

# Toward Bridging the GPM Level II and Level III using Multi-Radar Multi-Sensor

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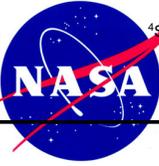
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## Context

**Characterization of satellite surface precipitation estimates and bridging GPM core, constellation and combined Level-3 estimates. Needed in water cycle and extreme events studies, weather and climate prediction; over land in flood prediction and water resources. GPM Mission Core satellite platform must meet Level 1 science requirements.**

## Objectives

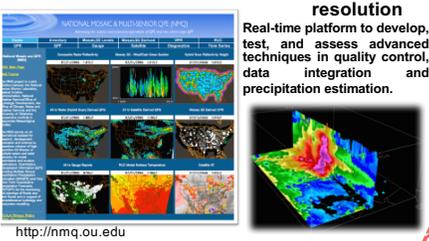
- use the NOAA/NSSL Multi-Radar/Multi-Sensor System (MRMS) system to provide a consistent reference research framework for creating conterminous US (CONUS)-wide comparison benchmark of precipitation retrievals across TRMM/GPM core and constellation satellites.
- cross-platform characterization acts as a bridge to intercalibrate active and passive microwave measurements from the GPM core satellite to the constellation satellites, and propagate to Level-3 precipitation products.

## Space sensors

TRMM-PR/TMI, SSMIS, AMSR-2, DMSP-SSM/I, MHS, ATMS, GPM-DPR/GMI

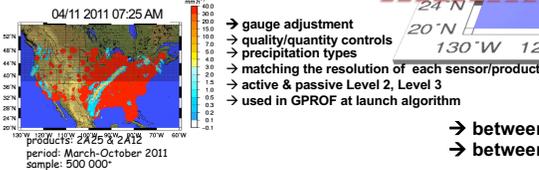
## Background: MRMS-Q3

Q3 provides 3D reflectivity mosaics and QPE products over CONUS at 1-km<sup>2</sup>/2-min resolution

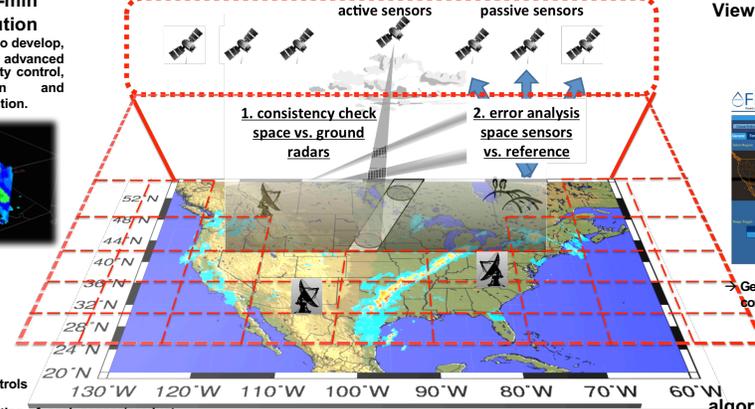


## Reference precipitation

Establish a trustworthy reference precipitation database in real-time



## 3. Bridge across GPM sensors and the gridded Level-3 products



## Comparison

View satellite (GPM, TRMM) and MRMS QPE Display



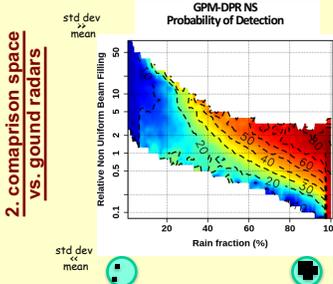
## Disseminating data

algorithm development (GMI)/validation purposes active/passive/combined level-2 and level-3 products

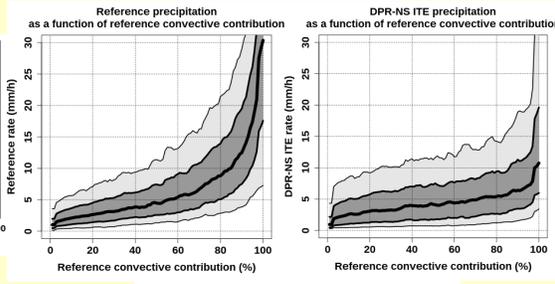
## Bridging between sensors

- between algorithms versions e.g. GPROF-GMI V03 vs. GPROF-GMI V04
- between active and passive sensors, e.g. GPM-DPR vs. GPROF-GMI

## precipitation detection

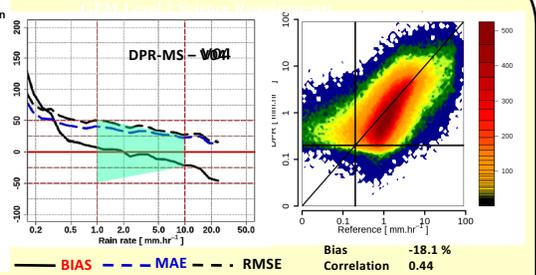


## precipitation classification

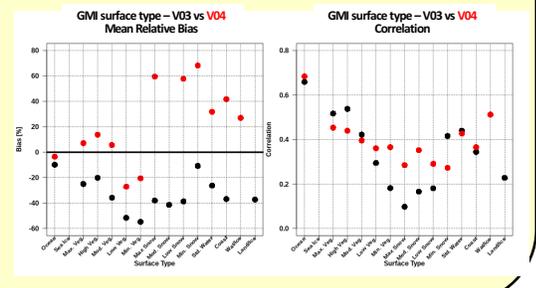
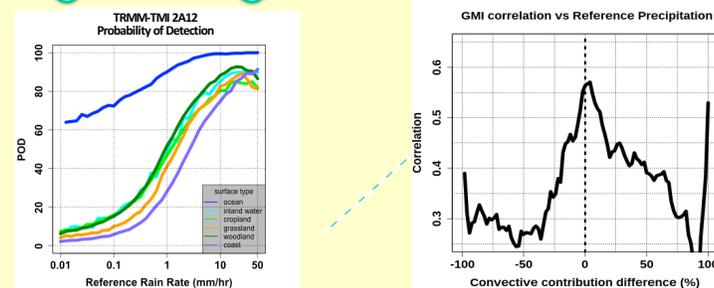


## precipitation quantification

GPM meets Level 1 Science Requirements !



## 3-4. analysis with passive sensors: GPROF-TMI & GMI



## Relevance and Broader Impact :

- development, evaluation, and validation of GPM retrieval algorithms
- propagation of uncertainties in Level 3 precipitation products
- bridging precipitation-related space missions (e.g. SMAP, CloudSat)

## Any question or comment?

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