Glossary of the African Drought Monitor

Basin average (units: millimeters)– The basin-averaged values of hydrologic variables. The basin average is calculated as follows: 1) Find all model grid cells (0.25 degree resolution) that are upstream of the stream gauge. 2) Sum all the values of the hydrologic variable for all grid cells found in part (1). 3) Divide the sum from part (2) by the catchment area.
Water Balance - Basin-averaged values of precipitation, evaporation, surface runoff, baseflow, and change in storage (soil moisture, vegetation canopy storage and snow, if present).
Soil Moisture Products - Basin-averaged values of relative soil moisture of model layers 1 and 2 and the corresponding soil moisture drought index.

Change in Storage (units: millimeters) – The change in the depth of water in model soil layers 1, 2 and 3, vegetation canopy storage and snow at each time step.

Drought Index – A measure of the severity of drought; low values indicate drought conditions. This index is calculated in the following manner: 1) Calculate the sum of model layers 1 and 2 (mm). 2) Divide the results from (1) by the sum of the height of void space of layers 1 and 2 (mm). 3) Calculate the percentile of the day in question by comparing it to the climatology provided by the historical simulations (1950 - 2008). The index is the resulting percentile.

Evaporation (units: millimeters/day) – The sum of soil evaporation, canopy interception and plant transpiration.

Frames per second – Drought Monitor interface option to change the speed of the animation of maps of hydrological variables. Higher frames per second lead to faster animations.

Image opacity – Drought Monitor interface option to change the transparency of the maps. An increase in opacity leads to a decrease in transparency.

Maximum Temperature (units: degrees Celsius) –
Historical (1950/1/1 – 2008/12/31):
Daily maximum temperature is from the Princeton University historical meteorological data set at a ¼ degree spatial resolution. To learn more about the data visit: http://hydrology.princeton.edu/data.pgf.php.
Real-time (2009/1/1 – Present):
Daily maximum temperature is from the NOAA Global Forecasting System (GFS) weather model output. The value is the maximum daily temperature from the analysis (00,06,12,18 UTC hours) and forecast (03,09,12,21 UTC hours) fields. This value is then bias corrected to ensure consistency with the historical meteorological data set.

Minimum Temperature (units: degrees Celsius) –

Historical (1950/1/1 – 2008/12/31):
Daily minimum temperature is from the Princeton University historical meteorological data set at a ¼ degree spatial resolution. To learn more about the data visit: http://hydrology.princeton.edu/data.pgf.php.
Real-time (2009/1/1 – Present):
Daily minimum temperature is from the NOAA Global Forecasting System (GFS) weather model output. The value is the minimum daily temperature from the analysis (00,06,12,18 UTC hours) and forecast (03,09,12,21 UTC hours) fields. This value is then bias corrected to ensure consistency with the historical meteorological data set.

Precipitation (units: millimeters/day) –
Historical (1950/1/1 – 2008/12/31):
Daily precipitation values are from the Princeton University historical meteorological data set at a ¼ degree spatial resolution. To learn more about the data visit: http://hydrology.princeton.edu/data.pgf.php.

Real-Time (2009/1/1 – Present):
Daily precipitation values are from the Tropical Rainfall Measuring Mission (TRMM) Multi-satellite Precipitation Analysis (TMPA). When available, the drought monitor uses the data that has already been rescaled to monthly gauge data (3B42V6). Otherwise, the daily precipitation values are from the real-time calibrated product (3B42RT). At the beginning of each month the entire previous month of TMPA precipitation values are bias corrected to ensure consistency with the historical meteorological data set.
When TMPA is not available for the day in question, the system relies on the precipitation from the Global Forecasting System (GFS) weather model.

Simulated Discharge (units: millimeters) – Daily basin discharge calculated by routing the modeled runoff to the basin stream gauge and dividing by the catchment area. The modeled surface runoff and baseflow from each grid cell in the basin are summed and then routed through the stream network to the gauge location. The contribution of each grid cell to the simulated discharge value depends on the amount of water originating at each grid cell and the time it takes for the water to reach the stream gauge.
The shaded lines on the *"Simulated discharge"* plot are the streamflow discharge values that correspond to different percentiles. These are calculated from the simulated historic record.
To calculate the discharged volume of water at the stream gauge, multiply the discharge depth (mm) by the catchment area.

Soil Moisture (%) - Layer 1 - Relative soil moisture of the top layer (0 - 10 cm) calculated from the land surface model output. To calculate the relative soil moisture, the depth of water in layer 1 is divided by the porosity of layer 1.

Soil Moisture (%) - Layer 2 - Relative soil moisture of the second layer (10 - ~100cm) calculated from the land surface model output. To calculate the relative soil moisture, the depth of water in layer 2 is divided by the porosity of layer 2.

Stream Gauges – Locations on the river at which simulated discharge from the land surface model output is calculated. On the map, these points represent the locations of stream gauges from the Global Runoff Data Center (gauge numbers with 7 digits, e.g. 1147010), FAO reservoir database (gauge numbers between 10000 and 19999), and simulated stream gauges (gauge numbers between 20000 and 29999). The colors of the points reflect the percentile of the simulated discharge at the date the monitor was last updated (e.g. Stream Gauges 18/1/2012).

Stream Gauge Percentiles - Percentile of the simulated discharge at each stream gauge with respect to the historical simulations (1950 - 2008). The percentile is calculated in the following manner: 1) Take the simulated discharge values within a 21-day window (centered at the day in question) for every year 1950- 2008. 2) Rank all the values obtained in (1) to estimate an empirical cumulative probability distribution. 3) Use the empirical cumulative probability distribution from part (2) to calculate the percentile of the simulated discharge of interest.

Surface runoff (units: millimeters/day) – Excess water from rain, snowmelt or other sources that does not infiltrate due to soil saturation or high intensity but instead flows overland.

Surplus of the Simulated Discharge (units: millimeters) – The yearly cumulative sum of departure of simulated discharge from the median divided by the catchment area. This value shows how much water is missing from the discharge of the basin with respect to the model climatology. The surplus is calculated as follows: 1) Find the 50th percentile of simulated discharge at the day of year in question from 1950 - 2008. 2) Subtract the 50th percentile value from the simulated discharge value. 3) Add the difference from part (2) to the yearly cumulative sum.
To calculate the volume of water surplus, multiply the value by the catchment area.

Wind Speed (units: meters/second)
Historical (1950/1/1 – 2008/12/31):
Daily mean wind speed is from the Princeton University historical meteorological data set at a ¼ degree spatial resolution. To learn more about the data visit: http://hydrology.princeton.edu/data.pgf.php.
Real-time (2009/1/1 – Present):
Daily mean wind speed is from the Global Forecasting System (GFS) weather model output. It is calculated as the average wind speed from the analysis (00,06,12,18 UTC hours) and forecast (03,09,12,21 UTC hours) fields. The data is then bias corrected to ensure consistency with the historical meteorological data set.