

Climate Needs for GPM

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Climate Needs for Precipitation

In Weather Chaos, a Case for Global Warming



Arif Ali/Agence France-Presse/Getty Images

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PAKISTAN The worst flooding in at least 80 years has killed at least 1,384 people and affected 20 million in a continuing crisis.

By **JUSTIN GILLIS**
Published: August 14, 2010

The [floods battered New England](#), [then Nashville](#), [then Arkansas](#), [then Oklahoma](#) — and were followed by a deluge in Pakistan that has upended the lives of 20 million people.

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New York Times Front Page,
August 14, 2010

Climate Benefits - Precipitation

- Perhaps single most important variable for societal use
- Monitoring of long-term fluctuations and change
- Improved representation of precipitation in climate prediction models and reanalyses
- Improved validation of climate models

Target Requirements from GCOS*

- Accuracy: 0.1 mm/hr, with total amount at an accuracy of <10% of actual values on monthly time scales
- Resolution: 100 km horizontal resolution and 3-hourly observing cycles; 1 km and 10 min observing cycle for extreme events
- Stability: 0.6%/decade (large-scale trend)
- Microwave instrument accuracy to 1.25° K brightness temp. and 0.03° K decadal stability

* GCOS, 2006: Systematic Observation Requirements for Satellite-based Products for Climate

Some Current CPO Activities

GPM targeted -- Funded by CPO (or in partnership with NASA)

- **Ping-ping Xie (NOAA Climate Prediction Center) - Improvement and Validation of a Multi-Satellite, Multi-Sensor Precipitation Estimation Algorithm For High-Resolution, Pole-to-Pole Global Precipitation Analyses**
- **Ralph Ferraro (NOAA NESDIS/STAR) - Improved Microwave Precipitation Retrieval over Land from TRMM through GPM Era**
- **Pavel Groisman (NOAA National Climatic Data Center) - In Situ Precipitation Dataset in High Latitudes of the Northern Hemisphere for Calibration of GPM Mission Products**

Some Current CPO Activities (ctd.)

Funded through CPO Climate Observations and Monitoring Program

- **Chris Kummerow (Colorado State University) - Development of an Improved Climate Rainfall Dataset from SSM/I**
- **Kuo-Lin Hsu, Soroosh Sorooshian (UC – Irvine) - Reconstruction and Analysis of High Resolution Precipitation Dataset**
- **Ping-Ping Xie (NOAA Climate Prediction Center) - Development of 60-year Gauge-Based Analysis of Hourly Precipitation for the Conterminous United States**

Some Current CPO Activities (ctd.)

**Funded by the CPO Climate Observations and Monitoring Program
through the NOAA/NCDC Applied Research Center**

- **NOAA Climate Prediction Center - IR histogram data and precipitation estimates from geostationary satellites for the GPCP project; Global full-resolution IR data from geostationary satellites**
- **NOAA/NESDIS/STAR and ESSIC/Cooperative Institute for Climate and Satellites (CICS) - Generate global monthly mean (1 deg and 2.5 deg spatial resolutions) hydrological products from the DMSP SSM/I**

Cited Issues on Precipitation Products (GCOS 2006)

- Biases/month-to-month variations between existing products
- Products designed for investigation of global water cycle; adequate for monitoring of climate variability and change?