



Nowcasting Applications

Jordan Gerth

University of Wisconsin

STAR JPSS Science Team Meeting

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WISCONSIN
UNIVERSITY OF WISCONSIN-MADISON

Challenges

- **What NPP and JPSS spectral bands and science products have a direct application to operational responsibilities of NWS meteorologists?**
- **How do we deliver polar satellite information so that it is timely enough for nowcasting?**
- **How do we present that information in the field?**



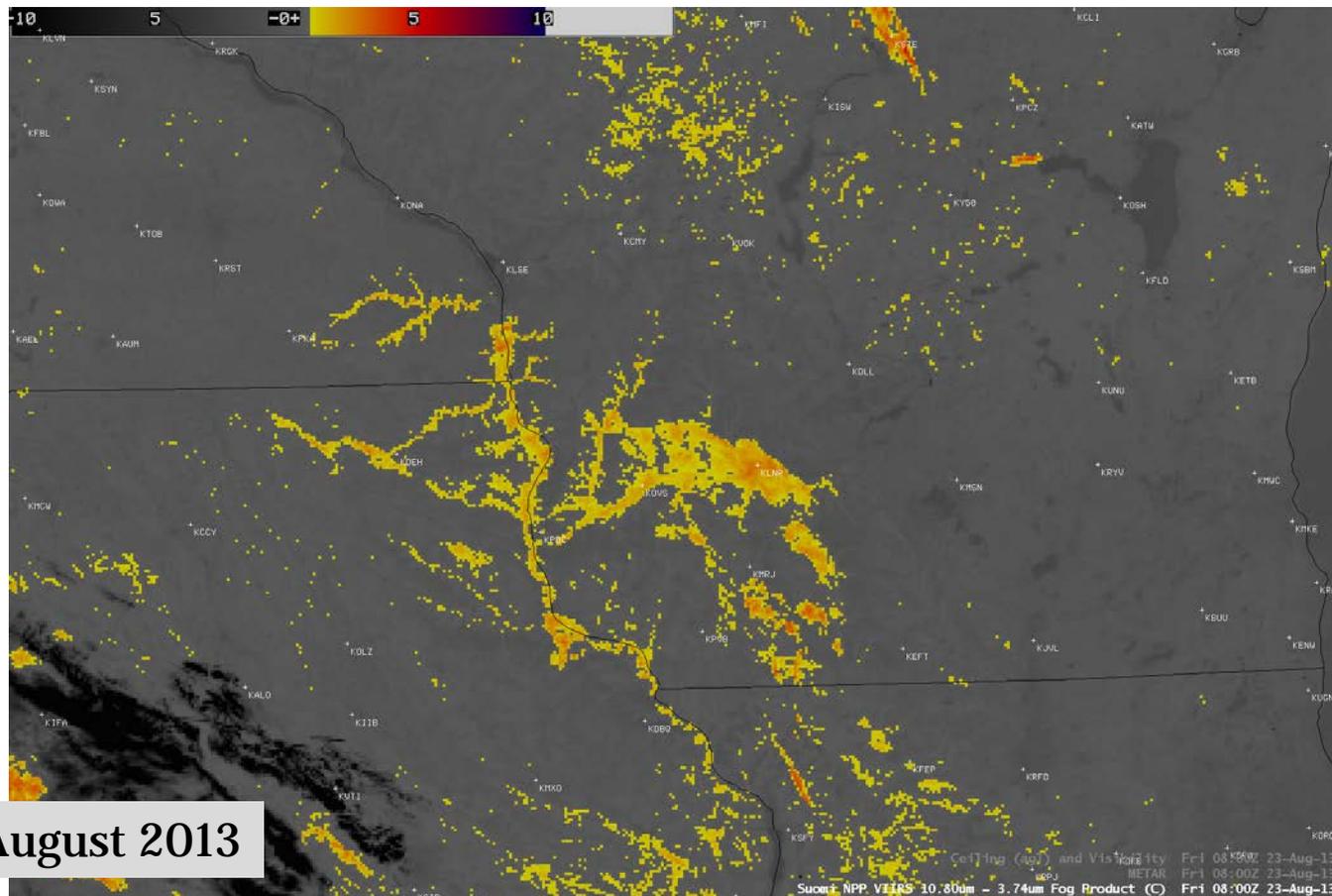
NPP and JPSS

- What instruments/capabilities of NPP and JPSS provide added value over geostationary satellites for nowcasting applications?
 - VIIRS Day/Night Band
 - Higher spatial resolution for imaging (VIIRS), especially in polar regions
 - Microwave products (ATMS)
 - Additional spectral information (CrIS) for characterizing clear scenes

Deliver and Display

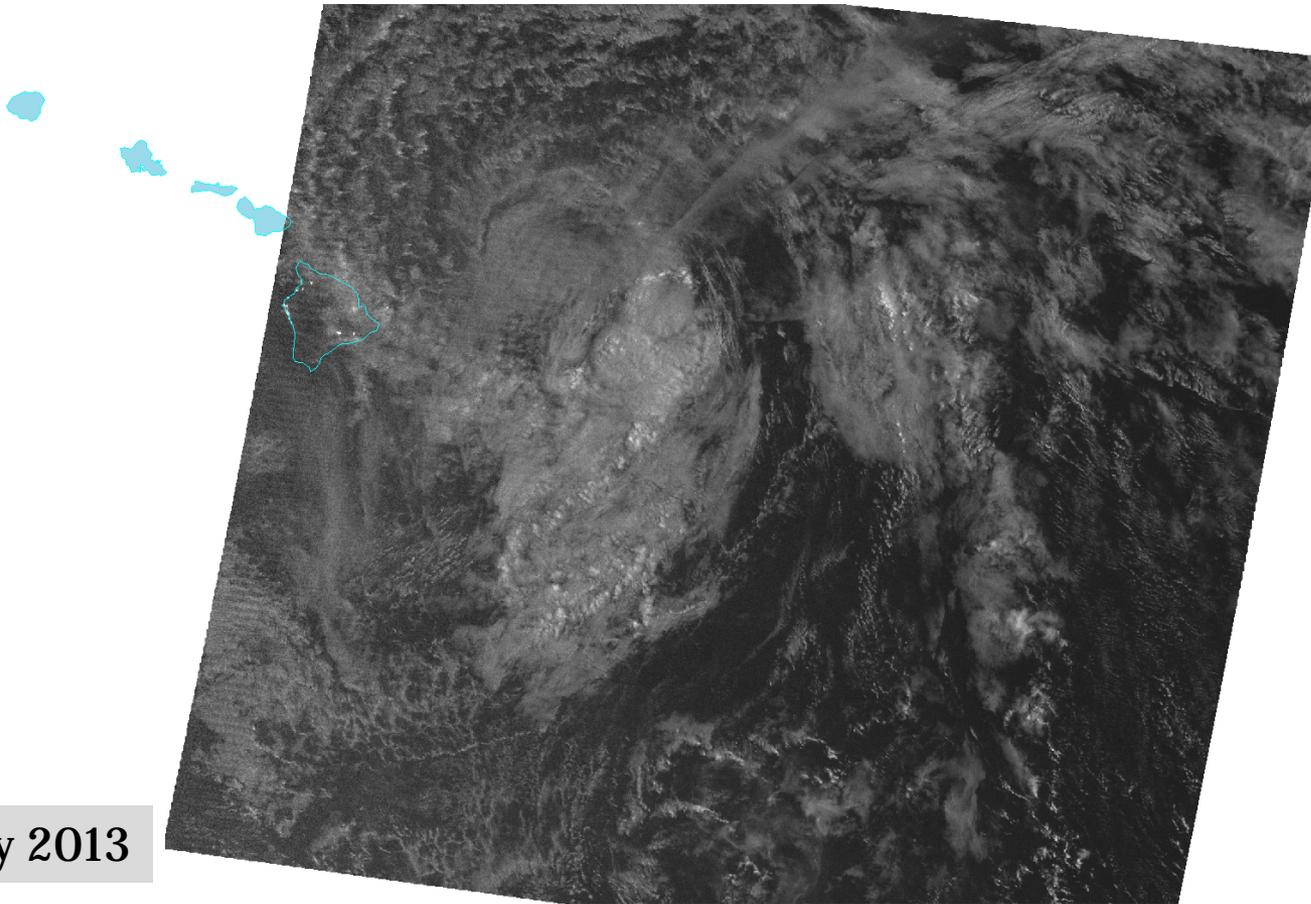
- **Timely delivery is facilitated by:**
 - A network of L/X-band antennas across the United States to capture and produce imagery and products with the Community Satellite Processing Package (CSPP)
 - Improved bandwidth, especially in OCONUS, to reach NWS forecast offices
- **Imagery and science products arriving at NWS offices are displayable within the Advanced Weather Interactive Processing System (AWIPS)**

The Early Days: Valley Fog



23 August 2013

The Early Days: Flossie



29 July 2013

The Early Days: Flossie

TROPICAL STORM FLOSSIE DISCUSSION NUMBER 19

NWS CENTRAL PACIFIC HURRICANE CENTER HONOLULU HI EP062013

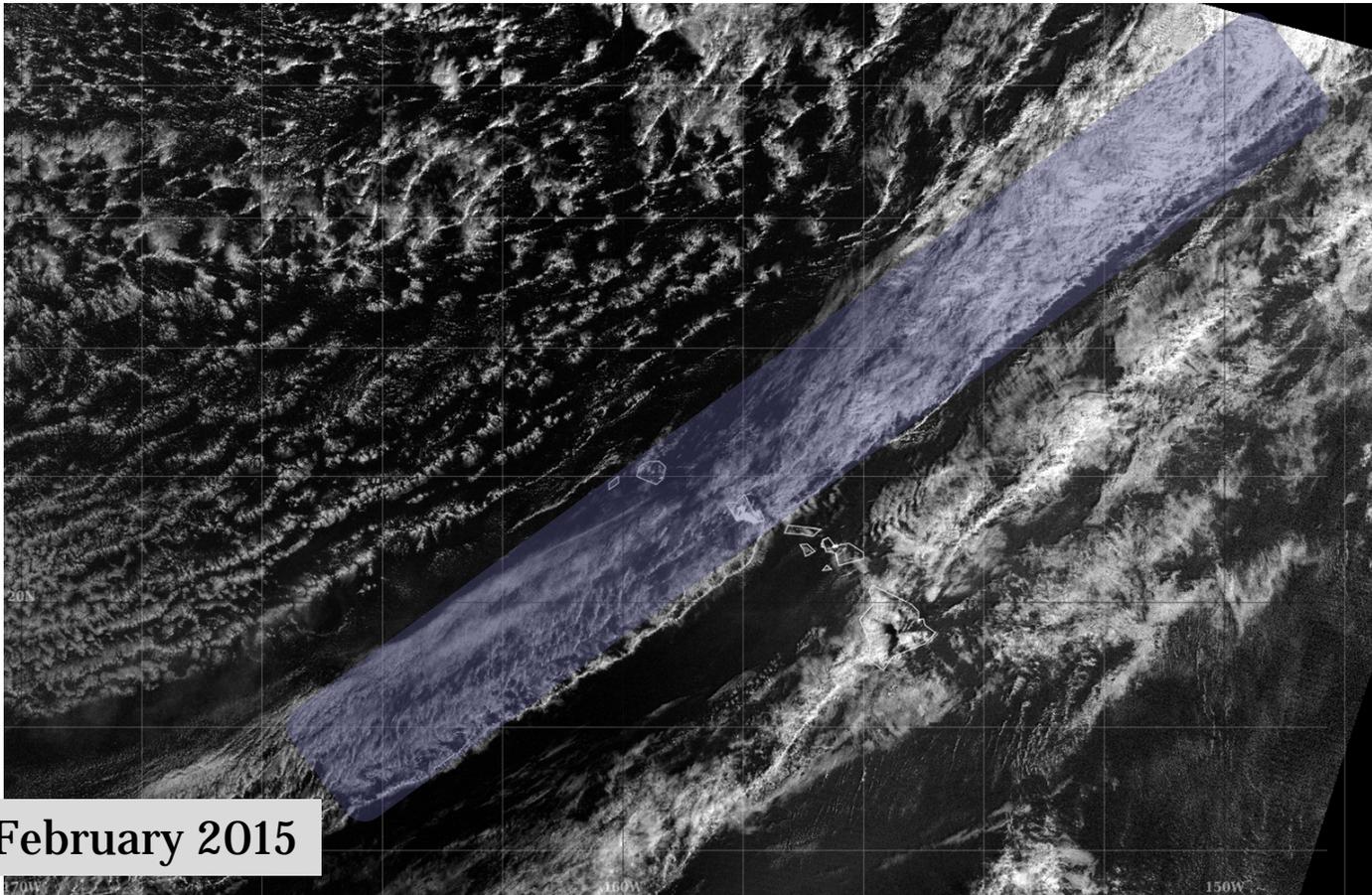
500 AM HST MON JUL 29 2013

THE CENTER OF FLOSSIE WAS HIDDEN BY HIGH CLOUDS MOST OF THE NIGHT BEFORE VIRS NIGHTTIME VISUAL SATELLITE IMAGERY REVEALED AN EXPOSED LOW LEVEL CIRCULATION CENTER FARTHER NORTH THAN EXPECTED. WE RE-BESTED THE 0600 UTC POSITION BASED ON THE VISIBLE DATA. SUBJECTIVE DVORAK ANALYSES CONTINUED SHOW CURRENT INTENSITIES OF 3.0 BUT SATELLITE LOOPS SUGGEST A RAPID WEAKENING TREND WITH THE LOW LEVEL CENTER PULLING AWAY FROM A SMALL AREA OF CONVECTION SOUTHEAST OF THE CENTER. IT IS LIKELY THAT CONTINUED NORTHWEST SHEAR WILL MAINTAIN THIS WEAKENING TREND.

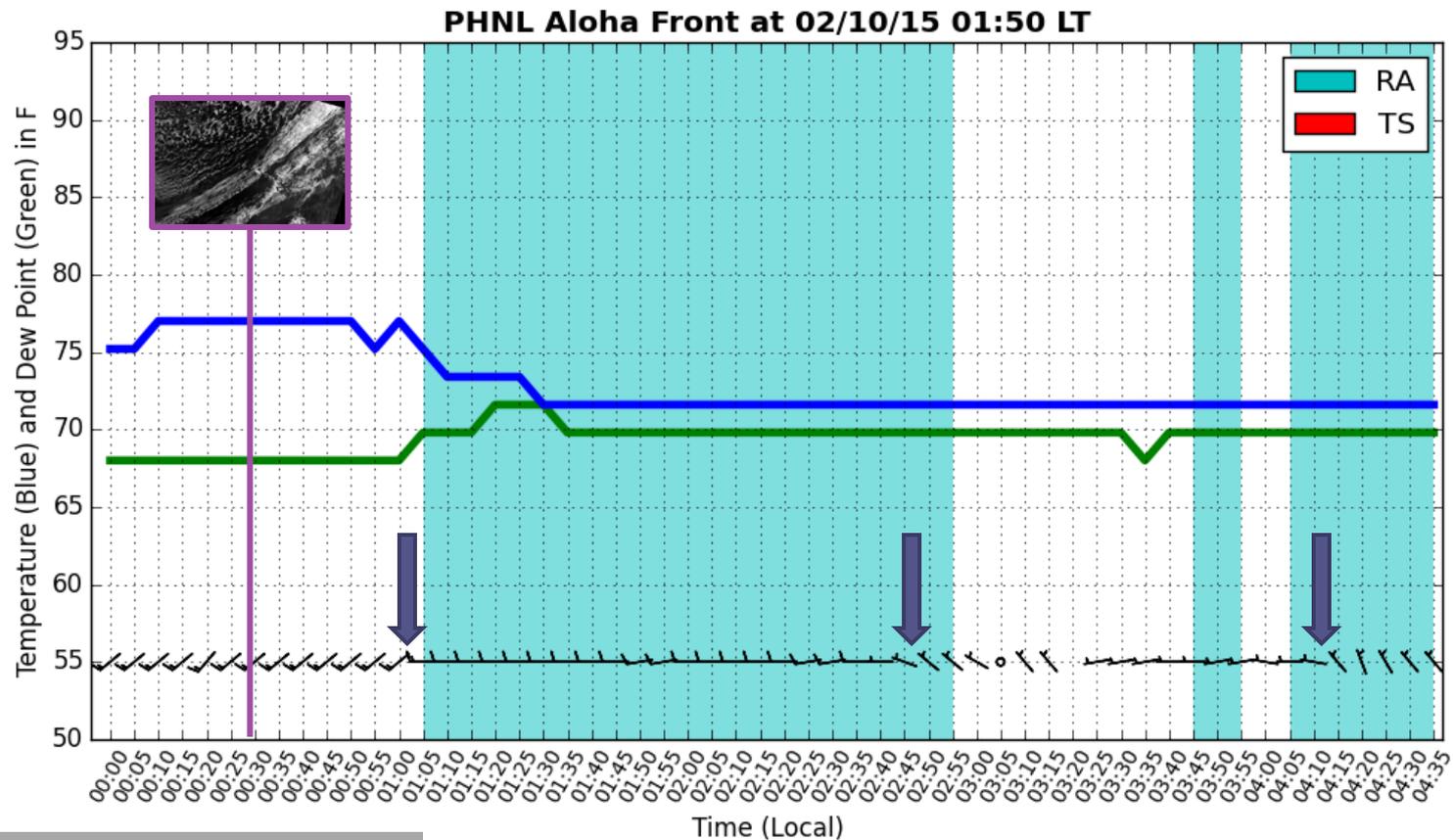
THE TRACK HAS BEEN SHIFTED NORTH TO REFLECT THE RE-LOCATED CENTER. THE TRACK GUIDANCE SHIFTED FOLLOWING THE TRACK CHANGE AND WAS CONSISTENT WITH A NEW TRACK FARTHER TO THE NORTH.

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Recent Application: Fronts



Frontal Passages in Hawaii

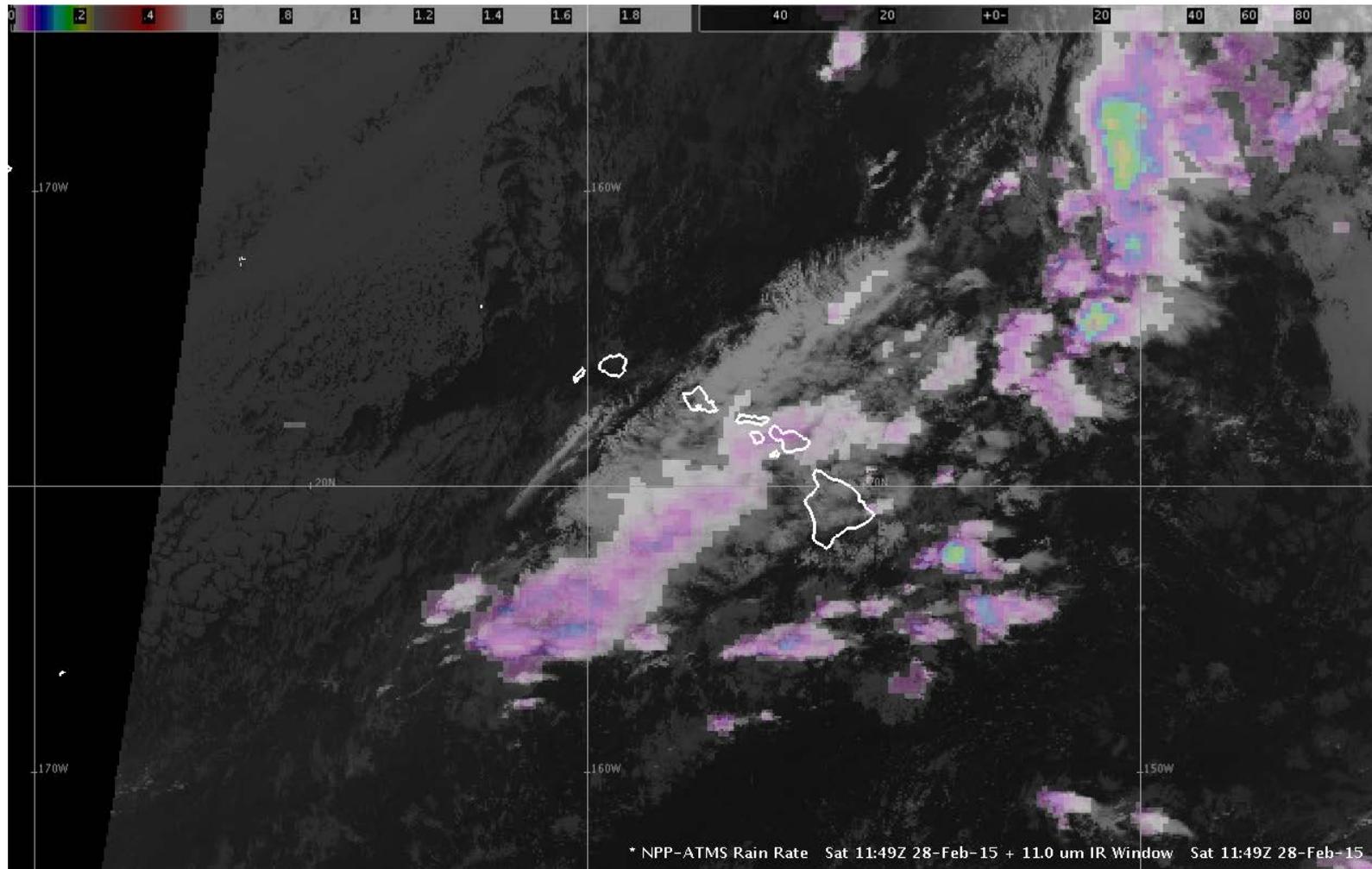


New Activities

- **Products for coastal forecasting applications**
 - ASCPO Sea Surface Temperature
 - MIRS 90 GHz and Rain Rate
- **Full-resolution VIIRS imagery in AWIPS II**
- **Enhancing AWIPS II and providing corrected reflectances for select VIIRS bands to support RGB multi-spectral applications**

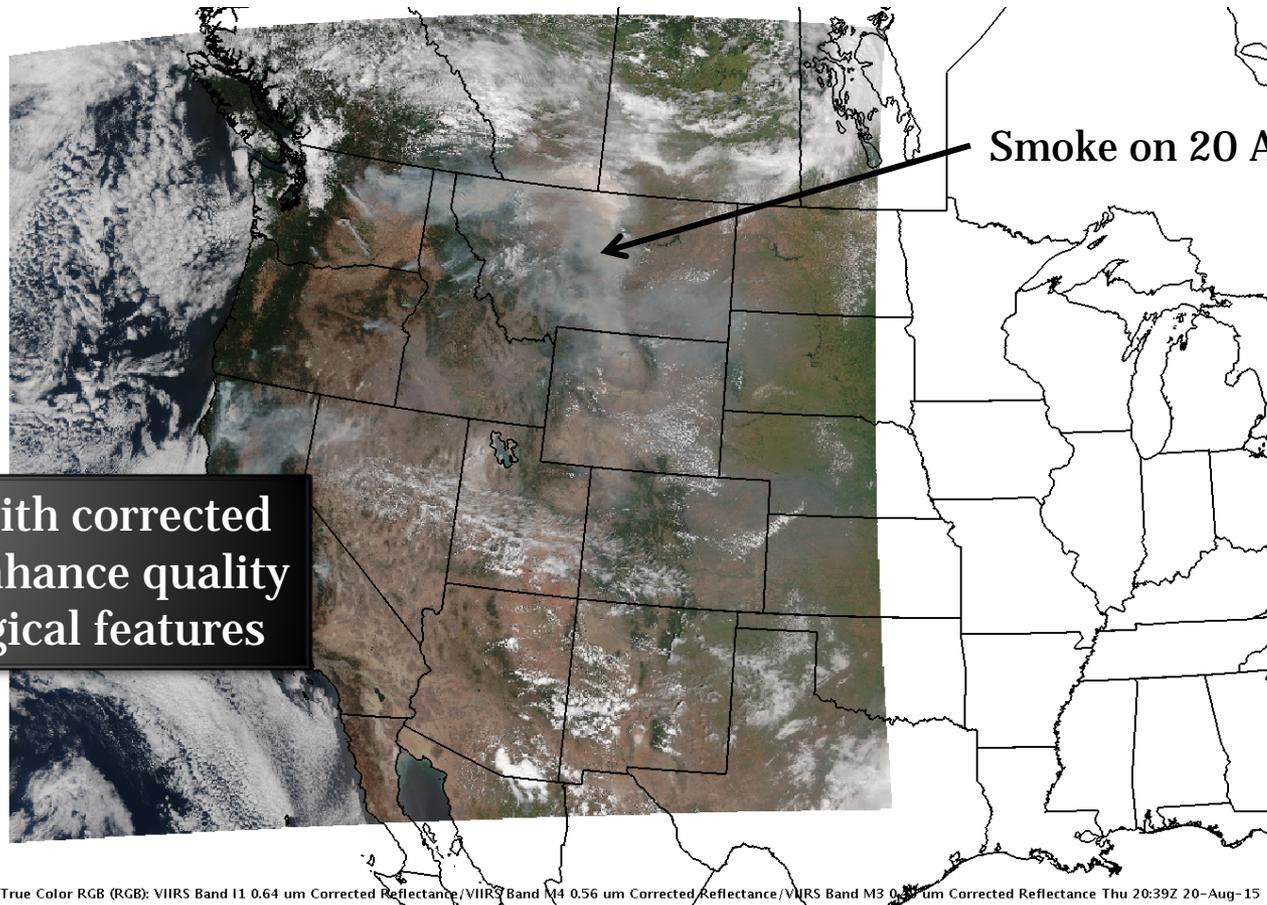
28 February 2015 11:49 UTC

Example of NPP-ATMS Rain Rate and 11.0 μm IR Window in AWIPS II



VIIRS True Color RGB in AWIPS II

(Full Bit Depth)

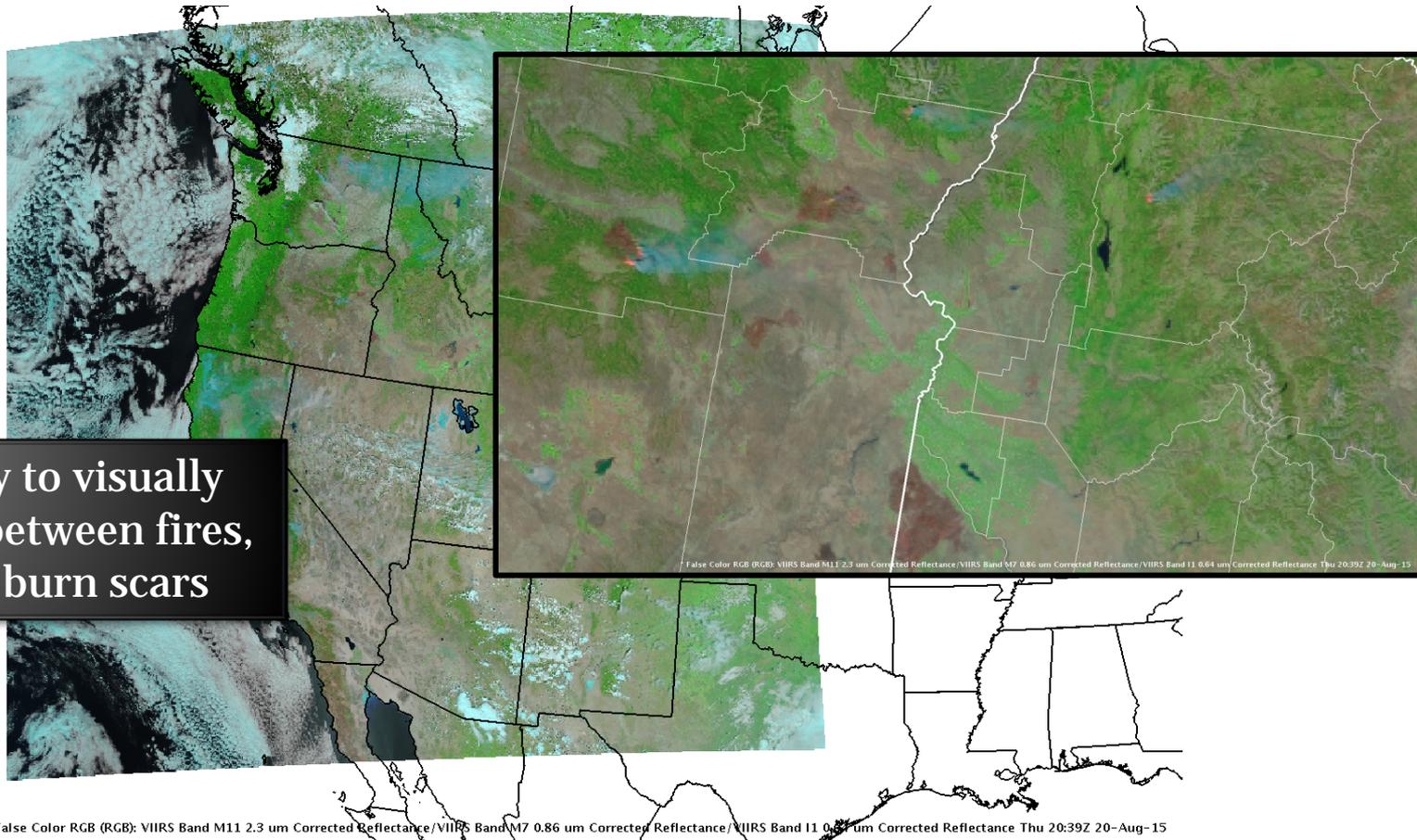


Composites with corrected reflectances enhance quality of meteorological features

* True Color RGB (RGB): VIIRS Band I1 0.64 um Corrected Reflectance / VIIRS Band M4 0.56 um Corrected Reflectance / VIIRS Band M3 0.55 um Corrected Reflectance Thu 20:39Z 20-Aug-15

VIIRS False Color RGB in AWIPS II

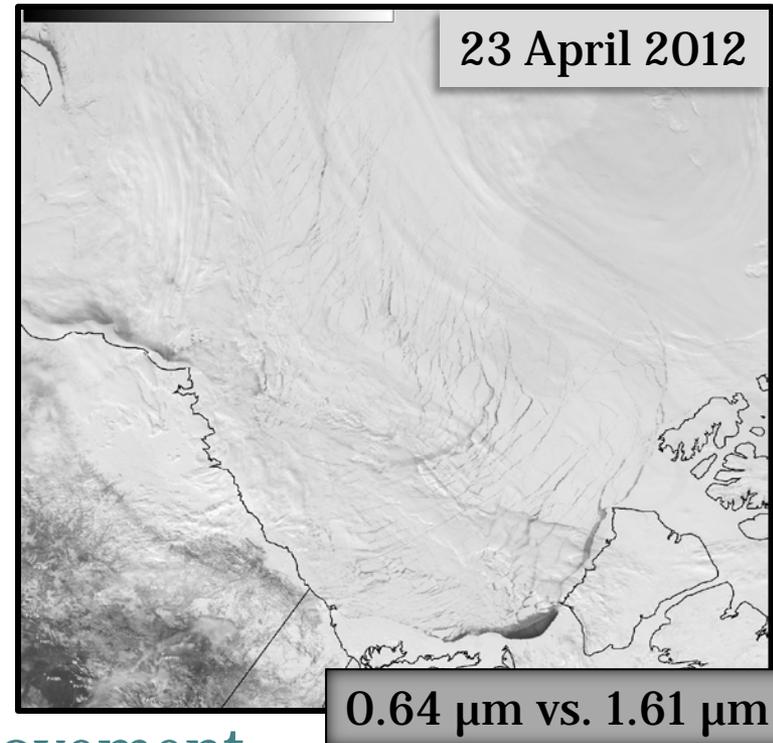
(Full Bit Depth)



Benefit: Easy to visually discriminate between fires, smoke, and burn scars

Other Applications

- **Phenomena-based products:**
 - Aerosols
 - Active fires
 - Land surface properties
 - River ice and flooding
 - Sea ice characterization and movement
 - Snow and ice cover
 - Volcanic ash detection
- Comparing to short-term numerical weather prediction forecasts
- Feature discrimination



Source: CIMSS Satellite Blog 

The Future

- What can we assimilate into models, integrate into products, and combine with other observations while maintaining the integrity of the disparate sources?
- How do we further improve the implementation of satellite imagery and products in our weather visualization tools (e.g., AWIPS II)?

Thank You

- If you are interested in learning more about how NWS conducts operations in the OCONUS and have a science product with an application to demonstrate, consider the NWS Pacific Region Visiting Scientist Program.
- Questions? Comments?
 - Jordan.Gerth@noaa.gov

