GPM Webinar
March 15, 2016

Access, Visualize, and Download IMERG Precipitation Data using Giovanni (Geospatial Interactive Online Visualization ANd aNalysis Infrastructure)

Giovanni is a web-based application that allows for easy and quick exploration of many NASA data products   (http://giovanni.gsfc.nasa.gov/giovanni/)

On the Giovanni page you will see the following options:

Select Plot:	Allows selection of analysis options
Select Date Range:	Allows selection of time period
Select Region (Bounding Box or Shapefile):	Allows section of a geographic region (By latitude-longitude, by map, or by shapefiles)
Keyword:	Search data parameter by keyword
Plot data (bottom right):	Make desired plot

Part 1: Map IMERG Precipitation

Example: IMERG Early Precipitation Data -- Recent Flooding over Texas and Louisiana March 8-11 March 2016

Go to (http://giovanni.gsfc.nasa.gov/giovanni/)
Enter the following options

- **Select Plot:**
  - Maps: Accumulated
- **Select Region (Bounding Box or Shapefile)**
  - Draw a box around Texas-Louisiana region or enter latitude-longitude [any US States, Countries, Watersheds from the drop-down selection]
  - Click on **'Show Map'** to see the region

- **Select Date Range (UTC)**

YYYY-MM-DD	HH:mm		
2016 - 03 - 08	00 : 00	to	2016 - 03 - 11
			23 : 59

Valid Range: 2015-04-01 to 2016-03-11

  - Using the calendar select the dates (March 8-11, 2016 in this case)

- Scroll down the Select **Variables** menu to the left until you get to **Platform/Instrument**, and Select GPM
- Alternatively, go to **Keyword (center of page)**
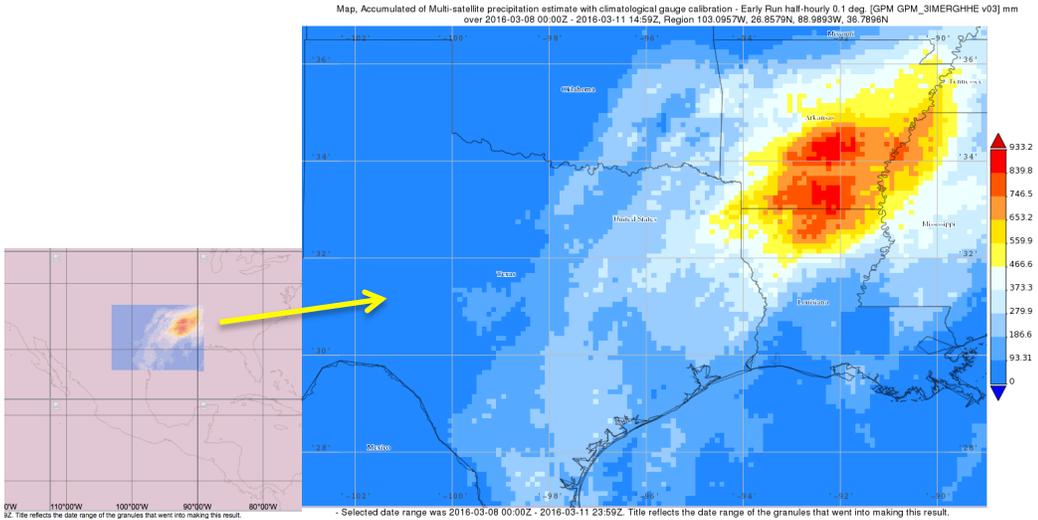 - Type the word 'GPM' or 'IMERG' and then click Search

	Keyword : GPM	Search	Clear				
	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
☐	Random Error for multi-satellite precipitation with climatological gauge calibration - Early Run (GPM_3IMERGHHE v03)	GPM	Half-Hourly	0.1 °	2015-04-01	2016-03-11	mm/hr
☐	Merged satellite-gauge precipitation estimate - Final Run (recommended for general use) (GPM_3IMERGM v03)	GPM	Monthly	0.1 °	2014-04-01	2015-10-31	mm/hr ÷
☐	Weighting of observed gauge precipitation relative to the multi-satellite precipitation estimate - Final Run (GPM_3IMERGM v03)	GPM	Monthly	0.1 °	2014-04-01	2015-10-31	%
☐	Accumulation-weighted probability of liquid precipitation phase - Final Run (GPM_3IMERGM v03)	GPM	Monthly	0.1 °	2014-04-01	2015-10-31	%
☐	Random error for merged satellite-gauge precipitation - Final Run (GPM_3IMERGM v03)	GPM	Monthly	0.1 °	2014-04-01	2015-10-31	mm/hr
☐	Merged microwave-only precipitation estimate - Final Run (GPM_3IMERGHH v03)	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	mm/hr
☐	Microwave satellite observation time - Final Run (GPM_3IMERGHH v03)	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	minutes
☐	Microwave satellite source identifier - Final Run (GPM_3IMERGHH v03)	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	-
☐	Weighting of IR-only precipitation relative to the morphed merged microwave-only precipitation estimate - Final Run (GPM_3IMERGHH v03)	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	%
☐	IR-only precipitation estimate - Final Run (GPM_3IMERGHH v03)	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	mm/hr
☐	Multi-satellite precipitation estimate with gauge calibration - Final Run	GPM	Half-Hourly	0.1 °	2014-03-12	2015-10-31	mm/hr ÷

- Under **Variable Name**, select the box for MERG Early Data

	Multi-satellite precipitation estimate with climatological gauge calibration - Early Run (GPM_3IMERGHHE v03)	GPM	Half-Hourly	0.1 °	2015-04-01	2016-03-11	mm/hr ÷

- Click on **Plot Data**   (at the bottom right)
  - o   You will get a plot of accumulated rain for the selected period

Map, Accumulated of Multi-satellite precipitation estimate with climatological gauge calibration - Early Run half-hourly 0.1 deg. [GPM_3IMERGHHE v03] mm over 2016-03-08 00:00Z - 2016-03-11 14:59Z, Region 103.0957W, 26.8579N, 88.9893W, 36.7896N

- Click on **Image** (top right of the map) and to save the image as **png** or **GeoTiff**
- Explore **Options** (top right of the map) to change colors and **Re-plot** if you wish
- Choose **'Downloads'** from 'History' on the right most side of the window
- You will see IMERG data file in for the region and time you selected in
             1) NetCDF format (.nc), 2) Geotiff, and 3) png image
- These files can be downloaded/saved by clicking on them
- GeoTIFF and NetCDF files can be used in GIS-ArcMAP or QGIS
- NetCDF file can be read/analyzed with appropriate sofware (e.g. Python, R, IDL, MATLAB, GrADS etc.)

Part 2: Precipitation Time Series

Example: Monthly IMREG Time Series averaged over Mississippi-Missouri Basin

- Click on **Back to Data Selection** (lower right)
- Go to **Keyword** and select monthly IMERG-Final

	Merged satellite-gauge precipitation estimate - Final Run (recommended for general use) (GPM_3IMERGM v03)	GPM	Monthly	0.1 °	2014-04-01	2015-10-31	mm/hr ÷

- **Select Region** (click on - **Show Shapes**)
  - o   Select **Watersheds** and from the Table select **Mississippi-Missouri**
- On the Top left **Select Plot**:
  - o   Time Series: Area-Averaged

- **Select Date Range (UTC):**
  - o   YYYY-MM (2014-04) to YYYY-MM (2015-10)
- Click on **Plot Data**   (at the bottom right)
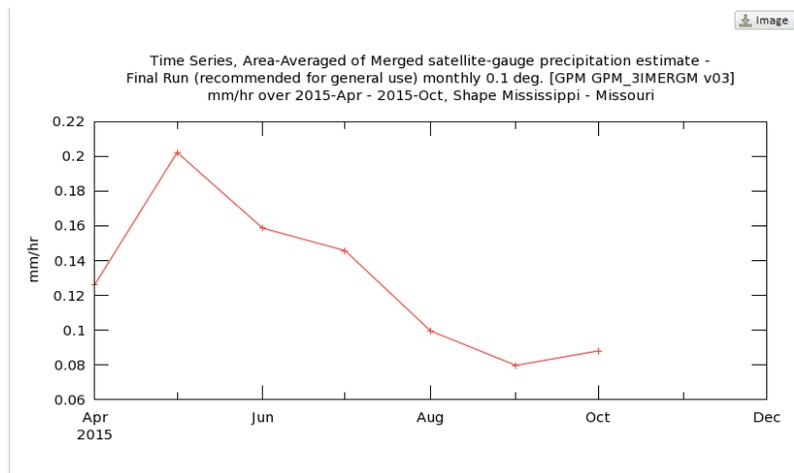
- From the **History** on the right most side of the window under **download** option
  - o   You will see Time Series Data in 1) CSV format and 2) png Image
  - o   These files can be downloaded/saved by clicking on them
  - o   CSV file can be used in Excel

Explore Additional Analysis Options

Click on 'Back to Data Selection' (lower right)
Select IMERG half-hourly snapshot (one at a time) for the area of your interest, time of your choice

Select Plot:
Miscellaneous: Histogram

Click on Plot Data   (at the bottom right)
Histograms data can be downloaded as a NetCFD file through the History on the right