

Tropical Rainfall Measuring Mission (TRMM) precipitation data for CTFS-ForestGEO Sites.

Last updated: February 27, 2017

Data set description:

Standardized precipitation data is presented for 63 CTFS-ForestGEO tropical, subtropical, and temperate sites. The Tropical Rainfall Measuring Mission (TRMM) by NASA was launched in 1997 and carried 5 instruments: a 3-sensor rainfall suite (PR, TMI, VIRS) and 2 related instruments (LIS and CERES).

Specific information on sensors and data generation can be accessed here <http://trmm.gsfc.nasa.gov>. For a summary of TRMM data products and services, see Liu *et al.* (2012).

Data presented here are from the “Algorithm 3B43”, which gives the best-estimate precipitation rate and root-mean-square (RMS) precipitation-error estimates from TRMM. The gridded estimates are on a calendar month temporal resolution and a 0.25° by 0.25° spatial resolution. Spatial coverage extends from 50 degrees south to 50 degrees north latitude, therefore some CTFS-ForestGEO sites have no data.

Algorithm 3B43 is executed once per calendar month to produce the single, best-estimate precipitation rate and RMS precipitation-error estimate field (3B43) by combining the 3-hourly merged high-quality/IR estimates with the monthly accumulated Global Precipitation Climatology Centre (GPCC) rain gauge analysis.

Monthly precipitation data were downloaded on October 21, 2015. Data was retrieved from the Mirador interface (<http://mirador.gsfc.nasa.gov>) from NASA Goddard Earth Sciences Data and Information Services Center (GES DISC). Version 7 was downloaded as recommended. Units were converted from mm hr⁻¹ to mm mo⁻¹ by multiplying by the number of hours in each month, and annual precipitation was computed by summing months.

Notes:

Comparison of TRMM data to local weather station data for CTFS-ForestGEO sites (Table 2 in Anderson-Teixeira *et al.*, 2015) showed that TRMM data tended to systematically underestimate MAP at sites with high MAP, particularly those receiving >3000 mm yr⁻¹. Thus, TRMM precipitation values for high precipitation sites should be considered probable underestimates.

Temporal coverage: 1998-01 to 2014-12

Temporal resolution: Monthly and annual

Data files:

- CTFS-ForestGEO_TRMM.3B43_monthly.csv.
- CTFS-ForestGEO_TRMM.3B43_annual.csv.

Data file contents:

CTFS-ForestGEO_TRMM.3B43_monthly.csv

Column	Description	Units
ID	Site ID number. Numbers 1 to 59 are as in Anderson-Teixeira <i>et al.</i> (2015); numbers 60+ joined the network after this publication.	-
Site	Site name	-
modlat	Latitude	Decimal degrees
modlon	Longitude	Decimal degrees
[YYYYMMDD]	Satellite/gauge precipitation estimates for month YYYYMM.	mm mo-1

CTFS-ForestGEO_TRMM.3B43_annual.csv

Column	Description	Units
ID	Site ID number. Numbers 1 to 59 are as in Anderson-Teixeira <i>et al.</i> (2015); numbers 60+ joined the network after this publication.	-
Site	Site name	-
modlat	Latitude	Decimal degrees
modlon	Longitude	Decimal degrees
MAP.1998.2014	Mean annual precipitation (satellite/gauge estimates) for 1998-2014.	mm yr-1
[YYYY]	Satellite/gauge precipitation estimates for year YYYY	mm yr-1

Data use:

Researchers who wish to use this data product are responsible to understand and evaluate its appropriateness for their research purposes. Information on the TRMM data product is summarized in (Liu *et al.*, 2012) and at <http://trmm.gsfc.nasa.gov>.

These data are freely available for scientific research purposes, as a service of the [CTFS-ForestGEO Ecosystems & Climate Initiative](#). Publications using these data should cite Liu *et al.* (2012) and cite this CTFS-ForestGEO data product.

Contacts:

Kristina Anderson-Teixeira, teixeirak@si.edu

Erika Gonzalez-Akre, gonzalezeb@si.edu

References:

- Anderson-Teixeira KJ, Davies SJ, Bennett AC et al. (2015) CTFS-ForestGEO: a worldwide network monitoring forests in an era of global change. *Global Change Biology*, **21**, 528–549.
- Harris I, Jones PD, Osborn TJ, Lister DH (2014) Updated high-resolution grids of monthly climatic observations - the CRU TS3.10 Dataset: UPDATED HIGH-RESOLUTION GRIDS OF MONTHLY CLIMATIC OBSERVATIONS. *International Journal of Climatology*, **34**, 623–642.
- Hijmans RJ, Cameron SE, Parra JL, Jones PG, Jarvis A (2005) Very high resolution interpolated climate surfaces for global land areas. *International Journal of Climatology*, **25**, 1965–1978.
- Liu Z, Ostrenga D, Teng W, Kempler S (2012) Tropical Rainfall Measuring Mission (TRMM) Precipitation Data and Services for Research and Applications. *Bulletin of the American Meteorological Society*, **93**, 1317–1325.
- .