New Tools for Monitoring Surface Water Availability

Water availability is key to food security. It's required for agricultural, livestock and domestic needs, as well as supply for irrigation and hydropower that may affect the broader food accessibility and livelihoods context. Using the FEWS NET Land Data Assimilation System (https://ldas.gsfc.nasa.gov/FLDAS/), with CHIRPS rainfall inputs, we can better track water availability needs. New water stress monitoring maps highlight places where people may not have access to the minimum amount of water to meet their day-to-day needs.
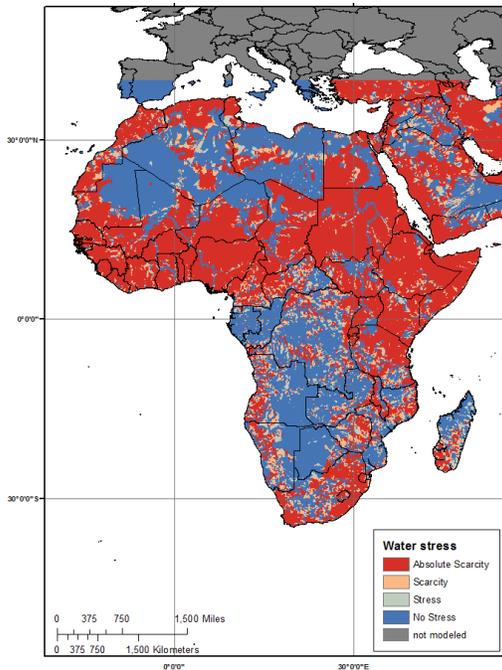
Water Stress
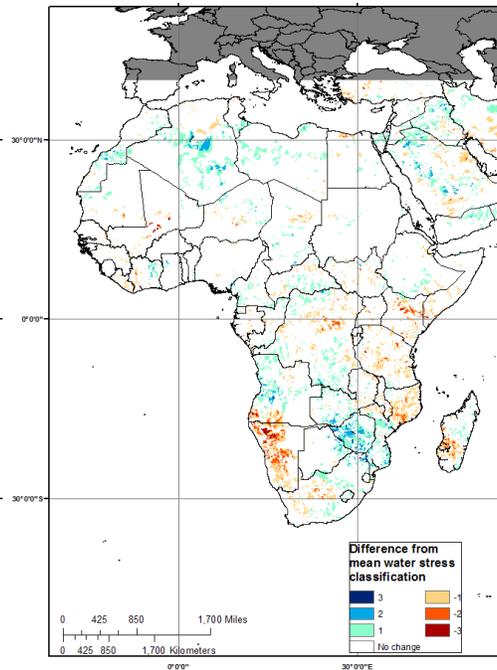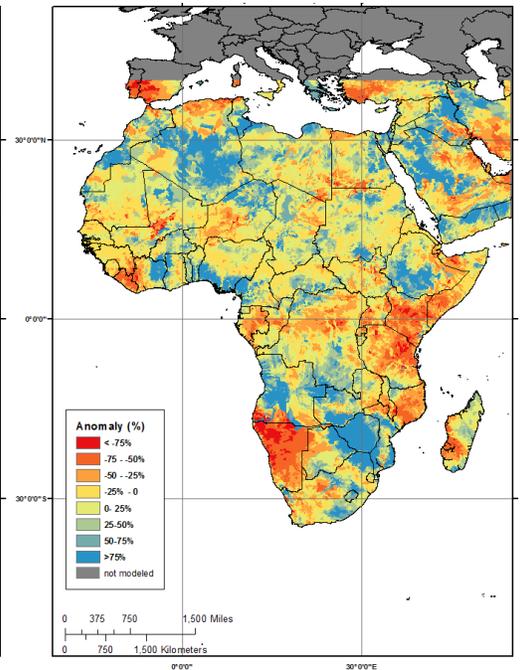
Water Stress maps highlight locations experiencing water stress based on current runoff and 2015 population.

Water Stress Anomaly

Water Stress Anomaly maps highlight departure from average (1982-2017).

Runoff Anomalies

Runoff Anomaly maps highlight water supply departures from average conditions (1982-2017).

Water Stress Thresholds from Falkenmark

Water Stress

- 🟥 Absolute Scarcity
- 🟧 Scarcity
- 🟩 Stress
- 🟦 No Stress
- ⬜ Not Modeled

Table 1. Annual and Monthly Falkenmark Categories

category	m3/yr/cap	m3/mo/cap
no stress	>1700	>142
stress	1000–1700	83–142
scarcity	500–1000	41–82
absolute scarcity	<500	<41

Maps updated twice a month at https://lis.gsfc.nasa.gov/projects/fewsnet

Panel 1. Water Stress, Water Stress Anomaly and Runoff Anomaly February 2018

Runoff data available from NASA https://disc.gsfc.nasa.gov/datasets?keywords=FLDAS

1a. Water Stress, classes based on m3/person in Level 6 basin (Verdin 2017), and WorldPop population density (Lindard et al. 2012)

1b. Water Stress Anomaly, difference from mean monthly water stress class (1982-2017)

1c. Runoff anomaly, based on monthly average (1982-2017) aggregated by Level 6 basin

Panel 2. Changes in runoff and population (1990–2017) and Lake Victoria Basin (LVB) annual water availability

Annual basin runoff (blue line), has a positive/neutral trend. Total basin population (orange line), are values interpolated from JRC's GHS 1990, 2000, and 2015 population estimates. Color blocks denote Falkenmark thresholds. Despite the positive/neutral trend in runoff, all years since 2001, with the exception of 2012, have been classified as scarcity or absolute scarcity (black dots).

Water Stress Change Over Time: Lake Victoria Basin

Lake Victoria Basin Runoff, Population and Runoff per capita
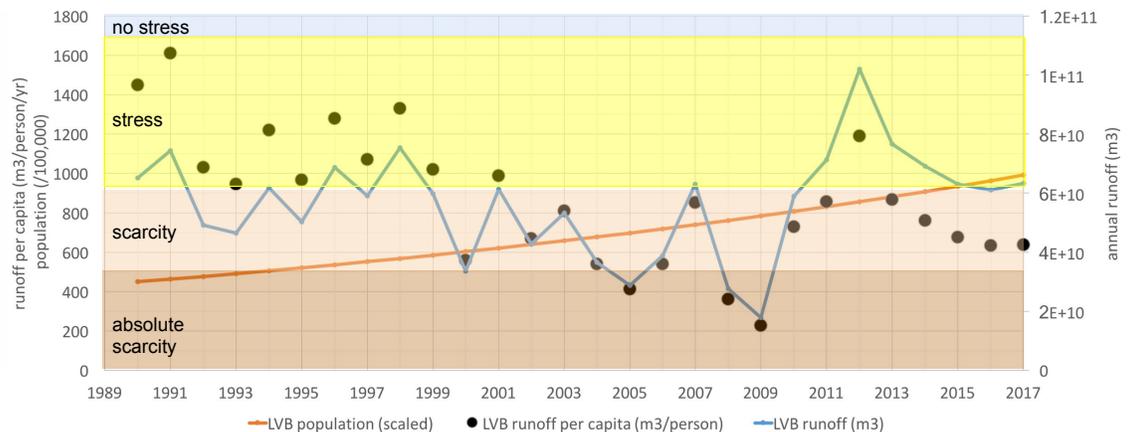
Annual runoff varies from year to year, while water availability trends downward with increasing population.

Legend: LVB population (scaled) — LVB runoff per capita (m3/person) • LVB runoff (m3)

Questions?

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