# SPoRT Update

## Session 101 - AWIPS/RGB Part II

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## 2nd NOAA Satellite Science Week 2013

## March 18-22, 2013

# Outline

- AWIPS II Plug-ins
- EPDT Spring 2013
- RGB Products
- User Feedback
- Poll Question

# AWIPS II Activities at SPoRT

Transition SPoRT products from AWIPS to AWIPS II and to develop, test, and transition new capabilities to ingest/display GOES-R Proving Ground products which best demonstrates the new satellite/sensor capabilities

**Focus on:**

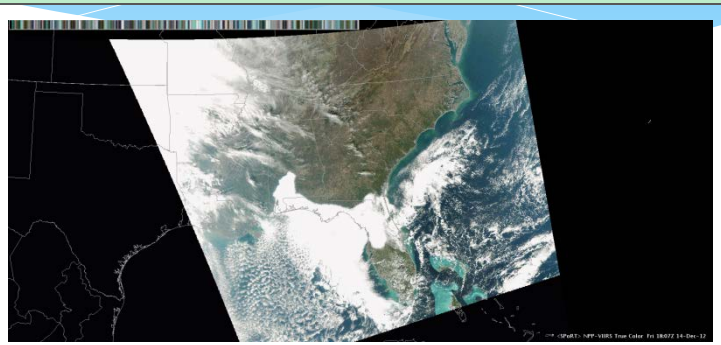
- Multi-byte data sets
- Enhanced RGB display capabilities (with CIRA)
- Ingest and display of non-standard products

Developed and tested a number of AWIPS II plug-ins

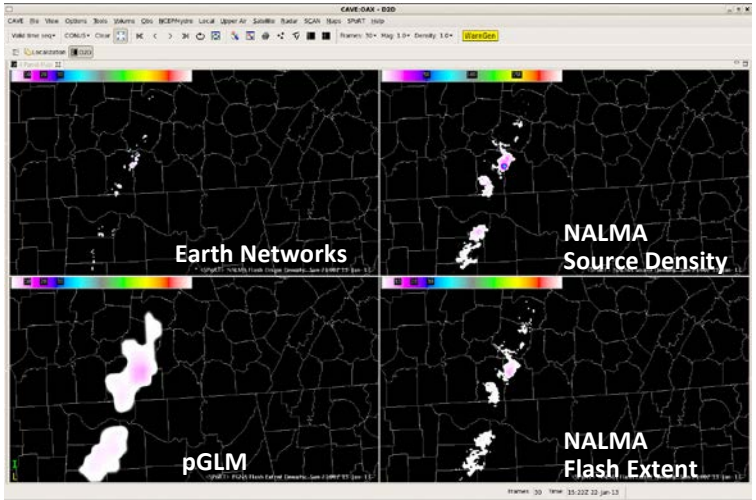
Working with NWS/OST SEC on establishing procedure to transition locally developed plug-ins and tools into AWIPS II for use across NWS (EPDT)

Leading efforts to train team of developers to support PG activities (*EPDT*)

Extension of NASA SPoRT activities for NASA data sets (leverage off existing expertise and resources)



***True color VIIRS data in AWIPS II***




***Total Lightning Data in AWIPS II***

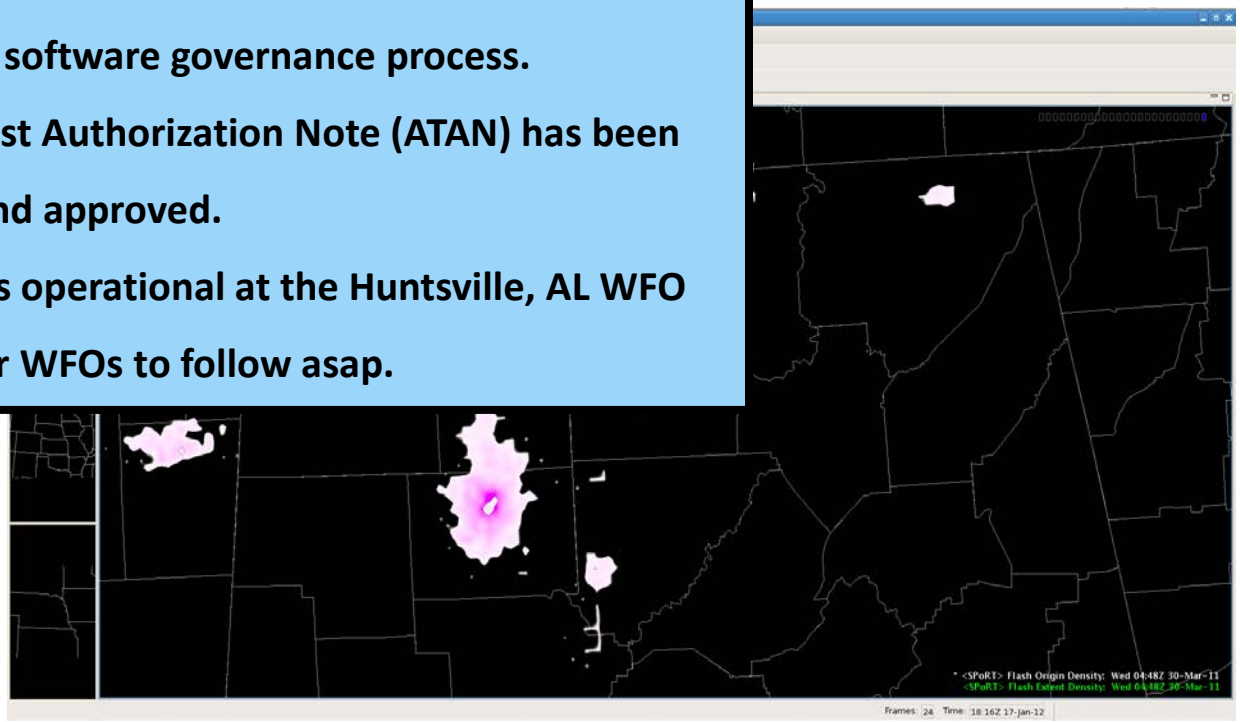
# AWIPS II Plug-ins

## Lightning Mapping Array (LMA)

**This plug-in (LMA) has been through the first phase of the AWIPS II software governance process.**

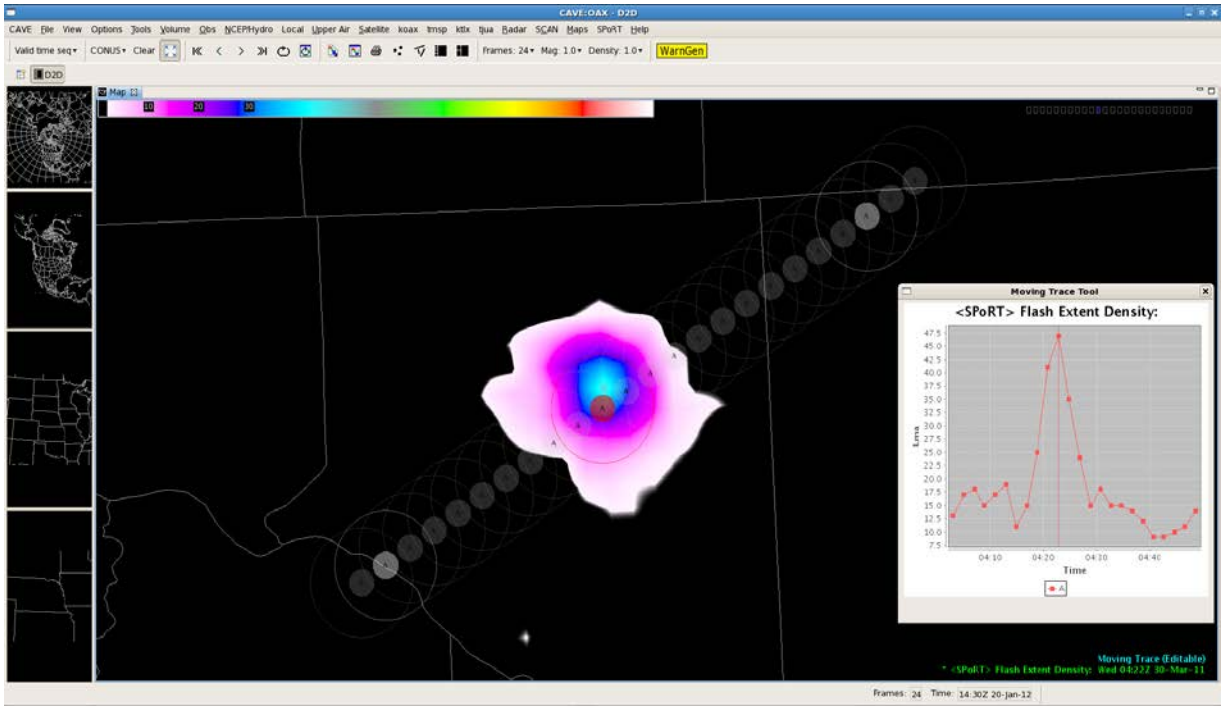
**An AWIPS Test Authorization Note (ATAN) has been submitted and approved.**

**The plug-in is operational at the Huntsville, AL WFO (HUN). Other WFOs to follow asap.**



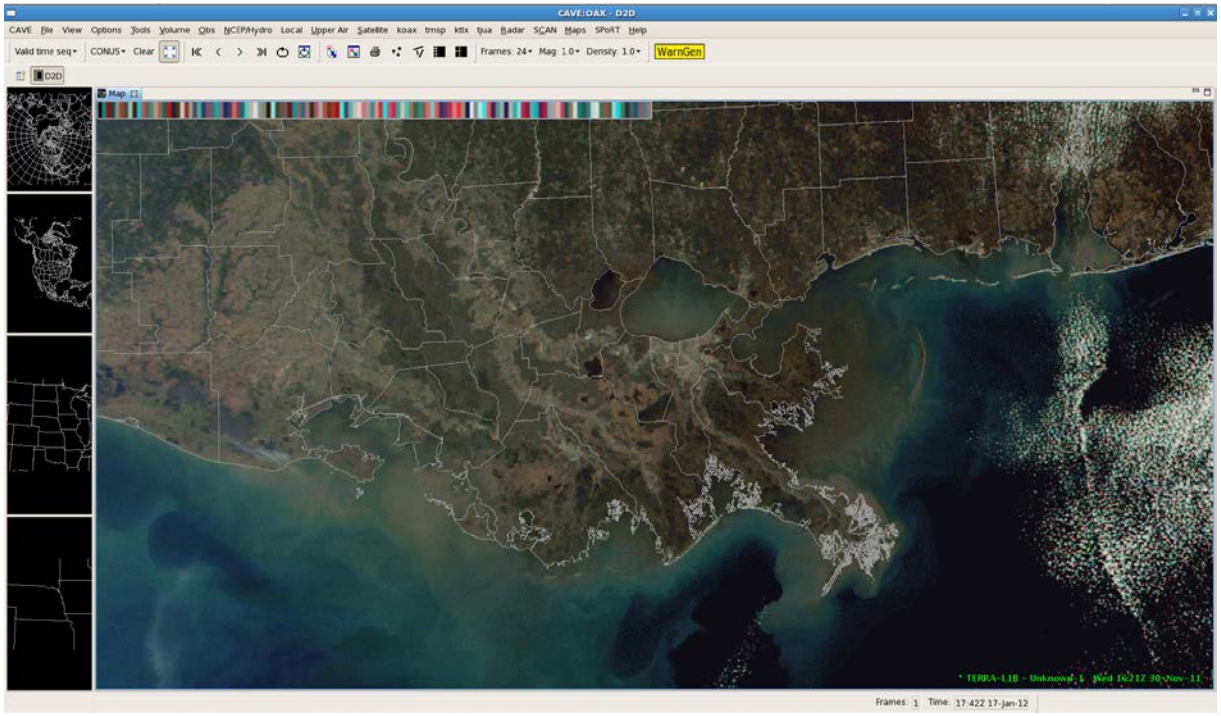
# AWIPS II Plug-ins

## Lightning Tracking Tool



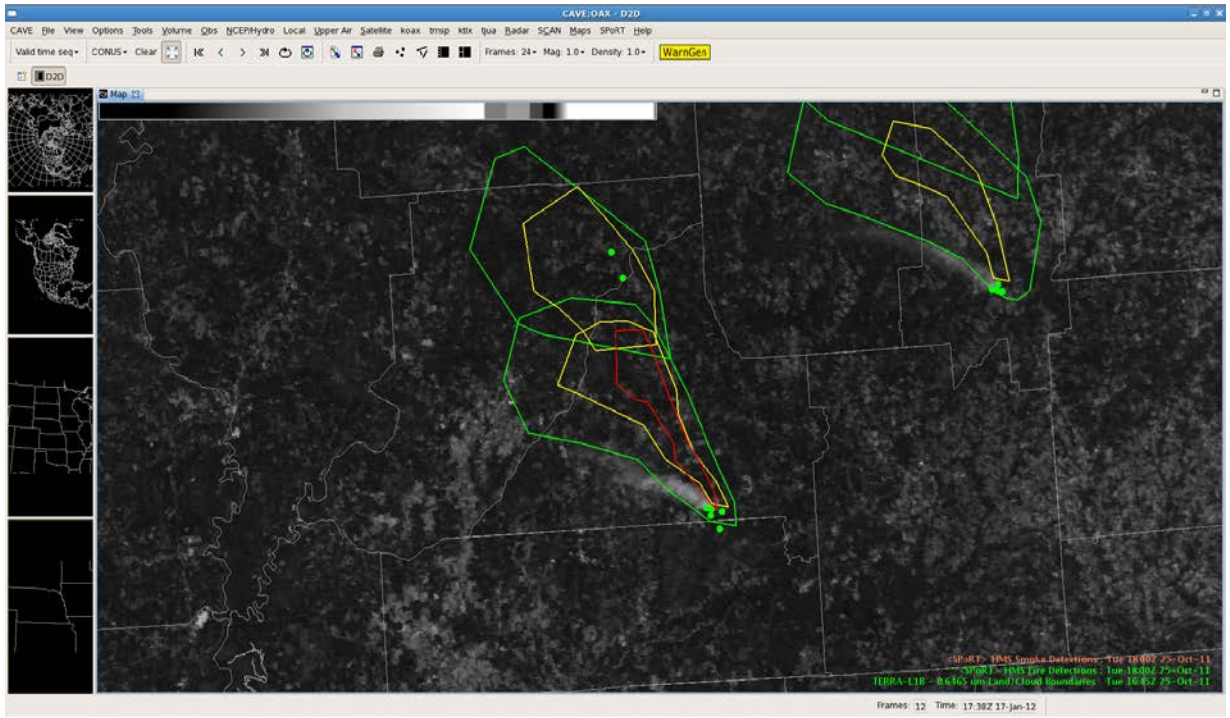
# AWIPS II Plug-ins

## Satellite (McIDAS)



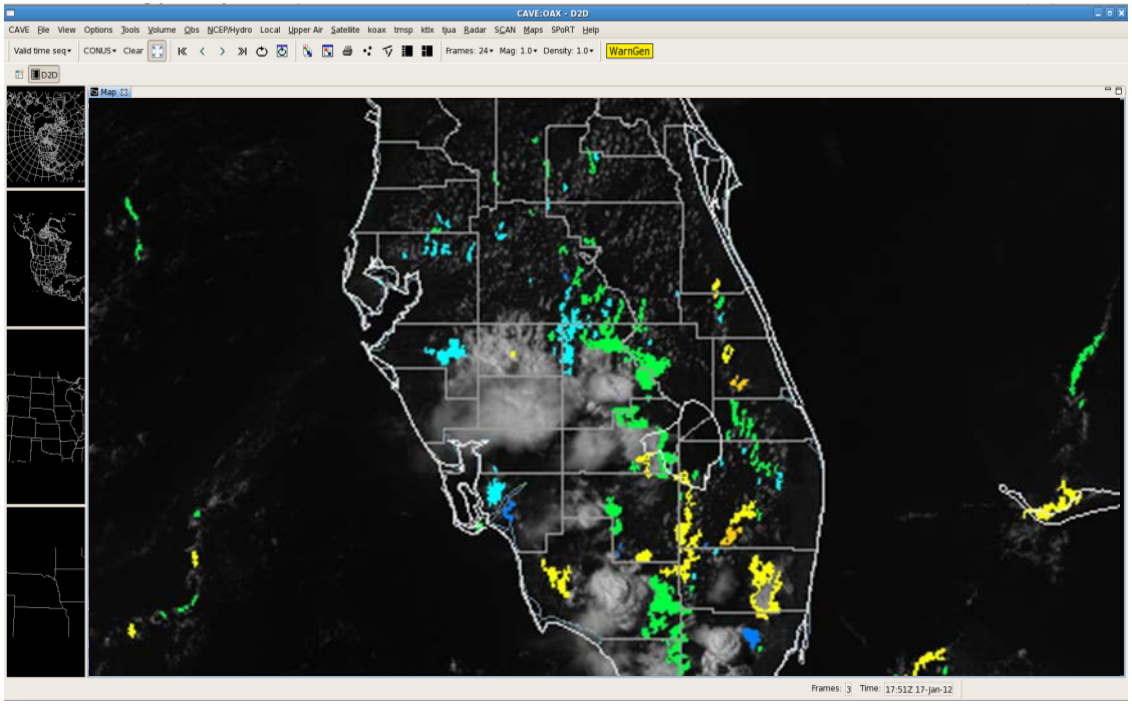
# AWIPS II Plug-ins

## Hazard Mapping System Smoke & Fire



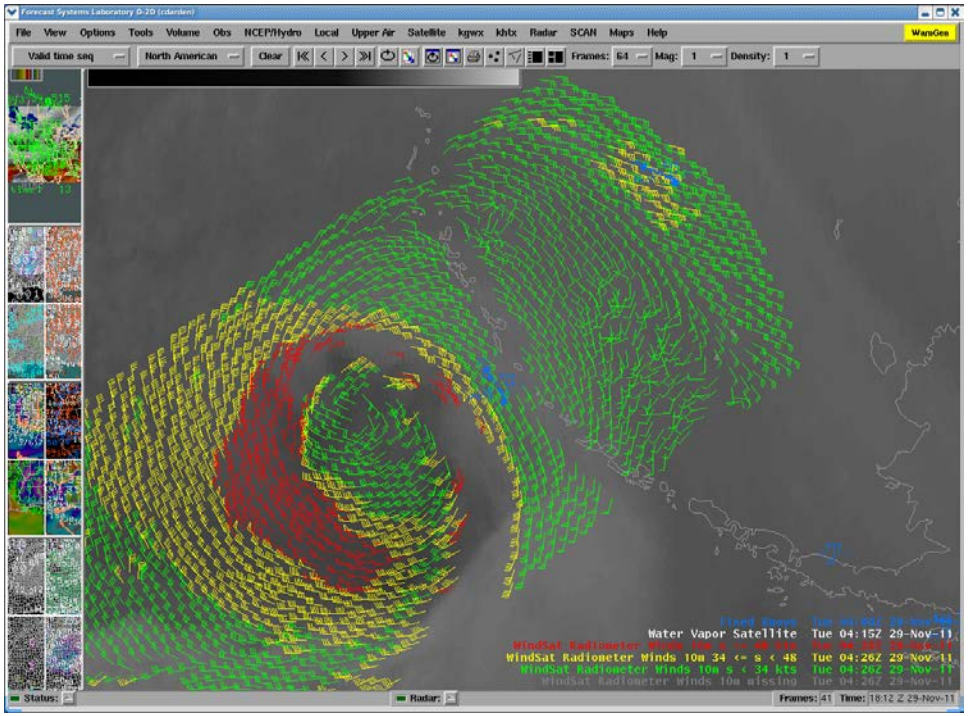
# AWIPS II Plug-ins

## Convective Initiation (GOES-R CI)



# AWIPS II Plug-ins

## Ocean Wind Vectors (in work)
## Modified from NCEP for D2D perspective



# EPDT Spring 2013

- EPDT held last week in Huntsville, AL (NASA/SPoRT)
- First of many workshops
- 15 trainees
- Focused on writing EDEX and CAVE plug-ins
- Some hands-on activities
- Governance plan has been developed/presented

# Current RGB Product Suite

| RGB Product | MODIS Channels or Differences for R,G,B | VIIRS Channels or Differences for R, G, B | SEVIRI Channels or Differences for R, G, B | Applications |
|---|---|---|---|---|
| **Air Mass** | 27-28, 30-31, 27 (inverted) | $C_{6.197}$-$C_{7.299}$*, $C_{9.703}$*-M15,$C_{6.197}$* (inverted) | 5-6, 8-9, 6 (inverted) | Jet Streaks, PV Analysis |
| **Day/Night Band** | | DNB, DNB, M15 | | Clouds |
| **Daytime Convective Storms** | | | 5-6, 4-9, 3-1 | Severe Weather, Water Vapor In/Outflow |
| **Daytime Snow-Fog** | | | 3, 2, 12 (solar: 4, 9, and 11) | Snow Melt, Ice Jams |
| **Daytime Microphysics** | | | 2, 12 (solar: 4, 9, and 11), 9 | Convective, Fog, Fire |
| **Dust** | 32-31, 31-29, 31 | M16-M15, M15-M14, M15 | 10-9, 9-7, 9 | Differential Dust from Cloud |
| **False Color** | 3, 6, 7 | M3, M10, M11 | | Snow, ice, clouds |
| **Natural Color (Land Cover)** | | | 3, 2, 1 | Ice/Water Cloud, Vegetation |
| **Nighttime Microphysics** | 32-31, 31-20, 31 | M16-M15, M15-M12, M15 | 10-9, 9-4, 9 | Fog/Low Stratus, Thin Cirrus |
| **True Color** | 1, 4, 3 | M5, M4, M3 | | Smoke, Land Surface Changes |

* $C_{6.197}$, $C_{7.299}$, and $C_{9.703}$ are corresponding channels from CrIS

# RGB Status

- SEVIRI RGB products used at NCs in NAWIPS
- GOES Sounder Air Mass RGB used at NCs
- MODIS RGBs used at collaborative CONUS WFOs and NCs
- VIIRS RGBs used at partner WFOs
- VIIRS RGBs available at NCs (Michael Folmer)
- Passive Microwave products used at NHC
- Products formatted for AWIPS (254 colors), NAWIPS (95 colors), and AWIPS II (256 colors)
- AWIPS II internal RGB generation and display capabilities being examined
- End user feedback via blog, telecons, and assessments
- Training via Quick Guides, Teletraining

# VIIRS "Blackout" Product

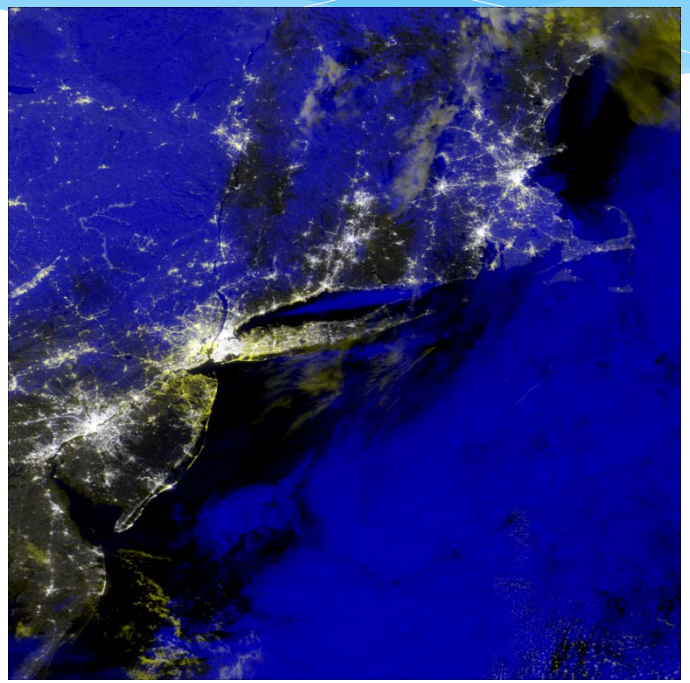
VIIRS day-night band (DNB) used to monitor city lights before and after power outages from Superstorm Sandy

- pre-storm data from August 31 combined with post-storm data in a color composite image
- pre-storm "reflectance" data used in red and green channels, post-storm in blue channels
- "bright" sources in pre-storm data but not in post-storm data show up as yellow

Daily (November 1-10) SPoRT blackout product provided to USGS data portal and used by several disaster relief agencies to stage resources

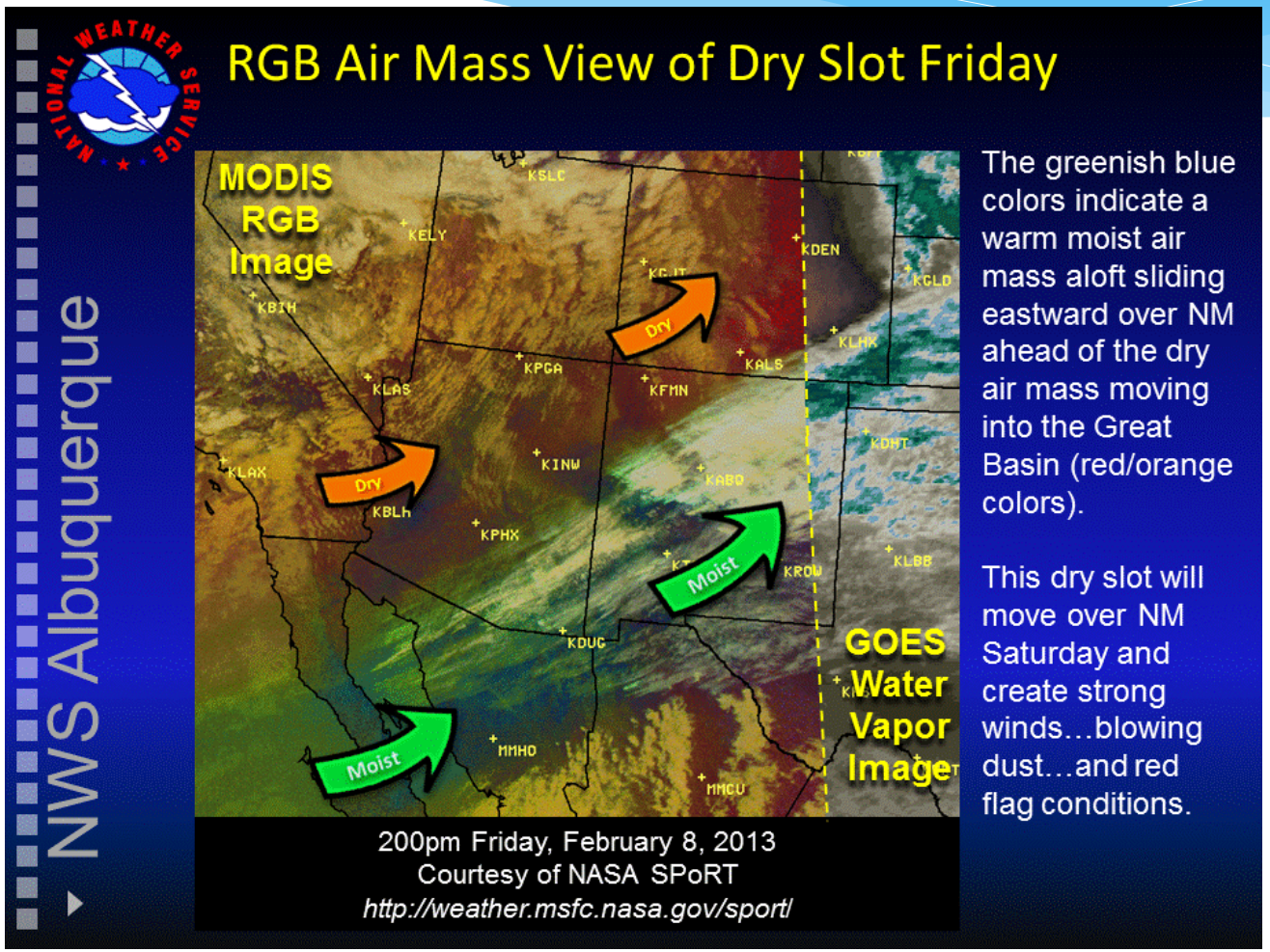
City Lights – 8-31-2012

City Lights – 11-04-2012



RGB composite image indicating extent of area affected by power outage (yellow)

# RGB Feedback




The greenish blue colors indicate a warm moist air mass aloft sliding eastward over NM ahead of the dry air mass moving into the Great Basin (red/orange colors).

This dry slot will move over NM Saturday and create strong winds…blowing dust…and red flag conditions.

# Product Training Important for Interpretation and Use of Data & Products

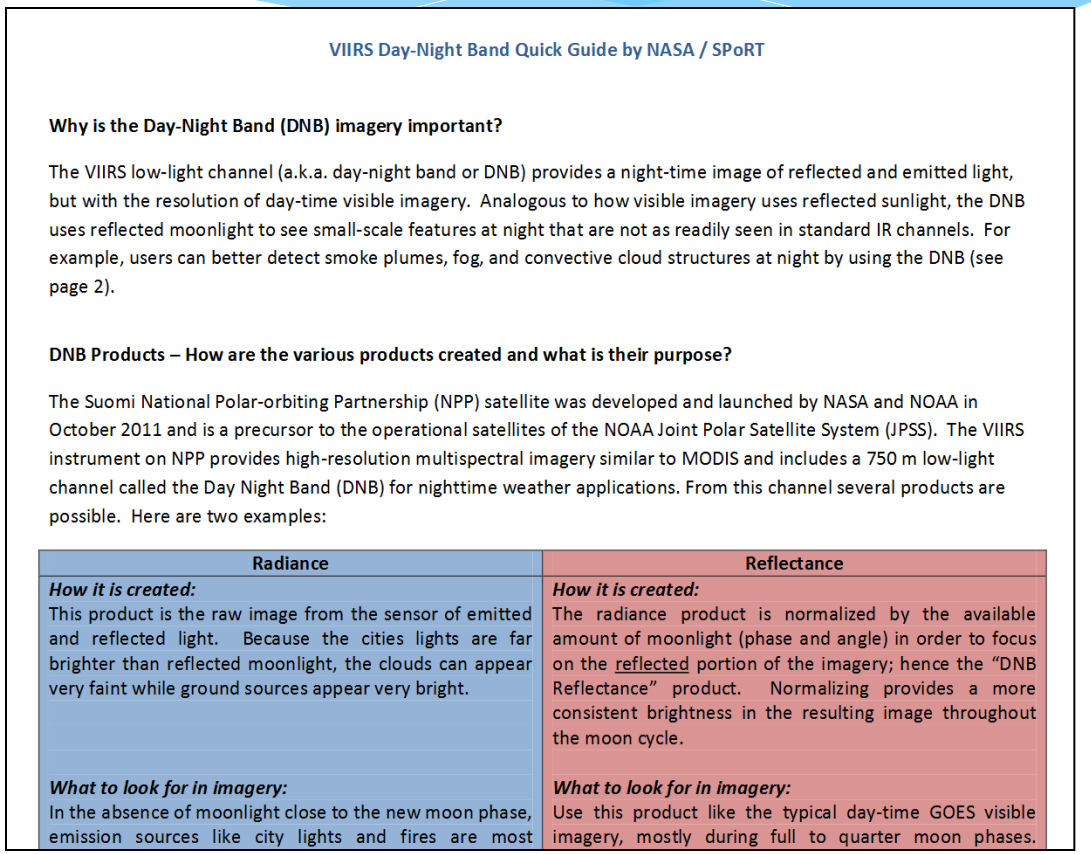
## SPoRT makes a variety of training modules available to end users

- Regular teletraining with users
- "quick guides" for easy forecaster reference
- distance learning modules
- science sharing sessions at WFOs

## Involve end user in training module development

- provide operational examples
- addresses forecasters concerns / usage
- ownership in process / data

Research satellite data offers many new capabilities to enhance situational awareness and disaster applications, but *training* is a key to better use.



VIIRS Day-Night Band Quick Guide by NASA / SPoRT

**Why is the Day-Night Band (DNB) imagery important?**

The VIIRS low-light channel (a.k.a. day-night band or DNB) provides a night-time image of reflected and emitted light, but with the resolution of day-time visible imagery. Analogous to how visible imagery uses reflected sunlight, the DNB uses reflected moonlight to see small-scale features at night that are not as readily seen in standard IR channels. For example, users can better detect smoke plumes, fog, and convective cloud structures at night by using the DNB (see page 2).

**DNB Products – How are the various products created and what is their purpose?**

The Suomi National Polar-orbiting Partnership (NPP) satellite was developed and launched by NASA and NOAA in October 2011 and is a precursor to the operational satellites of the NOAA Joint Polar Satellite System (JPSS). The VIIRS instrument on NPP provides high-resolution multispectral imagery similar to MODIS and includes a 750 m low-light channel called the Day Night Band (DNB) for nighttime weather applications. From this channel several products are possible. Here are two examples:

| Radiance | Reflectance |
|---|---|
| ***How it is created:*** This product is the raw image from the sensor of emitted and reflected light. Because the cities lights are far brighter than reflected moonlight, the clouds can appear very faint while ground sources appear very bright. | ***How it is created:*** The radiance product is normalized by the available amount of moonlight (phase and angle) in order to focus on the reflected portion of the imagery; hence the "DNB Reflectance" product. Normalizing provides a more consistent brightness in the resulting image throughout the moon cycle. |
| ***What to look for in imagery:*** In the absence of moonlight close to the new moon phase, emission sources like city lights and fires are most | ***What to look for in imagery:*** Use this product like the typical day-time GOES visible imagery, mostly during full to quarter moon phases. |

Two-sided laminated "Quick Guide" for VIIRS DNB

# Poll Question

After full transition to AWIPS II (matching AWIPS I capabilities), what is the most important new capability to develop?

A. Satellite data with native (>8-bit) data depth
B. True 24-bit imaging capability
C. 3-Dimensional capability
D. Other