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

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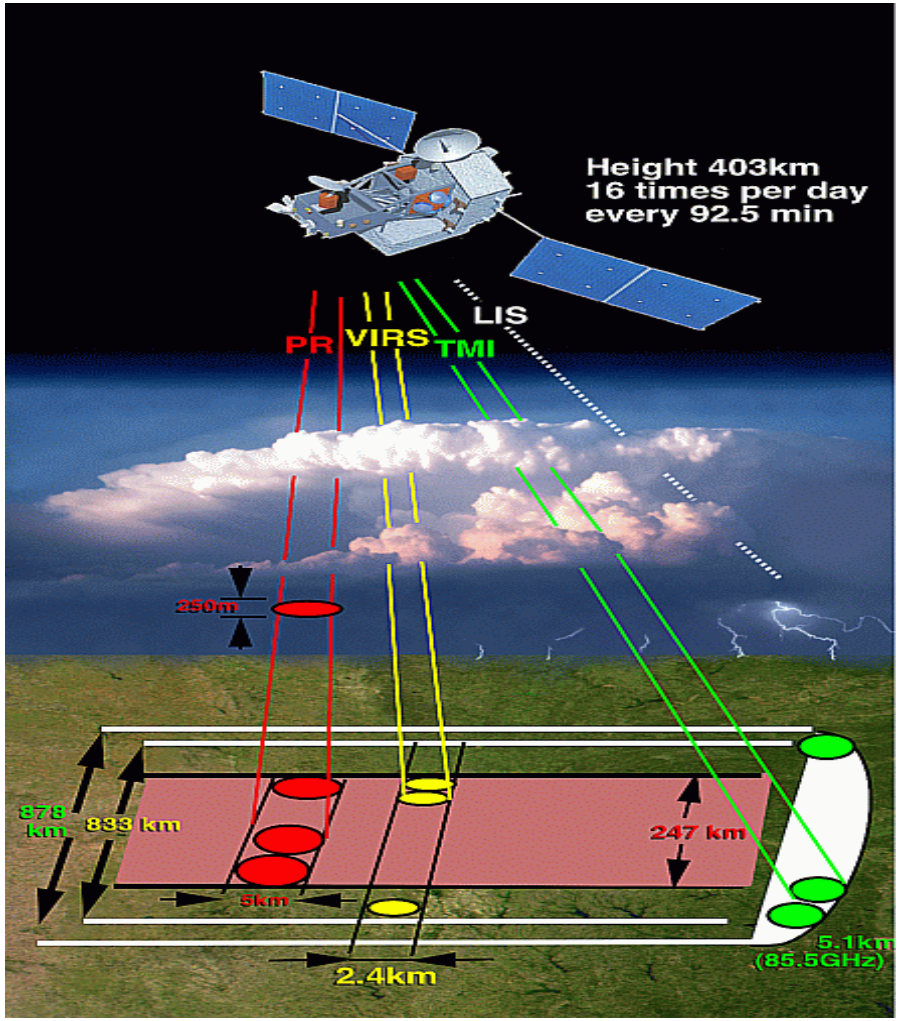
GES – DISC
Goddard Earth Sciences
Data Information Services Center

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

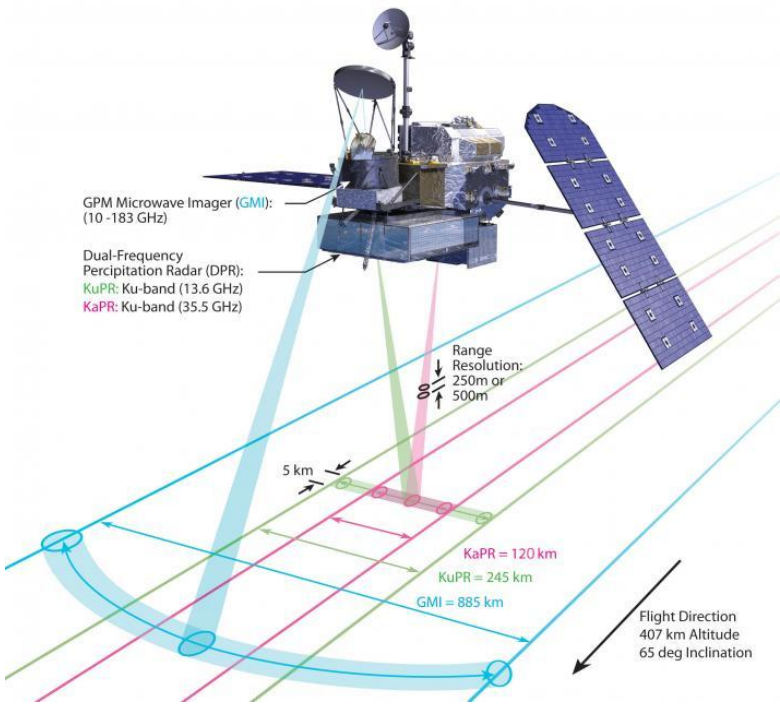
- Mirador (Google like search capability, format conversion, other products, etc.)
- Giovanni TOVAS (data visualization and analysis, no data and software needed, data for further analysis, etc.)
- Simple Subset Wizard (easy to use, NetCDF, products from other NASA data centers)
- GDS, OPeNDAP,WMS
-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

Further Reading:

Zhong Liu, Dana Ostrenga, William Teng, and Steven Kempler, 2012: Tropical Rainfall Measuring Mission (TRMM) Precipitation Data and Services for Research and Applications. *Bull. Amer. Meteor. Soc.*, **93**, 1317–1325. doi: http://dx.doi.org/10.1175/BAMS-D-11-00152.1

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

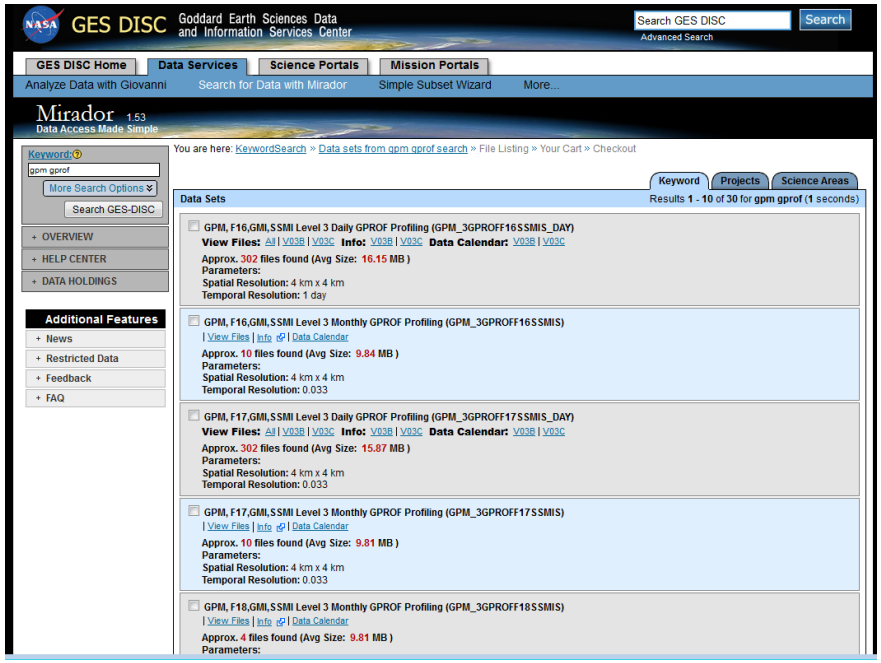
More parameters, higher data volume

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

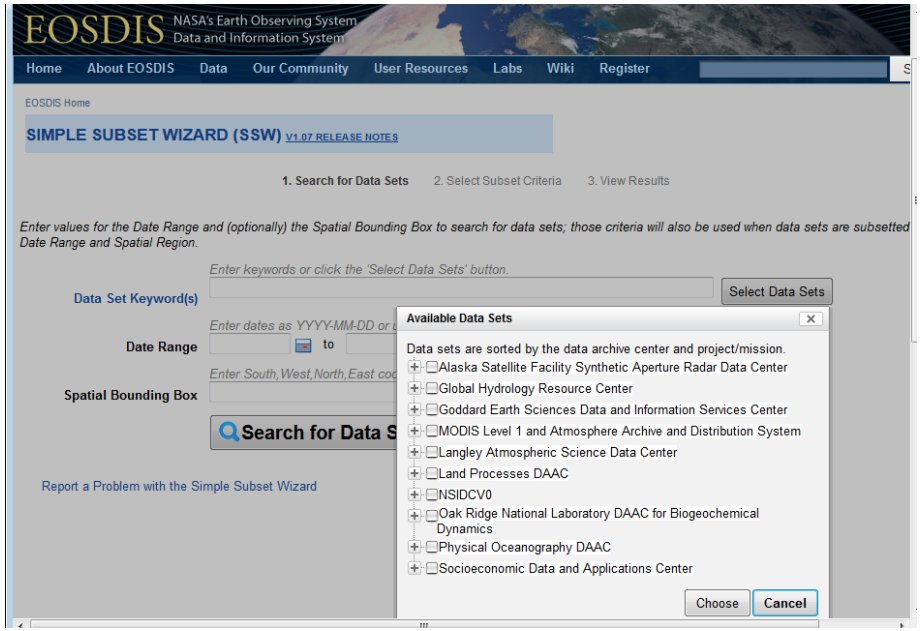
Mirador

- 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

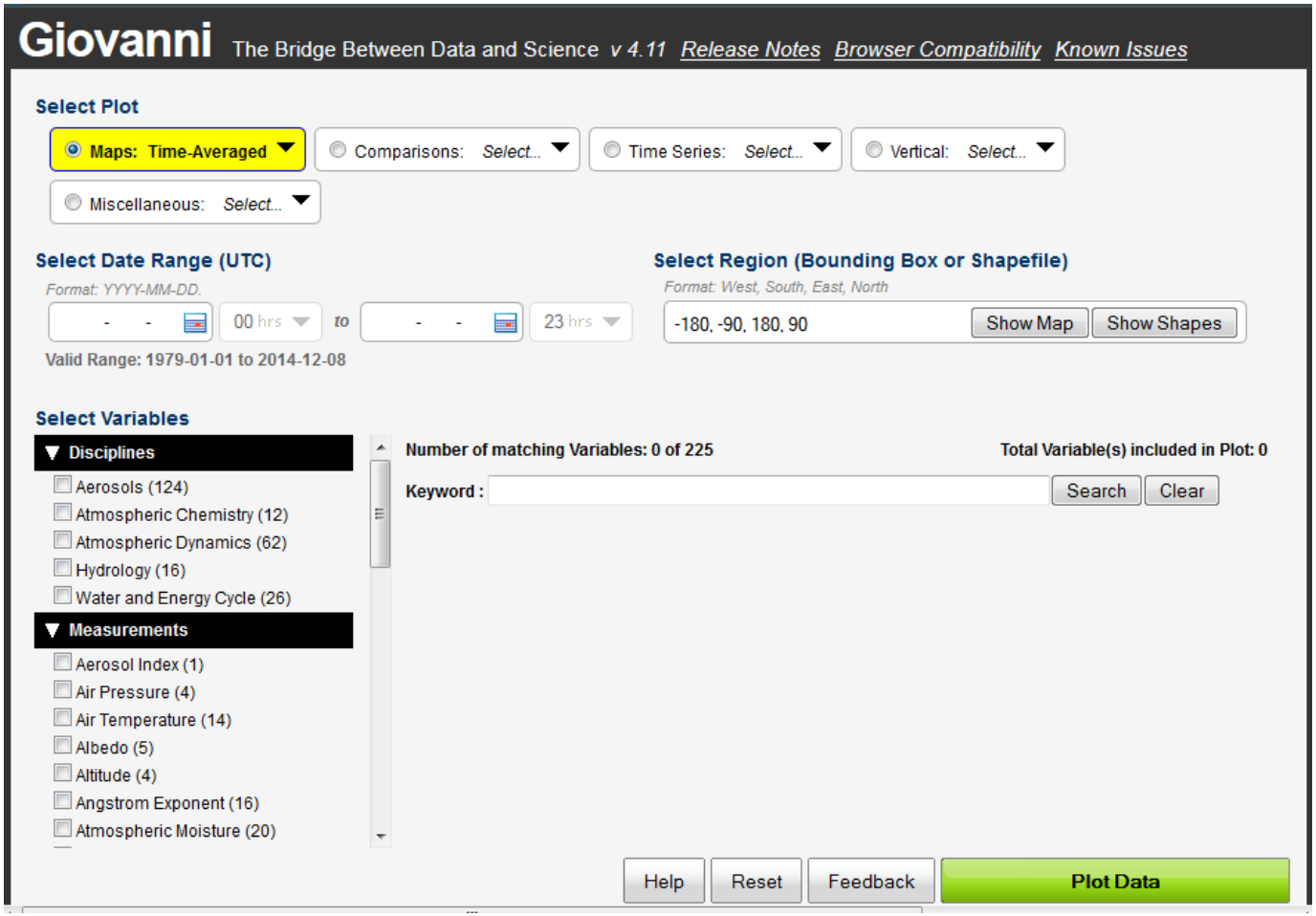


Simple Subset Wizard

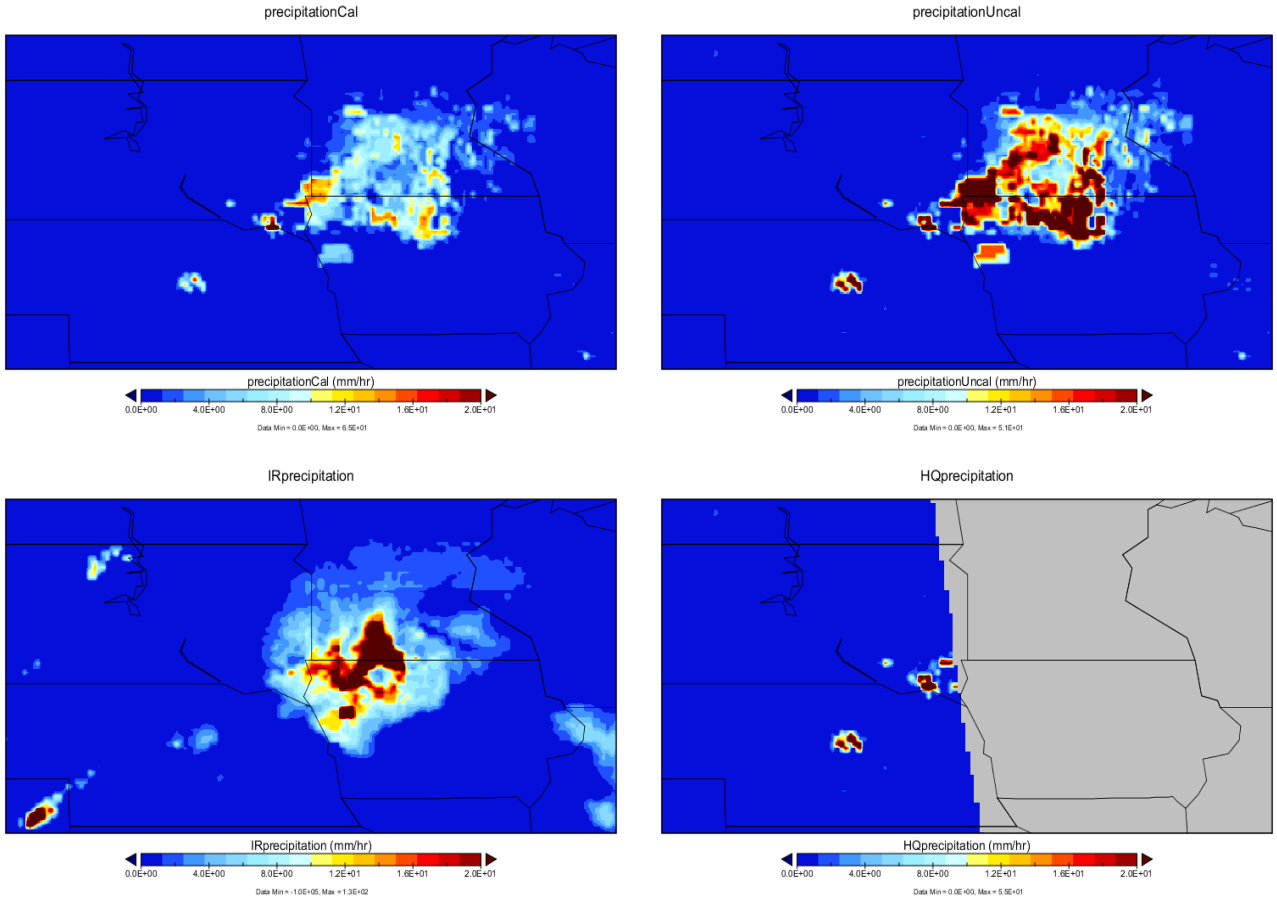
- Spatial subsetting and format conversion (i.e., NetCDF)
- Not just data at GES DISC. Can order data from other NASA data centers as well.



New Giovanni-4



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?

Summary

- 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/
- New Giovanni-4: http://giovanni.gsfc.nasa.gov/giovanni/
- 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!