

THE SATELLITE PROVING GROUND FOR MARINE, PRECIPITATION, AND SATELLITE ANALYSIS

Michael J. Folmer
(UMCP/ESSIC/CICS)

Satellite Liaison at OPC/SAB/TAFB/WPC
michael.folmer@noaa.gov

GOES-R/JPSS PG/User Readiness Meeting
06/03/14



Satellite Liaison Background

- Office Location: Ocean Prediction Center, NOAA Center for Weather and Climate Prediction, College Park, MD
- Started: May 15, 2011
- NWS Forecasters worked with:
 - OPC Forecasters (17, 3 vacant)
 - SAB Analysts (19)
 - TAFB Forecasters (16, 3 vacant)
 - WPC Forecasters (29, 2 vacant)
 - Hydro-Meteorological Testbed Activities
 - NASA Hurricane and Severe Storm Sentinel (HS3)
 - NEW – Key West WFO starting Summer 2014



Satellite Liaison Training

- ❑ CIMSS Satellite Boot Camp (July 2013)
- ❑ COMET modules (GOES Channel Selection, Multispectral Imagery, etc.)
- ❑ VISIT sessions (both as a presenter and a participant)
- ❑ Developer training before tailoring to our PG specific forecast challenges
- ❑ EUMETSAT Training (RGBs)



synthetic_severe_videos (8094 / 514)

VISIT

Outline | Thumbnails | News | Search

1. Title
2. Synthetic imagery (1)
3. Synthetic imagery (2)
4. Synthetic imagery (3)
5. Synthetic imagery bands
6. Weighting function
7. June 21 2010 case
8. WRF-ARW 6.88 um for 21 June 2010
9. GOES 6.8 um for 21 June 2010
10. WRF-ARW 10.35 um for 21 June 2010
11. GOES 10.7 um for 21 June 2010
12. May 12 2010 case
13. WRF-ARW 6.88 um for 12 May 2010
14. WRF-ARW 10.35 um for 12 May 2010
15. WRF-ARW vs GOES comparison
16. GOES visible up to 1732 UTC
17. GOES visible after 1732 UTC
18. August 4 2010 case
19. WRF-ARW 6.88 um for 4 August 2010
20. GOES 6.8 um for 4 August 2010
21. May 18 2010 case
22. WRF-ARW 6.88 um for 18 May 2010
23. GOES 6.8 um for 18 May 2010
24. WRF-ARW 10.35 um for 18 May 2010

Utilizing Synthetic Imagery from the NSSL 4-km WRF-ARW model in forecasting Severe Thunderstorms

WRF-ARW GOES WRF-ARW GOES

Dan Bikos and Dan Lindsey

Acknowledgements: Louie Grassio, Bob Pablin, Jack Kahn, Hiro Goshima, Deb Molnar

VISIT **CIRA**

articulate.comcast.net

60 SUBTITLED PLAYING 00:04 / 00:04

Airmass RGB

R = Difference WV6.2 - WV7.3
G = Difference IR9.7 - IR10.8
B = Channel WV6.2 (inverted)

Applications: Rapid Cyclogenesis, Jet Stream Analysis, PV Analysis
Area: Full MSG Viewing Area
Time: Day and Night

Training Conducted at the MPS PG

- ❑ All training to this point has been conducted in person, either individually or in small groups (3-5 forecasters/analysts at a time)
- ❑ Use PowerPoint presentations, then a Quick Guide is made available for the forecasters to get quick answers to analysis questions. COMET modules and blogs are also shared.
- ❑ The Liaison interacts with forecasters post training to discuss the products and points out significant uses when necessary.
- ❑ Training for TAFB and NASA HS3 has also been conducted in person, with additional information for HS3 available via a CIRA website. Training will be similar for KEY, but with help from the SOO.



Training Conducted at the MPS



AIRS Total Column Ozone and Ozone Anomaly Quick Guide by NASA/SPoRT

Why are AIRS Ozone Retrievals Important?

AIRS Total Column Ozone (TCO) and Ozone Anomaly products developed by NASA/SPoRT can be used to diagnose regions of warm, dry, ozone-rich stratospheric air. These regions indicate the possible presence of a stratospheric intrusion or tropopause fold; features which aid cyclogenesis or can lead to non-convective high wind events. Carlson (1998) notes that inspection of the tropopause structure can aid surface cyclogenesis forecasts due to the fact that the time lag between initiation of strong 500 mb vorticity advection, tropopause folding, and cyclogenesis may be on the order of hours to a day or more.

How do I interpret ozone values and anomalies?

The ozone analysis by itself can be difficult to interpret. The ozone layer's average thickness is about 300 Dobson units (DU); however the climatological mean varies seasonally and spatially. Therefore, identification of stratospheric air based on high total column ozone values could lead to misinterpretation if the values actually range within climatology. Van Haver et al. (1996) identified stratospheric air and tropopause folds as layers where the ozone is at least 25% larger than the climatological mean. Ziemke et al. (2011) constructed a zonal monthly mean climatology of stratospheric ozone on a global scale derived from the NASA Microwave Limb Sounder. The Ozone Anomaly product was created by SPoRT as a percent of normal from this climatology, with a scale ranging from 0-200%. For ease of interpretation and significance, the scale on the Ozone Anomaly product switches to shades of blue at 125% and greater. Therefore any blue shade on the anomaly product represents stratospheric air.

What to look for in the imagery?

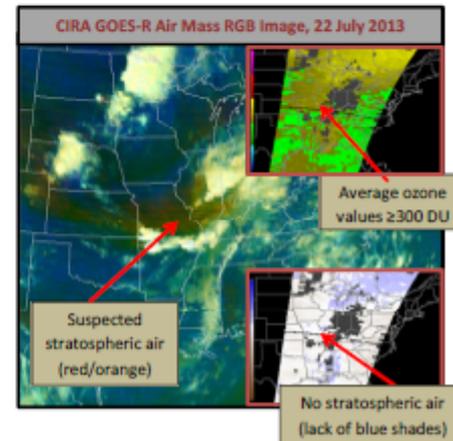
The Ozone Anomaly is intended to be used with products like the Air Mass RGB imagery, which only has qualitative colors for the user to interpret. Often, a red coloring results in the Air Mass RGB when a jet streak causes a stratospheric air intrusion (see reverse side). However, other dry air conditions can also result in red coloring in the RGB (see adjacent figure). The ozone anomaly product helps to quantify the red colors seen in the RGB. This confirms to the user whether it's really stratospheric air or not.

What is AIRS and when is it available?

The Atmospheric Infrared Sounder (AIRS) is an instrument on the polar-orbiting Aqua spacecraft, and it's available 2x/day, valid approximately 2:00 AM & PM locally (slight daily orbital variation) with a latency of about 4 hours. The instrument measures temperature and water vapor with height, as well as clouds, ozone, carbon monoxide, carbon dioxide, methane, sulfur dioxide, and dust.

Caveats

Thick clouds can interfere with the infrared energy measured by AIRS and therefore, result in missing values in these locations. To overcome the limitation in partly cloudy conditions, AIRS data are combined with data from microwave instruments on Aqua. Visit <http://airs.jpl.nasa.gov> to learn more about AIRS.



Last Modified July 2013

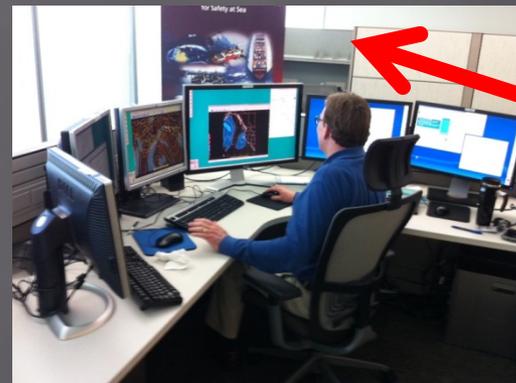
(see reverse side)

- These maps from this PG...
- The diagrams provided...
- Determine particular introduced...
- Learning completed display...

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User Community Preparation for GOES-R/JPSS

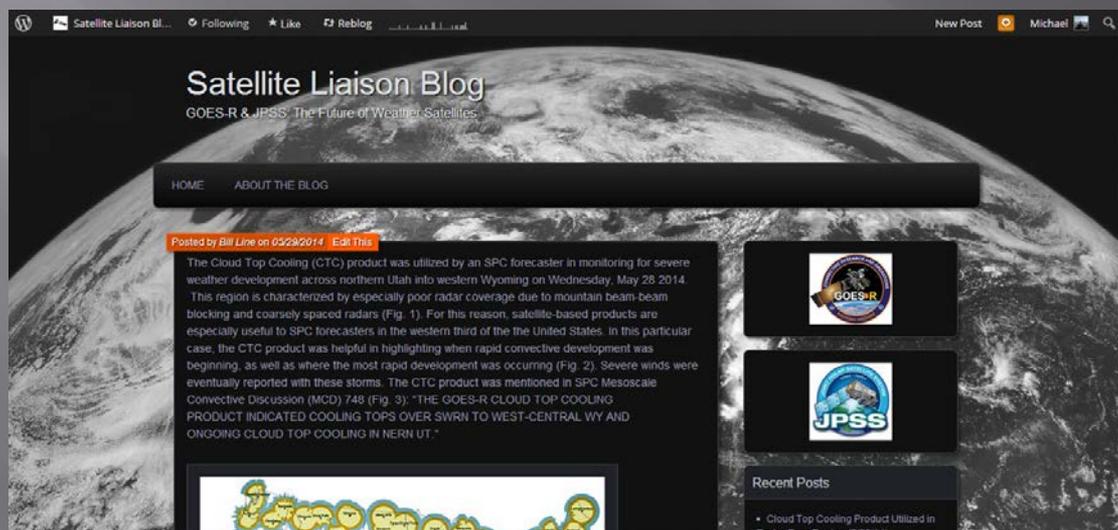
- ▣ It is very important to keep the Satellite Liaison positions at the National Centers to help facilitate the training on and transition of our current satellite instruments to the new, more advanced satellites (including Himawari, GOES-R, JPSS-1/2, GPM, MTG, etc.)
- ▣ Training of forecasters in the WFOs is more challenging, but the Liaisons could share lessons learned at National Centers with SOOs, science staff, and forecasters
 - site visits
 - webinars
 - testbeds/experiments.



Liaison Cube

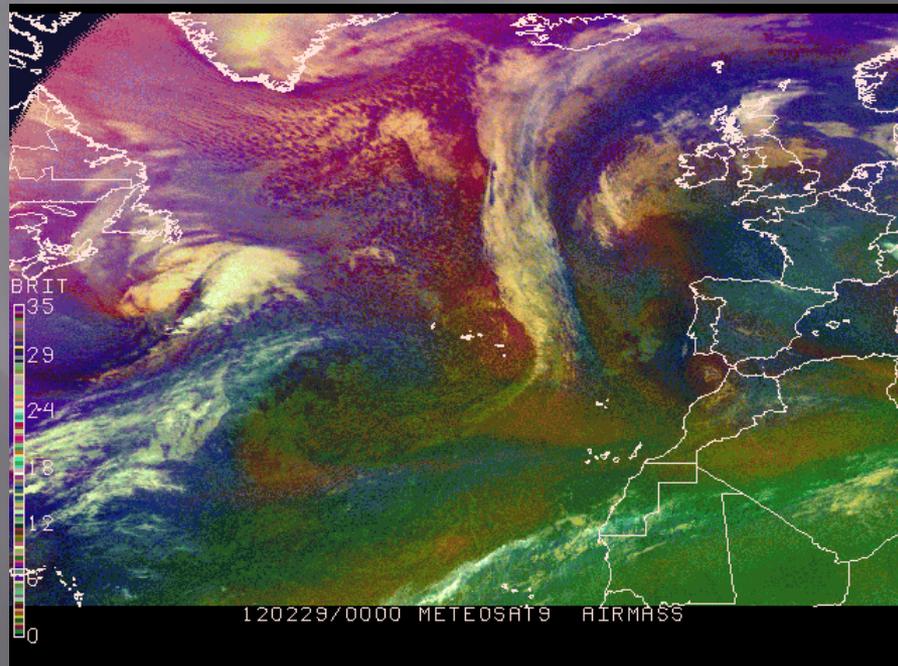
Liaison Interaction with Developers

- ❑ Liaison visits to SPoRT, CIMSS, and CIRA (upcoming)
- ❑ CI visits to the NCWCP
 - SPoRT visits on RGB and Ozone
 - SPoRT, CIMSS, and CIRA combined visit to occur in Summer 2014 to focus on RGBs in A2
- ❑ Occasional telecons to talk about PG related issues
- ❑ Use of blogs, reports, and emails to relay feedback, questions, and suggestions.



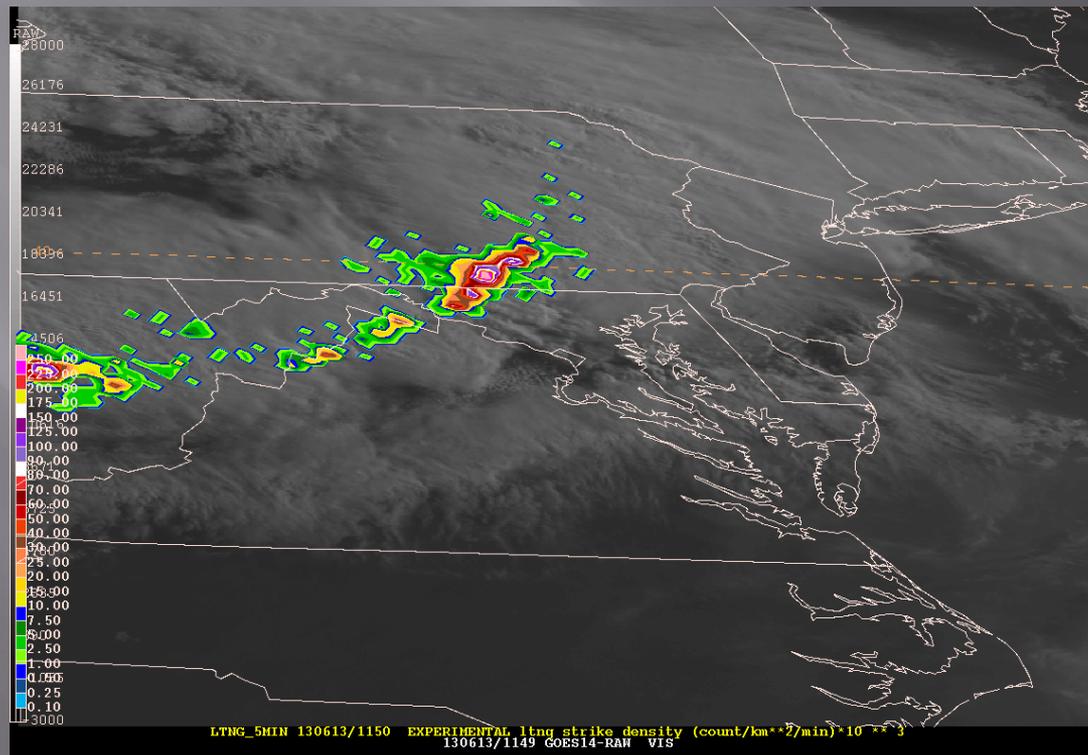
Success Stories

- ▣ RGB Air Mass transition to an NCEP Central Operations (NCO) supported product
 - Leads to easier incorporation into operations later at other National Centers
 - Helps NCEP and NWS prepare for the GOES-R-like data flow.



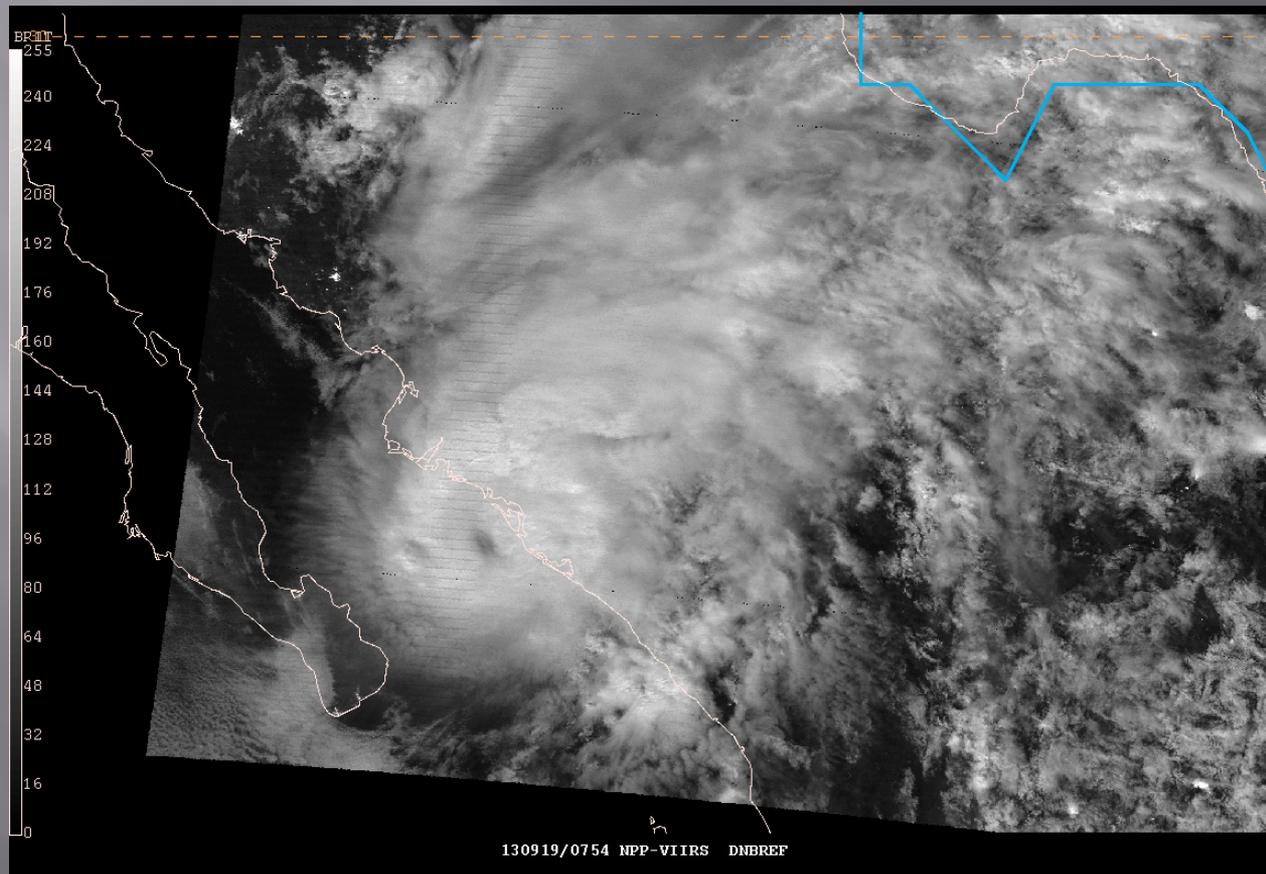
Success Stories

- ▣ One of the first NCEP centers to use GOES-14 SRSOR imagery in operations using N-AWIPS
- ▣ Creation and Dissemination of the GLD-360 Lightning Density product.



Success Stories

- ▣ The first Day-Night Band imagery into N-AWIPS at NHC for use in classifications at TAFB and HSU (September 2013).



Challenges

- ▣ Staffing. . .which leads to less science shifts. . .
. . .which leads to scheduling issues for training.
- ▣ Satellite Paradigm at WPC and OPC
 - 30 minute imagery
 - Course spatial resolution
 - Time matching issues with proxy products
 - *This is in the process of changing!!!!*
- ▣ Technical issues
 - Firewall security!
 - Workstation degradation
 - Storage for archiving
- ▣ Building forecaster confidence in the products and interpretation.



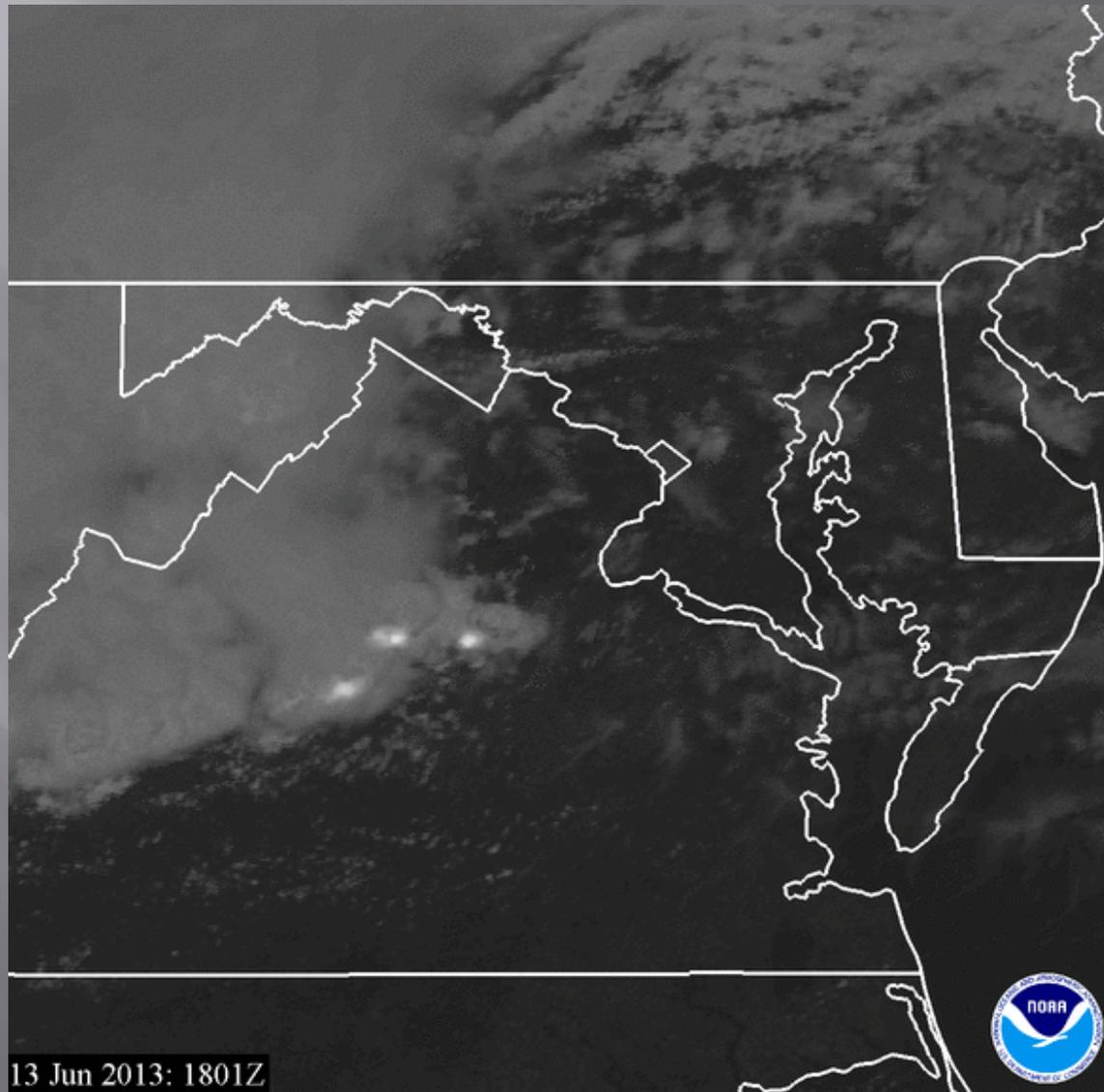
Vision of the Satellite Liaison Position

- ▣ The natural evolution of the Satellite Liaison position is to become a Subject Matter Expert embedded in National Centers or Regional HQs
 - Trust has been built between the Liaison and the forecasters
 - The Liaison has working knowledge of the satellite instruments
 - Training has been prepared, coordinated with CIs and other training centers, and administered to forecasters
 - New satellite techniques have or will be identified through post-launch.

More Vision

- ▣ The Satellite Liaisons will most likely continue to evolve, complimenting the current training and product flow.
 - Assist with transitioning products from A1 or N-AWIPS over to A2 in both D2D and NCP.
 - Work with forecasters on highlighting new satellite techniques using proxy and eventually real data.
 - Ensure correct satellite resolutions are used at National Centers and elsewhere in the field!
- ▣ Retention
 - The possibility of this position being more than just temporary, i.e. position retention beyond launch.
 - Be nice to us!

Questions



13 Jun 2013: 1801Z

