

Bureau of Meteorology

Satellite precipitation - data and applications

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presenting the work of Dr Beth Ebert The International Precipitation Working Group (IPWG)

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IR and microwave rain estimation

Bureau of Meteorology











GPM Constellation of Satellites

NPP (NASA/NOAA)

MetOp B & C (EUMETSAT) GPM Core Observatory (NASA/JAXA)

> Megha-Tropiques (CNES/ISRO)

> > NOAA 19 *(NOAA)*

DMSP F19/F20 (DOD)



GCOM-W1 *(JAXA)*

JPSS-1 (NOAA)

Near-real time global precipitation models Australian Government

Bureau of Meteorology



GSMAP 20110202





Additional precipitation estimates for climate monitoring

Product	<u>Source</u>	Resolution	Data record
GPCP	NOAA	2.5°, pentad & monthly, global	1979-present
CMAP	NOAA	2.5°, pentad & monthly, global	1979-present
TRMM 3B42	NASA	0.25º, 3 hr, 50ºS-50ºN	1998-present



GSMaP near-real time data viewer



We offer hourly global rainfall maps in near real time (about four hours after observation) using the combined MW-IR algorithm with <u>TRMM TMI</u>, <u>Aqua AMSR-E</u>, DMSP SSM/I and SSMIS, and GEO IR data. Background cloud images are produced from IR data observed by JMA's MTSAT satellite, NOAA's GOES satellites and EUMETSAT's Meteosat satellites (see <u>NOTICE</u>), and provided through JWA.

Because of limited use permission for Meteosat cloud images, we only display images of them at 00, 06, 10, and 10, UTO in this many TO DISPLAY ALL MATERIAL IMAGES (supercla) shares

Rainfall Analysis Tools



Monthly Global Precipitation (GPCP)

Alert: A new window may be opened when a link or a button is selected below.

Click and drag to select area; or input latitudes (-90, 90) and longitudes (-180 ~ 180) or Click for non Java/JavaScript version

More information on supported browsers and platforms

The Global Precipitation Climatology Project (<u>GPCP</u>) provides a global merged rainfall analysis for research and applications. This interface is designed for visualization and analysis of the GPCP's <u>Global Precipitation Version 2.1</u> <u>Data Set</u>.

Users can generate plots or ASCII Output for area average (Lat-Lon Map), time series (Time Series), and Hovmoller diagram. The animation is available for Lat-Lon Maps. Selecting <u>here</u> or the **Help** buttons will open a new window with detailed help. <u>More details about the data are also available</u>.

Help

North latitude

Giovanni

Visualize, analyze, and access a variety of earth science remote sensing data

Visualizations used on this slide were produced with the Giovanni online data system, developed and maintained by the NASA GES DISC





Applications – drought monitoring

 $N_{\text{LDAS}} D_{\text{rought}} M_{\text{onitor}}$

Total Runoff

NOTE: This page is best viewed with a screen resolution of at least 1024x768

DISCLAIMER: Any data provided on this server should be used for research or educational purposes only. This data should NOT be relied on for any operational use as data gaps can occur due to hardware failure and/or model upgrading procedures.

Ensemble Mean LSM OUTPUT:

Past Month Total Runoff Anomaly 🚽





LAB

the UNIVERSITY of OKLAHOMA HyDrometeorology and **REMOTE SENSING LABORATORY**



Applications – Global Realtime Hydrological Simulation and Flood Monitoring

Latest 24h/3h Soil Moisture (%)

2011-06-24 09h







Applications – tropical cyclone heavy rainfall

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ECMWF model and GPCP rainfall

JJA 2001

(Courtesy Peter Bauer, ECMWF)



Australian Government **Bureau of Meteorology**

Applications – historical climate reconstruction

Reconstructed monthly rainfall time series,

courtesy Tom Smith, NOAA

modes



CCA-based reconstruction near-global average over land locations with gauges, with similar averages for gauges and for GPCP

CCA-based reconstruction near-global average over oceans, with similar averages for AR4 and for GPCP.



Applications – crop production estimation

USDA United States Department of Agriculture Linking U.S. Agriculture Foreign Agricultural Service Crop Explorer Home | Return to Previous Page (Note: This is a Beta version) TMPA-RT Decadal Percent Normal Precipitation [%] (11jun2011 - 20jun2011) TMPA-RT Precipitation [mm] (11jun2011 - 20jun2011) 251 251 20N 201 400 151 200 15 100 10N 105 50 25 5N 10 50 EG FC 105 95E 140E 1 COF 130F 135E 130F 135E 140E 105

2011-06-25-09:06 GrADS: COLA/IGES

GrADS: COLA/IGES

Generated by NASA's Giovanni (giovanni.gsfo.nasa.gov)

Generated by NASA's Giovanni (giovanni.gsfo.nasa.gov)

2011-06-25-09:06

200

150

125

100

75

Applications – disease monitoring



Not only had the floods directly damaged infrastructure, but diseases such as cholera, malaria, diarrhea, and measles spread as a result of unsanitary conditions and contaminated drinking water.

Malaria is spread by Anopheles mosquitos





of the parameters used to model malaria incidences in Thailand.



Applications – ocean freshwater budget

Bureau of Meteorology



HOAPS ocean atmosphere fluxes based on SSM/I microwave data for consistency Andersson et al., *JAMC*, 2010



International Precipitation Working Group (IPWG)

http://www.isac.cnr.it/~ipwg/

Meetings

Data

Algorithms

Training

Reports

Newsletter

Links

(etc.)



CGMS & International Precipitation IPWG Working Group



Thank you...

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