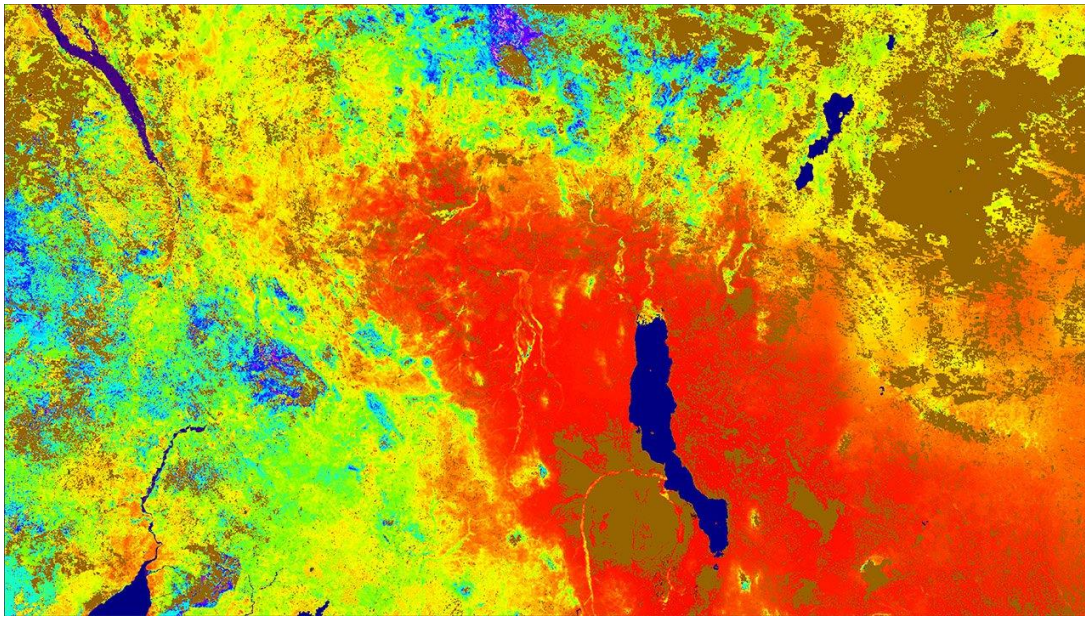


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## EVAPOTRANSPIRATION

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Terra MODIS evapotranspiration (ET) data from the MOD16A2 product over east Africa from August 13 - 20, 2018 (Source: [USGS](#))

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### CATEGORY

Product Development    Product Sales    Underwriting    Loss Adjustment    Claims Handling

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### DESCRIPTION

Evapotranspiration quantifies the amount of water used in the plant production process. EO products show the terrestrial evapotranspiration from earth land surface that can be used to assess regional water and energy balance as well as the soil water status. Evapotranspiration is the sum of soil evaporation, canopy transpiration and interception. The sum of these three parameters quantifies the amount of water consumed by agricultural use.

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### PRODUCT SPECIFICATIONS

Main processing steps	Information on evapotranspiration uses Earth observation satellite data combined with several other data and indicators. Derived information is based on indicators such as soil moisture information and several vegetation indices such as the Normalized Difference Vegetation Index (NDVI), Leaf Area Index (LAI), Fraction of Vegetation Cover (FVC). Also, meteorological data and indicators are used such as solar radiation, air temperature, vapour pressure, wind speed and precipitation. These data are combined and modelled to derive actual and potential evapotranspiration.
Input data sources	<u>Optical</u> : MODIS, Meteosat <u>Radar</u> : n.a. <u>Supporting data</u> : meteorological data
Spatial resolution and coverage	<u>Spatial resolution</u> : 250 m – 1 km <u>Coverage</u> : global <u>Availability</u> : globally available

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Accuracy / constraints	<p>Product accuracy has been estimated using a small number of independent measurements obtained from selected locations and time periods and ground-truth/field program effort.</p> <p>The pixel level quality control layer (ET_QC_500m) is a copy of the quality control data layer of the corresponding input LAI/FPAR (MOD15A2H) granule of the same 8-day composite period and does not reflect the quality of the retrieved evapotranspiration. The current operational process does not generate pixel level science quality information. Users are advised to exercise caution while using the product in their application. <a href="https://lpdaac.usgs.gov/products/mod16a2v006/">https://lpdaac.usgs.gov/products/mod16a2v006/</a></p>
Limitations	A large number of physical factors are involved in soil surface evaporation and plant transpiration processes, including microclimate, plant biophysics for site specific species and landscape heterogeneity, making accurate assessment of ET a challenge.
Frequency / timeliness	<p><u>Frequency</u>: daily</p> <p><u>Timeliness</u>: near real-time</p>
Delivery / output format	<p><u>Data type</u>: raster</p> <p><u>File format</u>: GeoTIFF</p>
Accessibility	Products derived from MODIS satellite data are freely accessible ( <a href="https://lpdaac.usgs.gov/products/mod16a2v006/">https://lpdaac.usgs.gov/products/mod16a2v006/</a> ). Data for Africa can be accessed through an FAO data portal ( <a href="https://wapor.apps.fao.org/catalog/WAPOR_2/1">https://wapor.apps.fao.org/catalog/WAPOR_2/1</a> ).

### CHALLENGES ADDRESSED

#### Product development:

- Index insurance: Toolbox for indices
- Index insurance: Relation between weather events and impact on crop productivity
- Index insurance: Functionalities of plants, chemical reactions, early stress detection
- Index insurance: Platform for crop health products
- Information on crop rotation
- Risk exposure (product design and customer communication)

#### Product Sales:

- Pre-contractual consulting (show-case risk exposure)
- Greater acceptance of index covers by farmers
- Regular market penetration review
- Risk alerts

#### Underwriting:

- Seasonal portfolio monitoring
- Online platforms or easy-to-use interfaces integrating various data sources (e.g. vegetation stress, field boundary changes, comparison, etc.)
- Actual crop health (vegetation)
- Procure better reinsurance terms/capacity from enhanced insurance practice
- Identification of productive units
- Identification of vegetation stages (identify most sensitive stages when crop is the most vulnerable to a risk, e.g. flowering stage)
- Crop calendar and crop practices

#### Loss Adjustment:

- Benchmark physical field observations against yield loss detection (e.g. product calibration)
- Risk mapping against crop's vegetation stages

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- Increase credibility of loss adjustment (e.g. show EO data/visualization to support loss adjustment communication to farmer)
  - Enhance field survey (better precision with EO data support)
  - Detect crop damage at field level
  - Assess crop damage at field level
  - Distinct field heterogeneity with crop damage

Claims handling:

- Quality control assessment of claims before pay-out
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