Global Precipitation Measurement (GPM) Mission Products and Services at the NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC)

Zhong Liu¹,⁴, D. Ostrenga²,⁴, B. Vollmer⁴, B. Deshong²,⁴, M. Greene³,⁴, W. Teng²,⁴, and S. J. Kempler⁴

¹CSISS, George Mason University
²ADNET Systems, Inc.
³Wyle Information Systems, LLC
⁴NASA GES DISC
Outline

- Overview of data services during the TRMM (Tropical Rainfall Measuring Mission) era
- Data services during the GPM (Global Precipitation Measurement) era
- Future plans
- Summary
• Launched on Nov 27, 1997; reboost on Aug. 24, 2001
• Geospatial coverage: Latitude: 38°S - 38°N; Longitude: 180°W - 180°E
• GES DISC – the official EOSDIS archive and distribution center
TRMM Data Products

- Orbital data products from VIRS (2.4 km), TMI (5.1 km at 85.5 GHz), and PR (5 km), at the sensor's resolution
- Gridded data products from VIRS, TMI, and PR, at a range of spatial and temporal resolutions. In particular, the TMPA 3-hourly (RT and research) and monthly products.
- Value added products, TMPA daily, 10-day, climatology, etc.
- Field experiment data
- Level-2 subsets
List of Data Services

- Mirador (Google like search capability, format conversion, other products, etc.)
- Giovanni TOVAS (data visualization and analysis, no data and software needed, data for further analysis, etc.)
- Simple Subset Wizard (easy to use, NetCDF, products from other NASA data centers)
- GDS, OPeNDAP, WMS
- HDF read software
Further Reading:

Data Services during the GPM Era

- GPM was launched in Japan on Feb. 27, 2014
- International network of satellites that provide the next-generation global observations of rain and snow
- GMI (10-183 GHz); Dual-Frequency Radar (DPR), KuPR (13.6 GHz) and KaPR (35.5 GHz)

Inclination: 65° (vs. 35° for TRMM)
GPM data overview

• L-1 and L2 (GPROF, DPR) orbital products
• L-3 gridded products (IMERG, GPROF daily, monthly products)
• Value-added products (similar to TRMM)
• TMPA for comparison
• Other non-standard products (MERRA, NLDAS, GLDAS, etc.)
• Data from users for comparison
Parameters in the **IMERG 0.1 deg. 30-min products** (vs. **0.25 deg. 3-hourly TMPA**):  

- precipitationCal  
- randomError  
- precipitationUncal  
- HQprecipitation  
- HQprecipSource  
- HQobservationTime  
- IRprecipitation  
- IRkalmanFilterWeight  
- probabilityLiquidPrecipitation
Mirador

• All GPM data (Google like data search and discovery; access to data product services, such as subsetting, format conversion, etc.)

• Not just GPM. Can search other data as well
Simple Subset Wizard

- Spatial subsetting and format conversion (i.e., NetCDF)
- Not just data at GES DISC. Can order data from other NASA data centers as well.
Sample Parameters in IMERG

Able to trace back to the Level-2 data?
Ongoing and Proposed Basic Data Services

• L-2 subsetting, format conversion (HDF => NetCDF)
• L-2 subsets for ground validation data
• Satellite-satellite intersect/subset
• Customized products at different temporal and spatial resolutions
• Customized products for modeling community
• Customized products for socioeconomic applications (shapefile-based subsets)
• Land surface types, terrain info, coastlines, etc.
• Uploading capability for comparison
Future Plans – GV Information Sharing

- GV work available around the world (government agencies, universities, etc.)
- Journal publications, reports, etc.
- But, no effort to share this info for users
- Can Google Earth help visually locate such info?
- Development of a knowledge base?
- Community based
- Funding source?
• Quite successful during the TRMM era, but more can be done, especially for Level-2 products

• New challenges and opportunities during the GPM era (basic services, GV info sharing, etc.)
Information

- Mirador: http://mirador.gsfc.nasa.gov/
- Simple Subset Wizard: http://disc.sci.gsfc.nasa.gov/SSW/
- Precipitation Portal: http://disc.sci.gsfc.nasa.gov/precipitation
- GES DISC: http://disc.sci.gsfc.nasa.gov/
- Help Desk: gsfc-help-disc@lists.nasa.gov

Thank you!