THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

SPORT Short-term Prediction Research and Transition Center

The 104th AMS Annual Meeting, 28 January to 1 February, 2024 in Baltimore, Maryland.

The Transition of RGB Imagery Applied to Fog and Low Clouds from NASA Capabilities within the GOES Proving Ground to the Present Era

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1.National Weather Service Morristown, TN
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Where do you sit?

Research

To

Operations

Why fog / low clouds have been an issue?

Capobianco 2001:
fatal weather accidents common factors

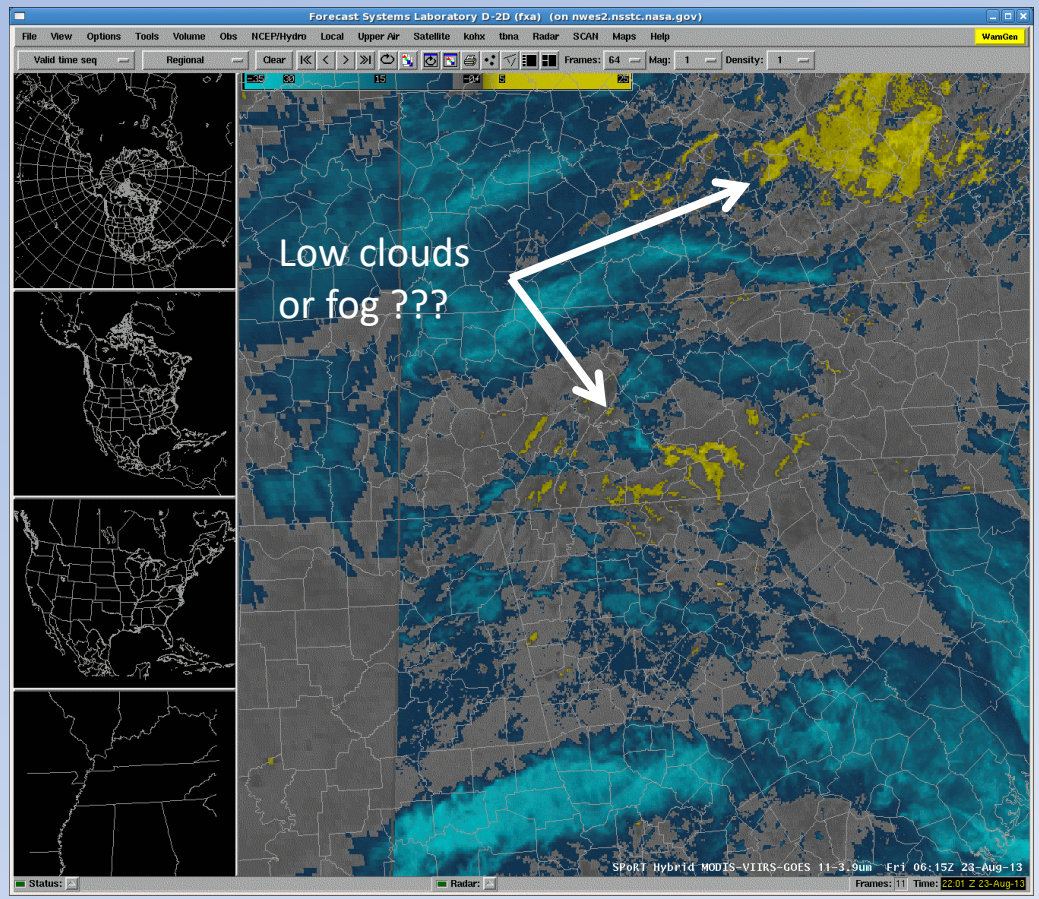
- Low ceiling (20%), Fog (14%)

Tech Report 2011:
Airport Wx Conditions

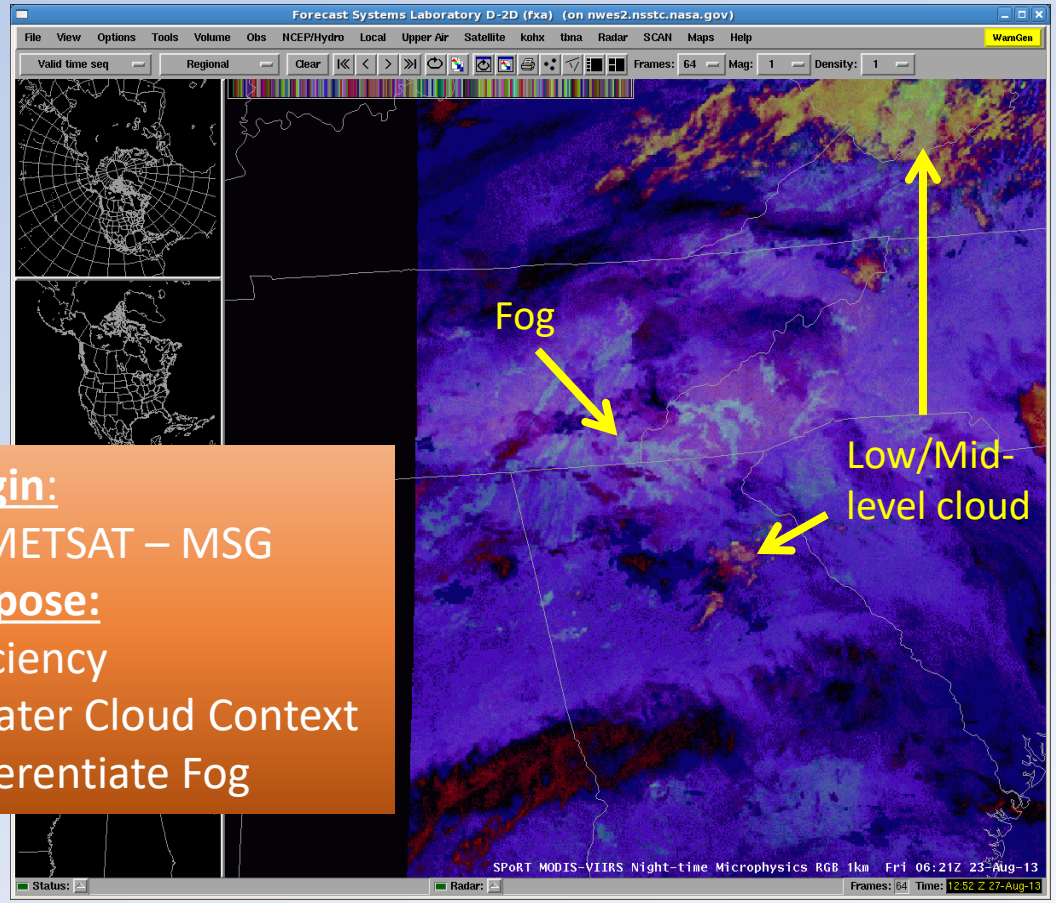
- 40% of all accidents wx related
  - **2/3 of these are Low Ceiling and Fog**

NtMicro RGB Origin and Purpose; NASA Proxy

Legacy Diff Product GOES



Nighttime Microphysics RGB (MODIS, VIIRS)



Origin:
EUMETSAT – MSG

Purpose:
Efficiency
Greater Cloud Context
Differentiate Fog

Transition Method & Experience

<u>Insights</u> *(your winning recipe):*

- Understandable Guidance
- Local Advocate
- Integrated Access

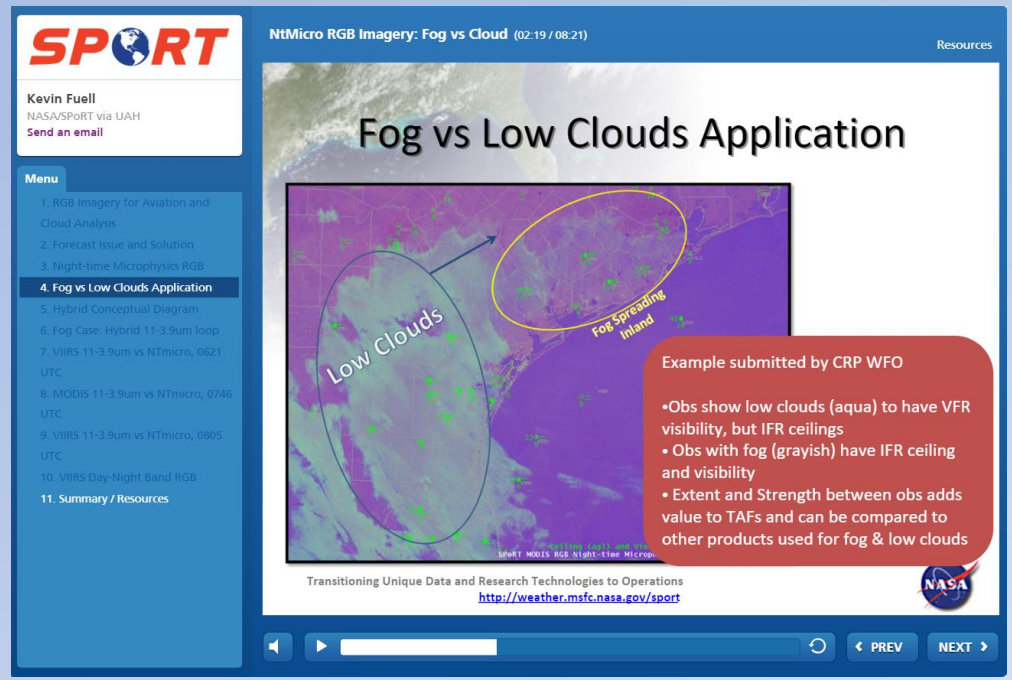
Doug: *"We like to look at products that we understand, that are easy to interpret, and are easy to access."*

Use of NASA LEO capability to prepare for GOES ABI:

- *How does one know that the early prototype was beneficial vs just waiting for the GOES version of the product and eventual popularity?*

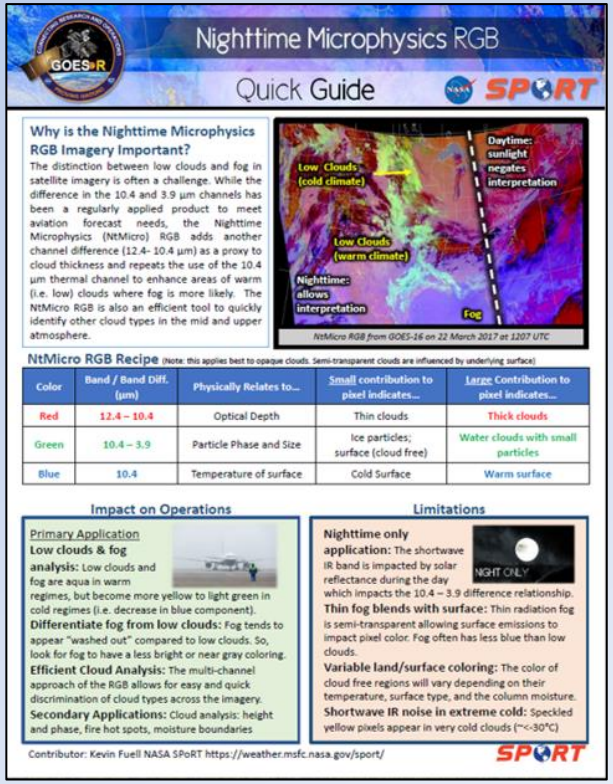
Training in Short Form, then QG

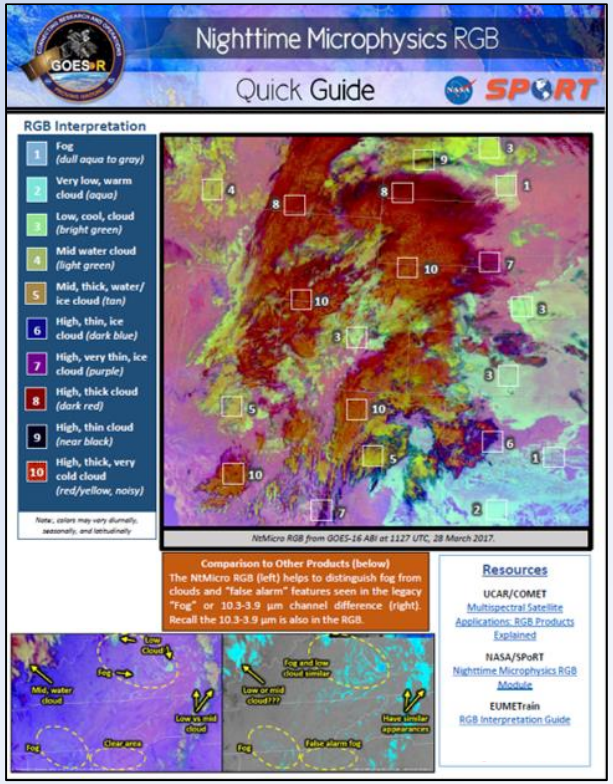
Microlesson (<10 minutes, complement, details)



2013

Quick Guide (tool, reference)



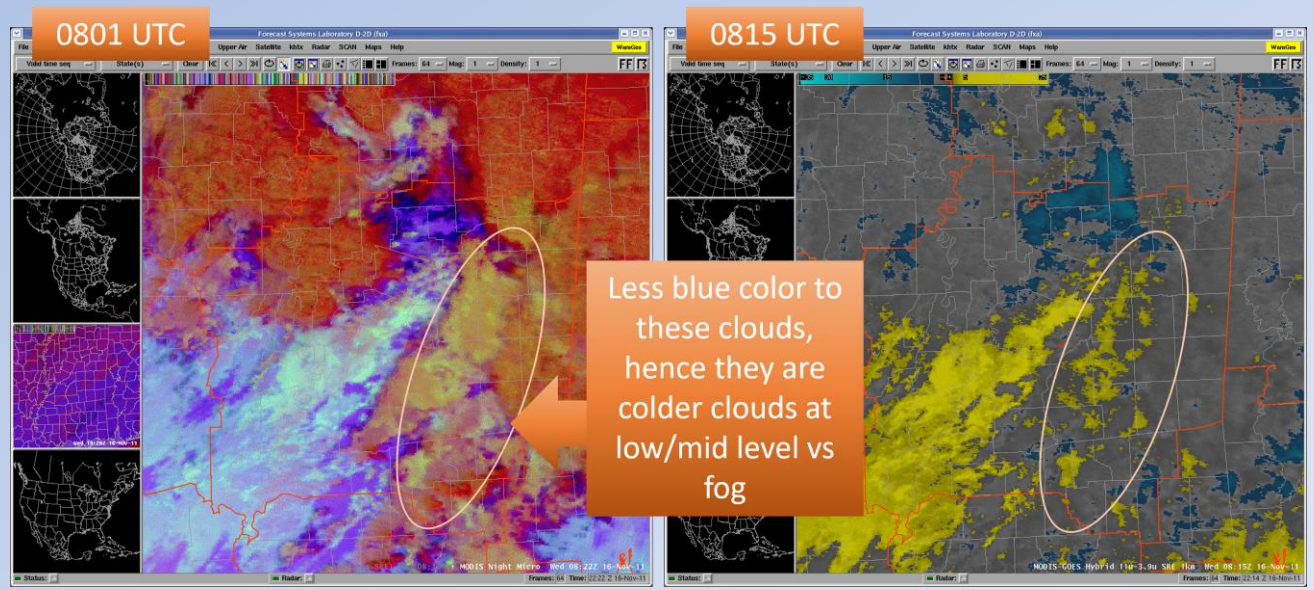


2011 – Initial AWIPS Integration for Testing

Integrate RGB into Display System

From Operations:

- ‘So much data available … limited time’
- ‘For new products, hard to break through the habit … and routine’



Umut Çolak, Public domain, via Wikimedia Commons

Advocate:
Peer-to-Peer Sharing

- Demonstration of value
- Reminder of new product
- Trusted source
- Culture Change

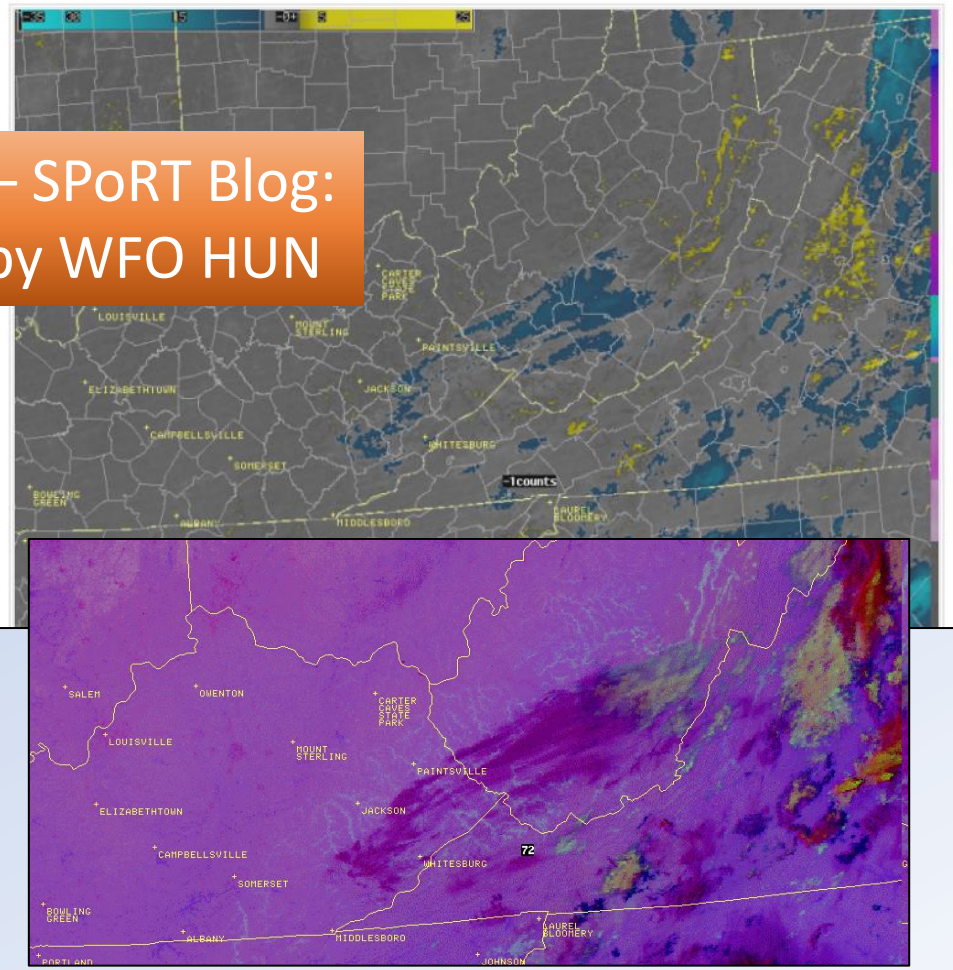
"For some forecasters, looking at NASA SPoRT products had become a regular part of their daily weather analysis routine, so the transition to new GOES-16 products was virtually seamless."

2012 – SPoRT Blog:
Post by WFO HUN

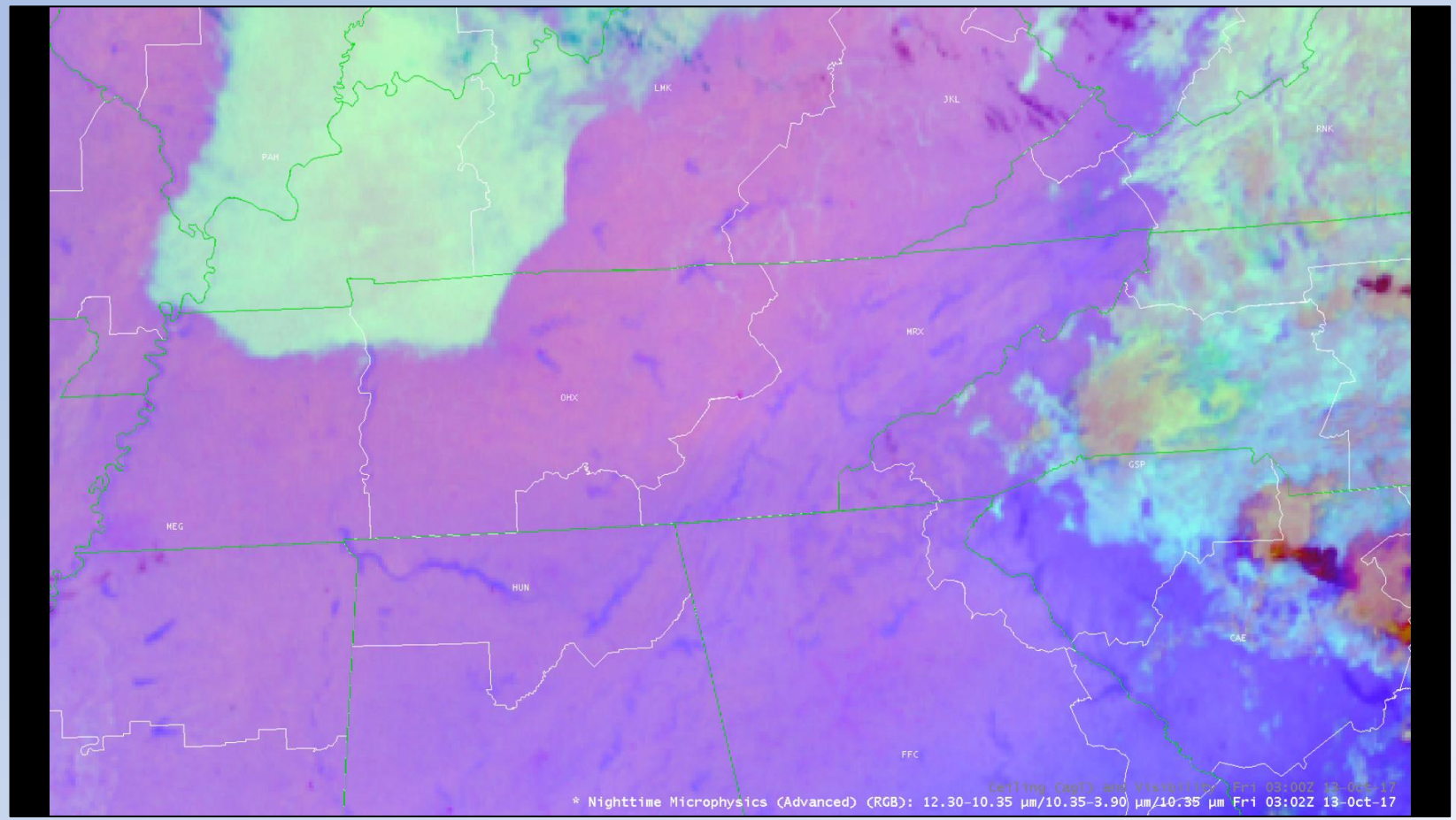
MAY 16, 2012 BY WFOHUNKRIS

RGB Products Show Enhanced Utility for Fog Monitoring

It was a "typical" post-rain foggy morning for portions of the Appalachian region this morning. When looking at the suite of SPoRT satellite products this morning, I noticed the usual fog in the GOES and MODIS imagery, but what caught my attention was the early detection of fog by the Nighttime Microphysics RGB product. Image 1 below shows the GOES-MODIS 10.8-3.9 µm product currently created by SPoRT and available through the Southern Region LDM to collaborating offices.



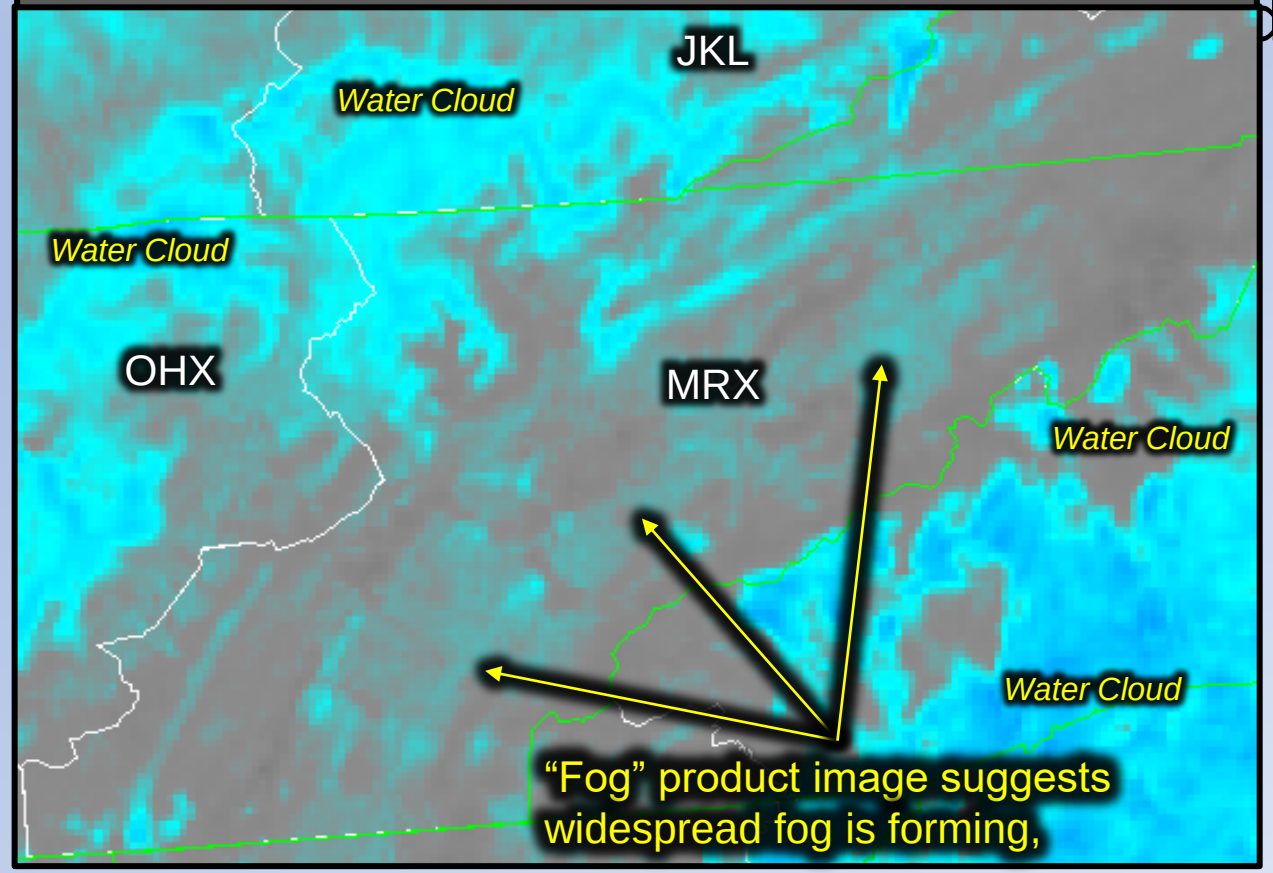
ABI Instrument Era: NtMicro RGB Events



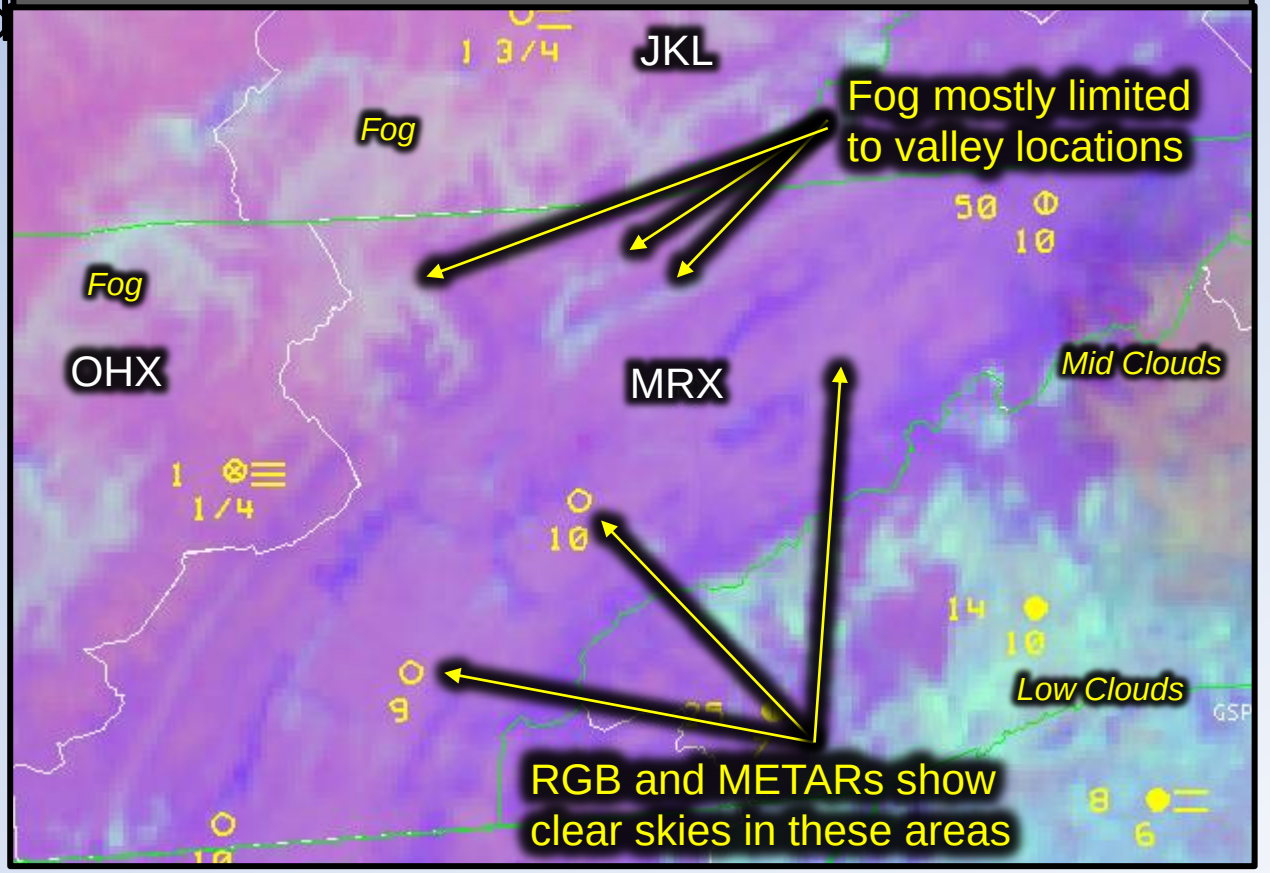
Example: Avoid 'False Alarm' Advisory at MRX

MRX Forecaster Feedback: "Using the NtMicro RGB actually helped me decide not to issue a dense fog advisory, due to the fog being isolated to water and valleys, while OHX and JKL did issue advisories."

10.3-3.9 µm Difference or "Fog" Product via GOES-R
at 0817 UTC, 13 October 2017



Nighttime Microphysics RGB via GOES-R, METAR Ceiling/Visibility
at 0817 UTC, 13 October 2017



State of NtMicro RGB today:

- Both NtMicro and Diff. products still used today
  - (Ever growing list of products)
- Given only one product allowed, ~70% choose the NtMicro RGB
- The other 30%: site ‘ease’, ‘familiarity’ with Diff. product
  - Missing out on false alarm value, context, and other applications

Future

Needs in NtMicro and other RGBs

- User Feedback: 'Blogs becoming outdated'
  - Would like 'video' or social media formats to showcase value
- Quick Guides = helpful,
  - Need better ways to keep these in front of users
- Products to complement
  - ML /AI

Research to Operations

Public Domain via Pexels

References

[1]Capobianco G., Lee M.D. The Role of Weather in General Aviation Accidents: An Analysis of Causes, Contributing Factors and Issues. *Proc. Hum. Factors Ergon. Soc. Annu. Meet.* 2001;**45**:190–194. doi: 10.1177/154193120104500241.

[2]*EUROCONTROL Algorithm to Describe Weather Conditions at European Airports.* Eurocontrol; Brussels, Belgium: 2011. Technical Report.