



# Enhancing Access and Understanding of Precipitation Measurement Missions Data and Information

William Teng<sup>1,2</sup>, Steve Kempler<sup>1</sup>, Zhong Liu<sup>1,4</sup>, Dana Ostrenga<sup>1,3</sup>, and Mary Greene<sup>1,2</sup>  
(<sup>1</sup>NASA/GES DISC, <sup>2</sup>Wyle IS, <sup>3</sup>Adnet, <sup>4</sup>George Mason Univ.)

NASA GSFC Earth Sciences (GES)  
Data and Information Services Center (DISC)  
William.L.Teng@nasa.gov

Precipitation Measurement Missions (PMM) Science Team Meeting, November 7-11, 2011

Successful science data support for Earth observing satellite missions and their data systems requires a large, well-planned and well-coordinated set of activities that spans more than the lifetime of the missions. The Goddard Earth Sciences Data and Information Services Center (GES DISC) has been providing such science data support for the Tropical Rainfall Measuring Mission (TRMM) since before its launch. These cradle-to-grave data support activities are summarized (below) as milestones. Current activities of the Precipitation DISC (PDISC), including preparations for GPM, are also described. The goal is to enable users to fully realize the scientific, educational, and application potential of NASA precipitation data. At all times, the GES DISC's precipitation data support remains responsive to user needs, accommodating to unanticipated demands, and innovative in availing the users of the latest appropriate technology. Through this support, in the 14 years of TRMM thus far, the GES DISC has largely achieved the goal of enabling an increasing number and variety of users to fully benefit from the use of TRMM data in solving problems. Innovative services are increasingly important and is the focus of the GES DISC going into the GPM era.

## Milestones in Precipitation Data Support at GES DISC

**Pre-launch Preparation (June 1997)**  
TRMM Support System (TSS), TRMM outreach, Hydrology web portal.

**TRMM Field Experiment Support (Feb 1999)**  
For algorithm validation, provides experiment and ancillary data archive and distribution support.

**OGC Compliant Web System (Aug 2001)**  
Remotely accesses, visualizes, and analyzes TRMM and other data. Key functions later implemented in NASA Giovanni.

**All TRMM Data Available Online (Dec 2005)**

**Hurricane Portal (June 2006)**  
Image Gallery, Hurricane Viewer, TRMM-QuikScat Analysis, Google Earth files, and more.

**TRMM Data in Google Earth (Jan 2007)**  
Facilitates scientific research and applications.

**Simple Subset Wizard (Aug 2011)**  
Simple interface for subset requests to multiple data centers.

**OPeNDAP Enhancements for Version 7 (2012)**

**TRMM Web Search and Order System (WHOM) (June 1998)**  
Searches for data hierarchically or by specifying space, time, and attribute criteria.

**TRMM Version 5 Reprocessing**  
Nov 1999 to April 2000

**TOVAS (Feb 2002)**  
Original Giovanni. Simple to use. Powerful. Research-enabling.

**Mirador (June 2006)**  
Fast interface for searching Earth science data at GES DISC.

**NetCDF Conversion in Mirador (July 2009)**

**Inter-comparison of V6 and V7 TRMM L3 monthly products (Dec 2011)**

**TRMM Composite Climatology (TCC) (2012)**

**TOVAS Enhancements (2012)**  
Additional portals and functions

**TRMM Version 4 Reprocessing**  
Oct 1998 to Feb 1999

**TRMM Data Mining (Nov 2000)**  
Reduces volume of distributed data; users receive more information-rich products.

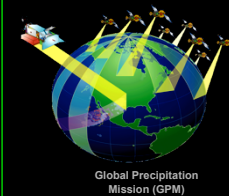
**TRMM Version 6 Reprocessing**  
April 2004 to April 2005

**Alternative Methods for Accessing TRMM Data (Aug 2006)**  
Via OGC Web Map Service and OPeNDAP.

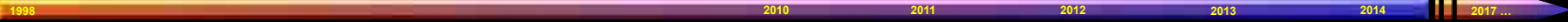
**Semantic Technology in Mirador (Sep 2009)**  
Knowledge base for improved services

**IPWG Project Tools for Precipitation Uncertainty Analysis (2011-2014)**

**Preparation for GPM data archive and distribution (2012 to Launch)**



Global Precipitation Mission (GPM)



**Ensuring Data Flow**  
The basis of any science data support is the unimpeded inflow of data from the data producer and outflow to the users.

**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)

**Simple Subset Wizard (SSW)**

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

- Inter-comparison of V6 and V7 TRMM (to be released in 2011)
- Inter-comparison of daily rainfall products (to be released in 2012)
- Inter-comparison of climatology products (to be released in 2013)

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

**Current Conditions Maps**

**For other examples, see companion poster, "Utilizing Precipitation Measurement Missions (PMM) Data in Applied Science Projects."**

**To be released:** Inter-comparison of V6 and V7 TRMM

3A25 (V6 - V7)

**New tool to be released:** Inter-comparison of 3B42 and 3B42RT

Enables applications users to inter-compare near-real-time (3B42RT) and research quality (3B42) rainfall data for adjustments (i.e., biases).

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

**Acknowledgment:**  
The authors are grateful for the valuable contributions to TRMM data support by former and current members of the GES DISC and for the continued support by NASA.