Application of LEO RGBs to Polar and Tropical Regions

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SPoRT Overview

• Started in 2003
• Transition unique observations and research capabilities to the operational weather community
• Mostly scientists and programmers
• Suites of products
• End users
• “Transition” staff focused on good Instructional Design practices
• Training is a key to transition
  • RGB Imagery, Total Lightning, NASA Land Information System, Global Precipitation Measurement products, Disaster Response Imagery, SAR, derived microwave products
SPoRT RGB Activities

- 2009-2012: Focused efforts to apply EUMETSAT RGB recipes to MODIS, VIIRS, and SEVIRI
  - Products were made available to NWS operational forecasters
  - Assessed for utility in operations
SPoRT RGB Activities

- 2013-2014: Developed methods to make imagery consistent across sensors
  - Limb correction to allow forecasters to utilize full swaths
  - Apply brightness temperature adjustment to match MODIS and VIIRS RGBs to SEVIRI

MODIS Air Mass RGB composites (original and corrected) showing a developing Hurricane Sandy with a dry air intrusion
SPoRT RGB Activities

• 2015-Present: Expansion of efforts to other sensors
  • Inclusion of AVHRR to provide additional overpasses to polar regions
  • Apply recipes to AHI to prepare for GOES-16
  • Developed methodology to adjust GOES-16 recipes to match SEVIRI

ABI Day Cloud Convection

AHI Air Mass
Alaska

- SPoRT first transitioned and trained Alaska forecasters on the use of the Nighttime Microphysics product
- Eventually introduced 24-hour Microphysics & Daytime Microphysics
- Began with MODIS and VIIRS; expanded to include AVHRR
Alaska

• Collaboration with Geographic Information Network of Alaska (GINA)
  • MODIS/VIIRS RGB products had been generated at SPoRT; then at
  • Desire to generate RGB products on-demand in AWIPS II
  • Developed and transitioned client-side RGB capability into AWIPS II that implements the EUMETSAT RGB recipe
    • GINA disseminating single channels to WFOs
    • SPoRT generating “corrected” IR channels, allowing for RGBs that compare well between sensors
Tropics

• SPoRT acquires real-time data form the Global Precipitation Mission (GPM) constellation and provides single channel, RGB, and rain rate products to the National Hurricane Center

• GMI used as baseline to inter-calibrate PM sensors from other satellites

• Rain Rate is a *quantitative* product vs. *qualitative* product
Tropical Applications

Use of GMI imagery by the National Hurricane Center

GOES-16 RGB products aid in identifying dry-air intrusion and discriminate cloud phase during Hurricane Harvey
Data Fusion

- VIIRS lacks water vapor channels
- Air Mass product created by fusing VIIRS and CrIS data
- Used by forecasters to anticipate high winds associated with tropical systems
- Most useful over polar regions where geostationary data is lacking
- Initial success with forecasters
- Could be applied to other products requiring water vapor
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