GPM Requirements from NOAA/NWS Climate Prediction Center

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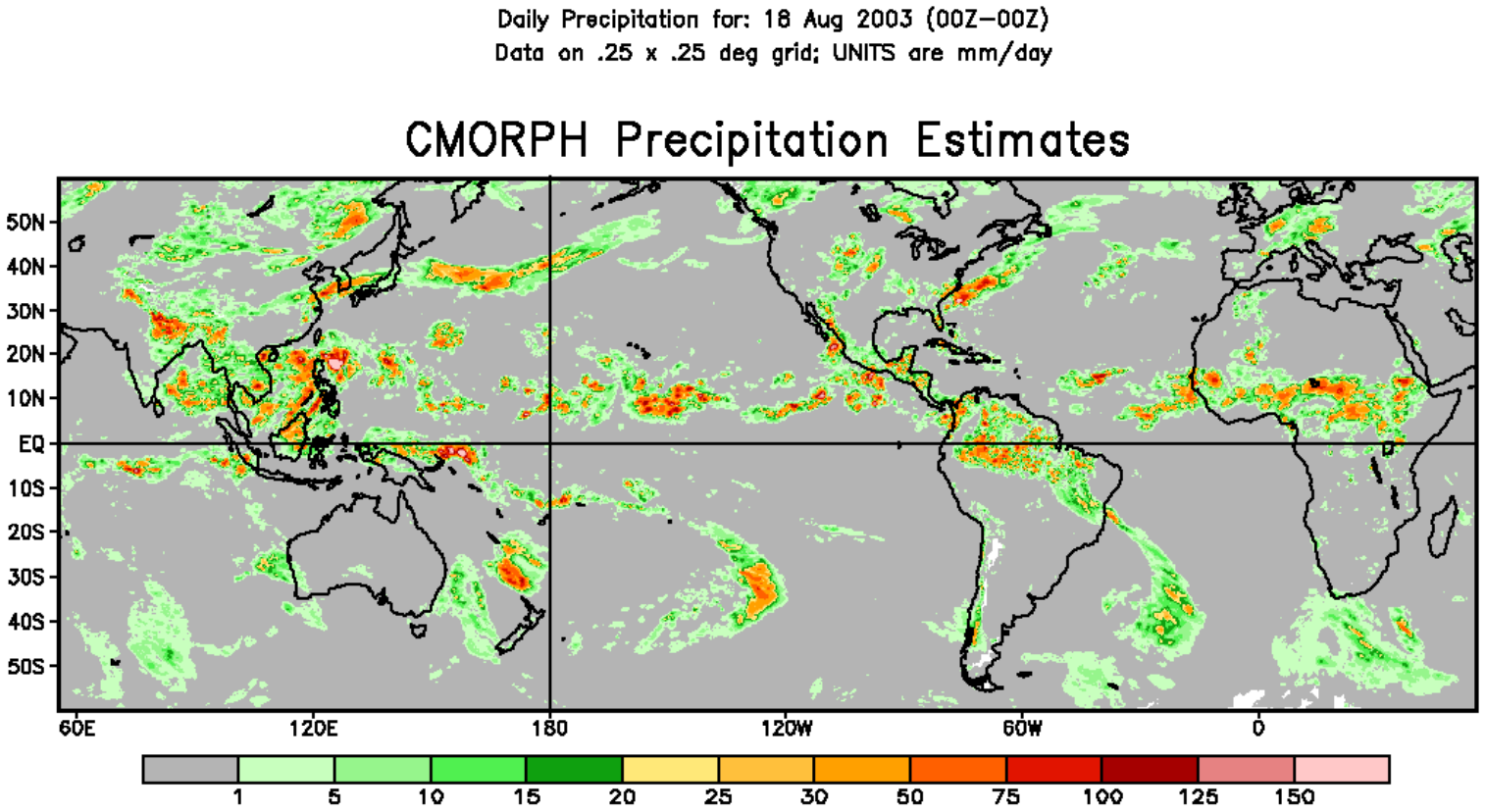
Precipitation Data is Vital to Understanding, Modeling, Predicting, Monitoring and Assessing Climate Variability

- Monitoring
  - Global; Regional; Real-Time
- Prediction
  - Initialization of forecast models; Verification;
- Assessments / Diagnostics
  - Short-Term climate variations (ENSO, NAO ..)

CPC has been a Leader in the Development of Precipitation Data Sets

- Gauge-Based
  - Global; Regional; Daily; Monthly; Real-Time
- Satellite Derived
  - GPI: Goes Precipitation Index
  - OPI: OLR-based Precipitation Index
  - CMORPH: High-Resolution Precipitation Estimates through integrating multi-sensor satellite obs.
- Merged
  - CMAP: CPC Merged Analysis of Precipitation (mon/Pen)
  - Gauge-Satellite Merged (0.25^{o}lat/lon / Hourly)

Example of CMORPH Multi-Sensor High-Res Global Precipitation Estimates



How can CPC benefit from GPM?

- Continuing the Record of High-Res Global Precipitation Estimates Starting from the TRMM Era
- Extending the Spatial Domain to Global
- Improving the Quantitative Accuracy over Oceans and Mountains
- Refining the consistency with long-term records (e.g. gauge and previous satellite observations)

NOAA / CPC Requirements

Observation Requirement	T/O	Geographic Coverage	Vertical Resolution		Horizontal Resolution		Measurement Accuracy		Measurement Precision		Sampling Interval		Data Latency	
Global Precip. Rate from PMW	T	Global		Km	4	km	.5	mm/h	.5	mm/h	3	hr	1	hr
	O	Global		km	4	km	0.5	mm/h	0.5	mm/h	3	hr	01	hr
Global precip L3 Product	T	Global			4	km	0.5	Mm/h	0.5	Mm/h	.5	hr	1	hr
	O	Global			4	km	0.5	Mm/h	0.5	Mm/h	.5	hr	1	hr
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Gaps in Current Satellite Product Suite

- Spatial (coverage) gaps:
  - Need to cover the entire globe
- Temporal gaps
  - Backward extension to cover the TRMM era (1998~)
  - Explore possibility of extending the hi-res estimates further back (e.g. to 1987/1988)
  - Ensure consistency between TRMM-GPM products
- Latency gaps:
  - L2 products: 1 hour
  - L3 products: 3 hours or shorter
- Accuracy shortcomings:
  - Uncertainties over ocean

Next Steps for GPM-era data & products [1]

- What are funded activities within your program/project over the next five years?
  - GPM project by CPO/COM; HMT
  - GPCP-related activities through ARC by CPO/COM
  - Construction of hourly CONUS precip maps by CPO/COM
  - Collaborations with AFWA through GSFC
- What are your funding gaps?
  - Increasingly difficult to get projects funded
  - Amount of funding for individual projects relatively small
  - Longer time spent to prepare proposals

Next Steps for GPM-era data & products [2]

- What are your plans to work with other elements of NOAA?
  - Have been working closely with NESDIS, NCDC, OHD
  - Preparing a group proposal to CPO/COM on NOAA Unified Precipitation Products
- What are your plans to work with NASA?
  - Collaboration with NASA L3 team (Huffman) on a unified US integrated satellite products
  - Working closely with NASA/GSFC hydrology team on application of CMORPH in hydrometeorological modeling