GOES-R Proving Ground Activities at the NASA Short-term Prediction Research and Transition (SPoRT) Center

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transitioning unique NASA data and research technologies to operations

What is SPoRT?

SPoRT is a NASA project to transition unique observations and research capabilities to the operational community, to improve 0-48 hour forecasts on the regional scale.

SPoRT Paradigm

- match observations/capabilities to forecast problems
- develop / assess solution in "testbed", transition to decision support system
- conduct training, product assessment and impact

Known Forecast Problems

- timing and location of severe weather
- detection and monitoring of fog, smoke, fires
- coastal weather processes (sea breeze convection / temperatures)
- development / movement of off-shore precipitation processes – tropical systems
- gap filler in data void regions – atmospheric rivers of moisture

SPoRT Partnerships and Collaborations

- Originated as a partnership with forecast offices in the NWS Southern Region
- Undergoing expansion efforts to address new challenges in other regions.
- SPoRT forms partnerships in research and development with end users by:
  - Providing training to WFOs
  - Soliciting feedback on current products for future development
  - Identifying new ways to use NASA data to solve forecast problems
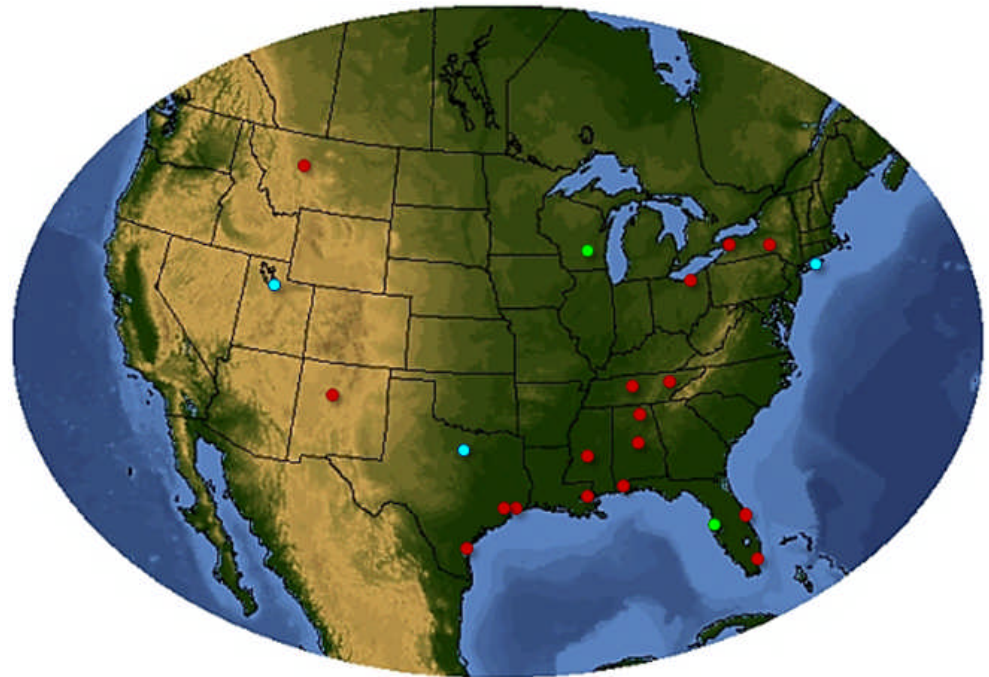
● NWS Forecast Office　　● NWS Regional HQ　　● Direct Broadcast Source

SPoRT in the GOES-R Proving Ground

Help NOAA with transition of GOES-R products to operational community

Use successful SPoRT paradigm to link product to problem, test and transition, train and assess impact

Focus on SPoRT strengths – GLM, selected ABI products including RGB composites, data display in AWIPS/NAWIPS/AWIPSII, and product training and assessment

<u>Product development</u>

Pseudo-GLM flash extent density product – multi-network applications
Lightning forecasts based on WRF model microphysics (LFA)
Prototype development of a near-real time ABI proxy products – GOES-MODIS hybrid, RGB products from GOES/MODIS/SEVIRI

<u>Transition –</u> work with GOES-R partners to transition products to DSSs

<u>Training</u>

•Total lightning modules, LFA usage, GOES/MODIS hybrid

<u>Product evaluation</u>

•PGLM / LFA at the NSSL / EWP Spring Experiment (2009-2011)
•GOES/MODIS hybrid simulating ABI at 8 WFOs (Spring/Summer)
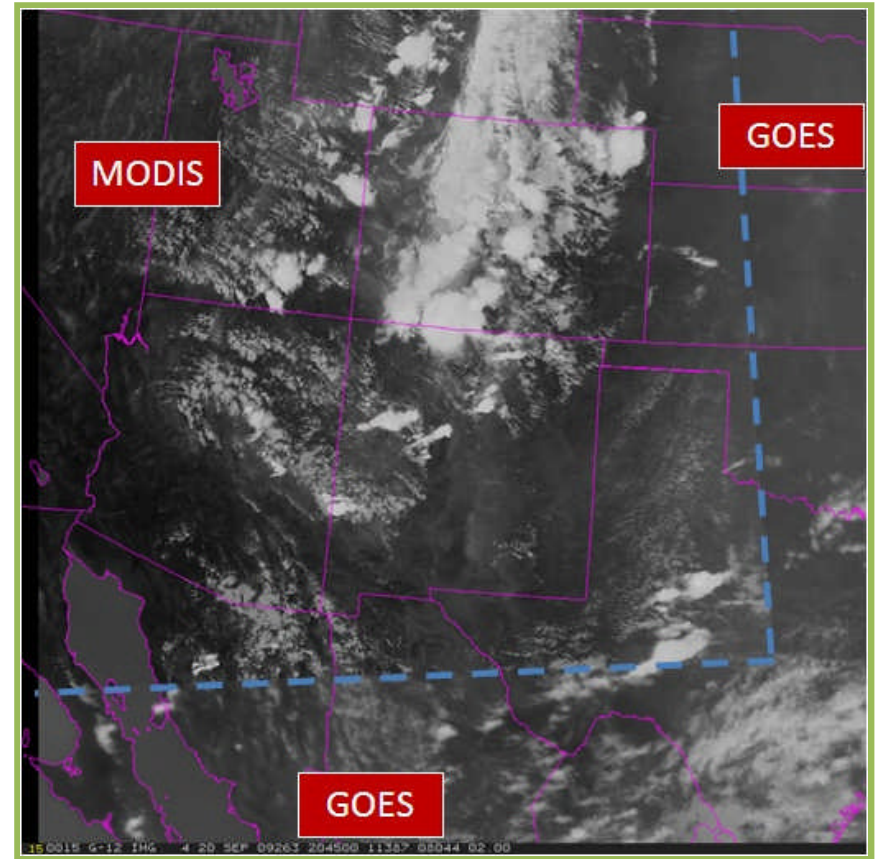•RGB product evaluation at NHC (Summer 2011)

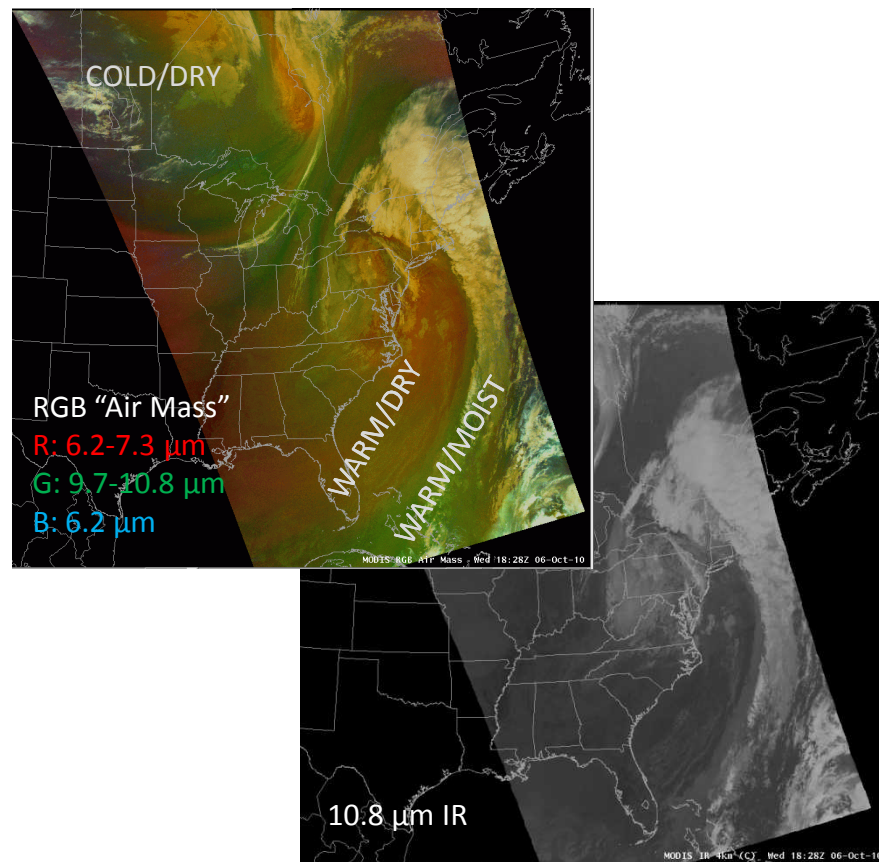**transitioning unique NASA data and research technologies to operations**

GOES-MODIS "Hybrid" Imagery

- Uses higher resolution MODIS imagery to emulate future GOES-R ABI abilities within current GOES data.

- 2 km resolution IR, shortwave, and WV.

- 500 m visible

- Provided to offices participating in PG activities.

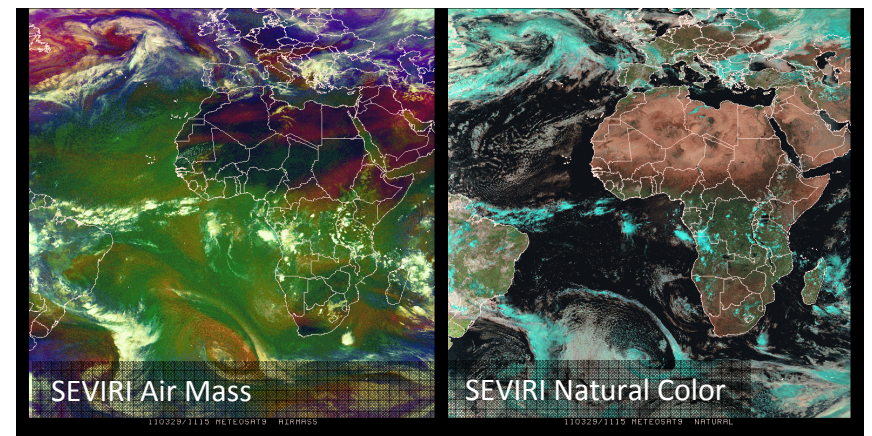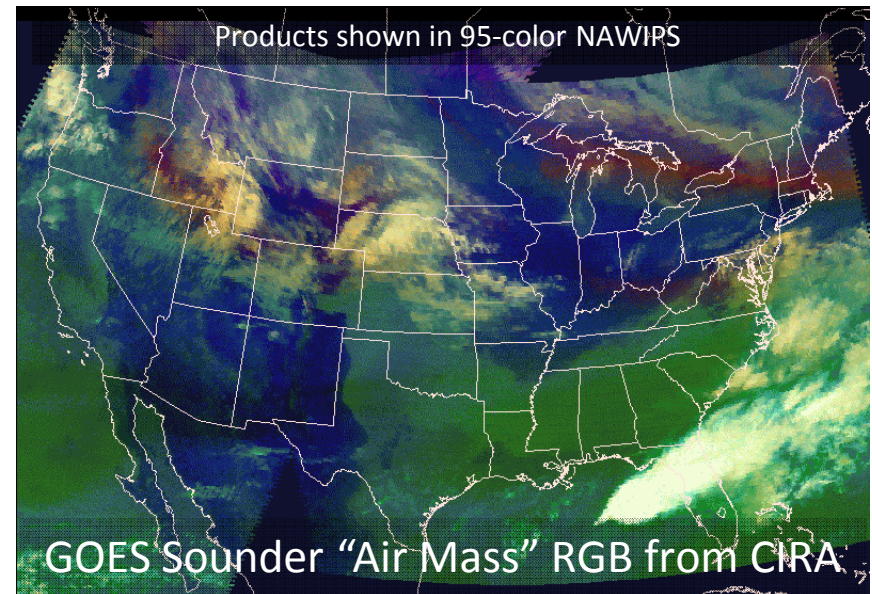# Multispectral Color Composites as "RGB" Imagery

- Developing RGB color composites from MODIS spectral bands

- Based upon EUMETSAT guidelines for consistency with SEVIRI data

- Provided to partners in AWIPS and NAWIPS systems

COLD/DRY

RGB "Air Mass"
R: 6.2-7.3 μm
G: 9.7-10.8 μm
B: 6.2 μm

WARM/DRY

WARM/MOIST

MODIS RGB AIR Mass Wed 18:28Z 06-Oct-10

10.8 μm IR

MODIS IR 4km (C) Wed 18:28Z 06-Oct-10
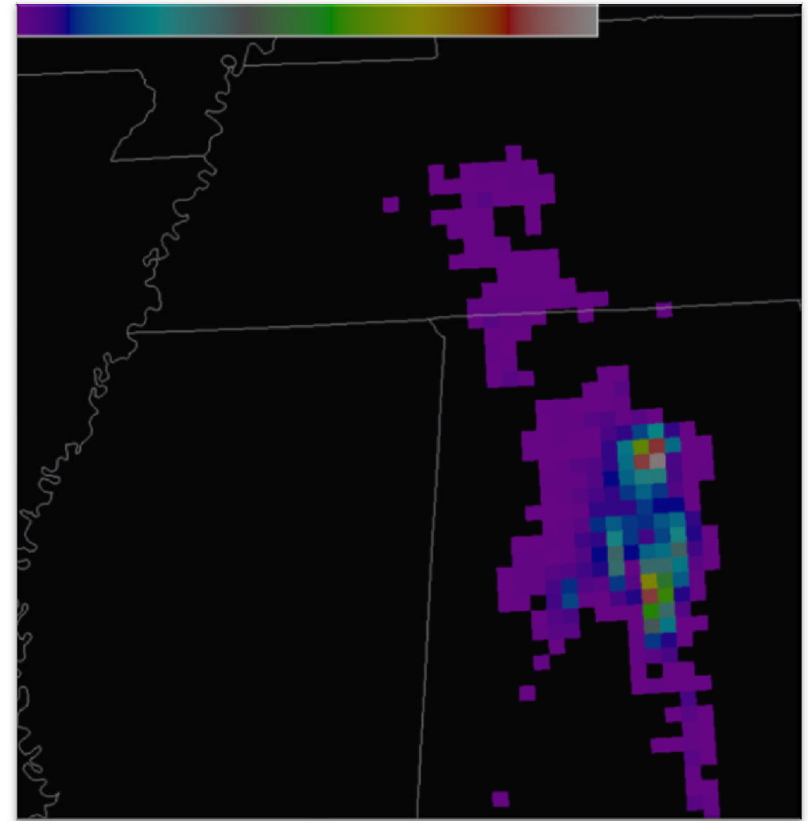
EUMETSAT "Air Mass" RGB via MODIS

Multispectral Color Composites as "RGB" Imagery

- Collaborating with CIRA to demonstrate RGB products over CONUS using the GOES Sounder.

- Hourly RGB imagery to be provided to GOES-R PG partners

- Generating SEVIRI RGBs as proxies for GOES-R capabilities over the tropics.

- Collaborating with CIRA to incorporate their suggested tuning and adjustment to improve product utility.

Products shown in 95-color NAWIPS

GOES Sounder "Air Mass" RGB from CIRA

SEVIRI Air Mass

SEVIRI Natural Color

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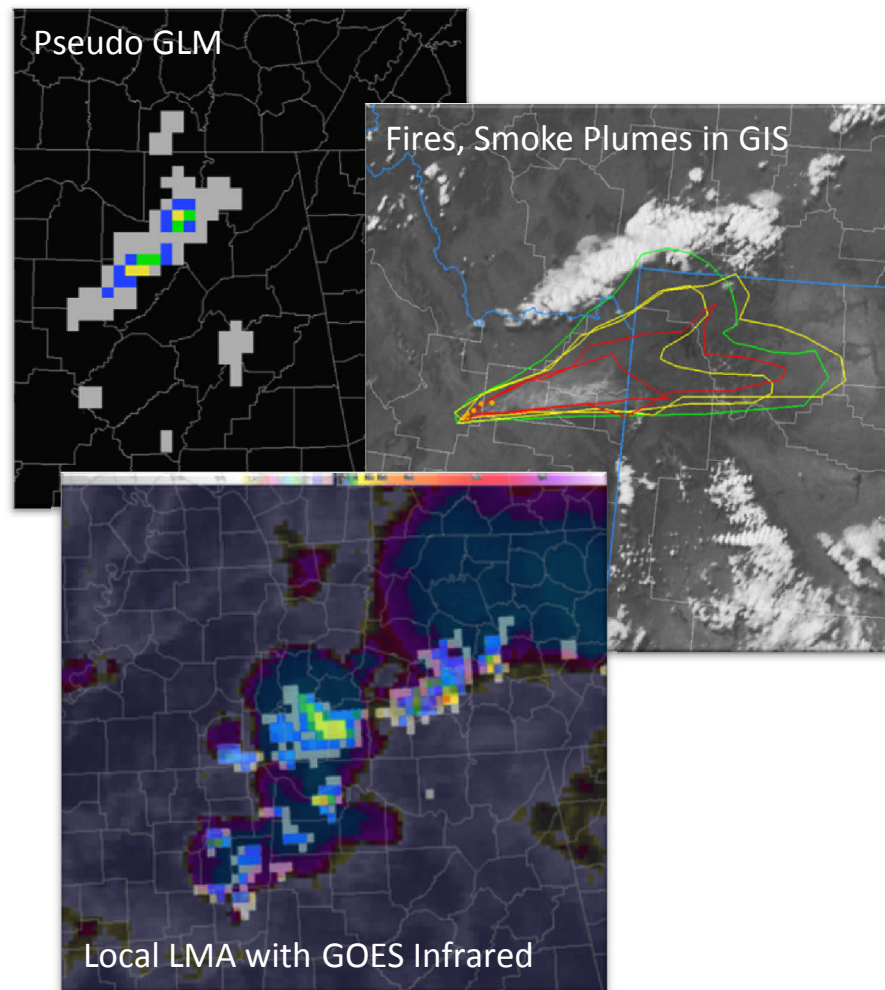# Pseudo Geostationary Lightning Mapper (GLM) Product

- **What is it?**
  - Flash extent density at GLM resolution
  - Uses ground data from regional lightning mapping arrays
  - Demonstrates operational applications of lightning data with resolution comparable to GOES-R GLM

- **Caveats**
  - NOT a GLM proxy
  - No attempt to use optical satellite data
  - Provides a stop-gap until true proxy is available

Pseudo GLM in AWIPS II

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Developing Capabilities for AWIPS II

- SPoRT is developing new capabilities to transition products to the next generation of AWIPS software.

- Java plugins:
  - McIDAS AREA formats
  - GIS Shapefiles
  - Convective initiation datasets
  - Lightning mapping arrays

Pseudo GLM

Fires, Smoke Plumes in GIS

Local LMA with GOES Infrared

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Summary of GOES-R Proving Ground Activities

- SPoRT is actively involved in GOES-R Proving Ground activities in a number of ways:
  - Applying the paradigm of product development, user training, and interaction to foster interaction with end users at NOAA forecast offices national centers.
  - Providing unique capabilities in collaboration with other GOES-R Proving Ground partners
    - Hybrid GOES-MODIS imagery
    - Pseudo-GLM via regional lightning mapping arrays
    - Developing new RGB imagery from EUMETSAT guidelines