

GOES-R Program



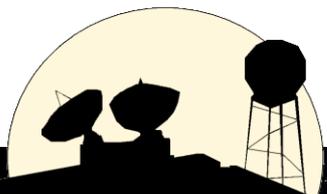
CIMSS/ASPB Participation GOES-R Proving Ground Status

Wayne Feltz, Mike Pavolonis, Tim Schmit, Andy Heidinger, Jordan Gerth, Scott Bachmeier, Scott Lindstrom, Justin Sieglaff, Lee Counce, Robert Aune, Gary Wade, Brad Pierce, Kaba Bah, Will Straka, Jason Otkin, Sarah Monette, Chris Velden, Ralph Petersen, Russ Dengel, Joleen Feltz, Dan Hartung



March 12, 2012

- Demonstration of GOES-R PG applications at National Center Testbeds and NWS WFOs
- Suomi NPP VIIRS demonstrated in AWIPS
- AWIPS Weather Event Simulator (WES) for the GOES-R ABI.
- AWIPS-2 status
- GOES-15 Update



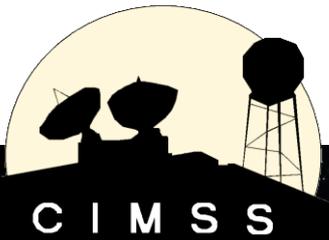
- Planning on 2012 Hazardous Weather Testbed (HWT) participation with distribution of WRF simulated radiances, Nearcasting
 - CTC within thin cirrus
 - Jordan Gerth, Justin Sieglaff, Lee Cronic, Bob Aune, Jason Otkin, and Wayne Feltz will participate
- Continue distribution of GOES-R Fire Hotspot and Intensity proxy products (GOES imager based) to SPC for Fire Weather Testbed (now AWIPS/N-AWIPS)
- Participated in Regional OSSE/High Impact Weather meeting in February (Petersen/Schmit/Li/Otkin)



- AWC GOES-R Research-to-Operations position face-to-face interviews will be conducted on Wednesday of this week (Bright/Feltz)
- NWSTC position: Chad Gravelle continues to become familiar with NWS TC and AWC infrastructure and will work closely with AWC satellite champion once hired
- Initial AWT planning telcon last week, plan is under development
- UWCI, OTTC, Fog/low cloud, and WRF simulated ABI radiance products are available via LDM and can be viewed in N-AWIPS
- MODIS volcanic ash and SO₂ are available in AWIPS
- Product evaluation periods for each product will be determined in the coming weeks as the operations plan is developed
- **UW-CIMSS satellite applications “Boot Camp” delayed until GOES-R satellite champion hires are in place**

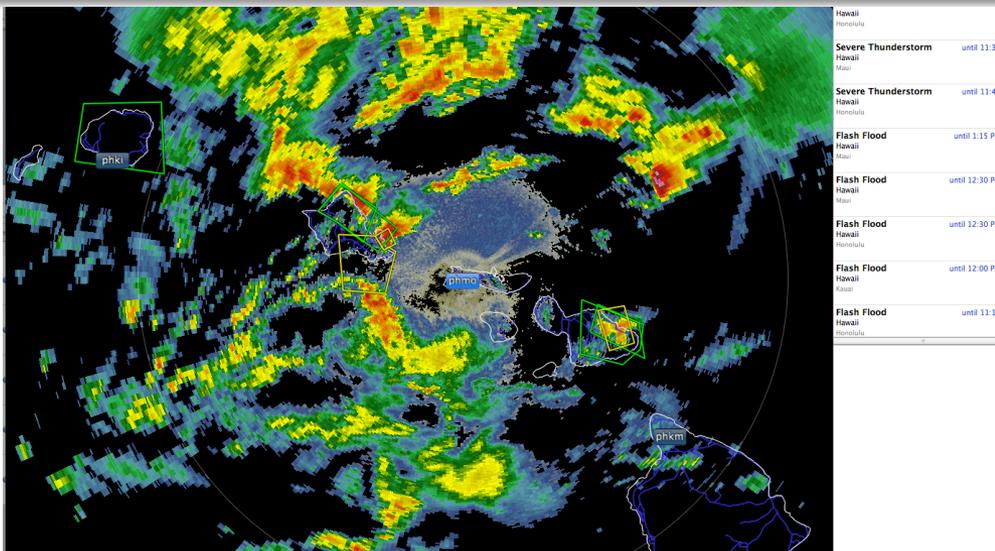


- **Volcanic ash, SO₂, Fog/low cloud, Cloud top phase, Cloud type products have been available in AWIPS at all WFO's in AK and at the AAWU since January 2011**
- **Live training sessions were conducted, and a volcanic ash VISITview module is available. Updated training for fog/low cloud is being developed**
- **A volcanic ash WES case is nearly complete**
- **Automated ash cloud alerts from AVHRR and MODIS will be provided to the VAAC and CWSU in the coming months. These alerts are already being distributed to the USGS in Alaska and successfully detected the eruption of Cleveland on December 29 2011. Cleveland is a seismically unmonitored volcano in the Aleutians.**
- **At the request of the Anchorage VAAC and CWSU, we are working on GOES-R like products for GOES-15**
- **We are awaiting user feedback**



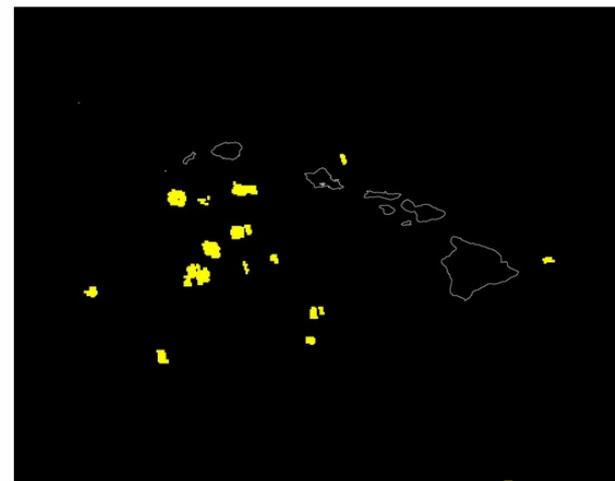
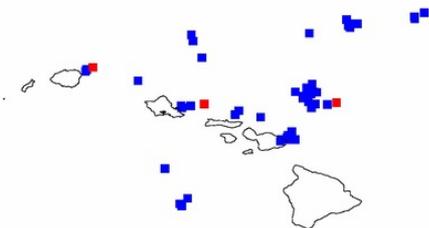
- Coordinating with Mark DeMaria and Steve Businger
- Roy Huff will visited UW-CIMSS Jan 30 – Feb 3 for orientation to UW-CIMSS provided GOES-R PG products within plan
- Jordan Gerth visited U of Hawaii and Honolulu NWS last week (March 5-9) to begin integration of Convective Initiation, Overshooting-Top, Morphed TPW (MIMIC TPW) products
- Wayne Feltz will visit in June or July 2012
- Volcanic ash and SO₂ (from MODIS) preliminary transition assessment also occurred, however most likely after DB antenna installed
- DB antenna is on an installation timeline of June 2012 after communication with Liam and Orbital Systems (Liam Gumley/ Steve Businger)





Daily Cumulative OT/TC Detects: 20120309 at 1645 UTC

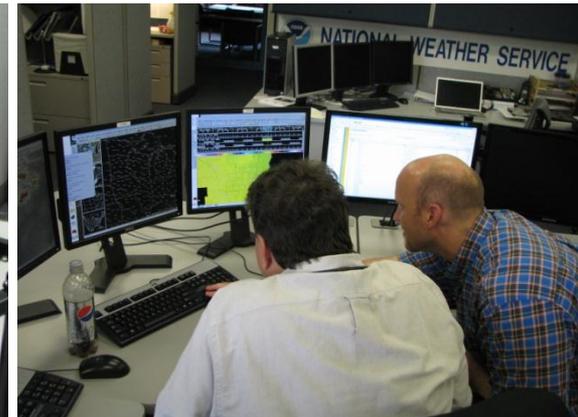
Daily Cumulative CI Hits: 20120309 at 1645 UTC



- Hourly ABI IR Bands using NSSL WRF
- Request for Nearcasting product for evaluation
- Simulated ABI Imagery (bands 8-16) over the CONUS, follow HPC/SPC methodology for delivery (N-AWIPS preferred); SAB wanted McIDAS format - sent ADDE server info to Jamie K.
- UW-CIMSS providing Overshooting-Top/Enhanced-V products (same methods as SPC delivery), N-AWIPS displayed at OPC
- Cloud top height, phase, and temperature from GOES imager are in progress for display within N-AWIPS and AWIPS
- Volcanic Ash due for integration
- Derived stability indexes (using GOES Sounder SFOV) delayed until 2012



- MKX GOES-R Demonstration plan in progress.....
- OMA AWIPS-2 now available and they are requesting cloud top cooling and OT as part of COMET grant, formal WFO PG plan will be developed (Chad will be informed)

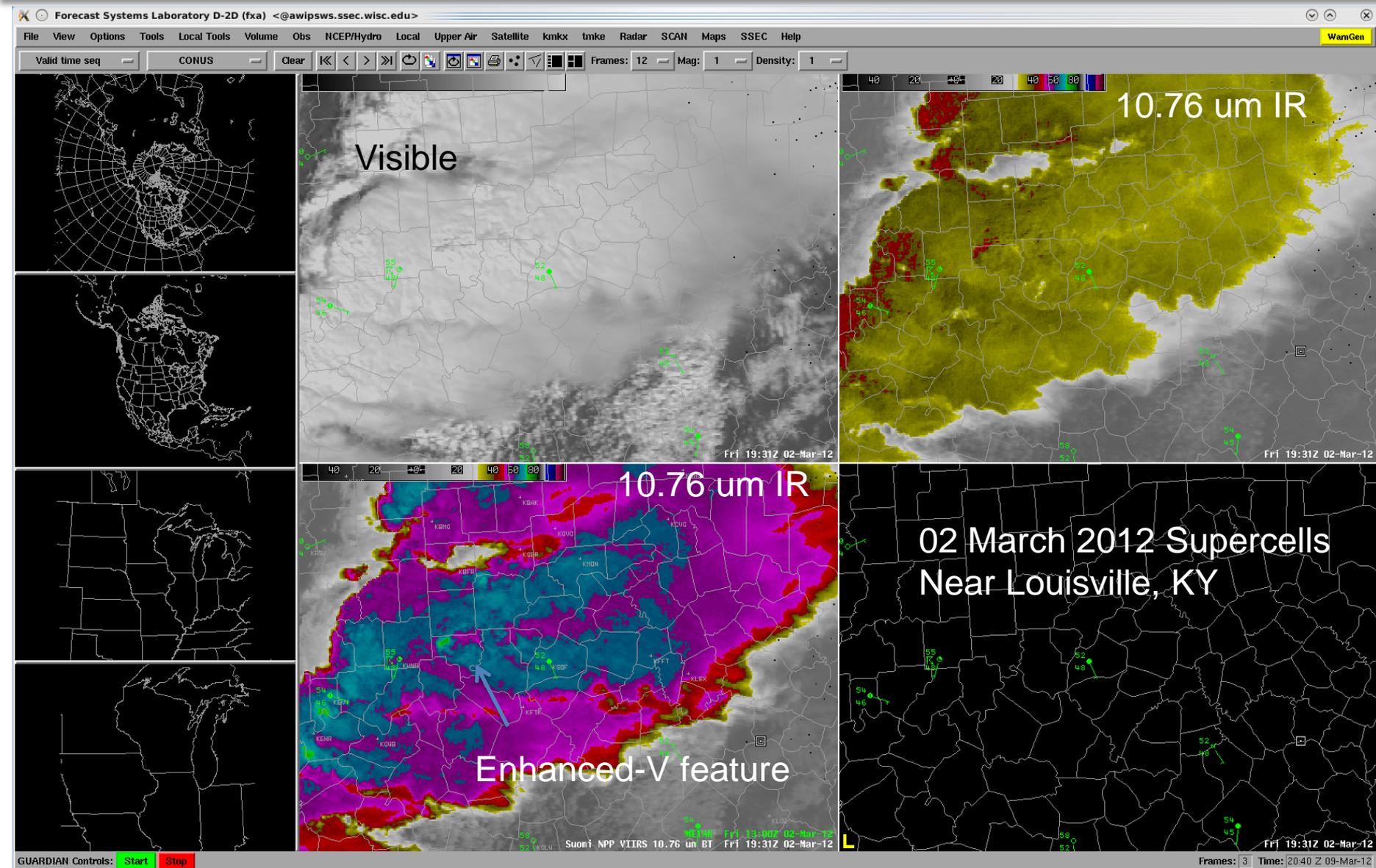




Suomi NPP VIIRS in AWIPS



Suomi NPP VIIRS AWIPS





Midwest storms (3/2/2012) SVM05



Applications Places System Wed Mar 7, 14:44

Forecast Systems Laboratory D-2D (fxa)

File View Options Tools Local Tools Volume Obs NCEPHydro Local Upper Air Satellite Linkx Radar SCAN Maps SSEC Help

Valid time seq CONUS Clear Frames: 12 Mag: 1 Density: 1

SSEC/CIMSS

Suomi NPP VIIRS 0.67 um ref1 FFI 19:34:02 Mar-12
Frames: 2 Time: 14:43 Z 07-Mar-12

GUARDIAN Controls: Start Stop
08:38 AM (4) ANNOUNCER: vb has been started successfully



Midwest storms (3/2/2012) Convection, SVM05



Applications Places System Forecast Systems Laboratory D-2D (fxa) Wed Mar 7, 14:46

File View Options Tools Local Tools Volume Obs NCEPHydro Local Upper Air Satellite knkx Imke Radar SCAN Maps SSEC Help

Valid time seq CONUS Clear Frames: 12 Mag: 1 Density: 1

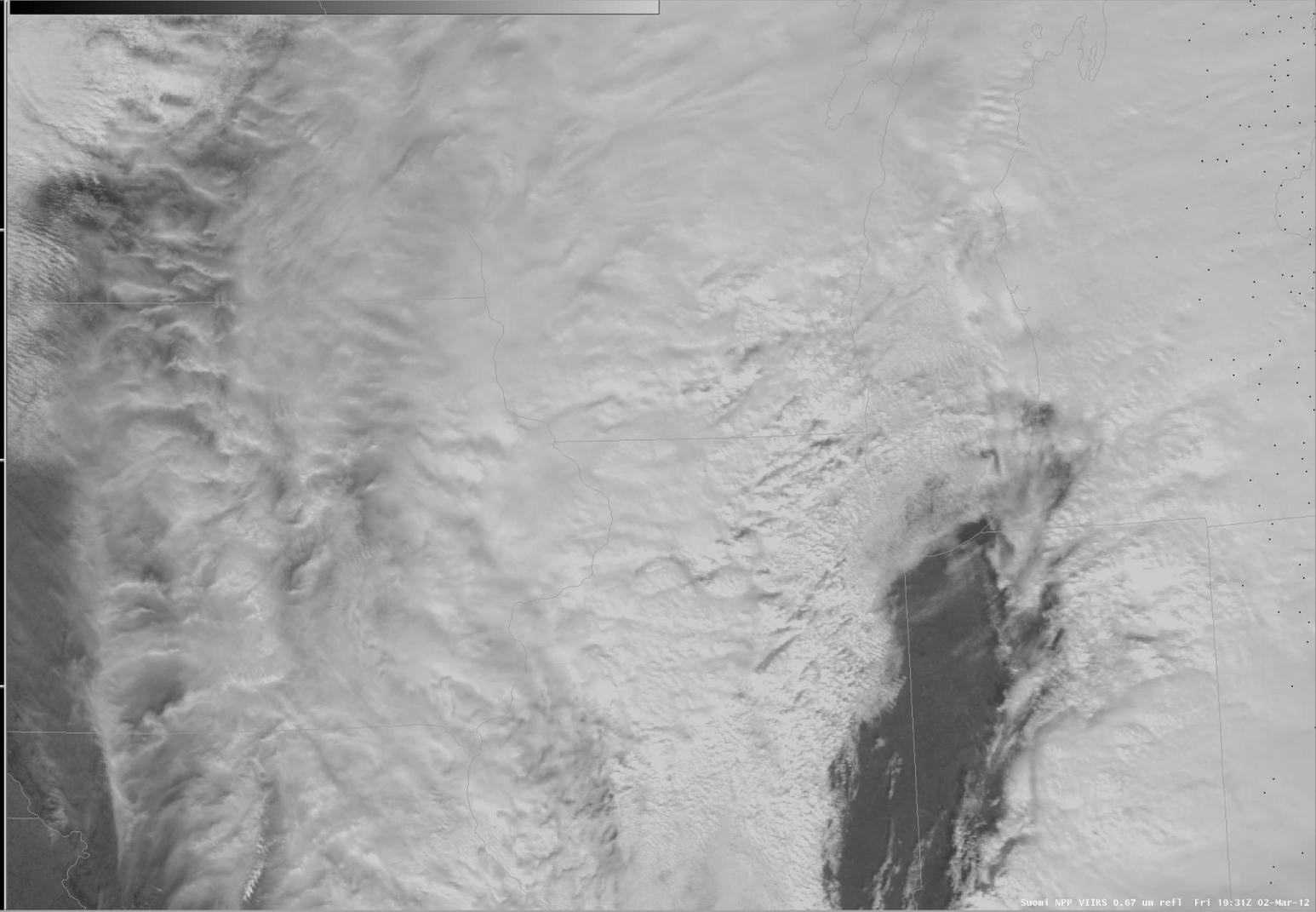
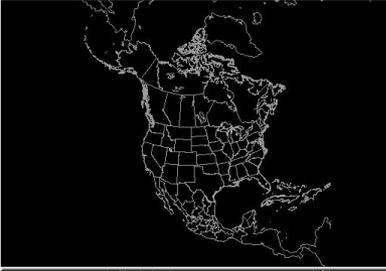
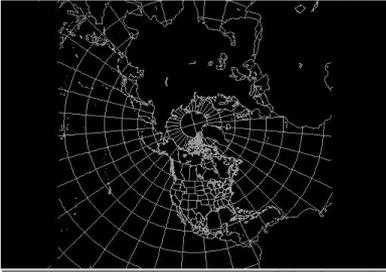
SSEC/CIMSS

Strom NPP VIIRS 0.67 um Refl Fri 19:31Z 02-Mar-12
Frames: 2 Time: 14:45 Z 07-Mar-12

GUARDIAN Controls: Start Stop
06:38 AM (4) ANNOUNCER: vb has been started successfully.



Midwest storms (3/2/2012) Wisconsin snow storm, SVM05



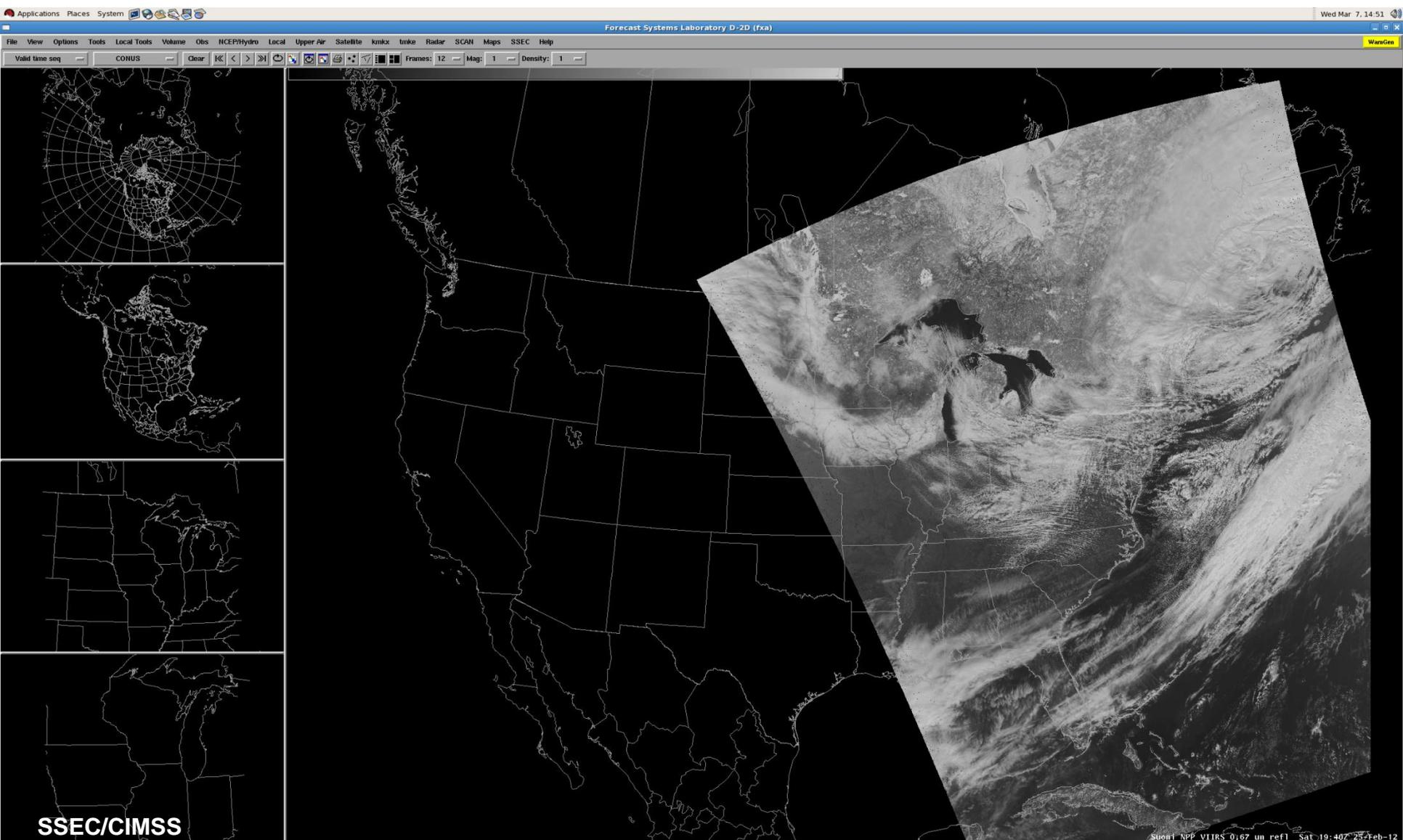
SSEC/CIMSS

Suomi NPP VIIRS 0.67 um refl Fri 19:31Z 02-Mar-12

Frames: 2 Time: 14:47 Z 07-Mar-12



Wisconsin snow (2/25/2012) SVM05



SSEC/CIMSS

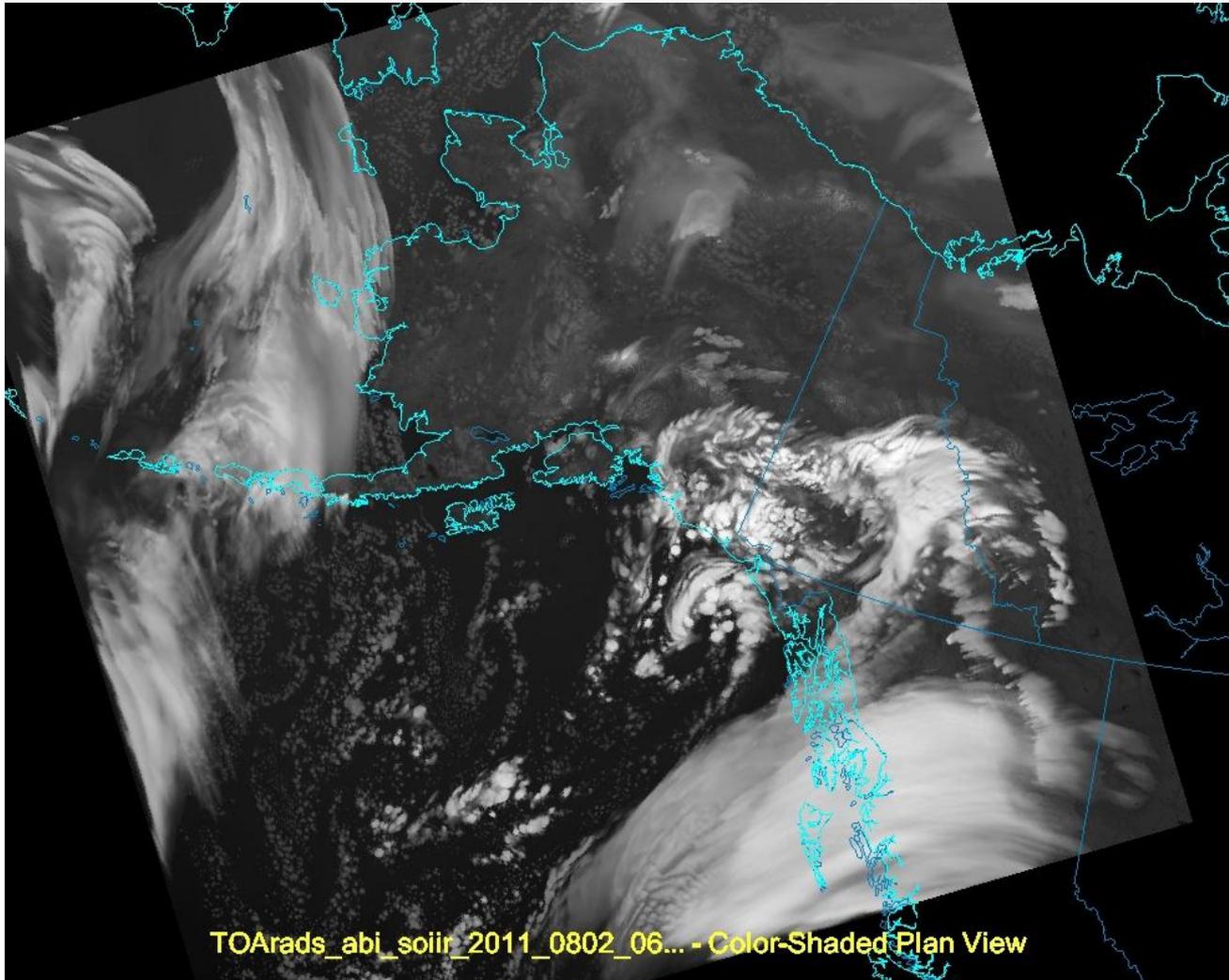
Suomi NPP VIIRS 0.67 um ref1 Sat 19:40Z 25-Feb-12

Frames: 2 Time: 14:51 Z 07-Mar-12

- Working on Alaska Volcanic WES case
- WRF – ABI WES case over Alaska domain



Alaska WES domain



WRF-ARW Alaska Domain – in collaboration with Don Morton



- **Modified existing plug-ins**

- GINI Satellite: To display GOES-15 Imagery and Products

- McIDAS AREA: To display NSSL-WRF Simulated ABI Imagery, MVFR/IFR Probabilities

- McIDAS AREA: Demonstrated derived parameters to support future data fusion

- GRIB2: Display convective initiation, nearcasting, and other model output

- **Tools to analyze and display data in AWIPS II**

- Interactive RGB image creation from multiple bands

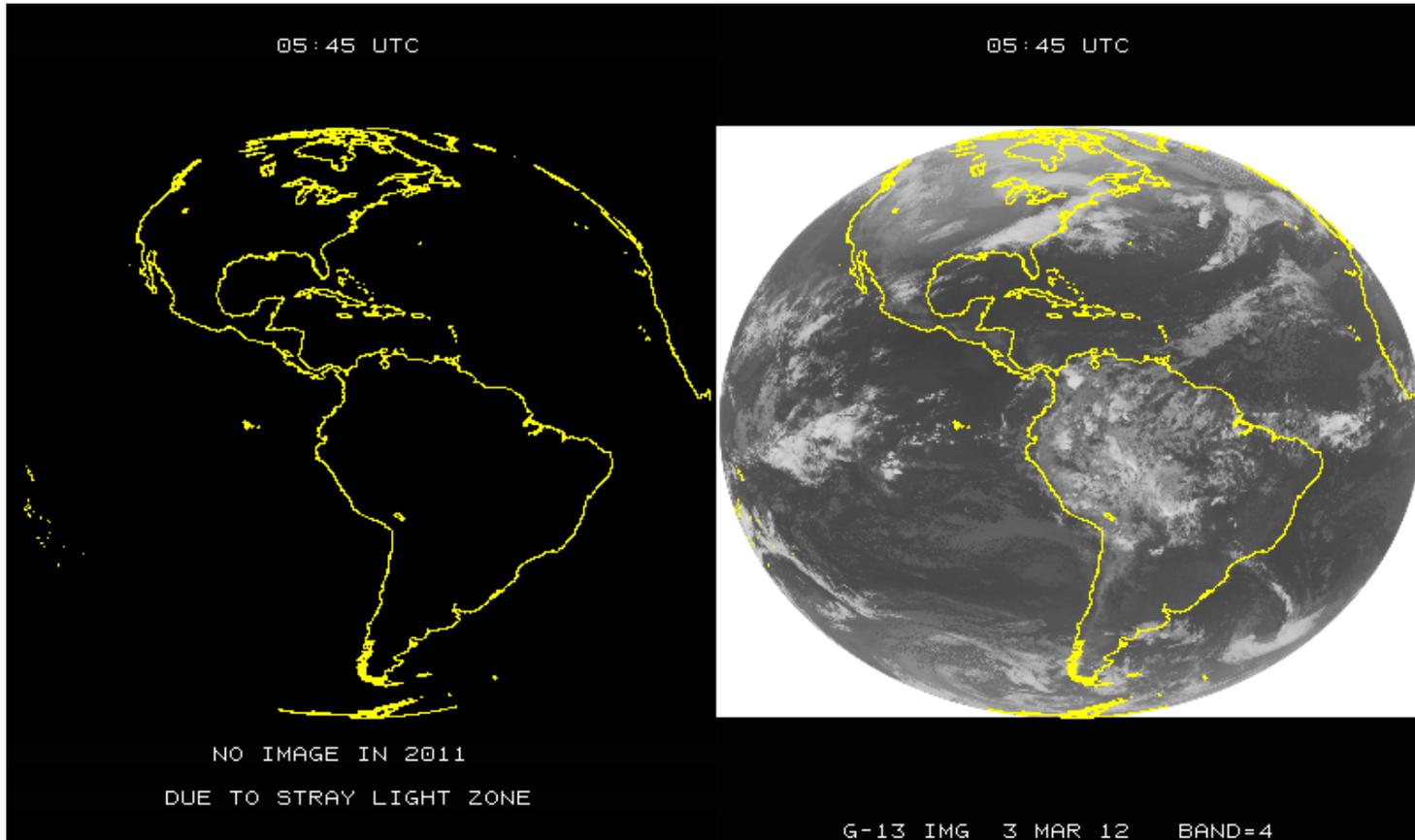
- VIIRS imagery ingest via netCDF4-CF

- Geospatial functionality to handle native navigation of polar satellite imagery in McIDAS AREA

- GOES Imager SLC Operational as of February 22, 2012 at 04 UTC
- Currently, GOES-13 Imager only is being corrected for stray light.
- Mostly affects GOES imager band 2 (4 micrometer)
- Allows extra images to be scanned around satellite midnight.
- Corrects most of the 'extra' or stray radiation in the earth scenes
- Stray Light correction status bits sent out over GVAR and are now part of the McIDAS area line prefix
 - Enabled, performed relative position of the sun, etc.
- GOES-15 Imager stray light correction is planned for the fall of 2012
- The GOES-R ABI can't scan as close to the sun as the GOES-13/14/15

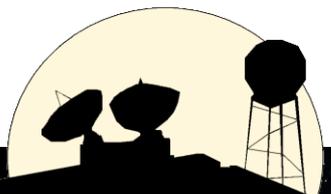


- Extra full disk image with the Stray light correction, compared to last year.



March 3, 2011

March 3, 2012



CIMSS



- <http://cimss.ssec.wisc.edu/goes/blog/archives/9816>



University of Wisconsin-Madison / Space Science and Engineering Center

CIMSS Satellite Blog



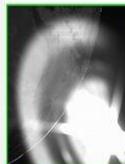
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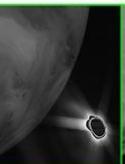
Stray Light Corrections in GVAR Signal for GOES-East

February 29th, 2012

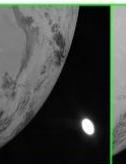
3.9um



6.5um



10.7um



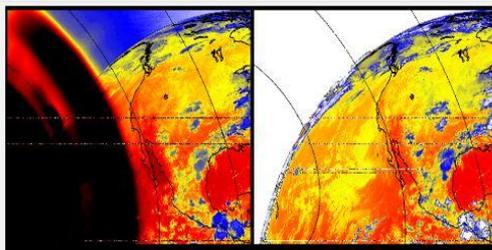
13.3um



Four IR Channel from imager with stray light contamination

There are periodic, and predictable, errors within the raw signal on the GOES satellites that arise when sunlight hits the Satellite so that it emits radiation that is detected by the sensor, or when satellite structures reflect energy towards the sensors. There errors usually arise when the Sun is close to being viewed directly by the sensor near "Satellite Midnight". NOAA/NESDIS has recently (22 February 2012) implemented a series of corrections to mitigate these errors on the GOES-13 Imager. Not only does this increase the number of useable images, but it makes derived products – cloud top pressure, for example – more accurate. Parameters pertinent to the correction are included within Block 0 of the GVAR signal. In McIDAS, these bits relating to the stray light status are included as part of the AREA line prefix.

An example of the error in the raw (or un-corrected) signal is shown at top, with data from the four infrared channels (3.9 6.5, 10.7 and 13.3 micrometers) shown. Note the comparative magnitude of the extra radiation: it is far stronger and more widespread in the 3.9 micrometer image because the sun emits so much more radiation at that wavelength. (The Imager band most affected is the visible band (click [here](#) to see two contaminated — and uncorrected — and one clean image), the images above are at night). Options to deal with the stray light errors included: (1) Send all imagery , regardless of solar position/contamination, and let users decide; (2) Cancel images if the sun is within 6 degrees (currently) or 10 degrees of the frame boundary; (3) Scan away from the sun – for example, scan only the Northern Hemisphere if the solar contamination is in the Southern Hemisphere during the Spring eclipse season; and (4) Apply an L1B algorithmic correction to minimize stray light in the images prior to GVAR broadcast. Option (4) has been implemented for GOES-13. Currently option (3) is being implemented for GOES-15.



3.9 micrometer images showing stray light contamination (left) and corrected version (right)

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March 2012

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<http://spaceplace.nasa.gov/mission-chronicles/#schmit>

Notes from real scientists and engineers working on space and Earth-from-space missions...



Watching from above—WAY above!

February 2012

Tim Schmit

Research Satellite Meteorologist, NOAA
NESDIS, Madison, WI
NOAA Geostationary Operational
Environmental Satellites

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NEXT-GEN WEATHER SATELLITES TO IMPROVE TORNADO WARNINGS

Feb 29, 2012: When you read the following paragraph, consider the following: Tornado season hasn't even started yet.

On Jan. 22 and 23, 2012, more than 37 tornadoes struck the southern USA. Ten of them tore across the Lower Mississippi Valley into Alabama. Worst hit were St. Clair and Jefferson County, Ala., where 2 people were killed, about 100 others injured, and at least \$30 million in damage was done. It was a chilling reminder of the April 2011 onslaught of deadly tornadoes that took a staggering toll across southern and Midwestern states.¹

In southern parts of the USA, tornado season tends to peak in springtime. Yet January 2012 produced 73 winter tornadoes — third most of any January in recorded history. Most of them struck southern states. And since over a quarter of the incredible 1,630 twisters confirmed across the US in 2011 occurred in the four-state region of Alabama, Georgia, Mississippi and Tennessee, residents there are becoming ever more wary of darkening skies.

"Even with our advances in science and communications, we can still be surprised by the deadliest storms," says NOAA scientist Steve Goodman. "But NOAA is working with NASA and university researchers to give more lead time in tornado warnings."

Southern tornadoes are especially insidious and challenging to track. The hilly, forested terrain in southern states makes an approaching twister harder to spot than in the flat Midwest. In the south you might not see the first evidence of an approaching tornado until it's almost in your back yard.

An Alabama resident describes the scene just before one of the April 2011 twisters struck near his home: "Suddenly, all the trees in my back yard corkscrewed violently, in unison, toward the northwest." Moments later, the storm was there.

Rain wrapped tornadoes are especially hard to see, as are night-time tornadoes. And records indicate that southern tornadoes often strike at night.

To reduce the surprise, NOAA and NASA² are developing the Geostationary Operational Environmental Satellite-R, or "GOES-R" series,³ with the first expected to launch in late 2015. These next-generation weather satellites bristle with state-of-the-art instruments for improved scouting of these killer storms, even at night.

Tornadoes are, by their very nature, difficult to pin down. The Advanced Baseline Imager (ABI) on GOES-R will improve meteorologists' ability to assess conditions that spawn twisters. Compared to current GOES imagers, the ABI provides twice the spatial resolution, three times as many channels of information, and more than five times the update rate.

"ABI will give us a much clearer picture of the clouds — where and how tall they are, how much and what kind of moisture they hold, and how they are moving and intensifying," says NOAA research meteorologist Tim Schmit.

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http://science.nasa.gov/science-news/science-at-nasa/2012/29feb_tornadosurprise/



- **2012**

- AMS Annual Meeting 22-26 Jan. New Orleans, LA
- Regional OSSE/HIW 07-09 Feb. Norman, OK
- TOVS 21-27 Mar. Toulouse, France
- AWG/PG/RR 30 Apr. – 4 May Kansas City, KS
- No O-CONUS -
- WMO Nowcasting 06-10 Aug Rio, Brazil
- EUMETSAT 03-07 Sept. Sopot, Poland
- NWA 6-12 October Madison, WI

- **2013**

- AMS Annual Meeting 6–10 January Austin, TX
- DRC/GUC 8-12 April Miami, FL
- O-CONUS (near Solstice) Alaska
- PG/AWG (between Solstice and Equinox)? Madison, WI
- EUMETSAT/AMS Sept Vienna, Austria

