Newly Released Version 7 TRMM Multi-satellite Precipitation Analysis (TMPA) Products and Data Services at NASA GES DISC

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ABSTRACT

The NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) is home of global precipitation product archives, in particular, the Tropical Rainfall Measuring Mission (TRMM) products. TRMM is a joint U.S.-Japan satellite mission to monitor tropical and subtropical (40° S - 40° N) precipitation and to estimate its associated latent heating. The TRMM satellite provides the first detailed and comprehensive data set on the four dimensional distribution of rainfall and latent heating over vastly under-sampled tropical and subtropical oceans and continents. The TRMM satellite was launched on November 27, 1997. TRMM data products are archived at and distributed by GES DISC.

The newly released Version 7 TRMM Multi-satellite Precipitation Analysis (TMPA) products includes several important changes: (1) additional output fields including sensor-specific source and overpass times; (2) additional satellite input data; (3) uniformly reprocessed input data using current algorithms; (4) a new IR data set (Jan. 1998 – Feb 2000) ; (5) use of a single, uniformly processed gauge analysis; and (6) use of a latitude-band calibration scheme for all satellites. More details are presented in this poster. Several new parameters have been included, such as gauge relative weighting in 3B43, HQ and IR precipitation in 3B42.

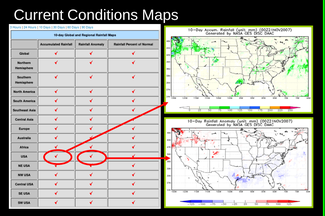
Data services include online tools and information web pages. The online tools are (1) Mirador (http://mirador.gsfc.nasa.gov/), a simplified interface for searching, browsing, and ordering Earth science data at GES DISC, and designed to be fast and easy to learn; (2) Giovanni TOVAS (http://disc.sci.gsfc.nasa.gov/precipitation/tovas); (3) Simple Subset Wizard for TMPA data subsetting and format conversion; (4) Data via OPeNDAP (http://disc.sci.gsfc.nasa.gov/services/opendap/), which provides remote access to individual variables within datasets in a form usable by many tools, such as IDV, McIDAS-V, Panoply, Ferret, and GrADS; (5) Open Geospatial Consortium (OGC) Web Map Service (WMS) (http://disc.sci.gsfc.nasa.gov/services/wxs_ogc.shtml); and (6) GrADS-DODS Data Server (GDS, http://disc2.nascom.nasa.gov/dods/). The Precipitation Data and Information Services Center (PDISC; URL: http://disc.gsfc.nasa.gov/precipitation) provides documentation, science focus articles and FAQ. User assistance is also available.

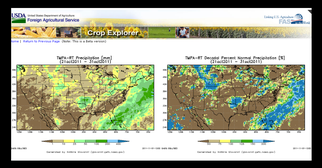
Outreach As Service and Collaborations
Purpose is not to just push data to users, but to make available potential solutions to users' problems.

Example Applications (Agriculture):
United Nations World Food Programme
USDA Foreign Agricultural Service

Agriculture Information System (AIS)

Current Conditions Maps

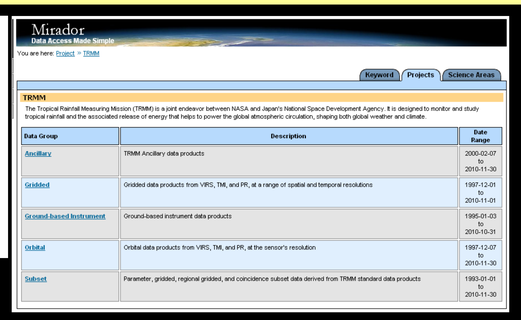


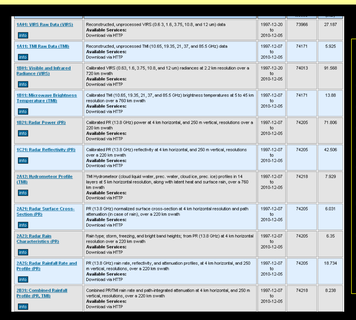


For other examples, visit talk "Utilizing Satellite-derived Precipitation Products in Hydrometeorological Applications" Dec. 6, 1:40 Moscone West 3018

NEW! TRMM Version 7 TMPA Products

ALG	V6 --> V7 CHANGES
Metadata	Complete redesign. Metadata elements are grouped; usually a group does not appear in all products. (In V6 all elements were in all products.) Number of scans written in SwathHeader group to allow multiswath products.
3B31	Redesign. Profiles have 28 layers (14 in V6). Grid 0.5° (5° in V6). Added surface precipitation.
3B42	Added gaugeRelativeWeighting
3B43	Added source information, HQ precipitation, IR precipitation





Above left: Precipitation products in Mirador (http://mirador.gsfc.nasa.gov/). ***Above right***: TRMM orbital data products.

Precipitation datasets :

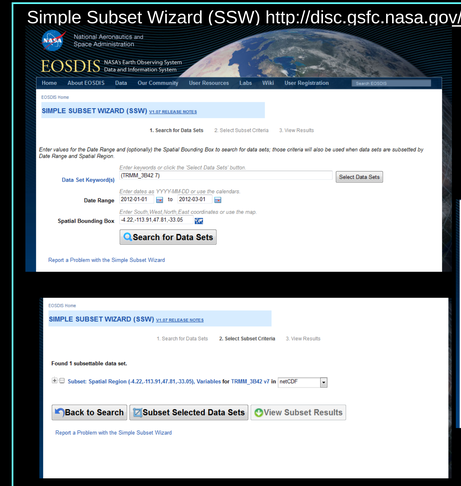
- Standard TRMM products
- Ancillary products (e.g., merged IR)
- Ground based instruments
- Other precipitation products in TOVAS (e.g, Willmott, GPCP, GPCC)

Other data products :

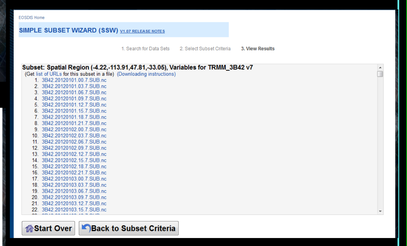
- Other remote sensing products from different missions (e.g., AIRS, A-Train)
- Modeling products (e.g., MERRA, GLDAS)

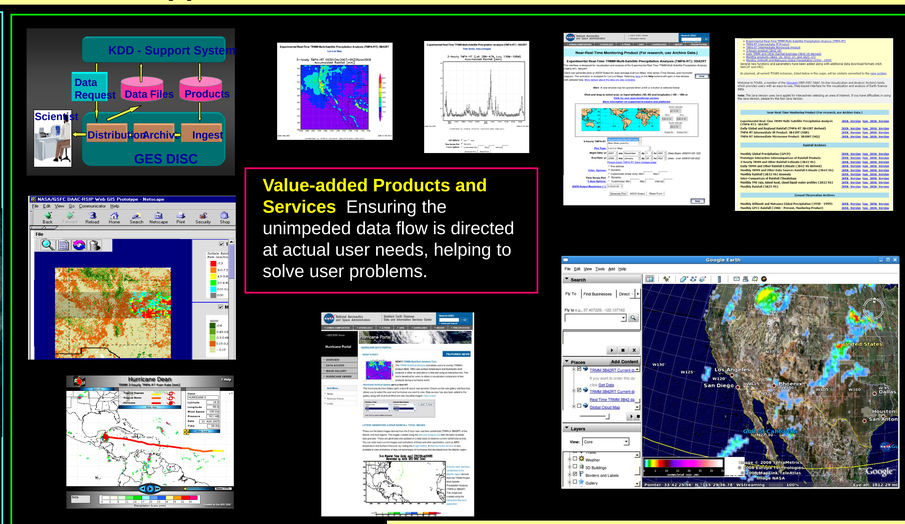
TRMM Data Services and Applications

Simple Subset Wizard (SSW) http://disc.gsfc.nasa.gov/SSW/



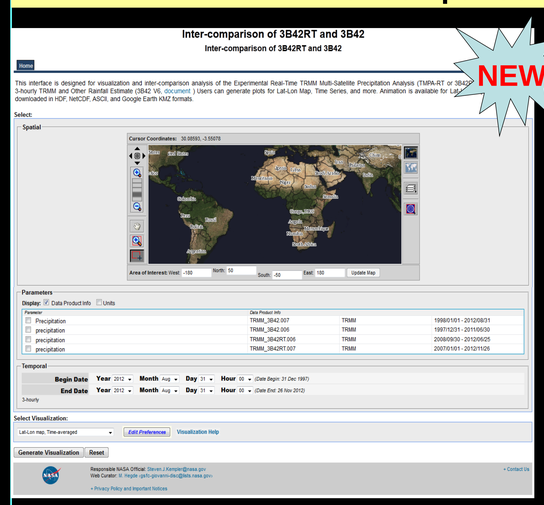
Simple Subset Wizard (SSW) provides a valuable service to precipitation users. It allows spatial and parameter subsetting, and the output format is either NetCDF or gzipped NetCDF.





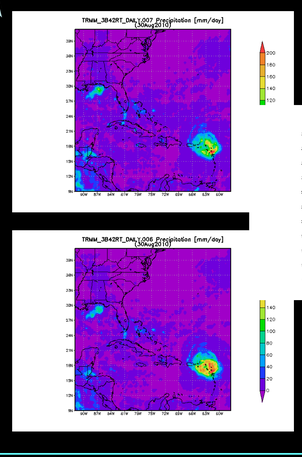
Value-added Products and Services Ensuring the unimpeded data flow is directed at actual user needs, helping to solve user problems.

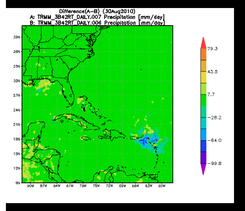
TRMM Inter-comparison of V6 and V7

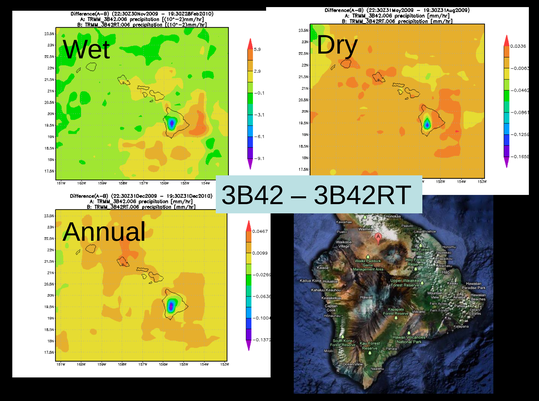


NEW

Enable application users to inter-compare the near-real-time (3B42RT) and the research quality (3B42) rainfall products for product adjustments (i.e., biases).



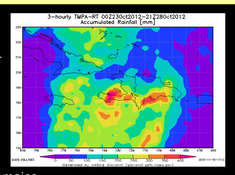




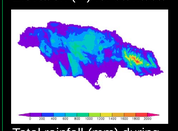
Large differences between 3B42 and 3B42RT are found in Hawaii Big Island during the wet and dry seasons of 2009.

GIS

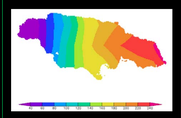
Coming Soon



Elevation (m) for Jamaica

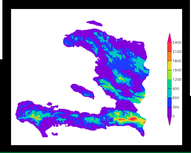


Total rainfall (mm) during Sandy for Jamaica

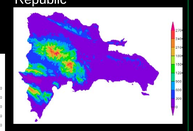


Total rainfall (mm) during Sandy for Haiti

Elevation (m) for Haiti



Elevation (m) for Dominican Republic



Total rainfall (mm) during Sandy for Dominican Republic

- TOVAS: http://disc2.nascom.nasa.gov/Giovanni/tovas/
- Mirador: http://mirador.gsfc.nasa.gov/
- GPCP 2.2 in TOVAS: http://disc2.nascom.nasa.gov/Giovanni/tovas/rain.GPCP.shtml
- PDISC Portal: http://disc.sci.gsfc.nasa.gov/precipitation
- Hurricane Data Analysis Tool: http://disc.sci.gsfc.nasa.gov/daac-bin/hurricane_data_analysis_tool.pl
- TRMM Near-real-time Product in USDA Crop Explorer: http://www.pecad.fas.usda.gov/cropexplorer/mpa_maps.cfm
- Current Rainfall Conditions: http://disc.sci.gsfc.nasa.gov/agriculture/additional/tools/current_conditions.shtml
- TRMM Project home page: http://trmm.gsfc.nasa.gov/

Ongoing: **Integrate IPWG Validation Algorithms into TRMM Online Visualization and Analysis System (TOVAS)**

- Estimated and observed rain area: Hits, misses, false alarms, correct rejections (2x2 contingency table)
- Estimated and observed rain volume: Bias score (ratio of estimated/observed rain frequency or area)
- Estimated and observed conditional rain rate: Probability of detection
- Estimated and observed maximum rain rate: False alarm ratio
- Mean absolute error: Hanssen and Kuipers score
- Root mean square (RMS) error: Equitable threat score
- Correlation coefficient: Heidke skill score

Help Desk: gsfc-help-disc@lists.nasa.gov

TRMM FAQ: http://disc.sci.gsfc.nasa.gov/additional/faq/precipitation_faq.shtml