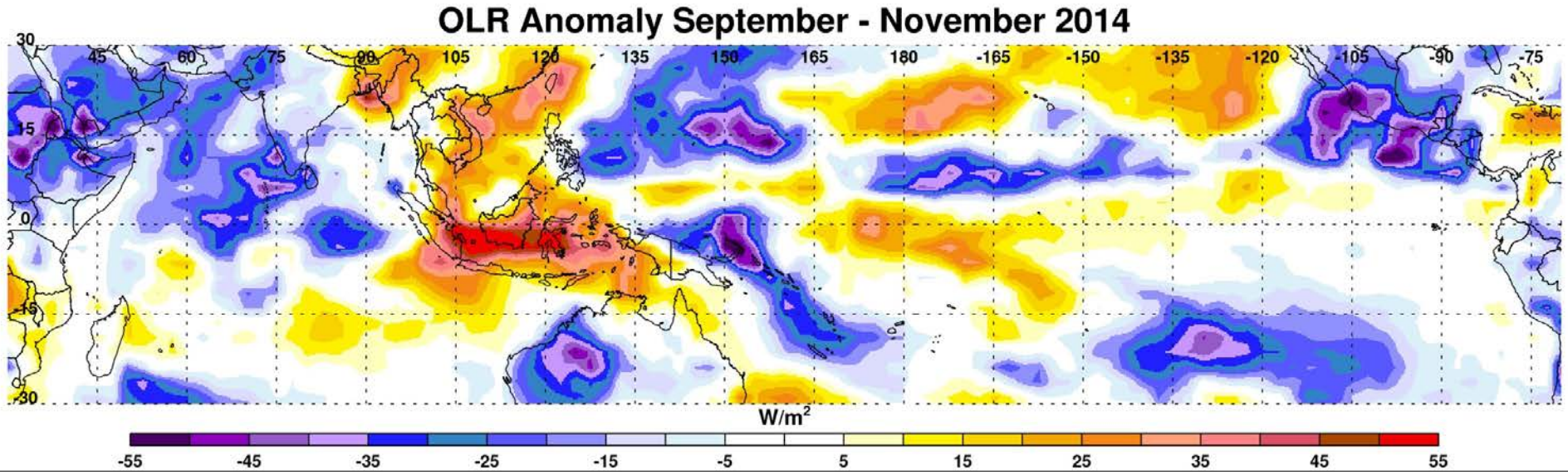


SON 2014

SSTa SON

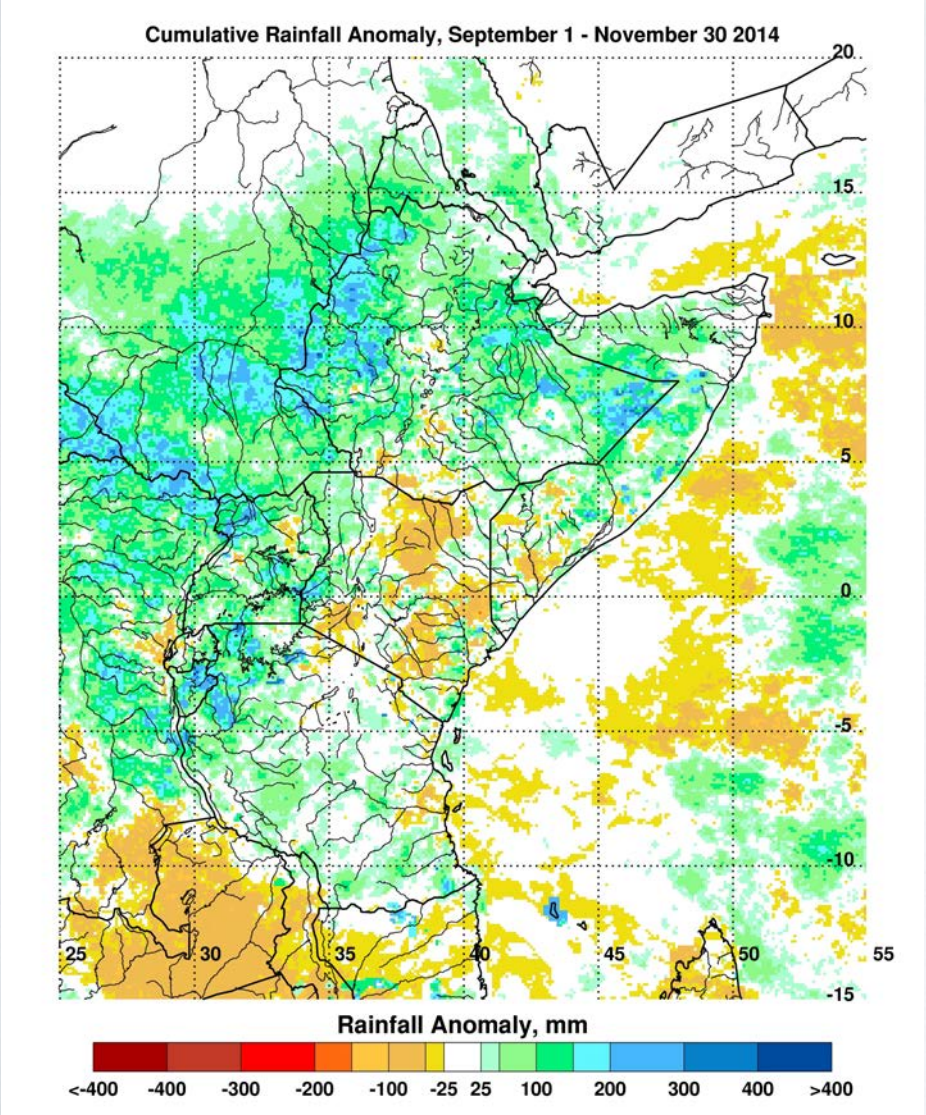


OLRa SON

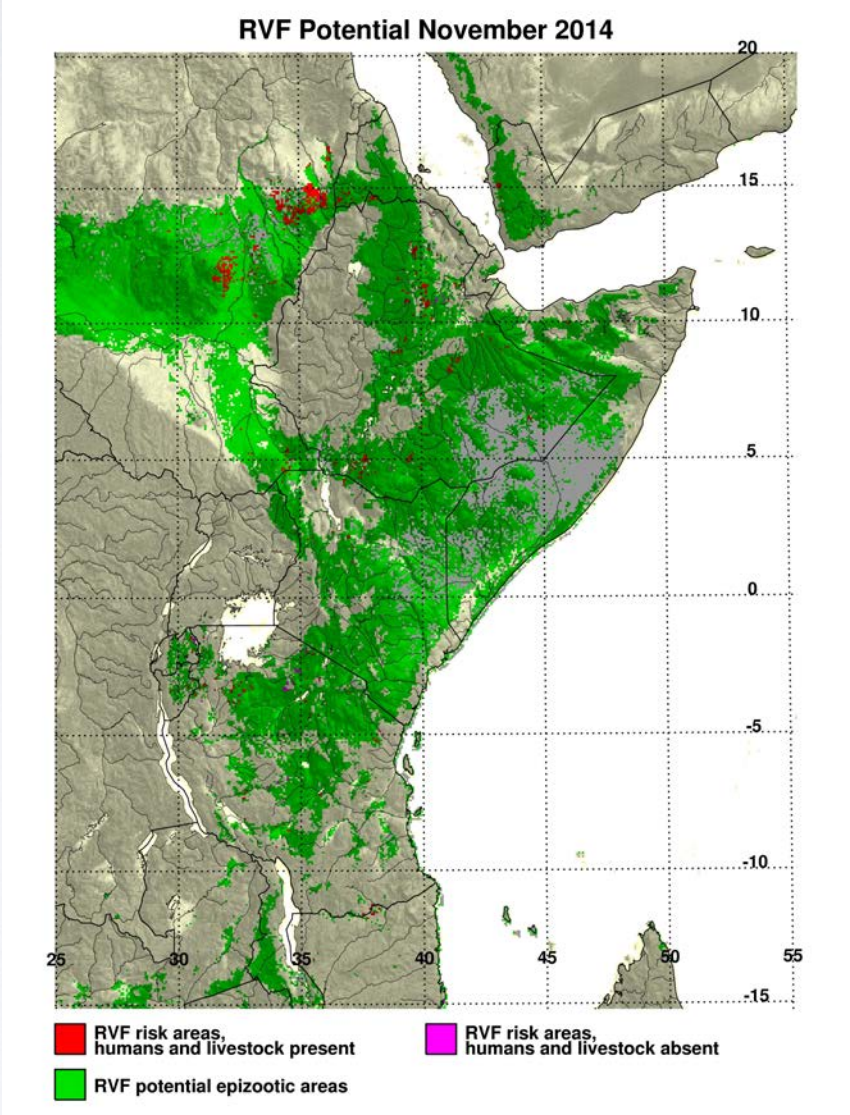


SON 2014

PRECIPa SON

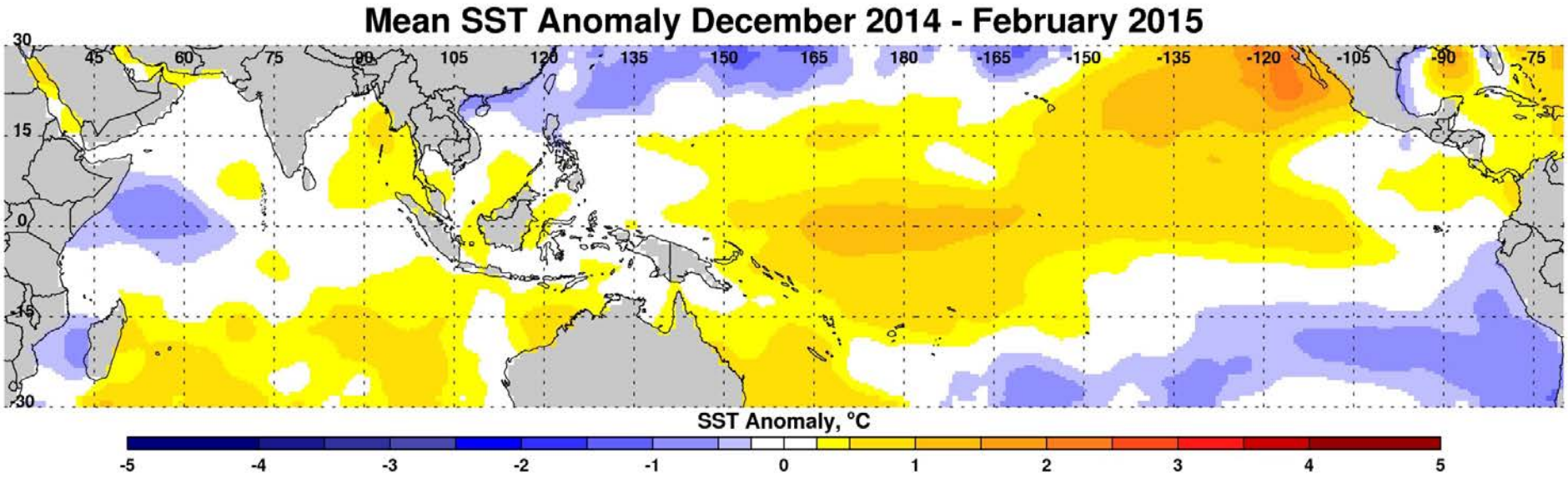


RVF RISK MAP SON 2014

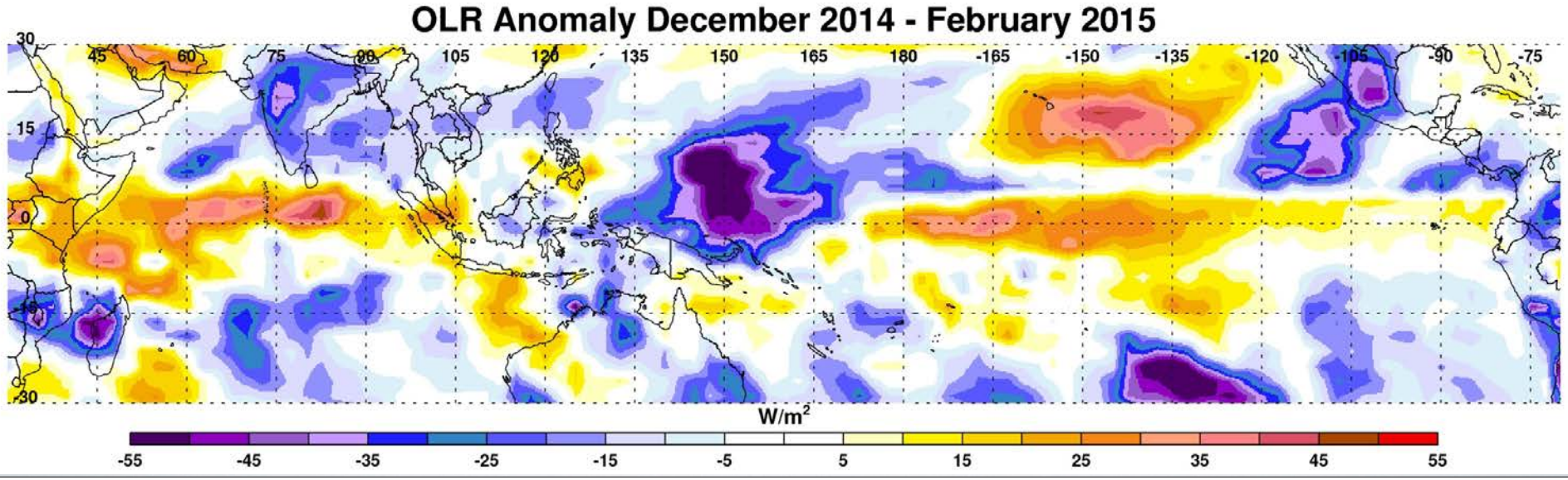


DJF 2014-2015

SSTa DJF

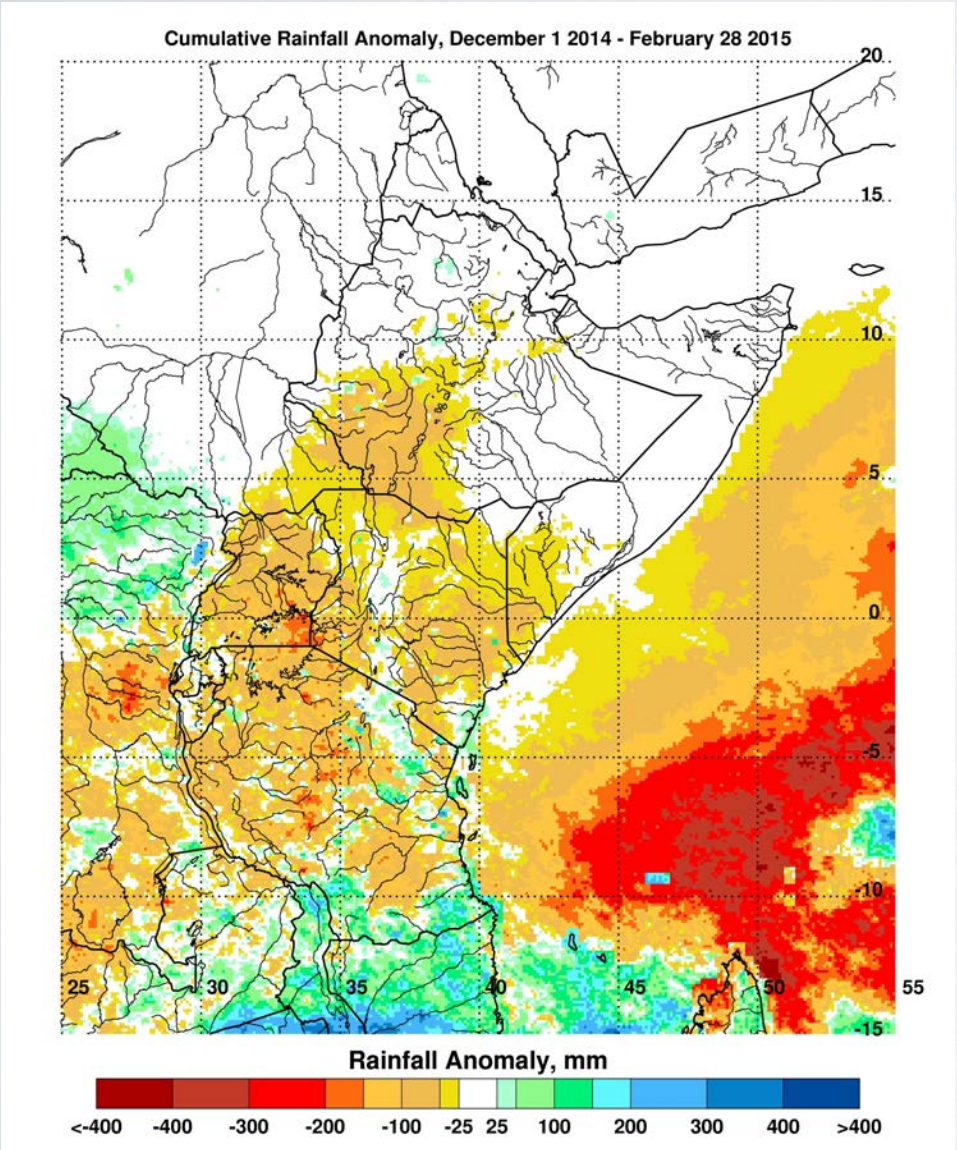


OLRa DJF

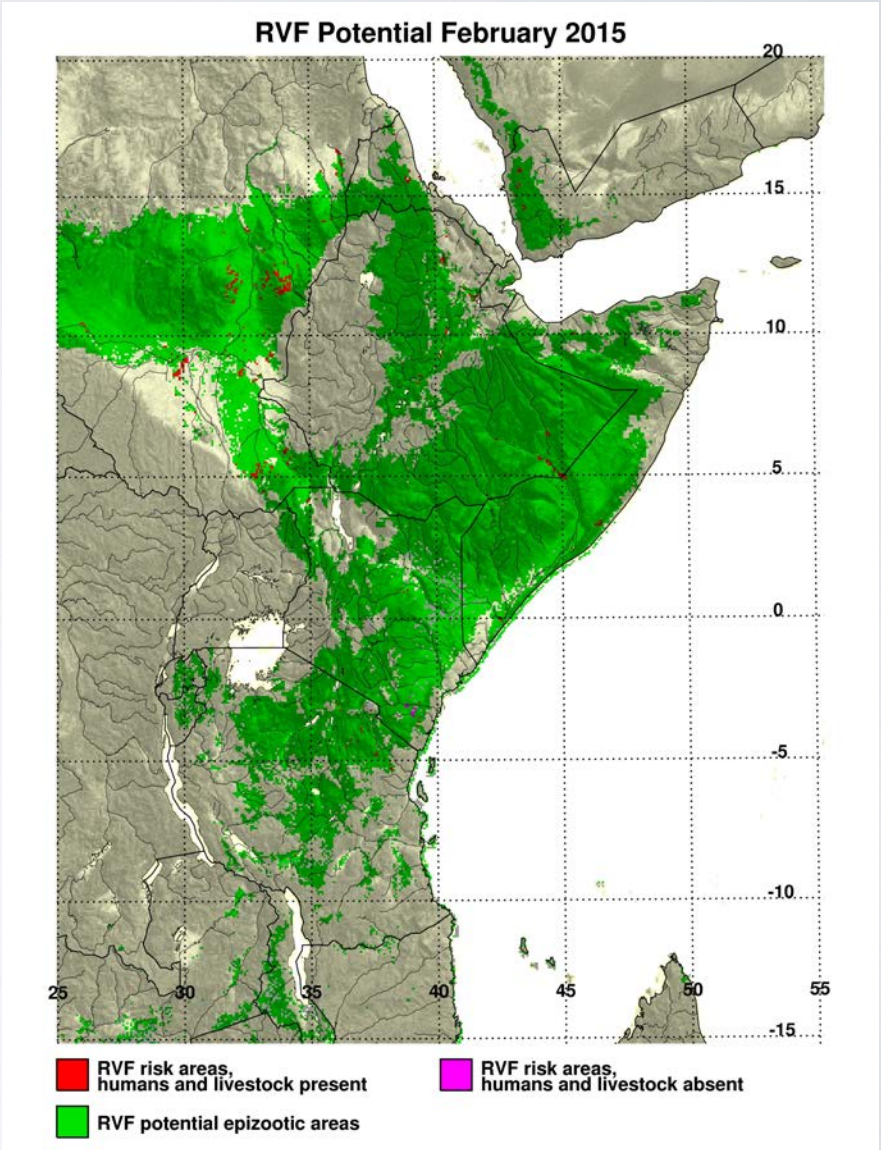


DJF 2015/15

PRECIPa DJF

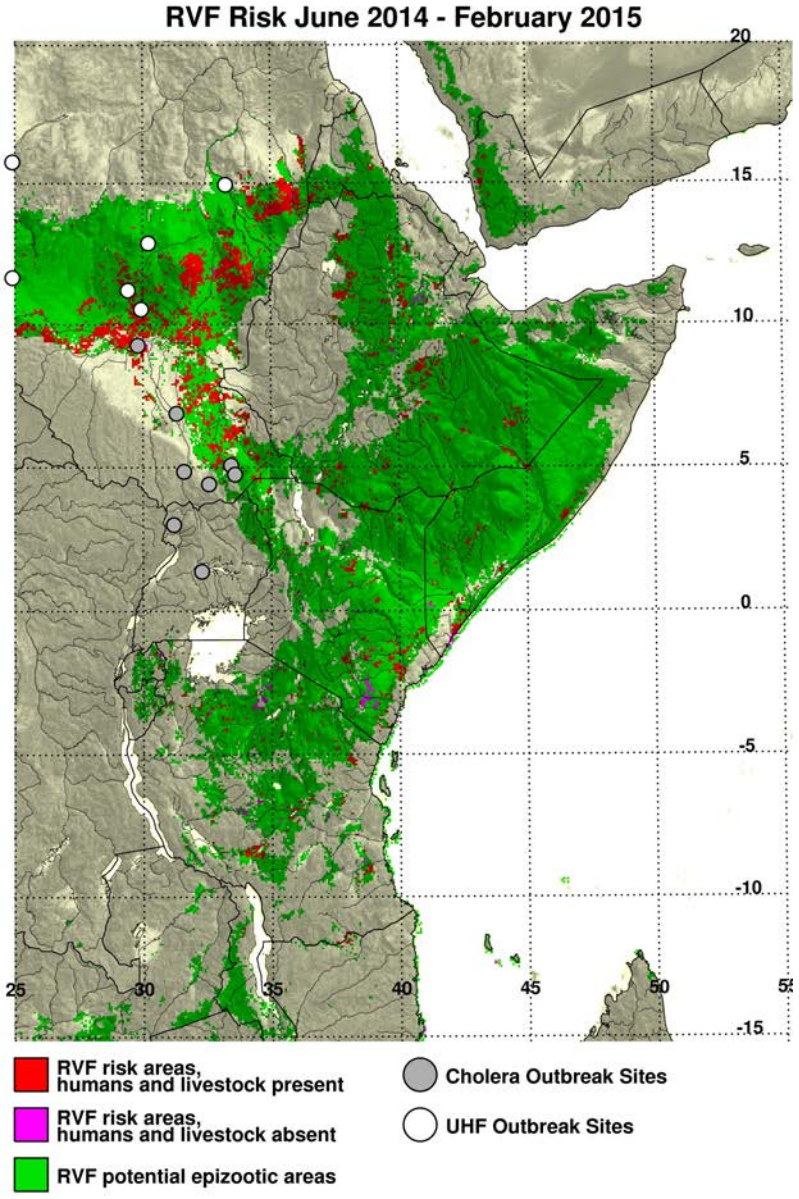


RVF RISK MAP DJF

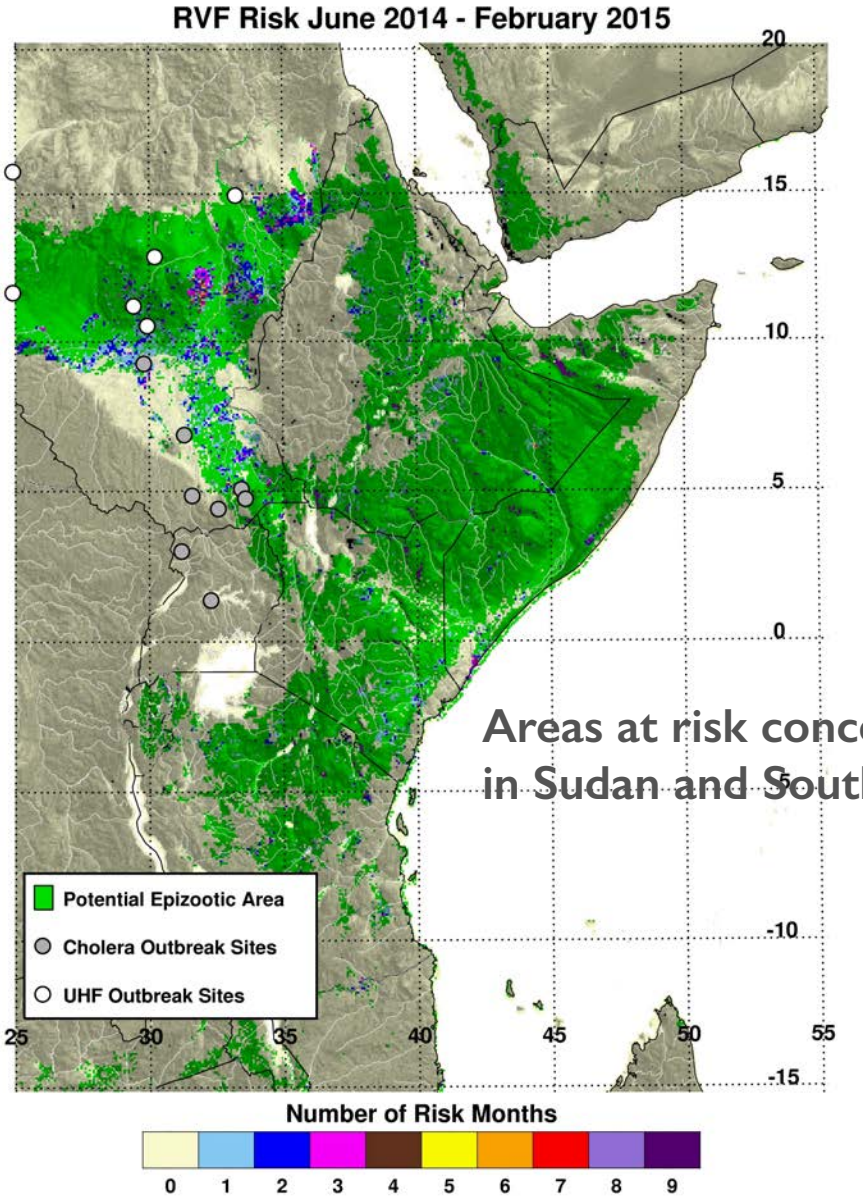


COMPOSITE and FREQUENCY RISK MAPS

JUNE 2014 - FEB 2015

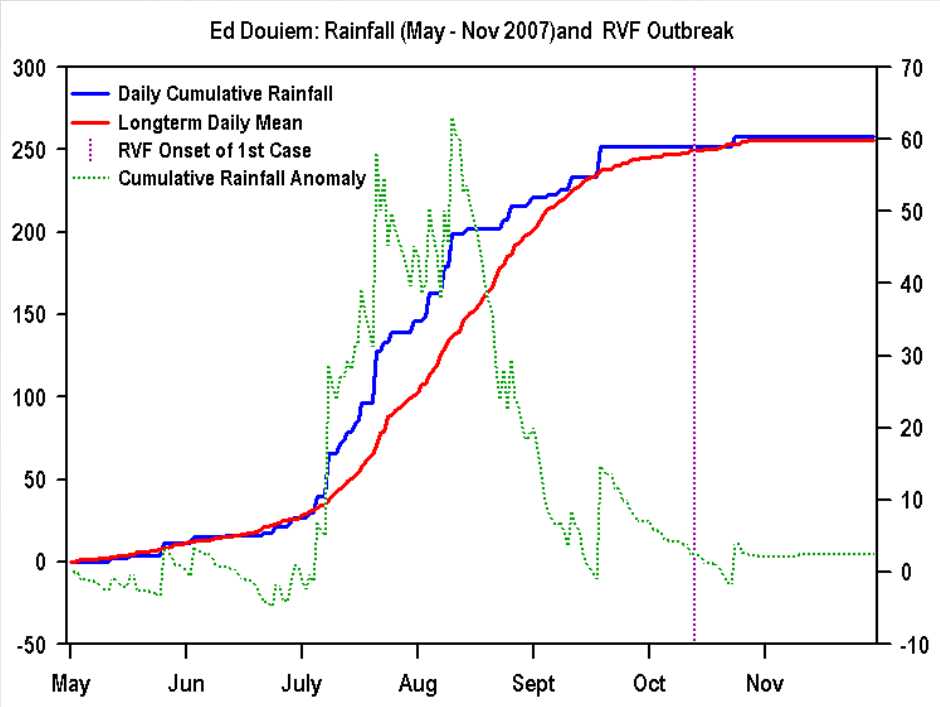


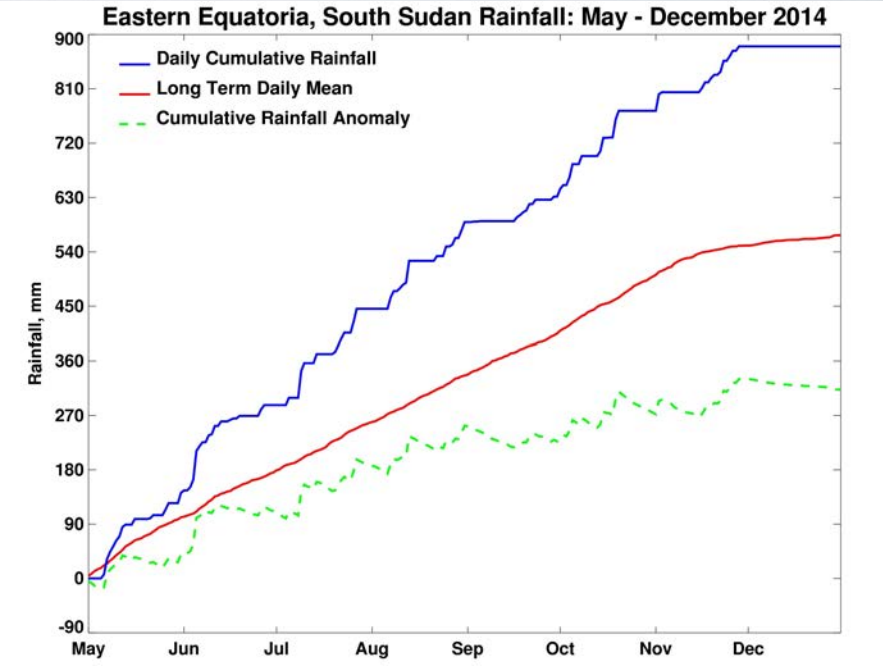
JUNE 2014 - FEB 2015



Areas at risk concentrated in Sudan and South Sudan

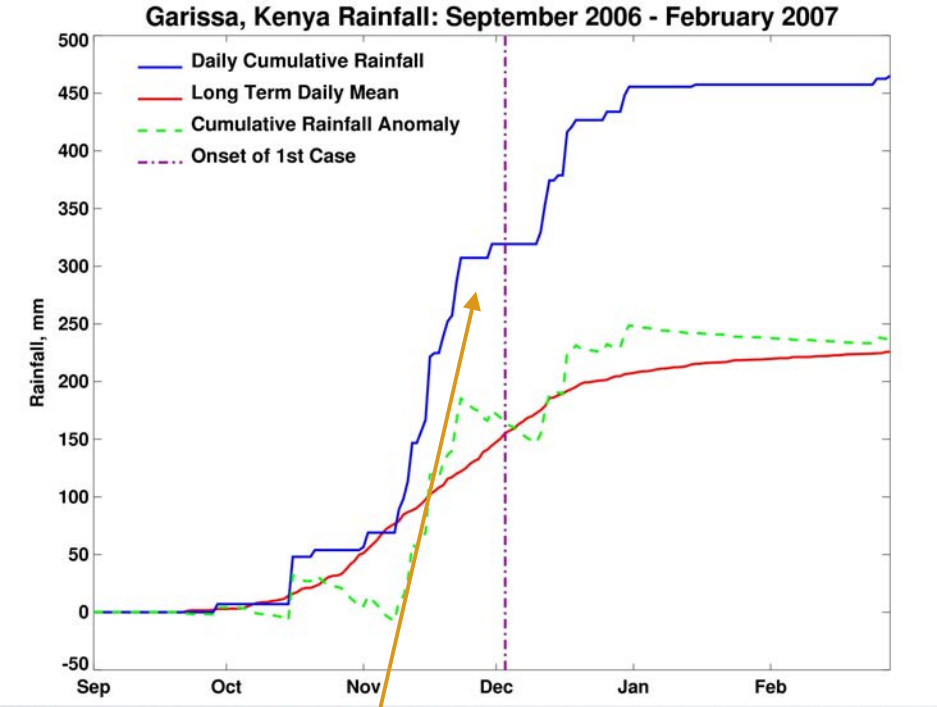
OUTBREAK TIMING

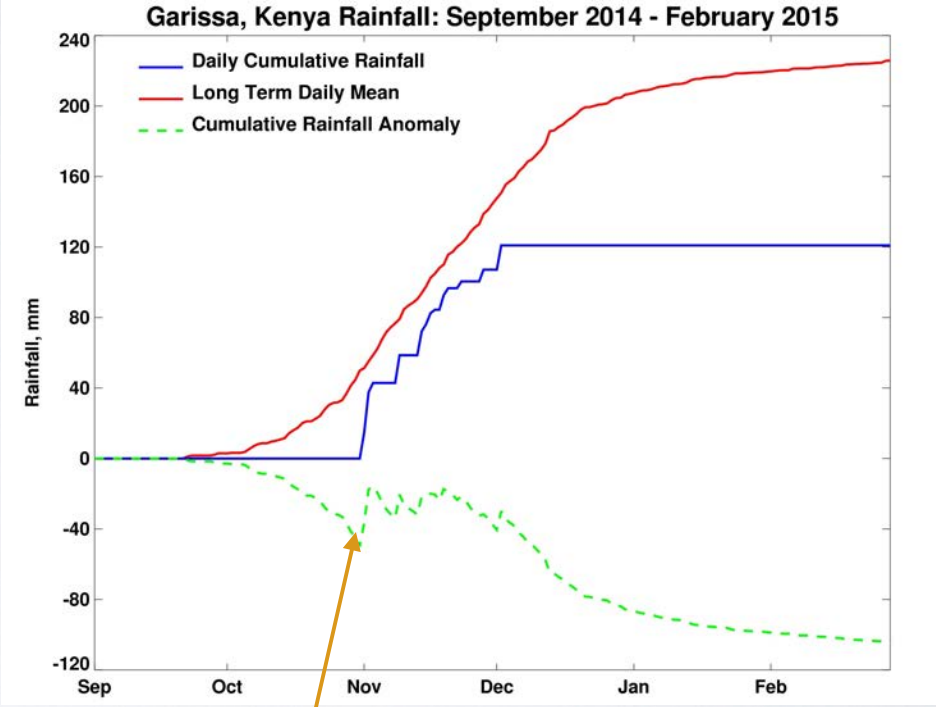




- No record of start date/index case of UHF in 2014 (right) unlike during 2007 RVF outbreak situation

OUTBREAK TIMING





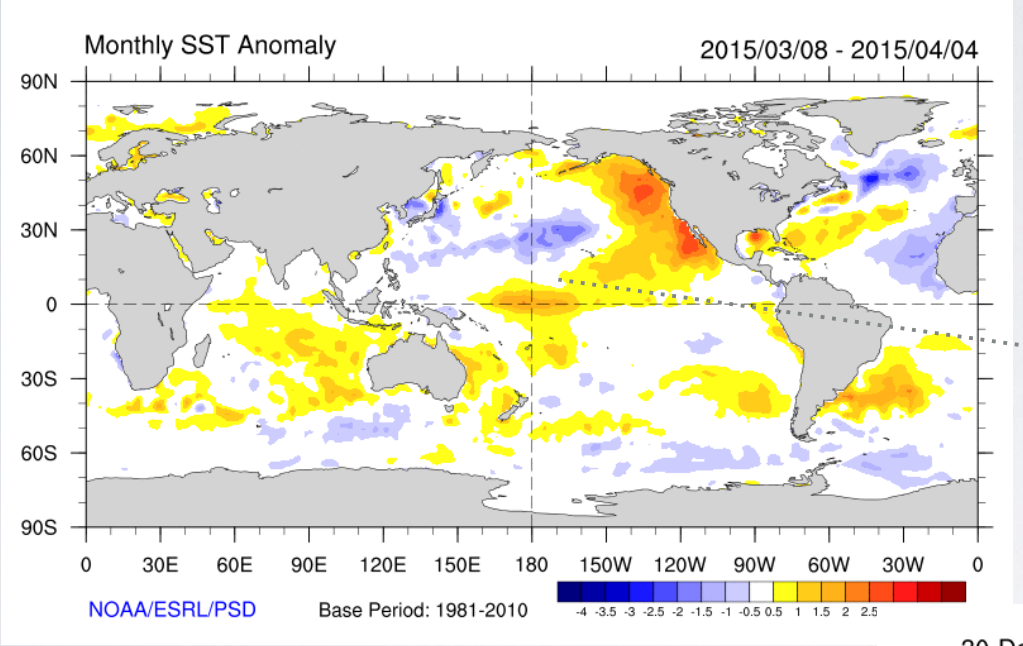
Above Normal

Below Normal

- 2014 - Failure to launch - collapse of the Short-rains season unlike in 2006

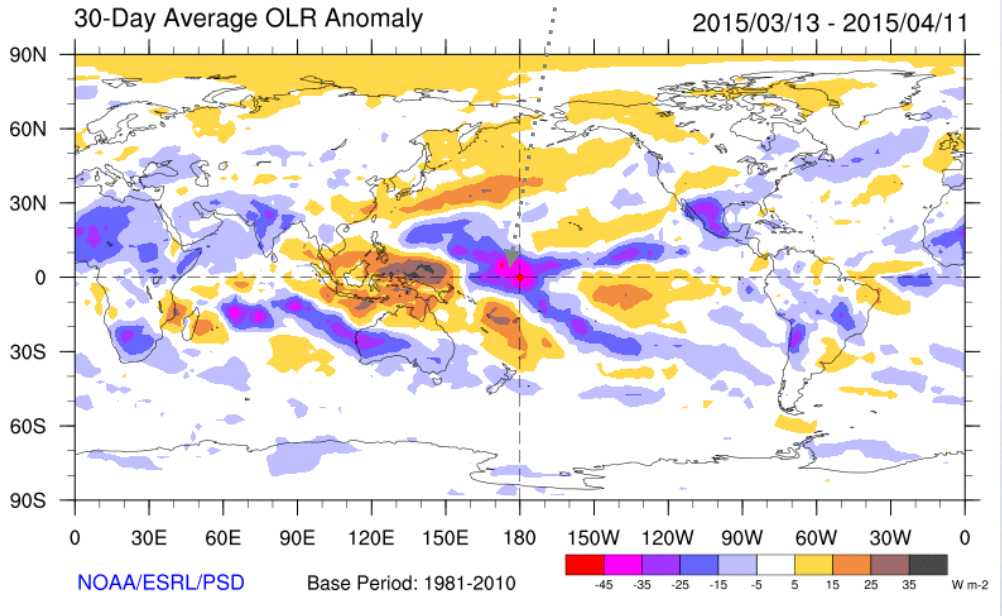
MARCH 2015

SSTa 2015



Late developing
Weak El Niño

OLRa 2015



- model forecasts predict weak El Niño conditions (70% chance) will continue through the Northern Hemisphere summer 2015.
- greater than 60% chance that it will last through autumn.
- In some locations, certain impacts often associated with El Niño may appear during the Northern Hemisphere spring and early summer 2015 season.

SUMMARY

- Extremes in either direction (+/-) of precipitation/ temperature have significant implications for disease vectors and pathogen emergence and spread
- Magnitude of ENSO influence on precipitation/temperature cannot be currently predicted — rely on average history and patterns.
- Timing of event and emergence disease can be exploited (GAP) in to undertake vector control and preparedness measures.
- Currently - no risk for ecologically-coupled RVFV activity however we need to be vigilant during the coming fall season due the ongoing buildup of energy in the central Pacific Ocean.
- Potential for the dual-use of the RVF Monitor system for other VBDs
- Need to invest in early ground surveillance and the use of rapid field diagnostic capabilities for vector identification and virus isolation

CONTACTS AND CREDITS

Remote Sensing, Climate Variability & Modeling

- Assaf Anyamba: assaf.anyamba@nasa.gov
- Jennifer Small jennifer.l.small@nasa.gov

Vector Biology and Ecology

- Kenneth J. Linthicum: Kenneth.Linthicum@ars.usda.gov
- Seth Britch seth.Britch@ars.usda.gov

AFHSC/GEIS

- Brett Forshey

Program Lead
Febrile and Vector-borne Infections

- Alaina Halbach

Epidemiologist

- LCDR J-P. Chretien

Division of Integrated Biosurveillence, DoD/ AFHSC-DIB.

Field Intelligence

- USARMU-K
- KEMRI
- CDC-Kenya
- OIE
- FAO
- WHO