WFO Raleigh NC (RAH) Participation in GOES-R Proving Ground Activities

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With contributions from Ryan Ellis and Gail Hartfield
NOAA Satellite Proving Ground/User-Readiness Meeting
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Timeline of WFO Raleigh Activities with the GOES-R Proving Ground

- UW/CIMMS Convective Initiation GOES-R Proving Ground product evaluation (spring-summer of 2011)
- GOES-R Partners Project begins *Towards Improved Anticipation of Prolific Lightning Events in Central North Carolina* with NC State begins (summer 2011)
- Formal collaboration with NASA SPoRT initiated after NWA conference (fall of 2011)
- NASA SPoRT visits WFO Raleigh (January 2012)
- Evaluation of the NASA SPoRT MODIS/GOES hybrid imagery (begins spring 2012)
- Evaluation of NASA SPoRT Night-time Microphysics RGB product from VIIRS and MODIS (fall 2012)
- NASA SPoRT/NWS Huntsville staff visit WFO Raleigh (summer 2013)
- Intensive evaluation of RGB imagery for cloud analysis (fall 2013)
- AWIPS II installed at Raleigh (November 2013)
- GOES-14 SRSOR used in severe weather operations at WFO Raleigh (May 2014)
- Planned formal evaluation of UAH/NASA SPoRT CI product (summer 2014)

Primary GOES-R Proving Ground Activities at RAH

- UW/CIMMS Convective Initiation Product
  - Evaluation
  - GOES-R Partners Project
- Evaluation of the NASA SPoRT MODIS/GOES Hybrid Products
- Evaluation of the NASA SPoRT Night-Time Microphysics RGB Product

Primary GOES-R Proving Ground Activities at RAH

- UW/CIMMS Convective Initiation Product
  - Evaluation
  - GOES-R Partners Project

- Evaluation of the NASA SPoRT MODIS/GOES Hybrid Products

- **Evaluation of the NASA SPoRT Night-Time Microphysics RGB Product**

GOES-R Proving Ground Training Activities at RAH

Accomplished through:

- Provider produced training materials
- Webinars and other virtual courses
- Local training workshops and staff meetings
- Online tutorials
- Case studies, primarily through blogs
- On the fly, one on one/small group event driven demonstrations
- SPoRT laminated Quick Guides

Experiences:

- There was not a single training mechanism, this is probably fine as multiple options are needed, no one-size fits all training product, must be flexible.
- The interpretation of the product featured a tight learning curve.
- A more seamless, "enterprise" training approach would be valuable
- We were able to provide input on some training products

RGB Night-time Microphysics Product - What is used in the combine and what does each color represent?

Color	Band / Band Diff.	Physically Relates to....	Little contribution to composite indicates.....	Large contribution to composite indicates .....
Red	12.0 – 10.8	Optical Depth	Thin clouds	Thick clouds
Green	10.8 – 3.9	Particle Phase and Size	Small water or ice particles of similar size	Presence of large water particles
Blue	10.8	Temperature of surface	Cold surface	Warm surface

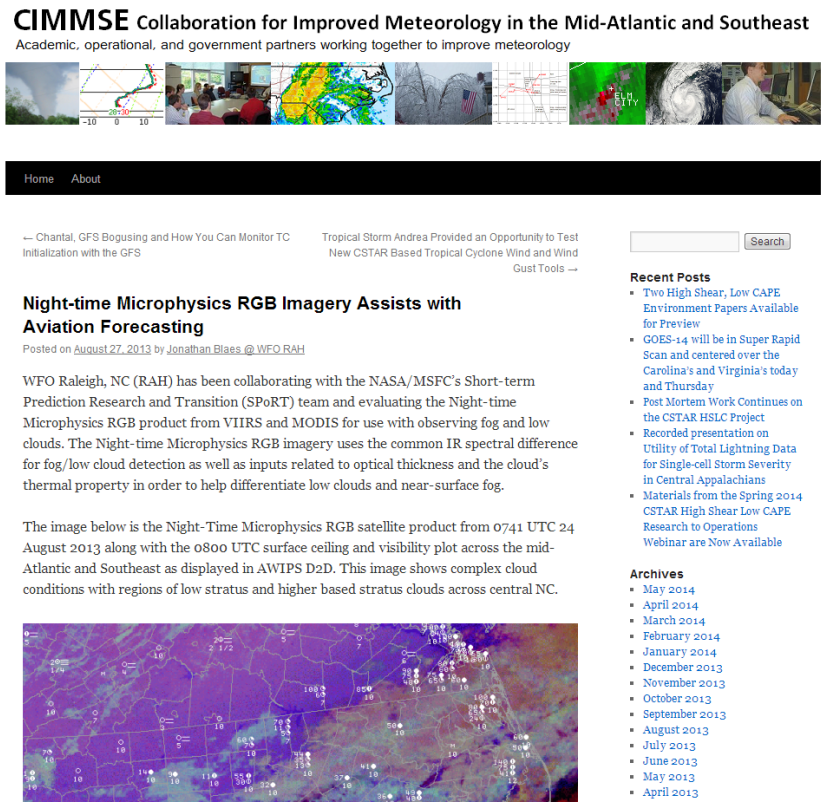
GOES-R Proving Ground WFO RAH Internal and External Communications

Internal communication:

- Email
- Training workshops and staff meetings
- Small group event driven demonstrations
- Blog posts
  - CIMMSE
  - SPoRT
- Comments to ERH

External communication

- Email
- Blog posts
  - CIMMSE
  - SPoRT
- AFDs
- NWS Eastern Region Virtual Satellite Workshops
- Want to share more at conferences and via journal articles



CIMMSE Collaboration for Improved Meteorology in the Mid-Atlantic and Southeast

Academic, operational, and government partners working together to improve meteorology

Home About

← Chantal, GFS Bogusing and How You Can Monitor TC Initialization with the GFS

Tropical Storm Andrea Provided an Opportunity to Test New CSTAR Based Tropical Cyclone Wind and Wind Gust Tools →

Night-time Microphysics RGB Imagery Assists with Aviation Forecasting

Posted on August 27, 2013 by Jonathan Blaes @ WFO RAH

WFO Raleigh, NC (RAH) has been collaborating with the NASA/MSFC's Short-term Prediction Research and Transition (SPoRT) team and evaluating the Night-time Microphysics RGB product from VIIRS and MODIS for use with observing fog and low clouds. The Night-time Microphysics RGB imagery uses the common IR spectral difference for fog/low cloud detection as well as inputs related to optical thickness and the cloud's thermal property in order to help differentiate low clouds and near-surface fog.

The image below is the Night-Time Microphysics RGB satellite product from 0741 UTC 24 August 2013 along with the 0800 UTC surface ceiling and visibility plot across the mid-Atlantic and Southeast as displayed in AWIPS D2D. This image shows complex cloud conditions with regions of low stratus and higher based stratus clouds across central NC.

Search

Recent Posts

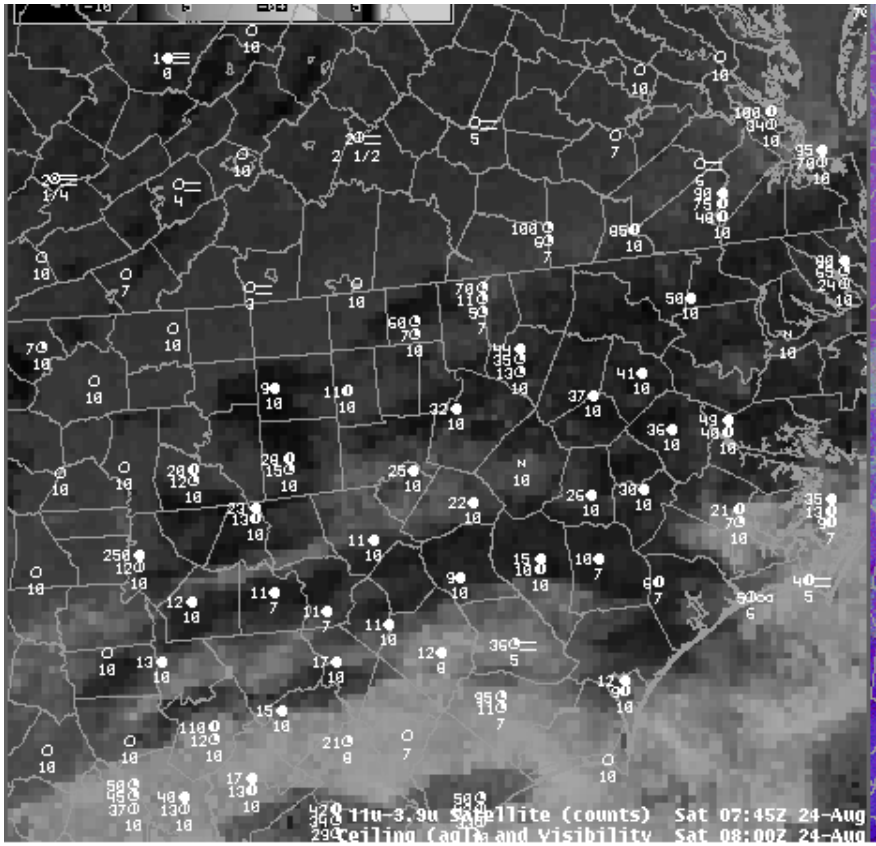
- Two High Shear, Low CAPE Environment Papers Available for Preview
- GOES-14 will be in Super Rapid Scan and centered over the Carolina's and Virginia's today and Thursday
- Post Mortem Work Continues on the CSTAR HSLC Project
- Recorded presentation on Utility of Total Lightning Data for Single-cell Storm Severity in Central Appalachians
- Materials from the Spring 2014 CSTAR High Shear Low CAPE Research to Operations Webinar are Now Available

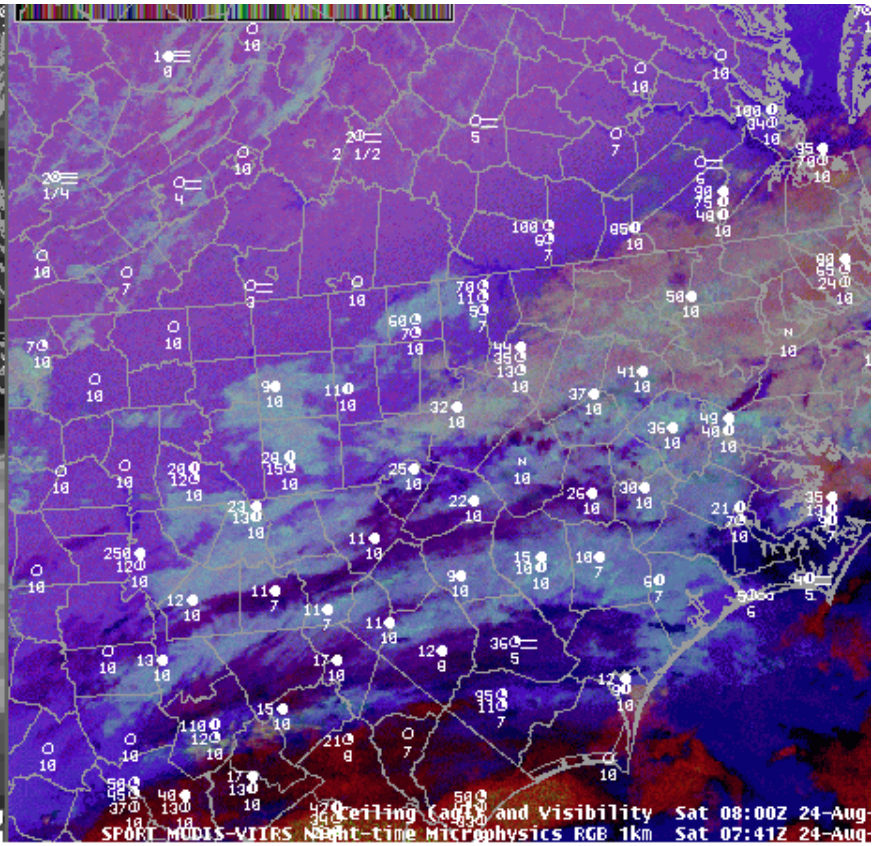
Archives

- May 2014
- April 2014
- March 2014
- February 2014
- January 2014
- December 2013
- November 2013
- October 2013
- September 2013
- August 2013
- July 2013
- June 2013
- May 2013
- April 2013

Night-Time Microphysics RGB Product

- The evaluation started during the fall of 2012 with an intensive evaluation of RGB imagery during the fall 2013
- Product is intended to provide more information on fog and clouds.
- A comparison of the traditional 11-3.9 micron product (left) and the Night-Time Microphysics RGB product (right) are shown below.





Night-Time Microphysics RGB Product

1) Shallow fog with reduced visibilities and no ceilings

2) Fog with probable IFR ceilings and IFR visibilities

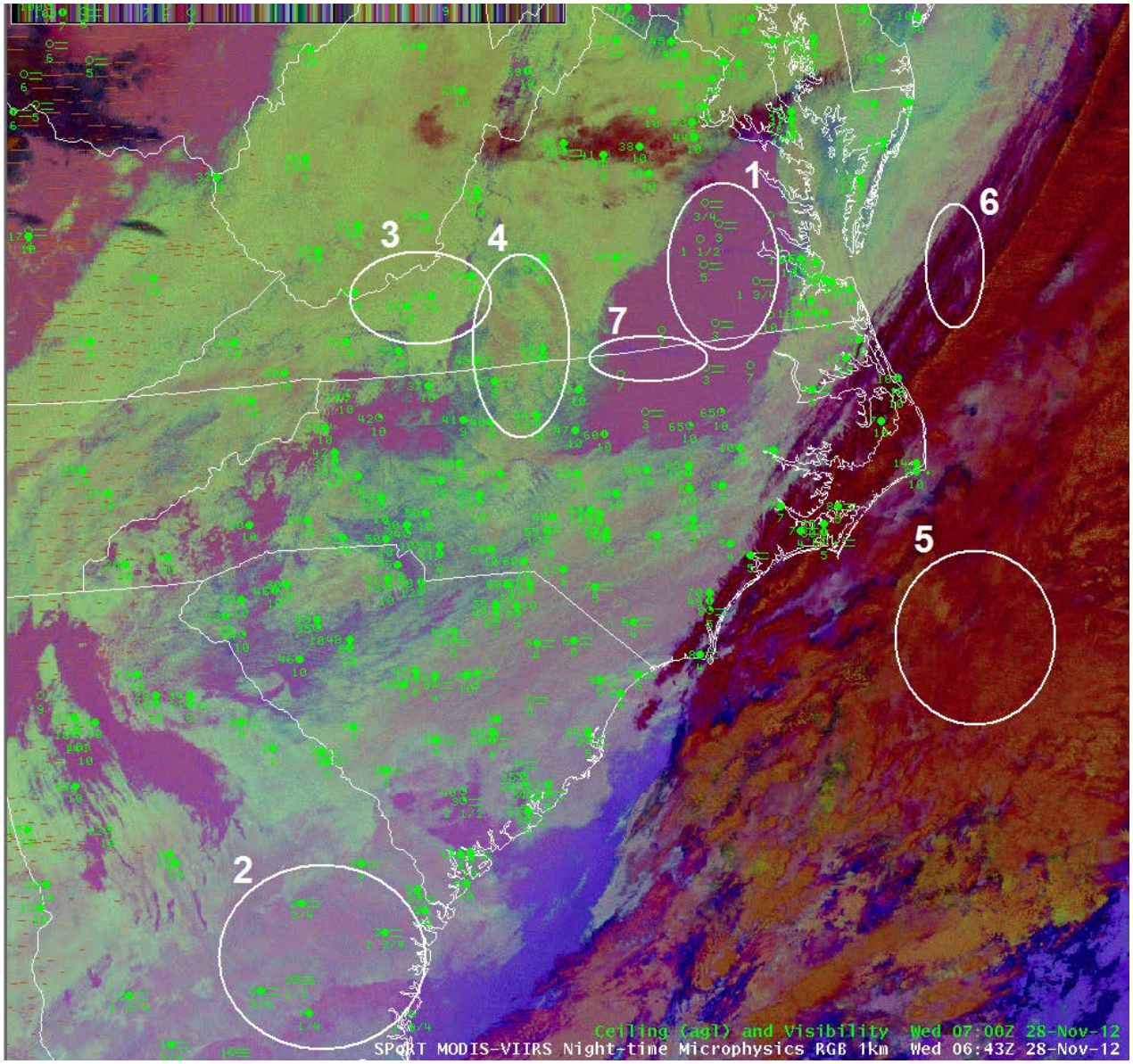
3) Stratus with IFR/MVFR ceilings and some fog with VFR visibilities

4) Mixed low and mid-level clouds with some thickness

5) High level thick clouds

6) Pockets of high level thin clouds

7) Warm bodies of water



Night-Time Microphysics RGB Product

Strengths

- Provides a new opportunity to take advantage of "vertical" aspects of satellite data.
- Powerful visualization tool.
- "Gap Filler", can fill in spatial and temporal gaps between observations, great for data sparse locations.
- Big impact on aviation forecasting and should complement the 4-D weather cube.

Weaknesses

- Can be very difficult to interpret with a 3-dimensional color curve. *"The aqua/light blue results from moderate amounts of red (medium thickness), lesser amounts of green, moderate amounts of blue (warmer clouds)."*
- Some visualization cues are subjective (bright aqua vs. purple).
- Steep learning curve for forecasters.
- Tough for a red-green color blind user.
- Higher clouds will inhibit use for low clouds/fog analysis.

Night-Time Microphysics RGB Relevance & Readiness

- The evaluations was difficult at times as the products were not available in final (temporal) form or frequency. A lot of looking, sometimes without reward.
- Despite these evaluation limitations, the product should have a very positive impact on multiple forecast problems.
- Need to emphasize this can be a complicated product to use and interpret.
- Readiness and effectiveness will largely depend upon:
  - Delivery (bandwidth)
  - Training and appropriate use by forecasters
- Future utility could be expanded to gridded forecast initialization or analysis of ceilings heights

Summary of Training and Future Readiness Needs

- Bandwidth to deliver the data is paramount
- Training is a very big issue
  - A big rollout with a well conceived and delivered training plan is essential.
  - WDTB AWOC style or WSR-88D “lite” training
- Need to seize the opportunity and not fumble the ball
- Once the satellite is up, many more steps are needed for success

Acknowledgements

- Ryan Ellis (RAH Satellite Focal Point) and Gail Hartfield (lightning projects and GFE) have made significant contributions to the GOES-R activities at RAH.

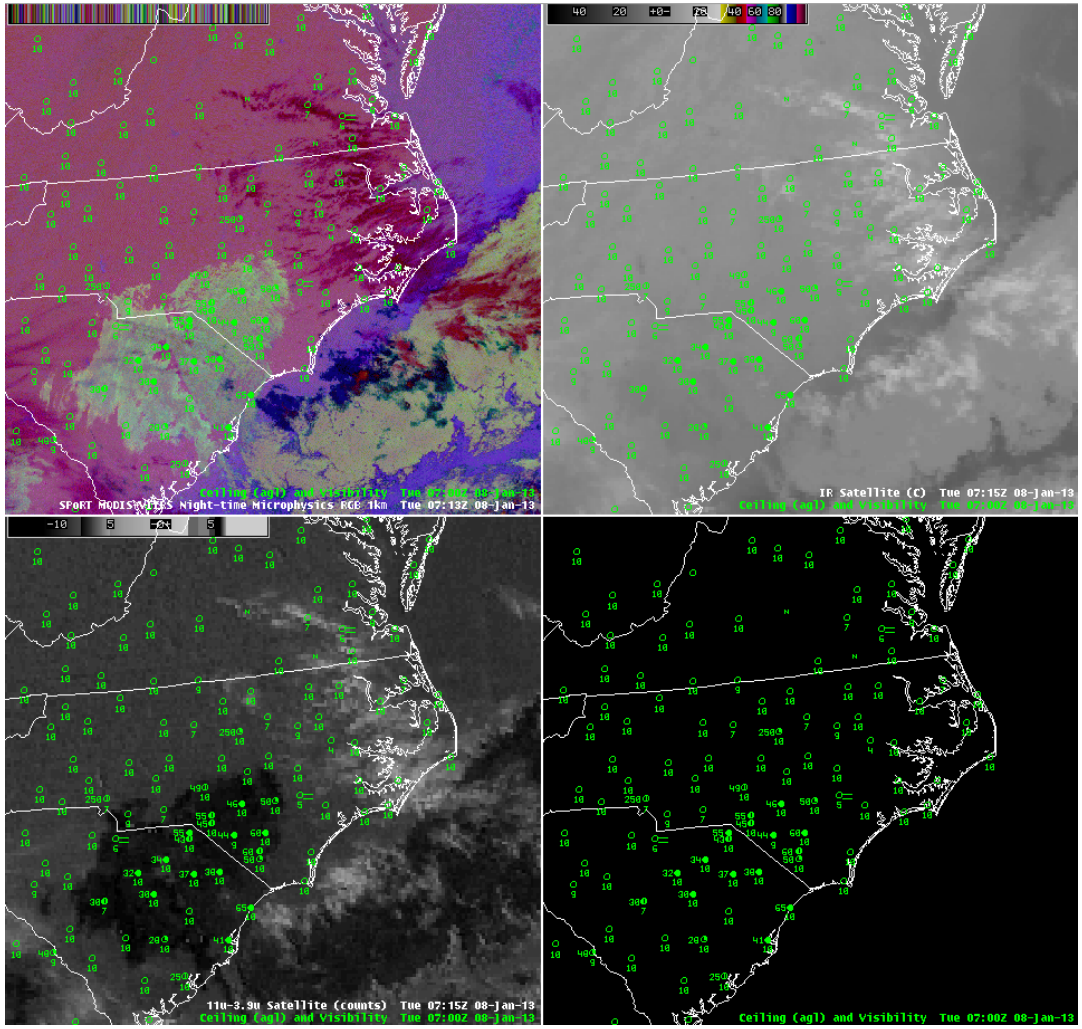
- Most of our activities have been associated with the NASA SPoRT folks. We have had great collaboration with Geoffrey Stano, Kris White, Gary Jedlovec, Jonathan Case, among others.

- The GOES-R Proving Ground supported our COMET project.

- NWS Eastern Region Headquarters has provided a great deal of support and motivation, in particular Dave Radell.

- The JPSS Program which supported my travel to the conference.

Questions?


SPoRT MODIS/VIIRS Night-time Microphysics RGB 1km Tue 07:13Z 08-Jan-13
IR Satellite (C) Tue 07:15Z 08-Jan-13
11u-3.9u Satellite (counts) Tue 07:15Z 08-Jan-13
Ceiling (agl) and Visibility Tue 07:00Z 08-Jan-13