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

Andrew Molthan
NASA Marshall Space Flight Center/SPoRT, Huntsville, Alabama
andrew.molthan@nasa.gov

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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
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

Product development
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

Transition – work with GOES-R partners to transition products to DSSs

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

Product evaluation
• 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)
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

RGB “Air Mass”
R: 6.2–7.3 μm
G: 9.7–10.8 μm
B: 6.2 μm

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.
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
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
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