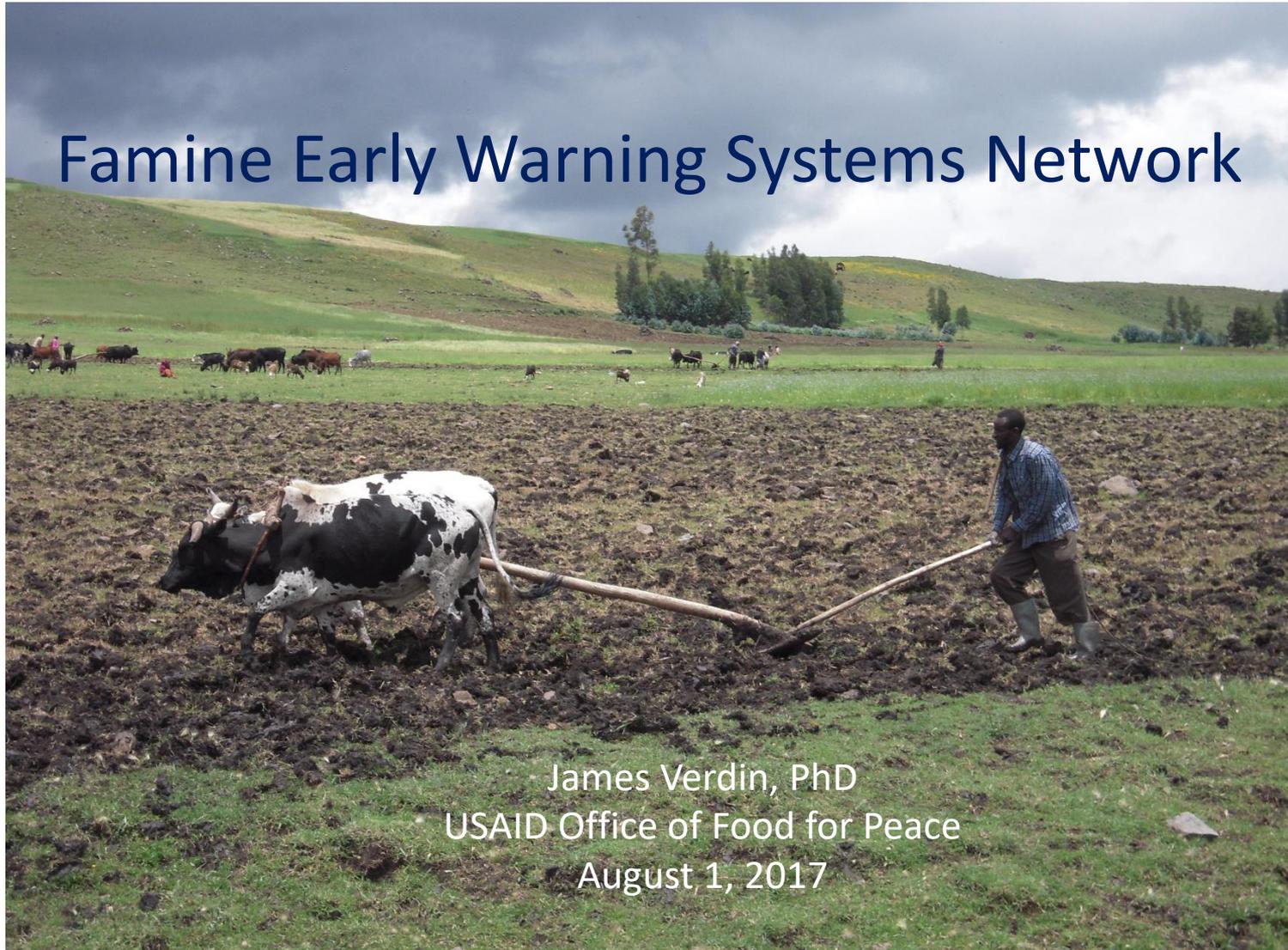


Famine Early Warning Systems Network



James Verdin, PhD
USAID Office of Food for Peace
August 1, 2017

Famine Early Warning Systems Network

An activity of the USAID Office of Food for Peace

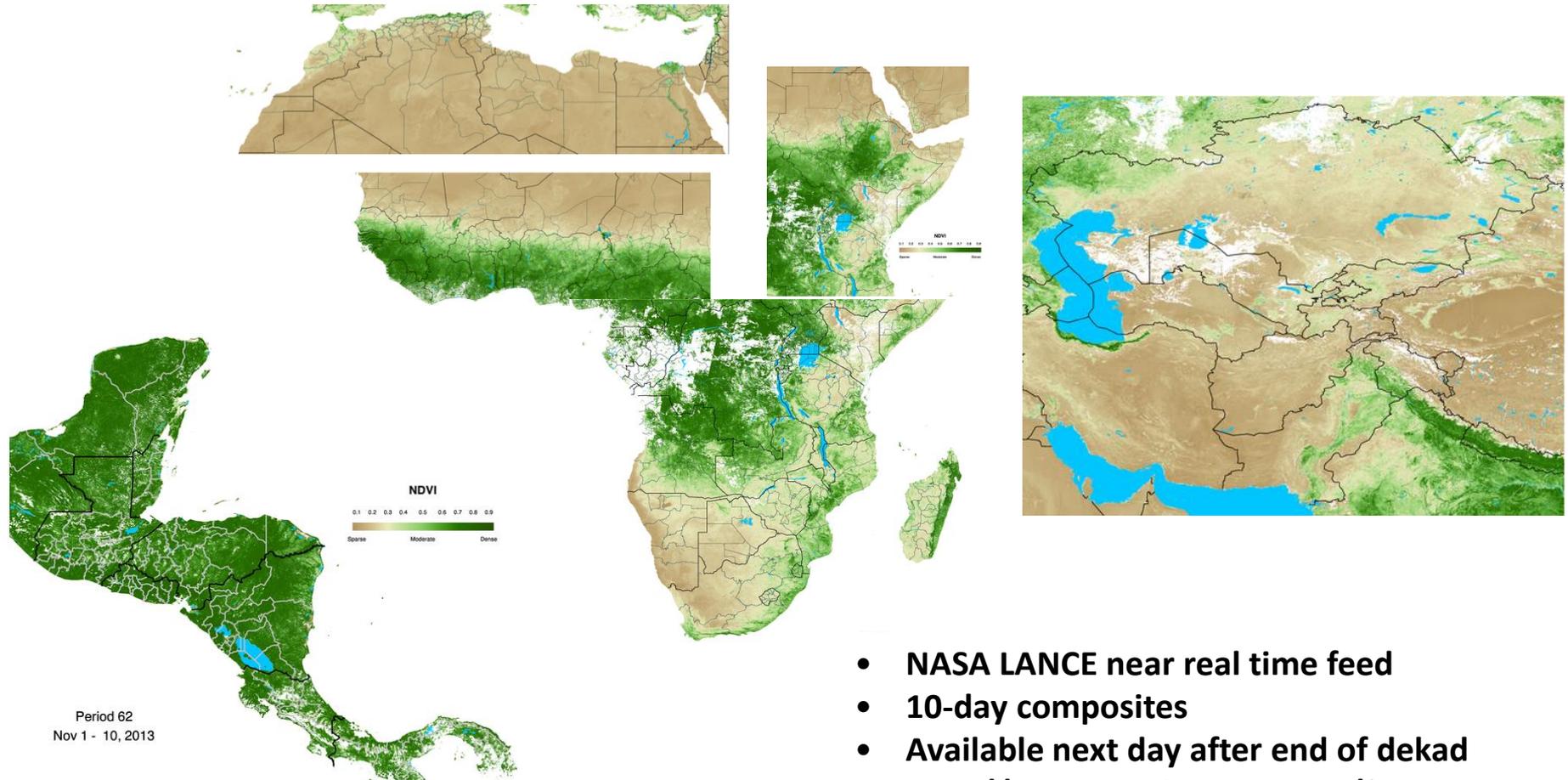


“to ensure that appropriate...emergency food aid is provided to the right people, in the right places, at the right time, and in the right way”

The FEWS NET World

- Livelihood systems are based on subsistence agriculture and/or pastoralism, and are highly climate-sensitive
- Conventional climate station networks are sparse and/or late reporting
- Satellite remote sensing and models fill the gap, and provide the basis for early detection of agricultural drought

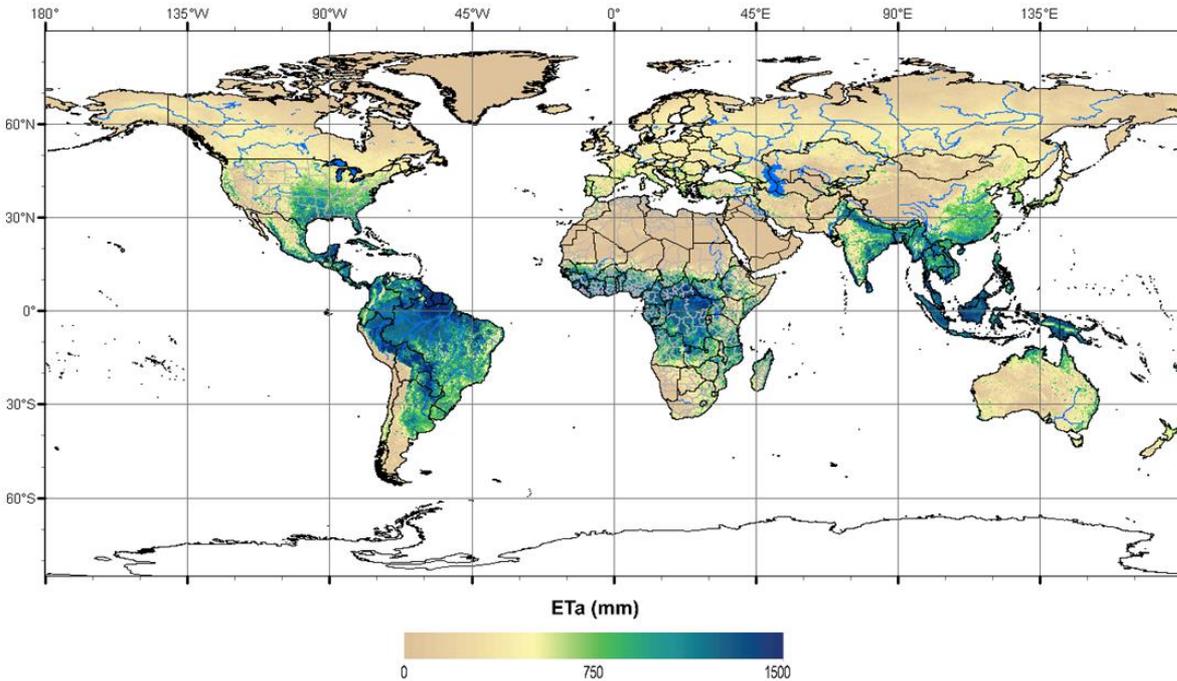
eMODIS NDVI at 250 m



- **NASA LANCE near real time feed**
- **10-day composites**
- **Available next day after end of dekad**
- **<http://earlywarning.usgs.gov/fews>**

Actual ET from MODIS LST at 1 km

Global
SSEBop Actual ET
2016



Map Produced by USGS/EROS



Evapotranspiration (mm)

NASA LANCE near real time feed

Dekadal, monthly and annual accumulations

Time-series from 2003 to present

Anomaly as % of median for monthly, seasonal, and annual accumulations

<http://earlywarning.usgs.gov/fews>

NASA FEWS NET Land Data Assimilation System



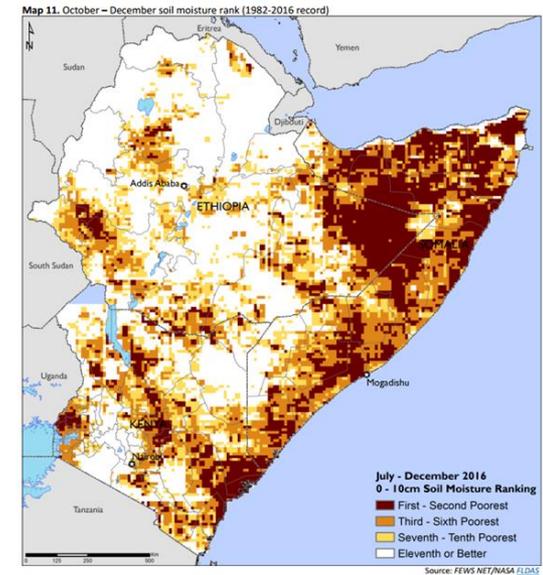
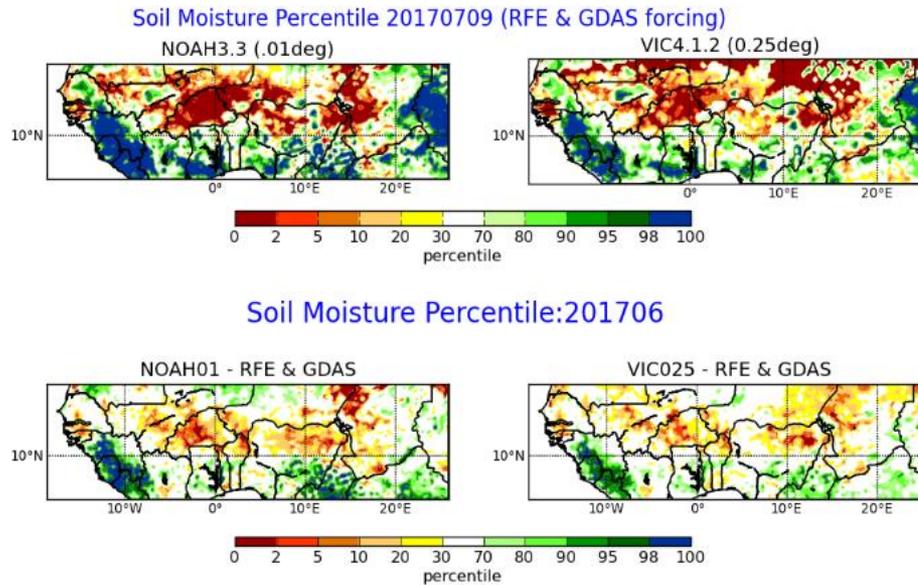
Projects / FEWSNET / FEWSNET - West Africa

FEWSNET - West Africa

Central Asia | West Africa | Southern Africa | EastAfrica

FEWS NET Land Data Assimilation System (FLDAS) West Africa simulations:

Soil moisture percentiles from the FLDAS experiments with 2 Land Surface Models (VIC 4.1.2, resolution: 0.25°; Noah 3.3, resolution: 0.1°) with 2 combination of forcing sets (RFE2 rainfall & GDAS meteorological forcing, CHIRPS rainfall & MERRA meteorological forcing) are shown. Detailed model specifications is available [here](#).

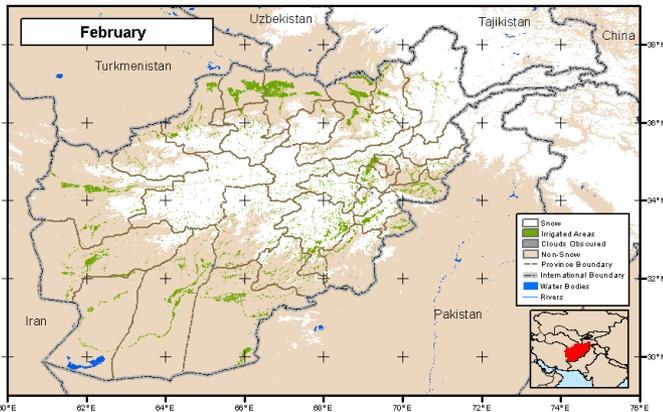
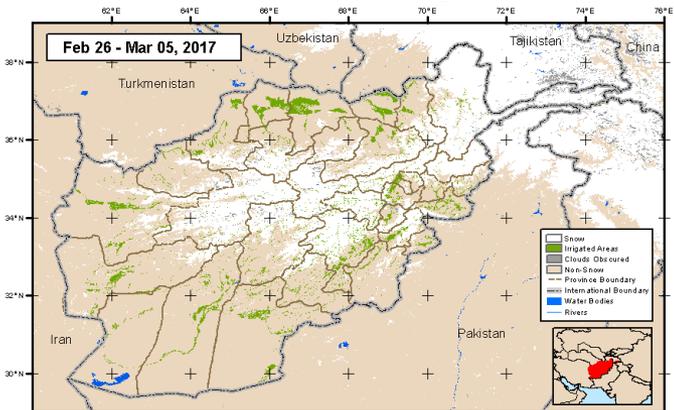


<https://lis.gsfc.nasa.gov/projects/fewsnet>

Snow Cover and Snow Water Equivalent

MODIS 8-day Snow Cover Extent

Current Period vs. Monthly Average (2001-2012)

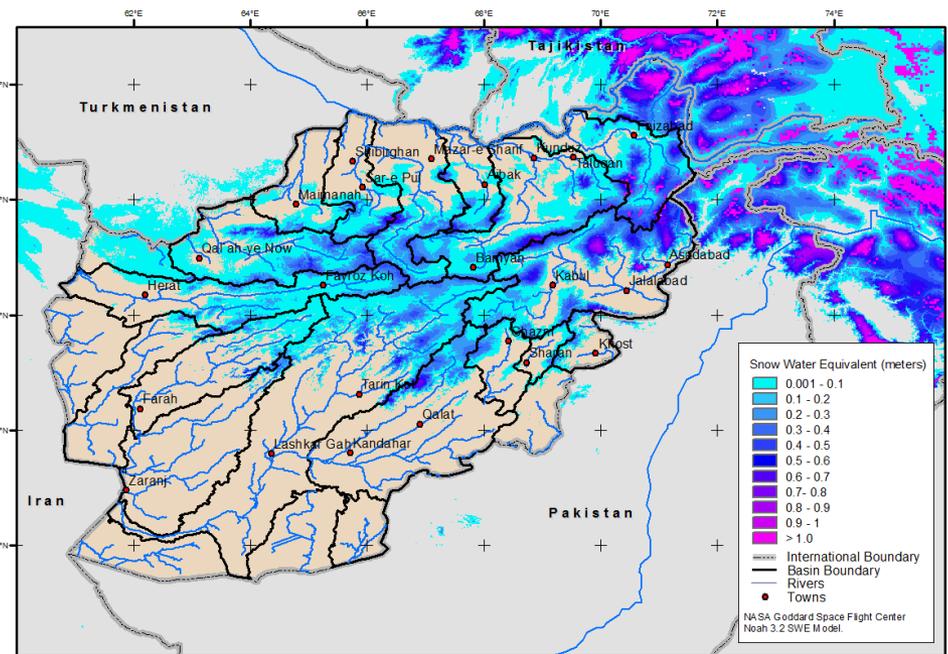


Map created by USGS/EROS



Snow Water Equivalent by Basin

February 26, 2017



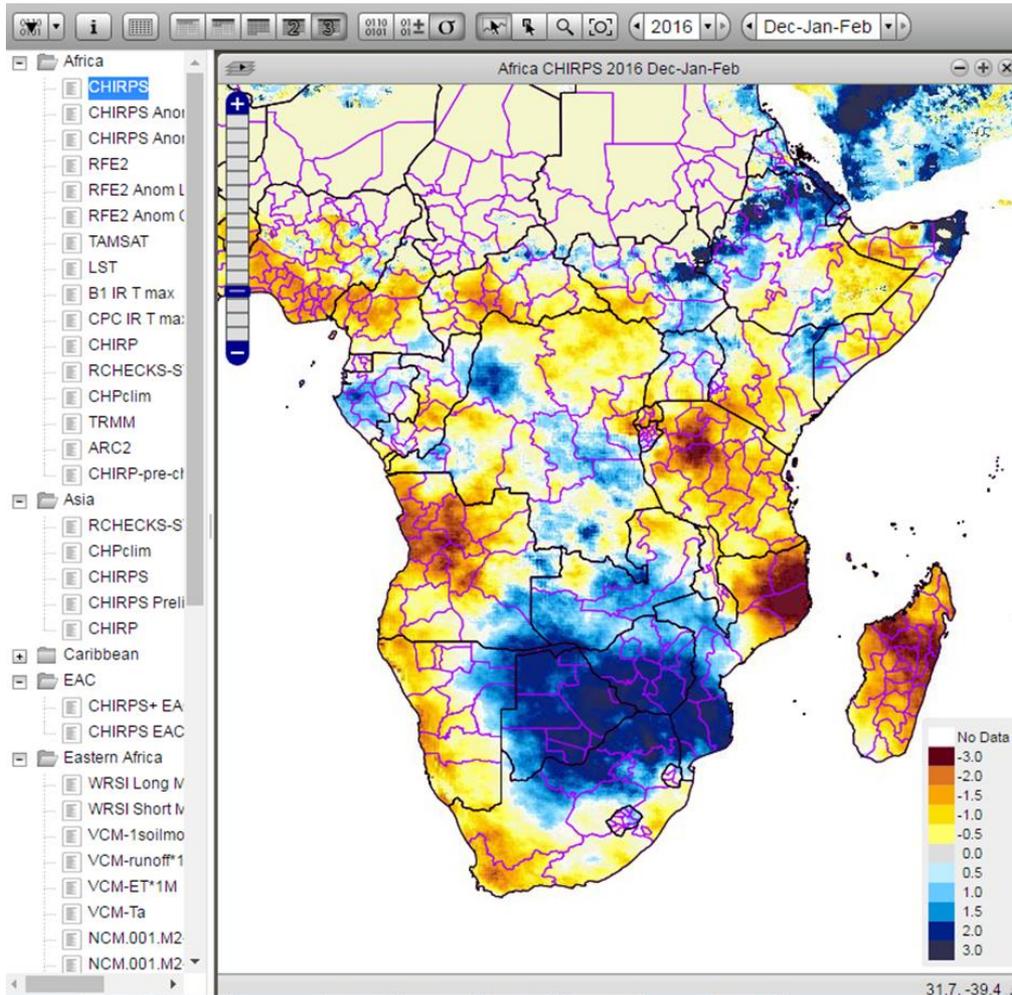
Map created by USGS/EROS



SWE Modeling by NASA/GSFC with NOAH in LIS6

<http://earlywarning.usgs.gov/fews>

CHIRPS Rainfall



Precipitation (mm)

Pentadal, dekadal, and monthly accumulations

Time-series from 1981 to present

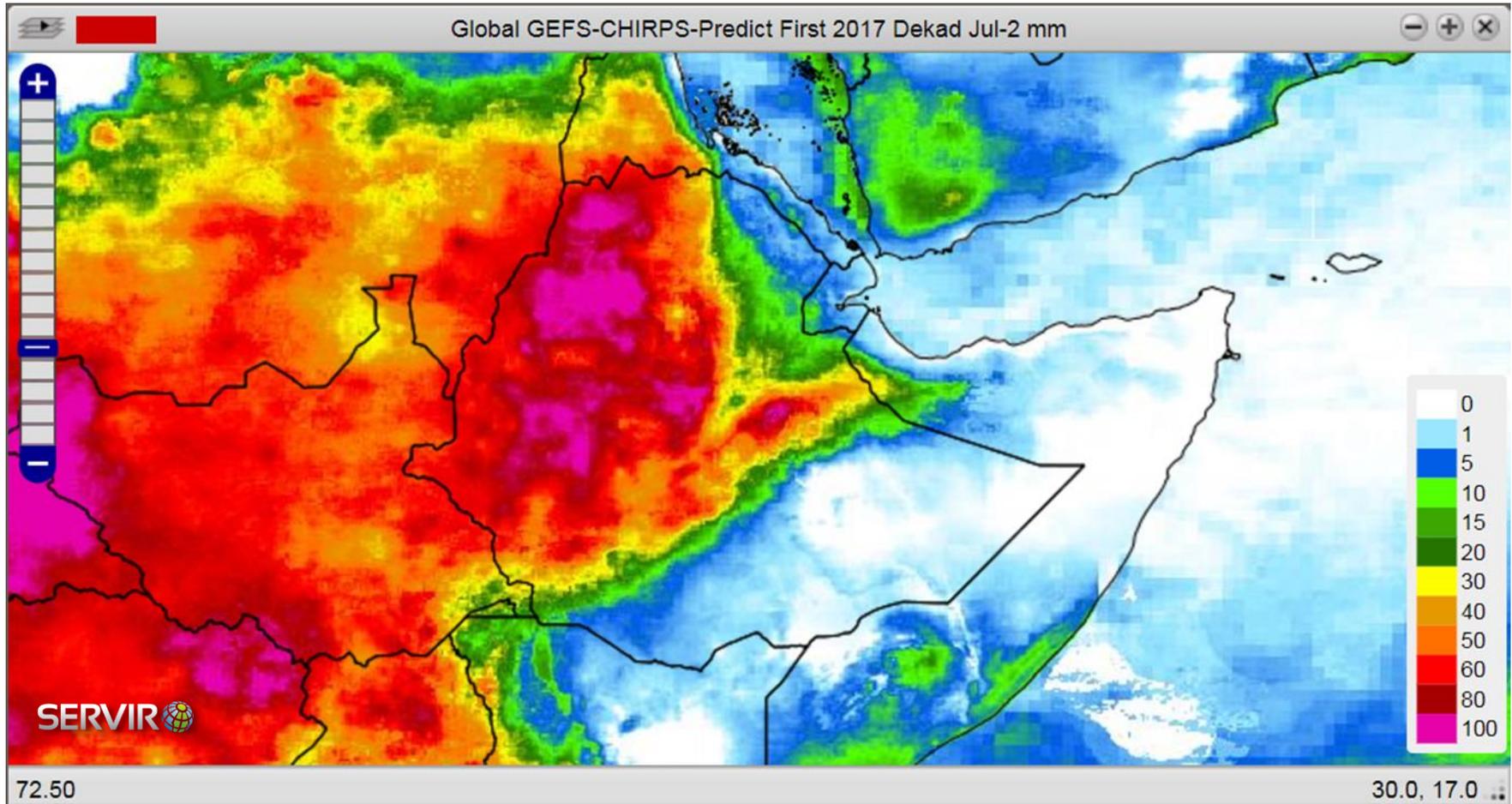
A blend of station and satellite data

Satellite estimates trained on NASA TRMM TMPA product

<http://earlywarning.usgs.gov/fews>

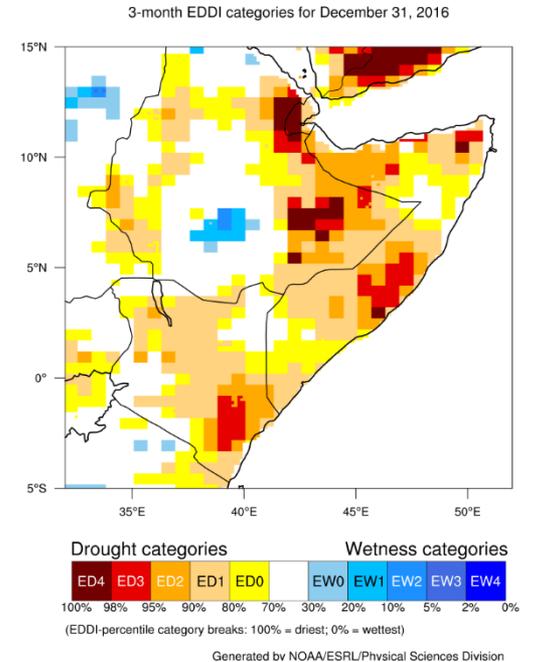
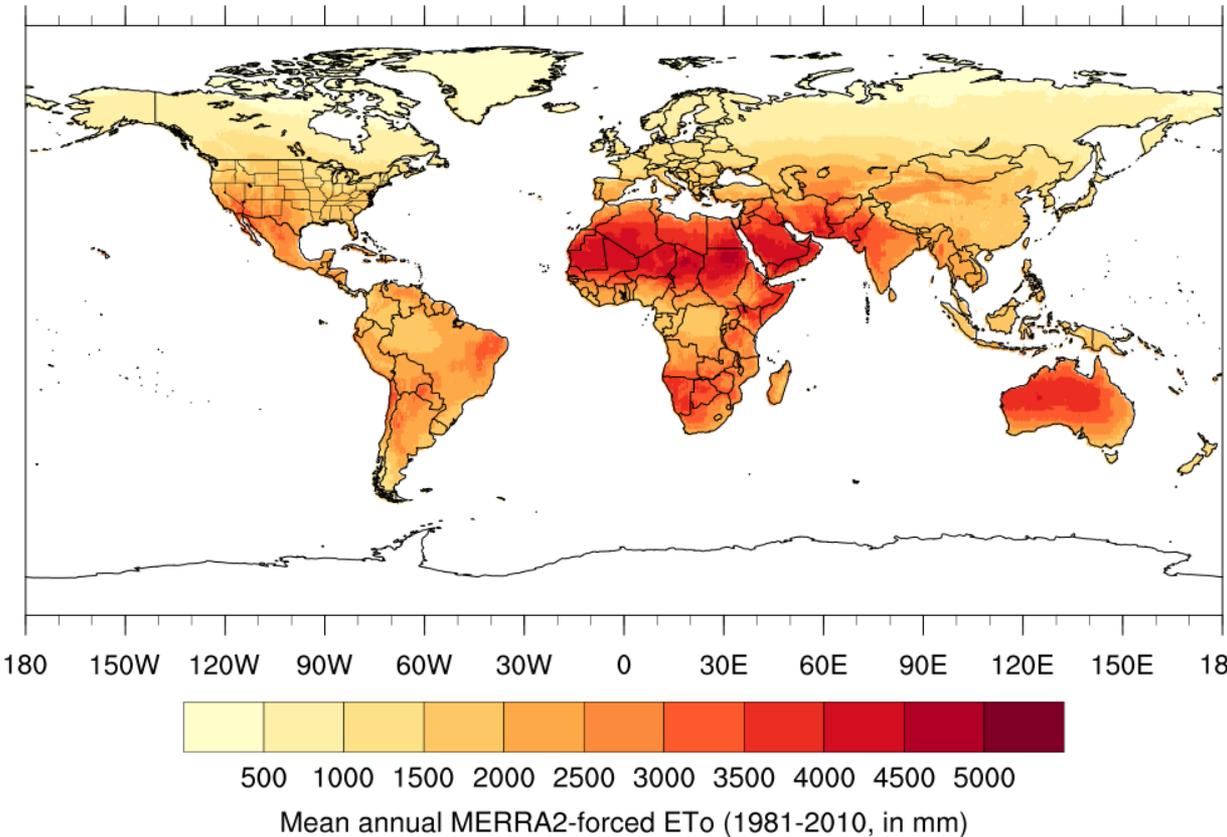
<http://chg.geog.ucsb.edu>

Downscaled GEFS Precipitation Forecasts



GEFS weather forecast scaled to match CHIRPS PDF, <http://chg.geog.ucsb.edu>

Global Reference ET from MERRA2



Evaporative Demand Drought Index (EDDI)

Food Assistance Decision Support



EAST AFRICA Food Security Alert

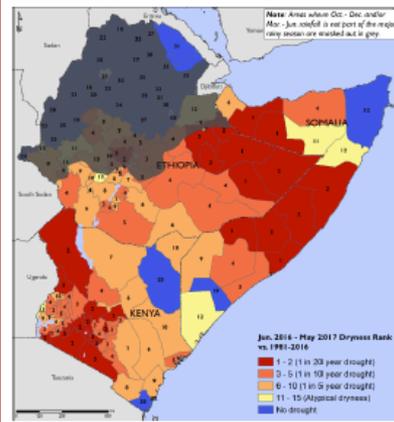
July 6, 2017

Prolonged drought drives a food security Emergency in Somalia and southeastern Ethiopia

A major food security Emergency is expected to continue in the Horn of Africa into early 2018, following very poor performance of the March to June 2017 Gu/long rains, the second consecutive below-average season in many areas. The regeneration of pasture and water resources for pastoralists has been well below normal in southeastern Ethiopia, central Somalia, and northern Kenya, and July harvest prospects are very poor in most areas of southern Somalia. These factors are likely to sustain high humanitarian assistance needs across the Horn of Africa, and drive a continuation of Emergency (IPC Phase 4) acute food insecurity in southeastern Ethiopia and Somalia. In addition, Somalia continues to face a risk of Famine (IPC Phase 5). Improved humanitarian access in Somalia, and urgent, sustained assistance in Somalia and southeastern Ethiopia, is needed to mitigate very high levels of acute malnutrition and the threat of loss of life.

The start of the March to June 2017 rains was delayed by 10 to 40 days across the Horn of Africa, and cumulative totals between March 1 and May 31 were less than 70 percent of average in much of central Somalia, southeastern and southern Ethiopia, and northern Kenya. In the worst-affected areas of Mudug and Galguduud regions of Somalia, and Koraha Zone in Ethiopia, cumulative rainfall was less than 50 percent of average. Many areas of Somalia, southeastern Ethiopia, and northern Kenya are facing drought conditions that have persisted for nearly a year or more. To put the severity of this drought into perspective, rainfall totals between June 2016 and May 2017 were the first or second lowest in the past 36 years in many areas, including in Warder and Koraha zones of Somali Region in Ethiopia and much of central Somalia (Figure 1).

Figure 1. June 2016 to May 2017 Dryness Rank vs. 1981-2016, by administrative zone



Source: FEWS NET



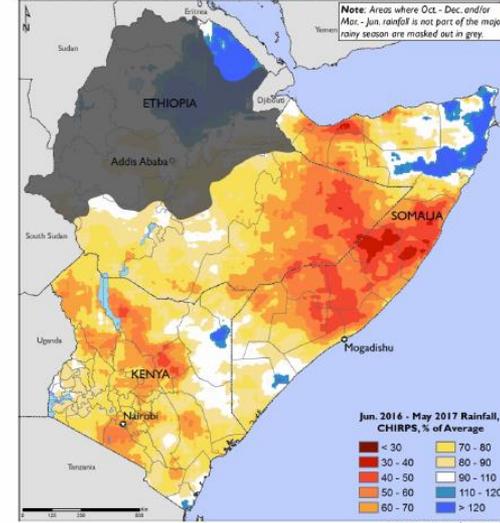
EAST AFRICA Special Report

July 13, 2017

Illustrating the extent and severity of the 2016/17 Horn of Africa drought

From mid-2016 to mid-2017, a severe drought occurred across the Horn of Africa. Rainfall was erratic and significantly below-average during both the October-December 2016 and the March-May 2017 seasons. This drought greatly limited crop production, pasture growth and water availability. In Somalia and Ethiopia in particular, food security impacts are expected to be severe. This report presents a series of maps which illustrate the extent and the severity of the drought, and its impacts on crop and rangeland conditions and on food prices. For a more detailed narrative and analysis of the drought's current and expected impacts on food security, please visit <http://www.fews.net/east-africa>.

Map 1. June 1, 2016 – May 31, 2017 rainfall anomaly (% of the 1981-2010 average)



This map illustrates how rainfall between June 1, 2016 and May 31, 2017 deviated from the 1981-2010 average over the Horn of Africa. During this period, rainfall was less than 60 percent of average across central Somalia, the Somali Region of Ethiopia, and parts of eastern and western Kenya. The timing of rainfall in these areas was also very erratic.

FEWS NET EAST AFRICA
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www.fews.net/east

FEWS NET is a USAID-funded activity. The content of this report does not necessarily reflect the view of the United States Agency for International Development or the United States Government.



U.S. Government humanitarian assistance for Somalia \$336.7 million to date in FY 2017

Data Access

- Data latency can be an issue for the application of NASA data for early warning
- The NASA Land-Atmosphere Near-real-time Capability for EOS (LANCE) server demonstrates how latency can be effectively handled to meet time-sensitive requirements
- Some data sets are still subject to unpredictable latency periods (e.g. the MERRA2 climate reanalysis)

Thank you