Activities Involving NASA Rainfall Products at the National Severe Storms Laboratory

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TRMM-3B42RT

TRMM-3B42V6

PERSIANN-CCS-RT

PERSIANN-CCS-MW

RADAR-ONLY

GAUGE-ONLY

STAGEIV

(a) NB=0.50
RMSE= 567
CORR=0.60

(b) NB=-0.10
RMSE=136
CORR=0.60

(c) NB=0.34
RMSE= 364
CORR=0.63

(d) NB=0.16
RMSE=189
CORR=0.60

(e) NB=0.61
RMSE= 753
CORR=0.49

(f) NB=-0.22
RMSE=194
CORR=0.72
Hourly resolution with GOES-based PERSIANN-CCS products performed better than 3-hr TRMM products in capturing diurnal-scale convection.

All satellite-based rainfall algorithms depicted nocturnal rainfall max 3-4 hrs too early…presumably due to cirrus clouds.

Evaluation of Inputs in HL-RDHM Distributed Hydrologic Model
TS Erin (100-yr return flow)

Study region showing various ground-based radar platforms in the OK region, as well as in situ observation networks.

**Methodology**

Schematic of geometry matchup of the Ground Radar (GR) and Precipitation Radar (PR). The purple area show the intersections between GR sweeps and PR footprints.

Scatterplots and histograms for reflectivity with improving quality control: (a) and (b) KOUN reflectivity and attenuation corrected PR reflectivity with no quality control; (c) and (d) removed non-meteorological echoes based on KOUN’s hydrometeor classification algorithm (HCA) results; (e) and (f) same as (c) and (d) but applied >18 dBZ threshold. Data density denoted on color scale is in units of number of points per 1-dBZ bin.

Why PR and KOUN have differences?  
—Back scattering? Attenuation?

Bias \([(PR-KOUN)\times100/KOUN]\) for the different hydrometeor classifications, as determined by KOUN HCA for all 20 events.

Mean vertical reflectivity profiles classified from PR for: (a) convective rain, (b) stratiform rain, and (c) all rain types. ZG is reflectivity from KOUN, Zm is measured reflectivity from TRMM 1C21, and Zc is attenuation corrected TRMM 2A25.
Real time platform to develop, test, and assess advanced techniques in quality control, data integration and precipitation estimation and short term forecasting.

http://nmq.ou.edu
Q2 exists today as a scientific and community-based convergence towards accurate, 1-km²/2.5-min multi-sensor precipitation estimates on a national scale.

Q2 is a continuation of NSSL's departure from a radar-centric approach to precipitation estimation towards a integration of radar, satellite, model, and surface observations.

Q2 goal is to glean the best practices and techniques from NOAA’s River Forecast Centers, Forecast Offices, Office of Hydrology, domestic/international organizations and universities.
• Real-time ingest of TRMM 2A25 and 3B42RT products in NMQ underway enabling CONUS-wide evaluation

• Same architecture will be used for forthcoming GPM and NEXRAD dual-pol products (Q3?)

• By maintaining a complete archive of NMQ/Q3 and TRMM/GPM intermediate and final products, robust analyses and intercomparisons can proceed...ultimately leading to joint, synergistic development using ground- and satellite-based observing platforms for multisensor precipitation estimation