

# Advances in AMSR2 Precipitation Retrievals: *Validation and Monitoring Tools*

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*CICS-MD Science Meeting*

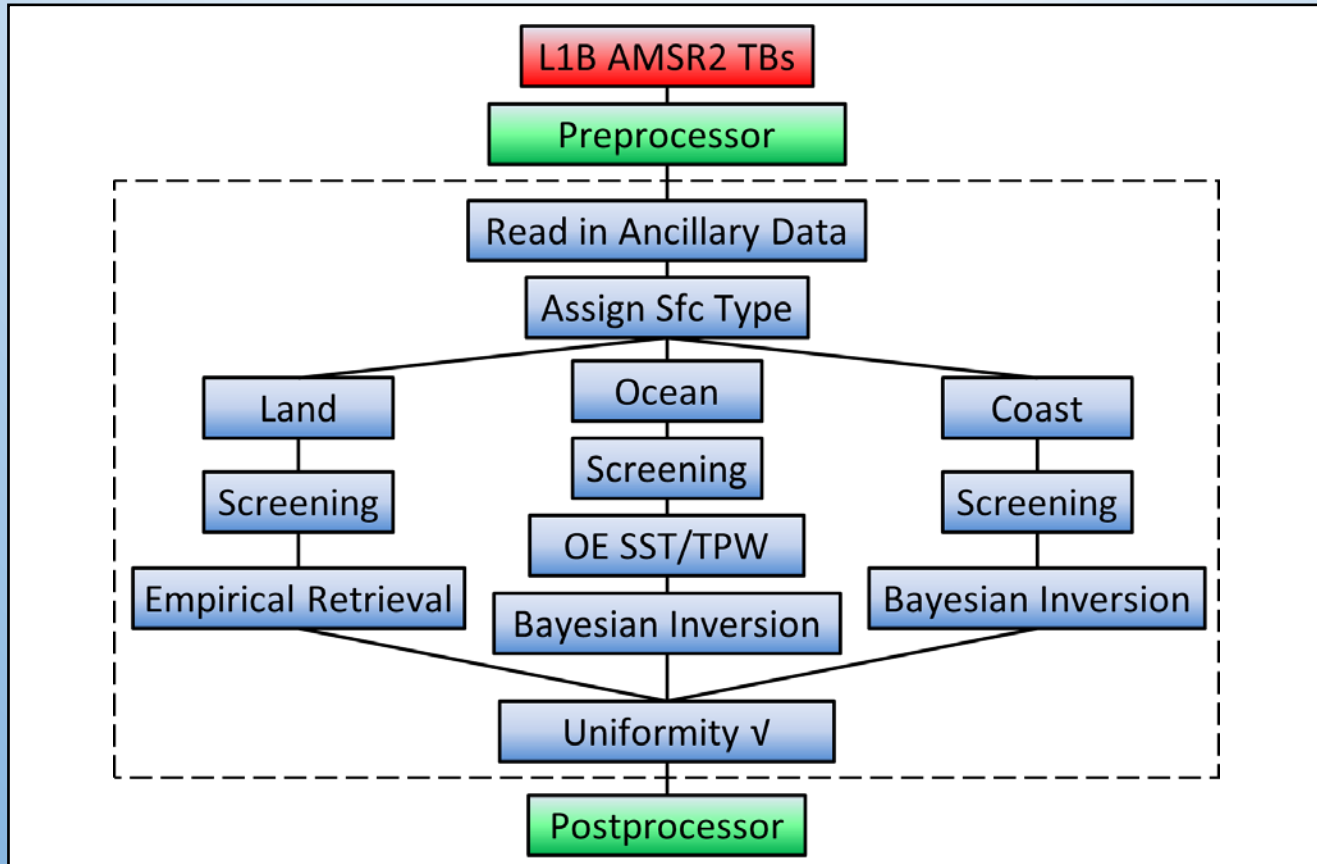
*November 13, 2014*

# Operational AMSR2 Retrievals



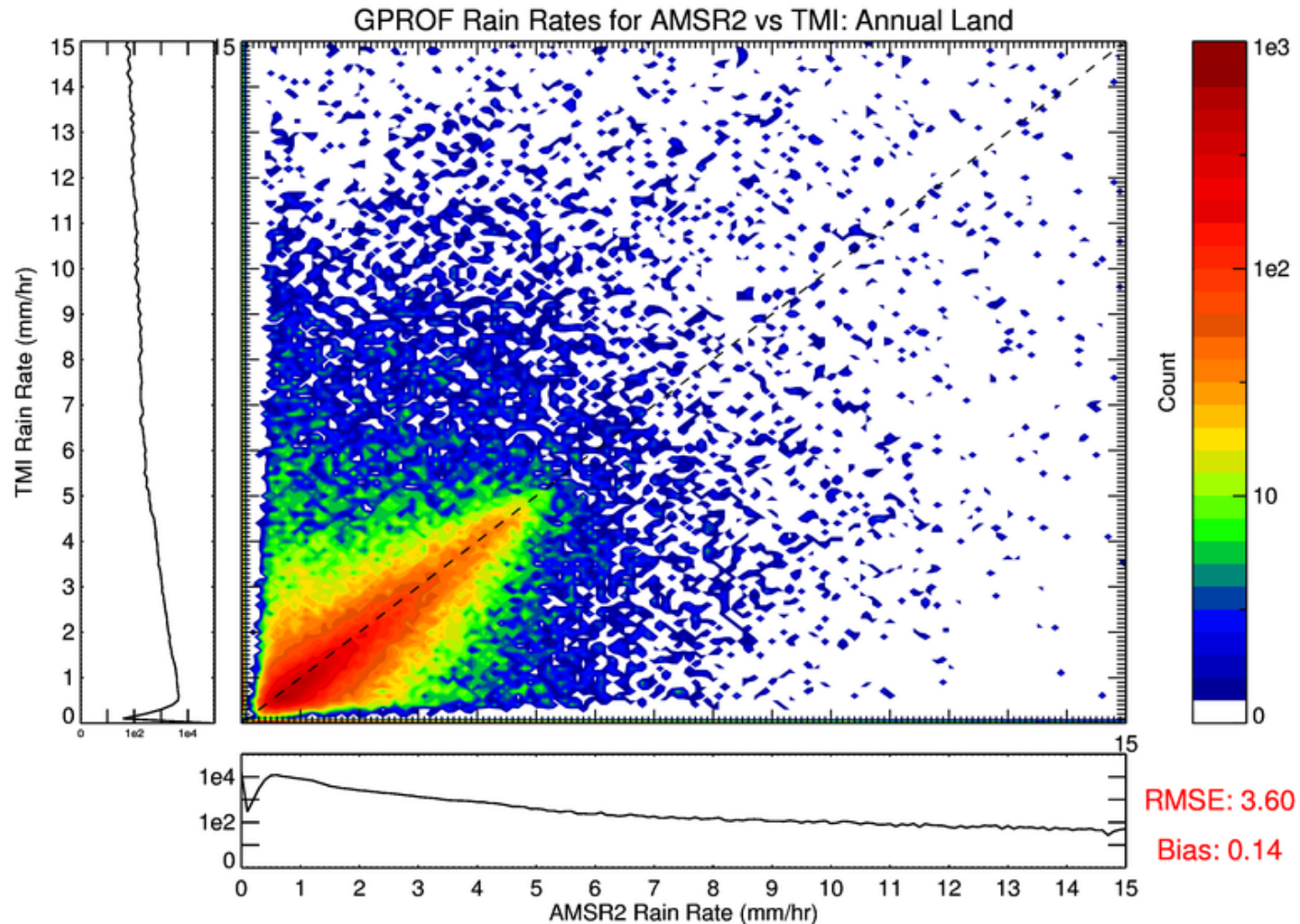
- Operational precipitation product distributed by STAR
- Meeting all latency/accuracy requirements
- Day-2 algorithms for Snow / Sea Ice / Soil Moisture retrievals transitioning to ops
- Meeting with JAXA GCOM Team next week

# AMSR2 GPROF2010V2 Structure



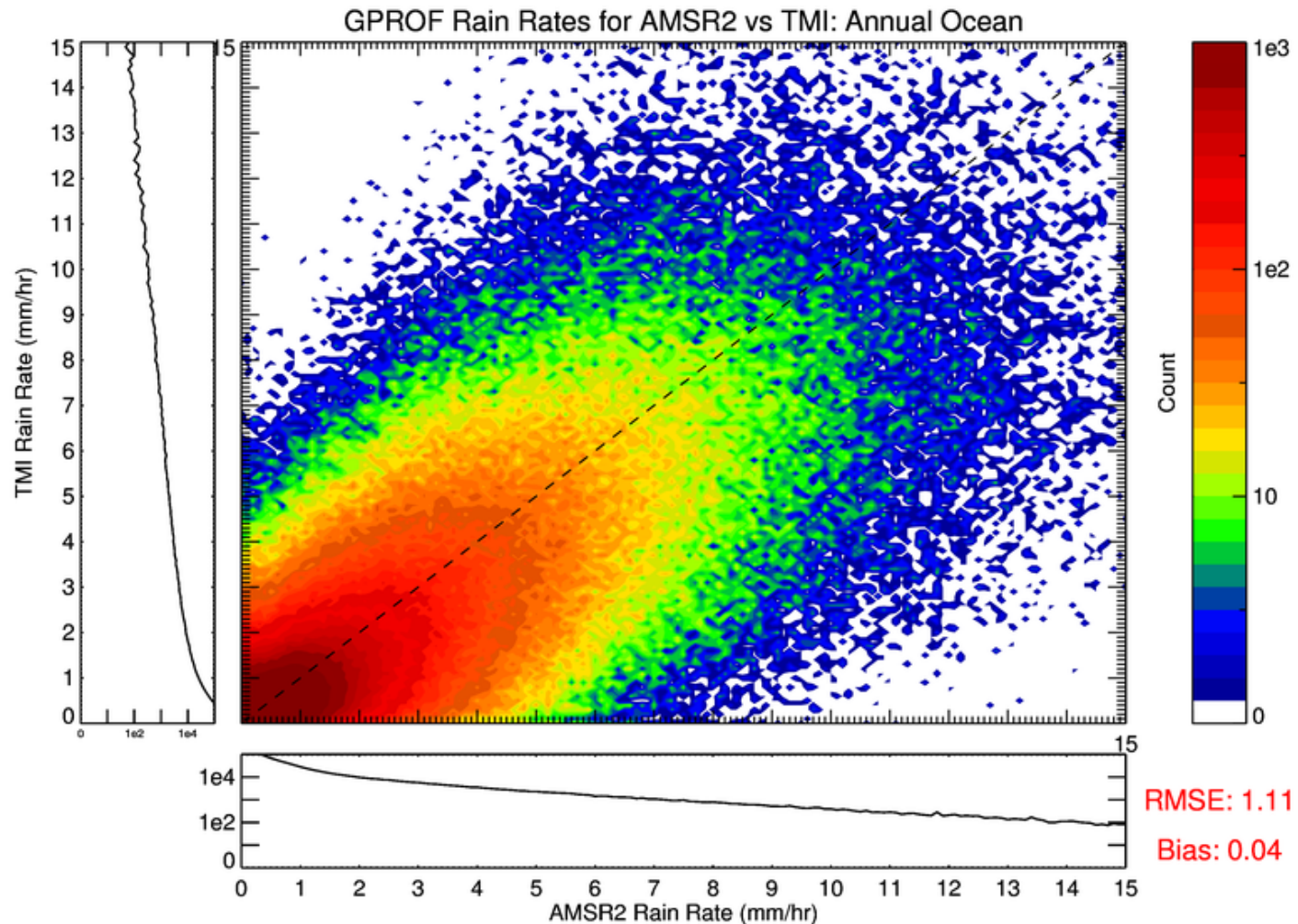
- Validated against TRMM/TMI: Similar sensors, similar algorithm
- Collocation within 30 minutes and 10 km
- Removed pixels flagged for RFI, coast, snow, bad SST/TPW values

# AMSR2/TMI Validation: Rain over Land



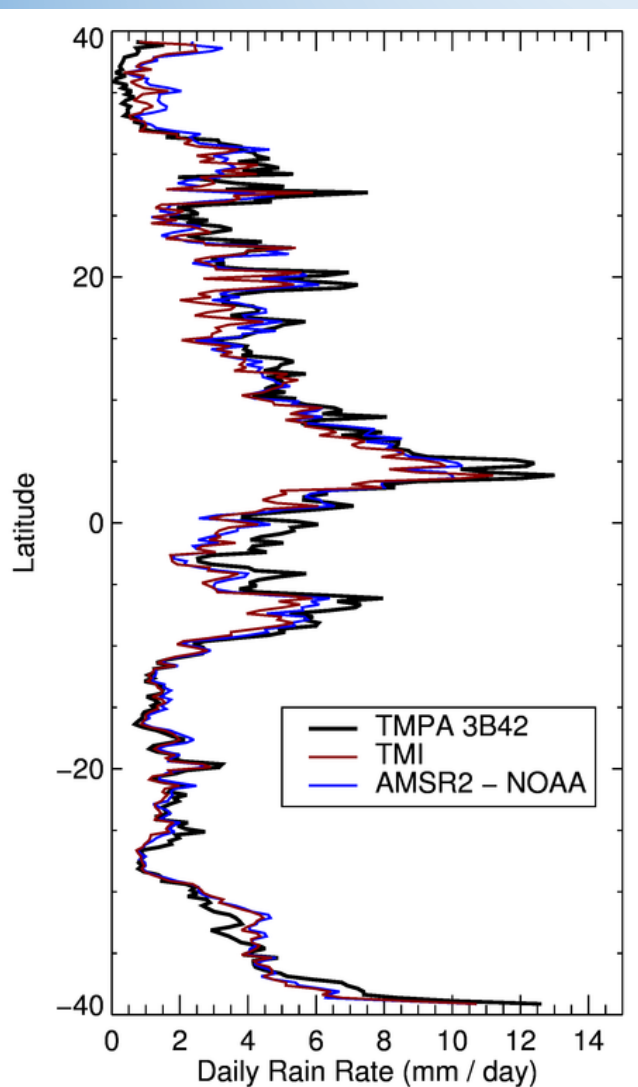


# AMSR2/TMI Validation: Rain over Ocean



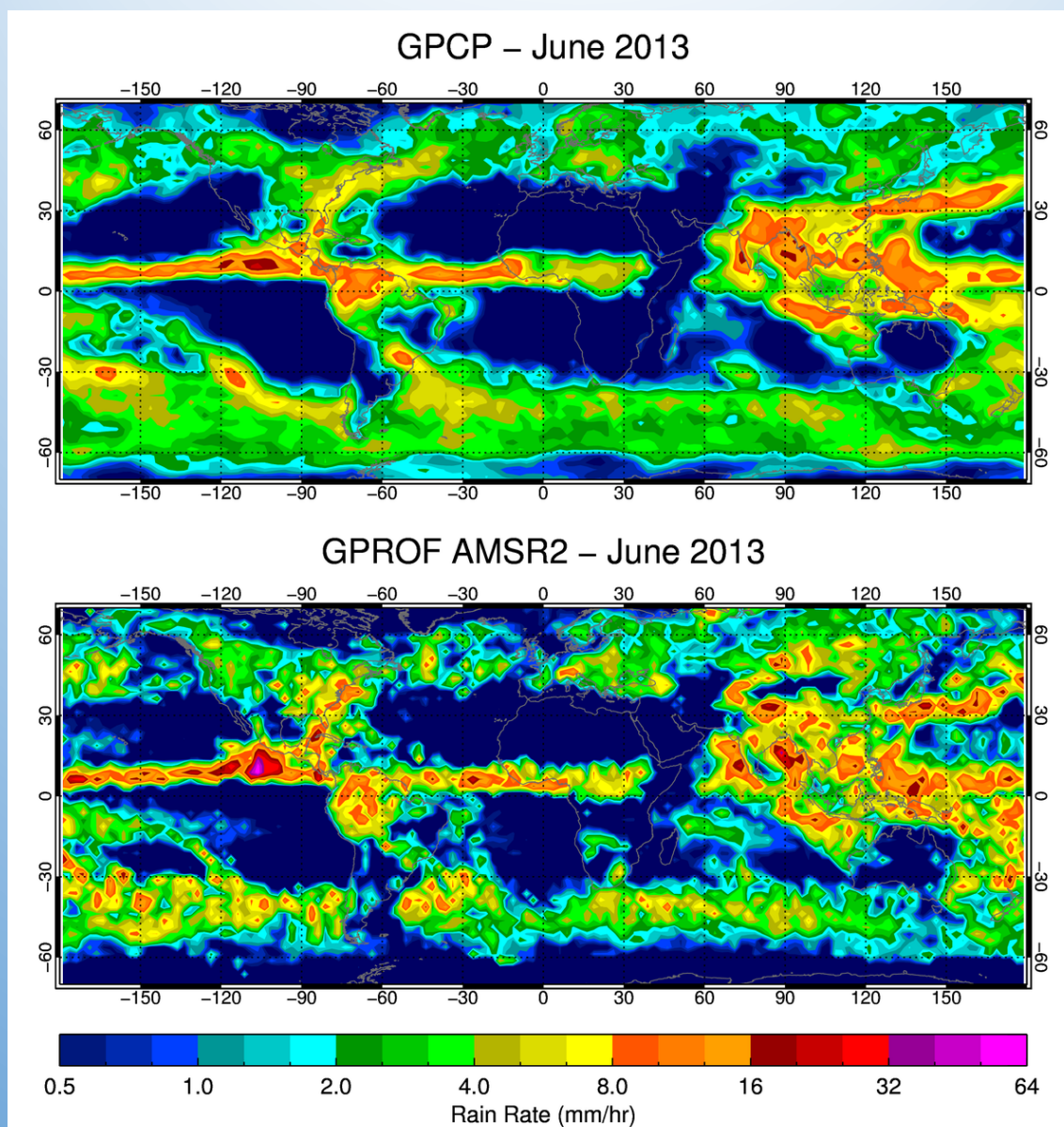
# AMSR2 Validation with TRMM

- AMSR2 Level 2 swath retrievals
- 2A12: Level 2 TMI rain retrievals
- 3B42: Level 3 3-hr estimate from multiple satellites



RMSD (mm/hr)	Land	Ocean	Overall
Requirements	5.0	2.0	—
TMI & TMPA	3.1	1.2	1.6
AMSR2 & TMI	3.6	1.2	1.8
AMSR2 & TMPA	3.1	1.4	1.9

# Monthly Averages: GPCP vs AMSR2

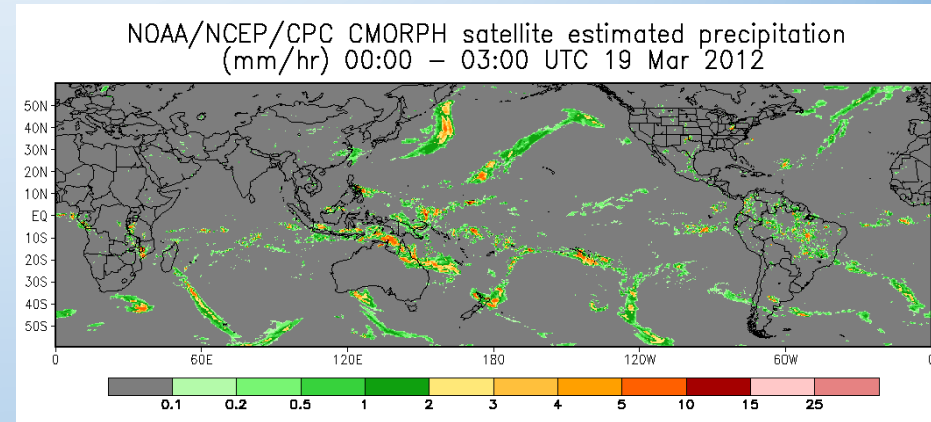




# AMSR2 Applications

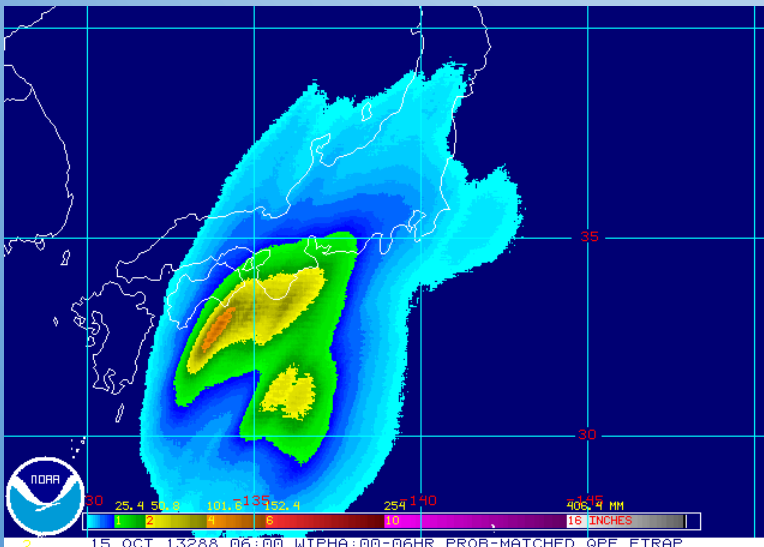
## CPC Morphing Technique (CMORPH)

- Global precipitation analysis at high spatial/temporal resolution
- Precipitation estimates from PMW propagated by geostationary IR motion vectors



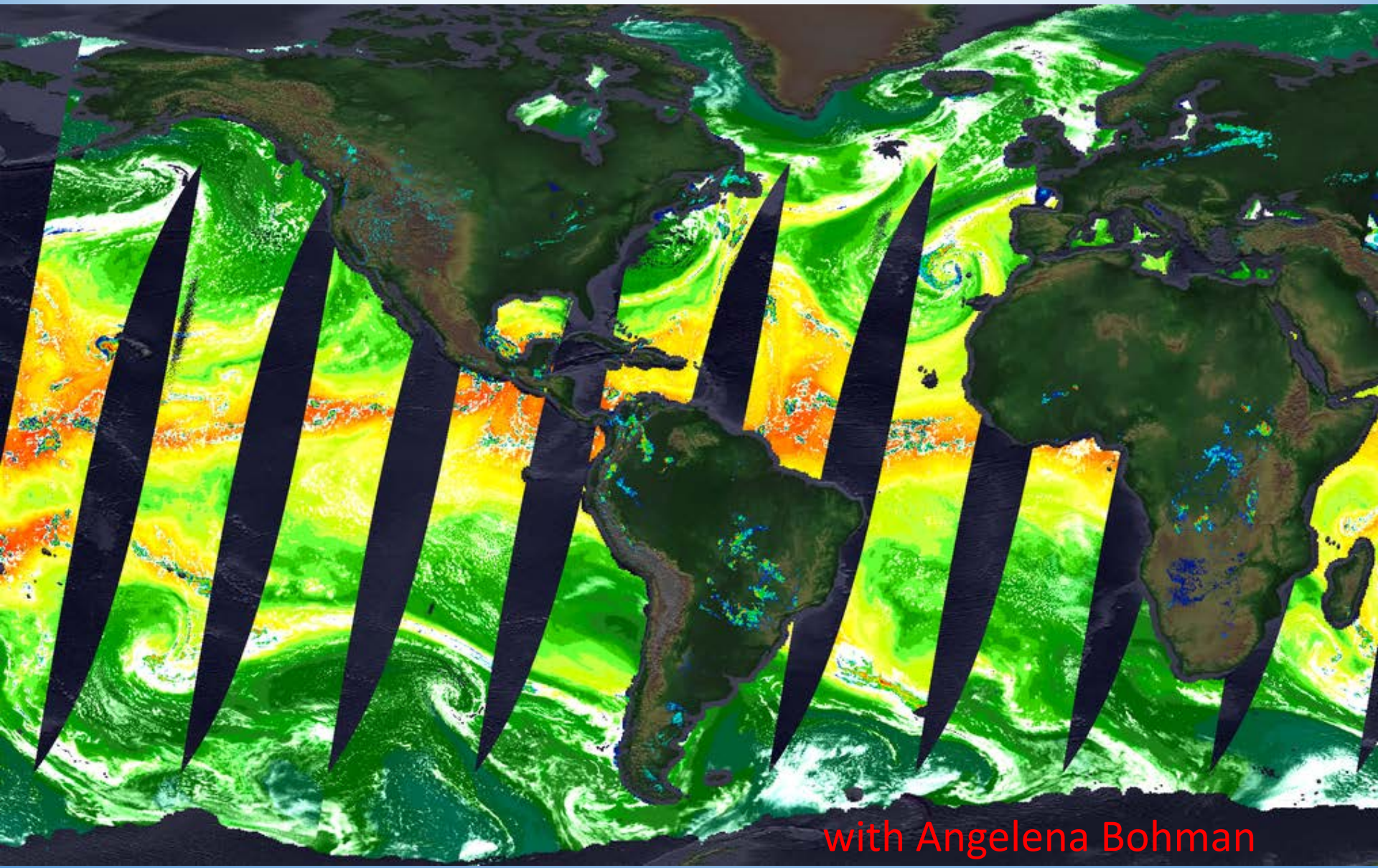
## Ensemble Tropical Rainfall Potential (eTRaP)

- Cumulative 6-hr rainfall estimate from an ensemble of PWM radiometers
- Produces probabilistic and deterministic forecasts of precipitation for tropical cyclones
- Typhoon Wipha – 15 Oct 2013 (left)





# AMSR2 Monitoring Tools

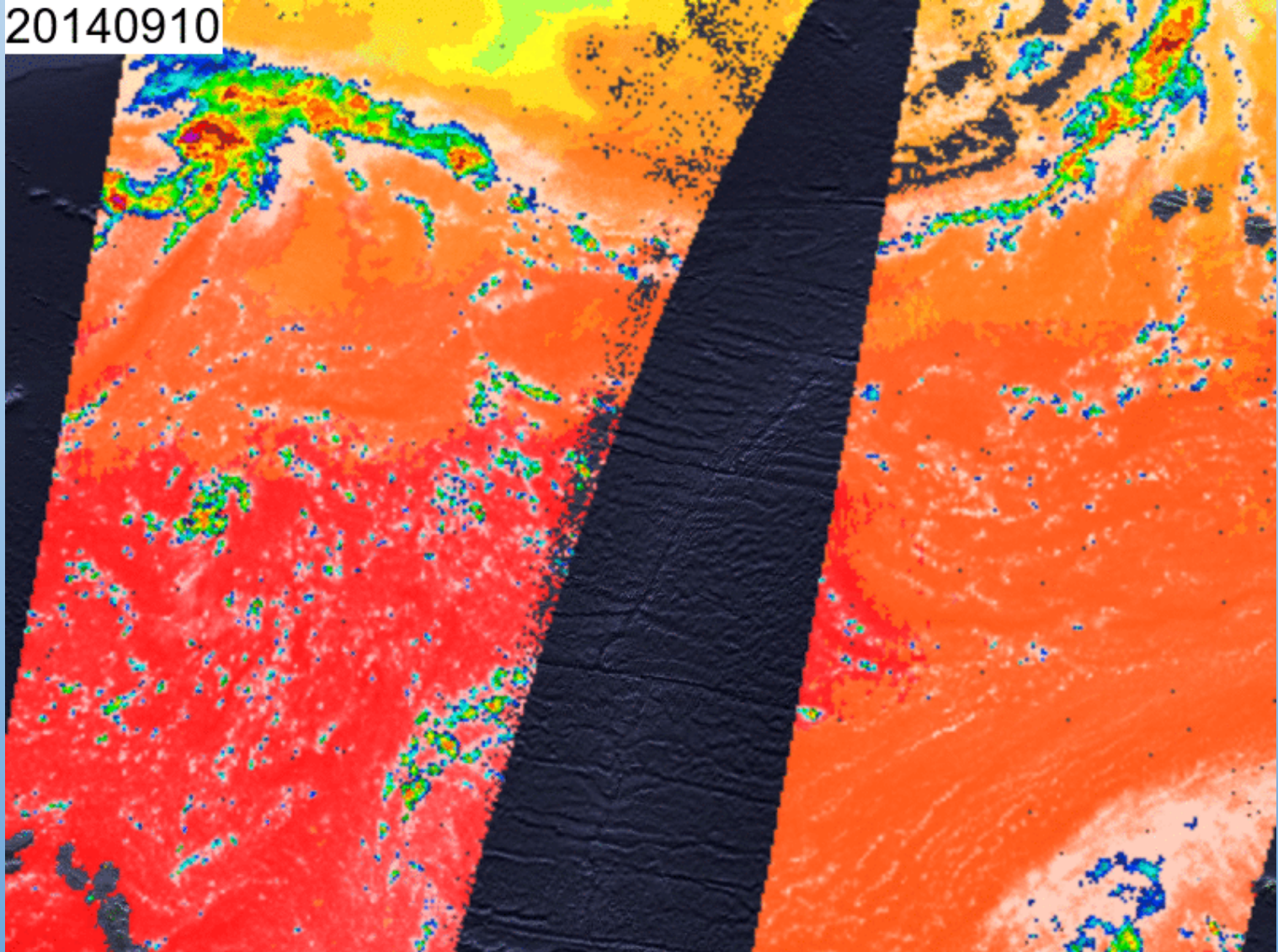


with Angelena Bohman



# Hurricane Edouard – Sept 2014

20140910



# AMSR-2 Data:

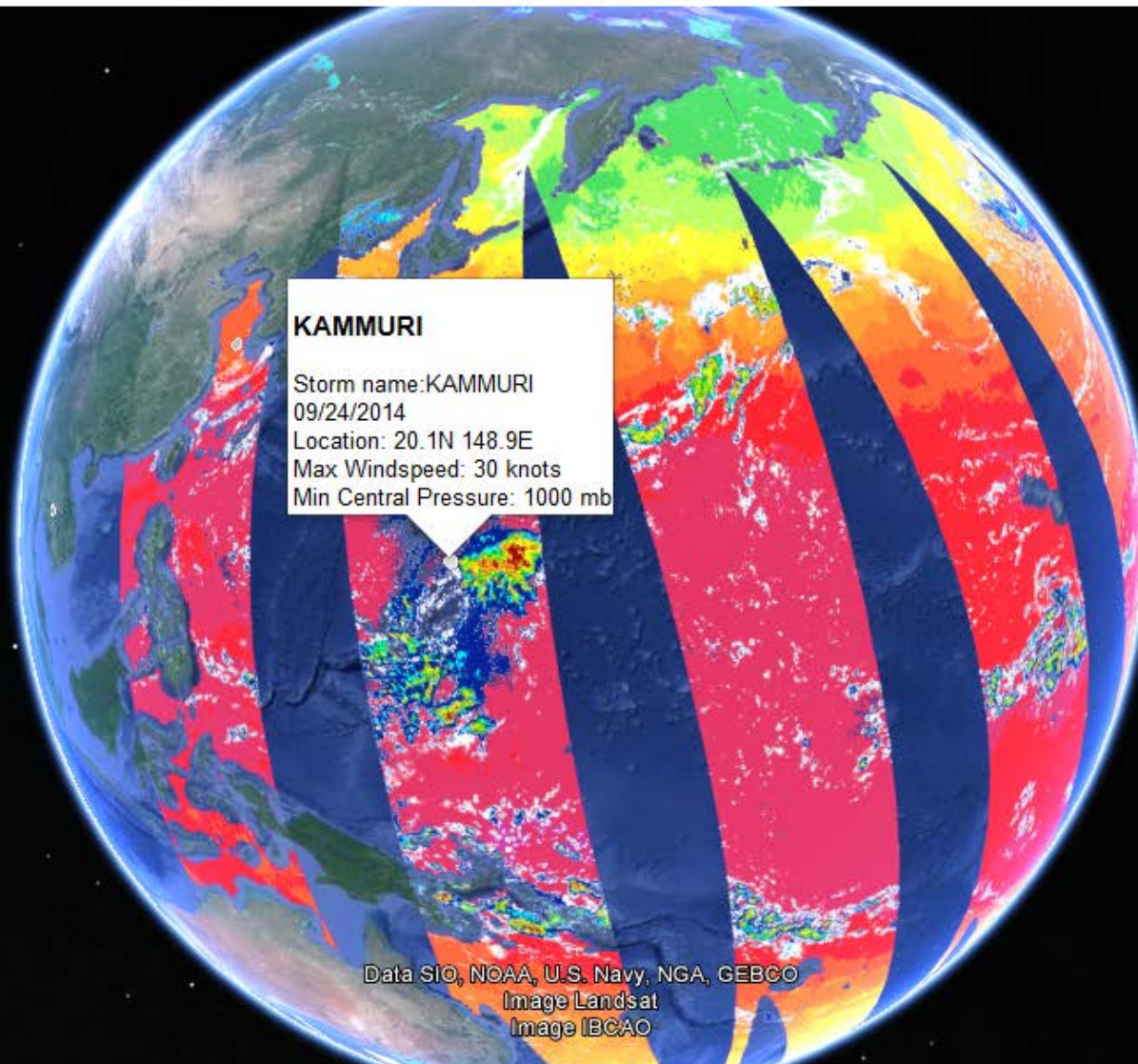
Ascending

Descending

- ☒ sst
- ☐ tpw
- ☒ rain
- ☒ clw
- ☐ ws

- ☐ sst
- ☐ tpw
- ☐ rain
- ☐ clw
- ☐ ws

- ☒ current storms



## KAMMURI

Storm name: KAMMURI  
09/24/2014  
Location: 20.1N 148.9E  
Max Windspeed: 30 knots  
Min Central Pressure: 1000 mb

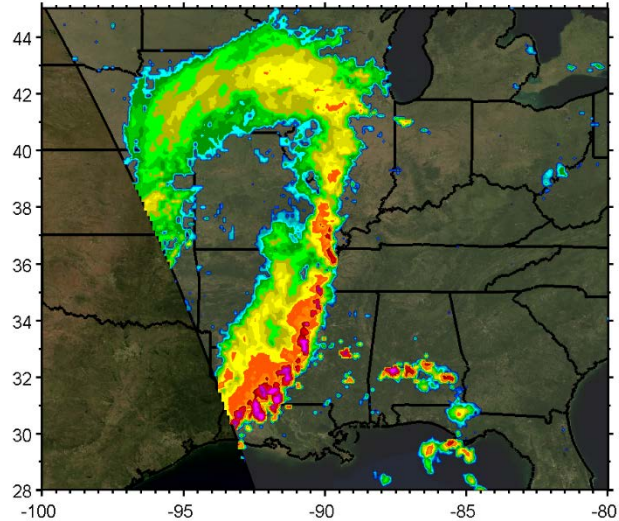
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image Landsat  
Image IBCAO



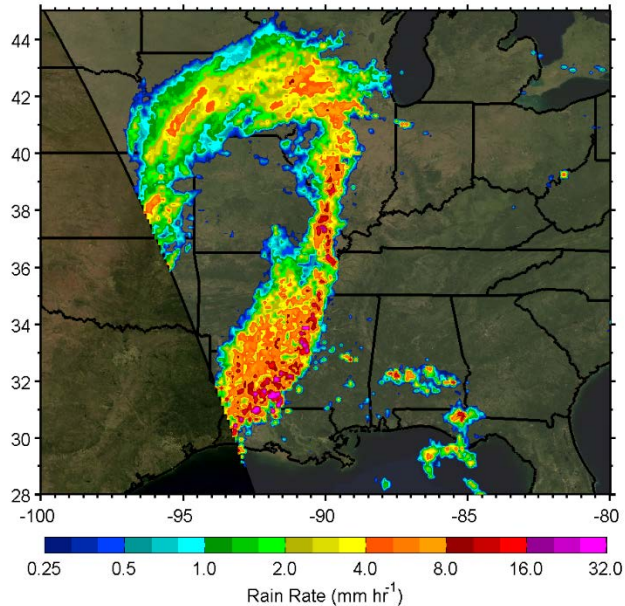


# Moving to the GPM Era: GPROF2014

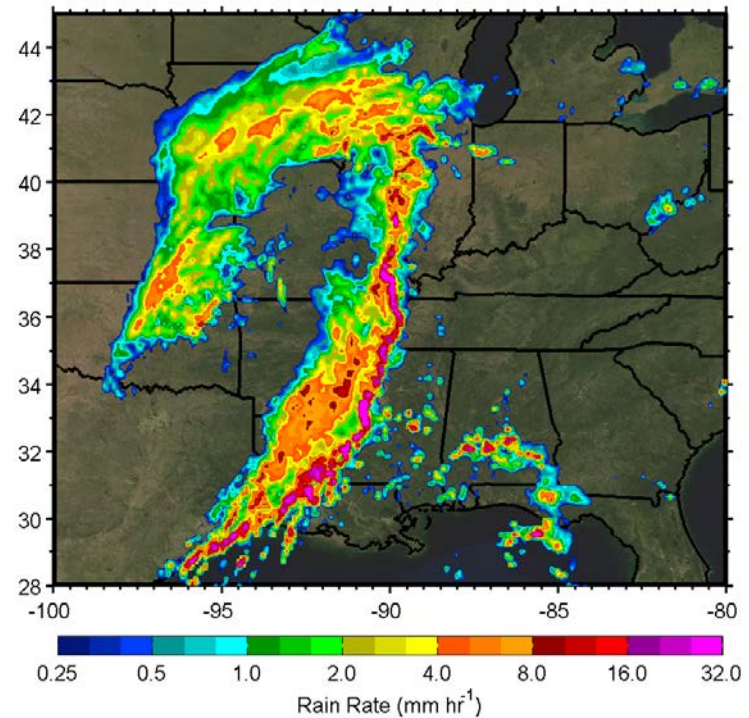
GPROF2010 : 13 Oct 2014 - 1852Z



GPROF2014 : 13 Oct 2014 - 1852Z

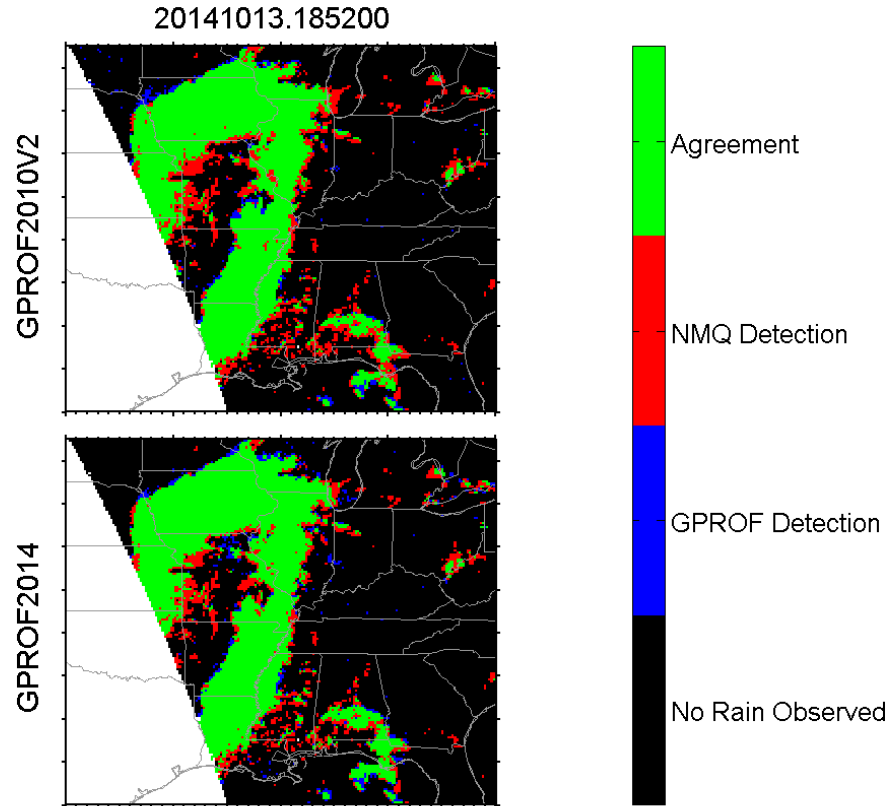


NMQ : 13 Oct 2014 - 1852Z

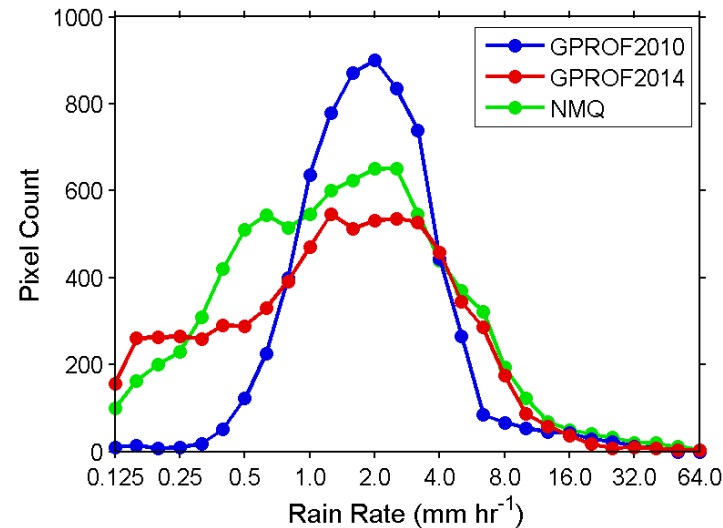
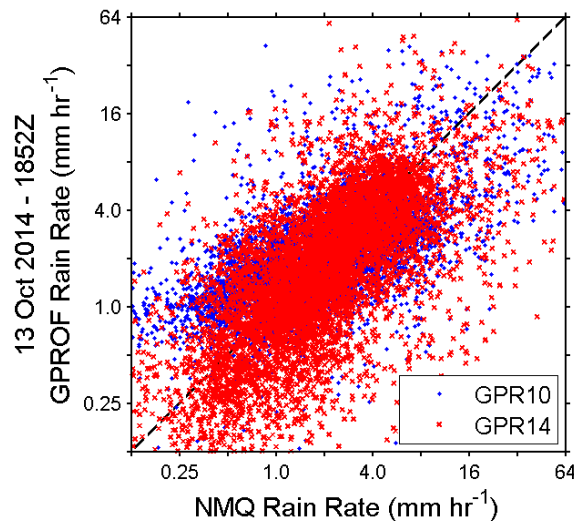




# Swath-based Monitoring



	GPROF2010	GPROF2014
Bias	-0.54 mm/hr	-0.54 mm/hr
r	0.51	0.43
RMSE	4.30 mm/hr	4.70 mm/hr
POD	76%	80%
FAR	6%	7%



# Summary

- GPROF2010V2 is operational for AMSR2
- Latency and accuracy requirements met
- Several monitoring/validation tools developed for automated display
- Please contact for data visualization