Newly Released GPCP Version 3.2 Global Precipitation Datasets at NASA GES DISC

NASA/Goddard EARTH SCIENCES DATA and INFORMATION SERVICES CENTER (GES DISC)

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Abstract

The Global Precipitation Climatology Project (GPCP) is the precipitation component of an internationally coordinated set of (mainly) satellite-based global products dealing with the Earth's water and energy cycles, under the auspices of the Global Water and Energy Experiment (GEWEX) Data and Assessment Panel (GDAP) of the World Climate Research Program. As the follow-on to the GPCP Version 2.X products, GPCP Version 3 (GPCP V3.2) seeks to continue the production of long, homogeneous precipitation record using modern input and calibration datasets.

The GPCP V3.2 provides globally complete analyses of surface precipitation on a 0.5˚ x 0.5˚ latitude/longitude grid at both monthly and daily intervals, respectively covering 1983 to the present and June 2000 to the present. New data fields have been introduced to better characterize the precipitation, particularly including an estimate of the fraction of the precipitation that is liquid (rain) in both the Monthly and Daily, and a Quality Index for the Monthly. Compared to the operational GPCP V2.3 Monthly, the V3.2 Monthly provides a more reasonable climatology in the Southern Ocean, and increases the global average precipitation by about 4.46%, which is in line with recommendations of recent assessments. However, the two versions have comparable global and regional trends for 1983-2020. Compared to the operational One-Degree Daily (Version 1.3) product, the V3.2 Daily better represents the histogram of precipitation rates, particularly at high values.

In this presentation, we will present the latest GPCP V3.2 daily and monthly datasets archived and distributed at NASA Goddard Earth Sciences (GES) Data and Information Services Center (DISC) along with examples from NASA Giovanni.

Product Summary

Daily

Shortname: GPCPDAY
Longname: GPCP Version 3.2 Daily Precipitation Data Set
DOI: 10.5067/MEASURES/GPCP/DATA305
Version: 3.2
Format: netCDF
Spatial Coverage: -180.0,-90.0,180.0,90.0
Temporal Coverage: 2000-06-01 to 2020-12-31
File Size: 1.6 MB per file
Data Resolution
Spatial: 0.5 ° x 0.5 °
Temporal: 1 day

Table 1. Key data fields in the MEaSUREs GPCP V3.2 daily dataset

Data Field Name	Description	Units
precip	Precipitation estimate	mm/day
probability_liquid_phase	Probability of liquid phase	percent

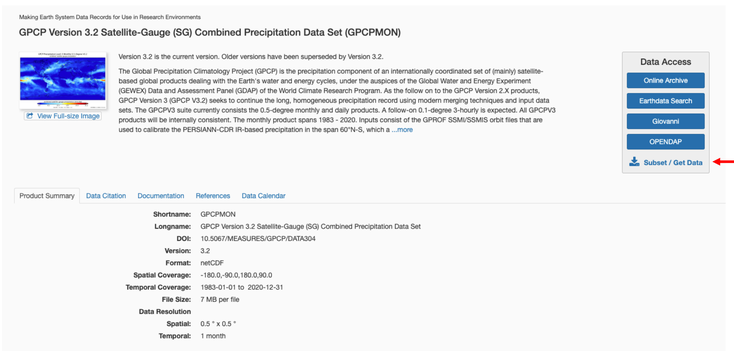
Monthly

Shortname: GPCPMON
Longname: GPCP Version 3.2 Satellite-Gauge (SG) Combined Precipitation Data Set
DOI: 10.5067/MEASURES/GPCP/DATA304
Version: 3.2
Format: netCDF
Spatial Coverage: -180.0,-90.0,180.0,90.0
Temporal Coverage: 1983-01-01 to 2020-12-31
File Size: 7 MB per file
Data Resolution
Spatial: 0.5 ° x 0.5 °
Temporal: 1 month

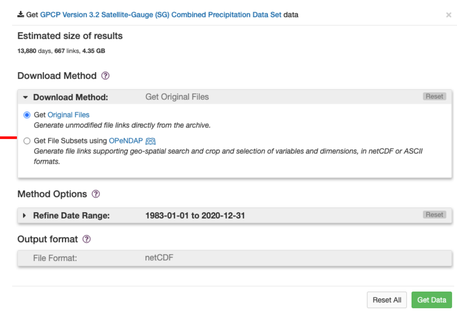
Table 2. Key data fields in the MEaSUREs GPCP V3.2 monthly dataset

Data Field Name	Description	Units
sat_gauge_precip	Combined satellite-gauge precipitation estimate	mm/day
sat_gauge_error	Combined satellite-gauge precipitation random error estimate	mm/day
satellite_precip	Satellite-only precipitation estimate	mm/day
satellite_source	Source of the contributing satellite estimate	index values
gauge_precip	Wind-loss adjusted gauge precipitation	mm/day
probability_liquid_phase	Probability of liquid phase	percent
gauge_relative_weight	Gauge relative weighting	percent
quality_index	Quality index	index values

Dataset Landing Page



Above: The dataset landing page (e.g., the monthly product) is the place for data access and all dataset related information including data citation, documentation, references, etc.

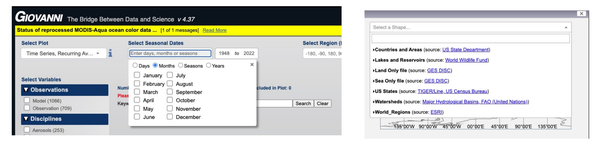


Data subsetting provides a convenient way to download data in your area of interest.

GPCP V3.2 in Giovanni:

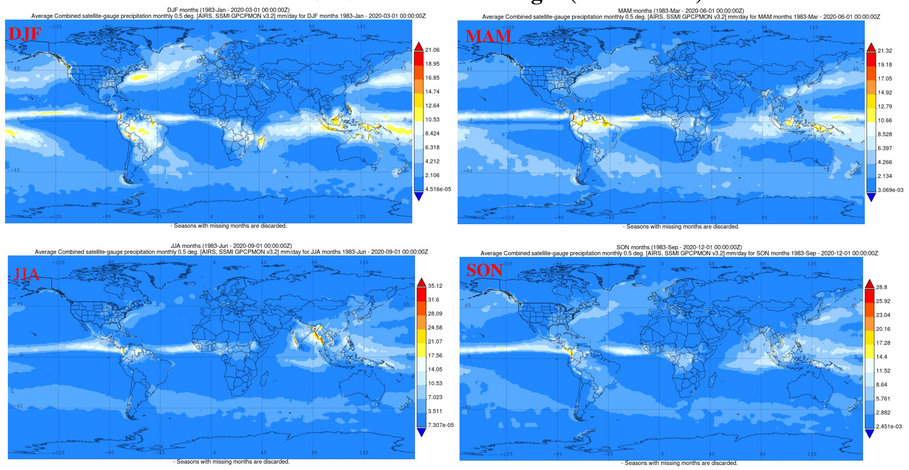
New features available:

- Most Level-3 precipitation products are in Giovanni
- Daily added to Recurring Averages (in addition to Monthly and Seasonal)
- Time Series, Recurring Averages (yearly) has been added
- Shapefiles include 24 World Regions
- Shapefiles include Lakes and Reservoirs (125 largest)

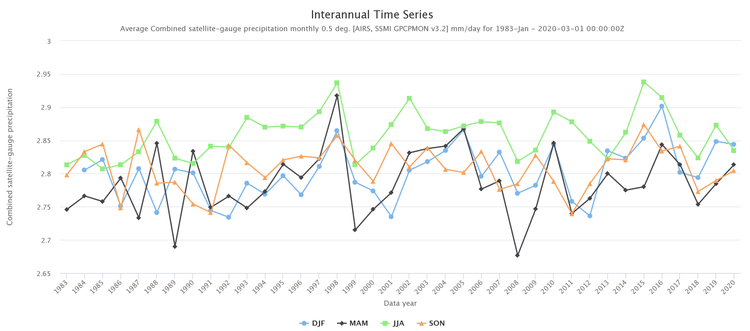


Top left: Daily and yearly have been added to recurring averages. *Top right:* More shapefiles are now available (world regions, lakes and reservoirs).

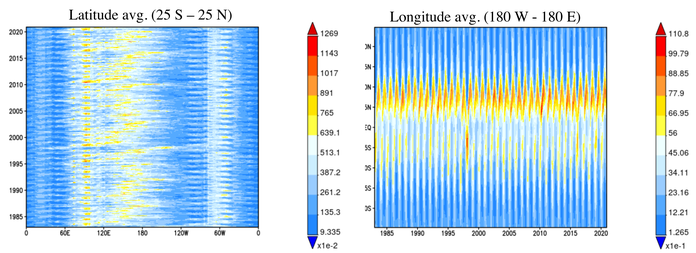
GPCP Seasonal Averages (1983 – 2020)



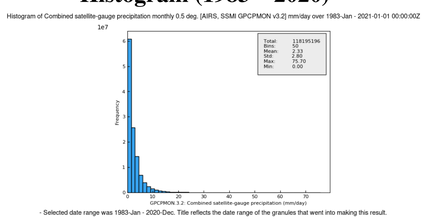
GPCP Seasonal Time Series (1983 – 2020)



GPCP Hovmöller Diagrams (1983 – 2020)

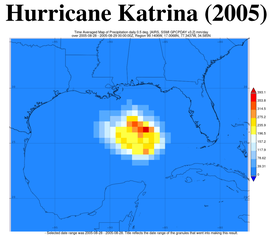


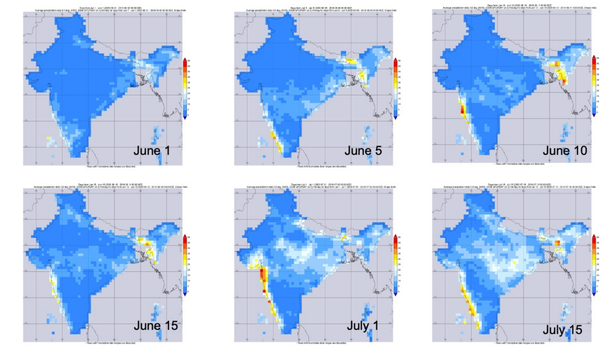
Histogram (1983 – 2020)



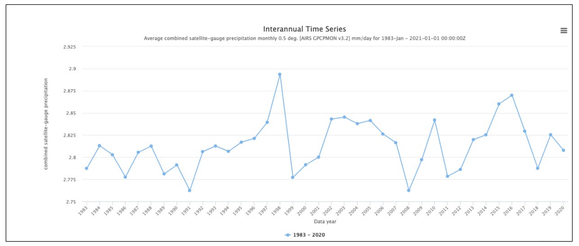
- Selected date range was 1983-Jan - 2020-Dec. Title reflects the date range of the granules that went into making this result.

Hurricane Katrina (2005)

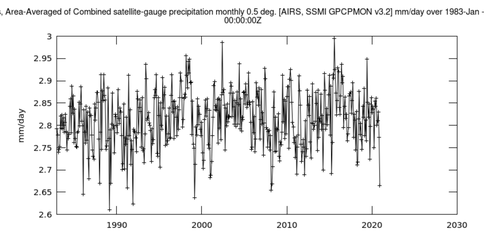




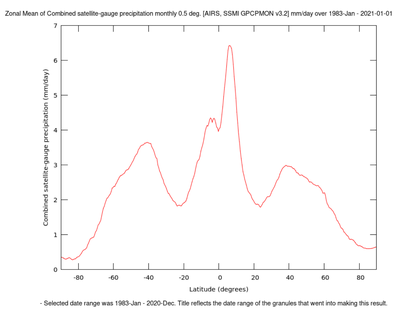
Example of recurring time averages – daily: Indian monsoon season average onset dates (T.N. Krishnamurti).



Example of yearly recurring time series: Global average monthly precipitation time series (mm/day) (1983 – 2020).



Example of time series: Global average monthly precipitation time series (mm/day) (1983 – 2020).



- Selected date range was 1983-Jan - 2020-Dec. Title reflects the date range of the granules that went into making this result.

Global zonal mean of the monthly dataset.

Related presentation: H26F-07 - The latest Global Precipitation Climatology Project Daily and Monthly products (Version 3.2): Early results and comparisons (https://agu.confex.com/agu/fm22/meetingapp.cgi/Paper/1135368) Tuesday, 13 December 2022, 17:45 - 17:55 CST, McCormick Place - E270 (Lakeside, Level 2)

Acknowledgments: GPCP V3.2 was supported by the NASA Making Earth System Data Records for Use in Research Environments (MEaSUREs) program. Dr. Ali Behrangi (University of Arizona) is the Principal Investigator of the MEaSUREs 2017 project entitled "High Latitude Improvement of Long-Term GPCP Precipitation Products Using Recent NASA Missions", and Lucia Tsaoussi is the NASA MEaSUREs Program Manager.

GPCP products: https://disc.gsfc.nasa.gov/datasets?keywords=%22GPCPDAY_3.2%20GPCPMON_3.2%22 Giovanni: https://giovanni.gsfc.nasa.gov/ GES DISC: https://disc.gsfc.nasa.gov *Help Desk:* gsfc-dl-help-disc@mail.nasa.gov