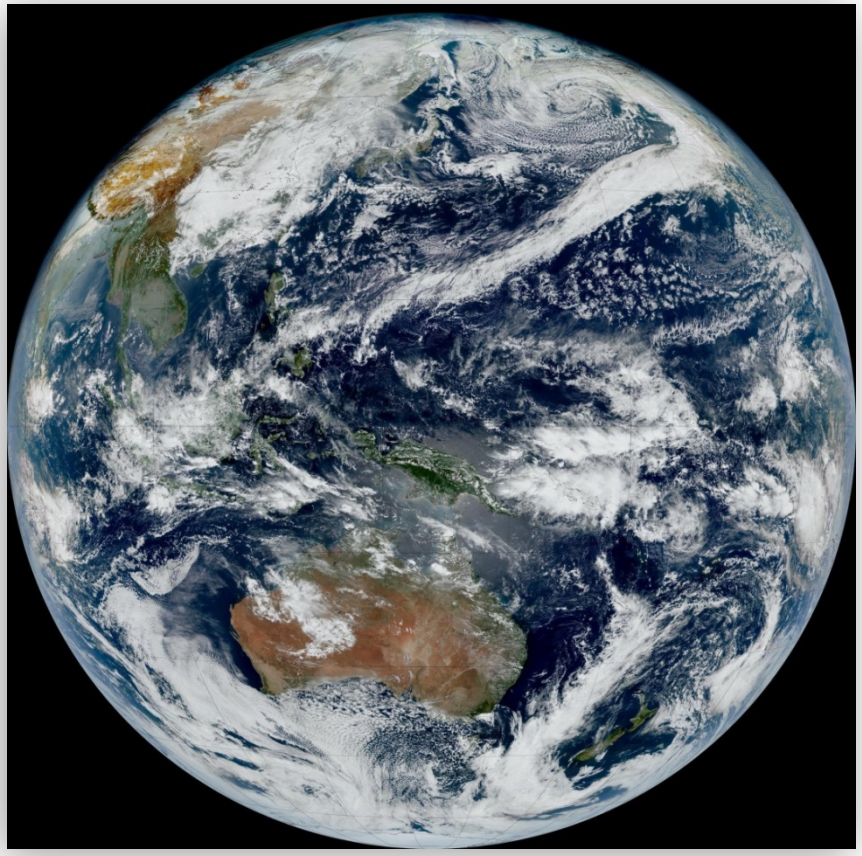
Leveraging Himawari-8/AHI for GOES-R Readiness

Leveraging Himawari-8/AHI for GOES-R Readiness

- Himawari-8 was successfully launched October 7, 2014 and carries the AHI which is an almost identical instrument to the ABI
- Availability of AHI datasets brings an unprecedented opportunity to exercise the Level-2 algorithm developed for GOES-R
- NESDIS/STAR is now pulling full resolution AHI data (all bands) from JMA's Cloud Service
- GOES-R Algorithm Working Group (AWG) teams are working to test their product algorithms with AHI data
- Used in GOES-R Proving Ground Activities
- Special thanks to JMA for sharing data and collaborating with NOAA and NASA during their post launch checkout

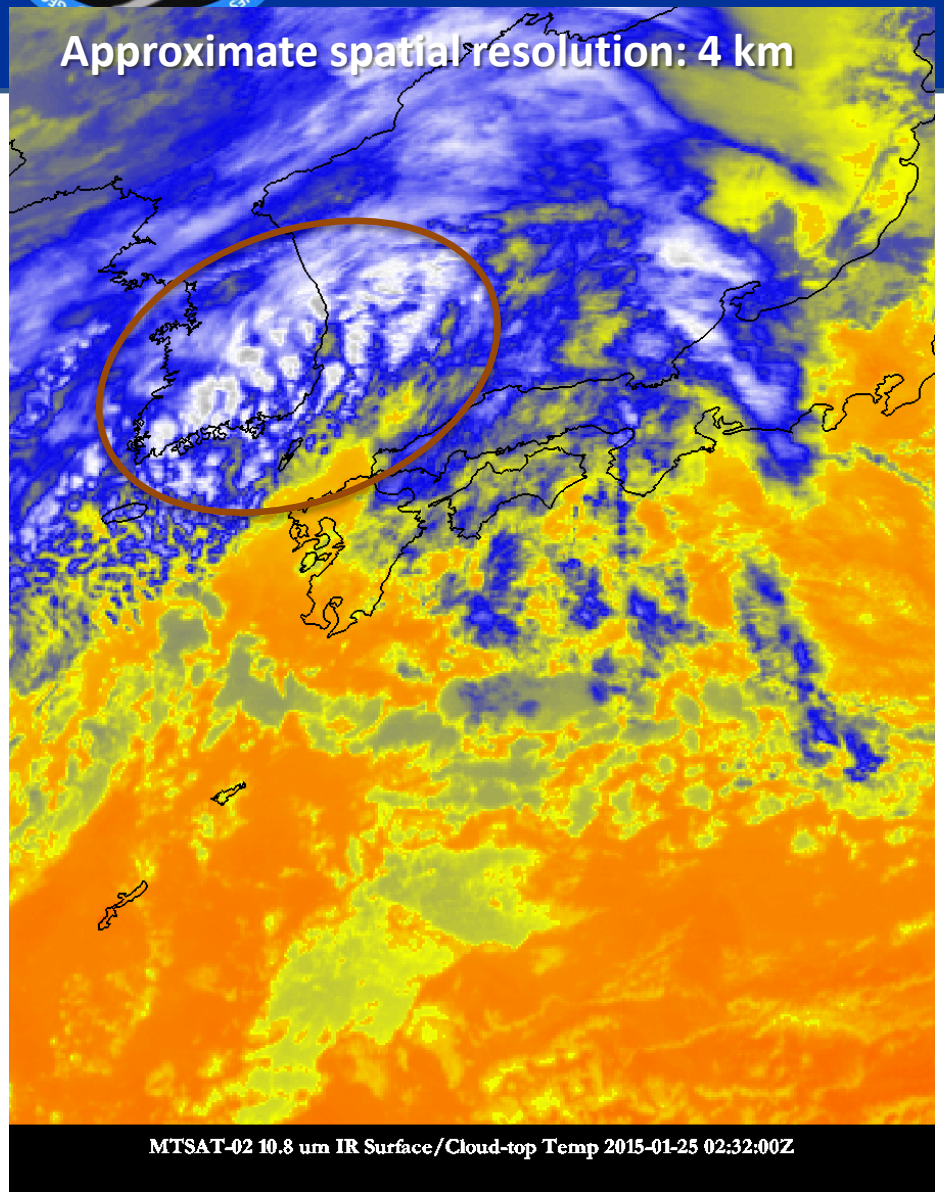


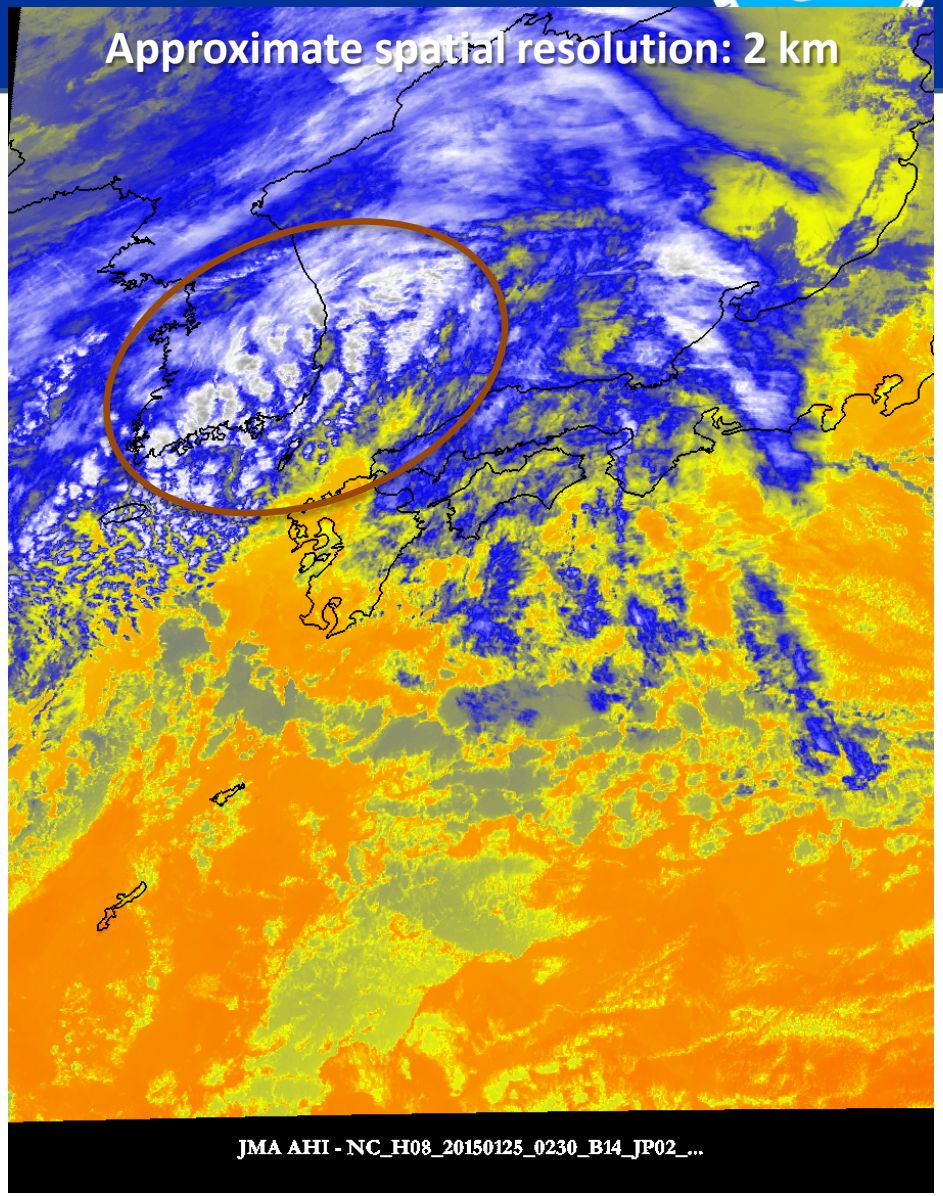
Blue Marble, Himawari 8 True Color Composite
25-January-2015 02:30 UTC
S. Miller (CIRA) - GOES-R AWG Imagery Team

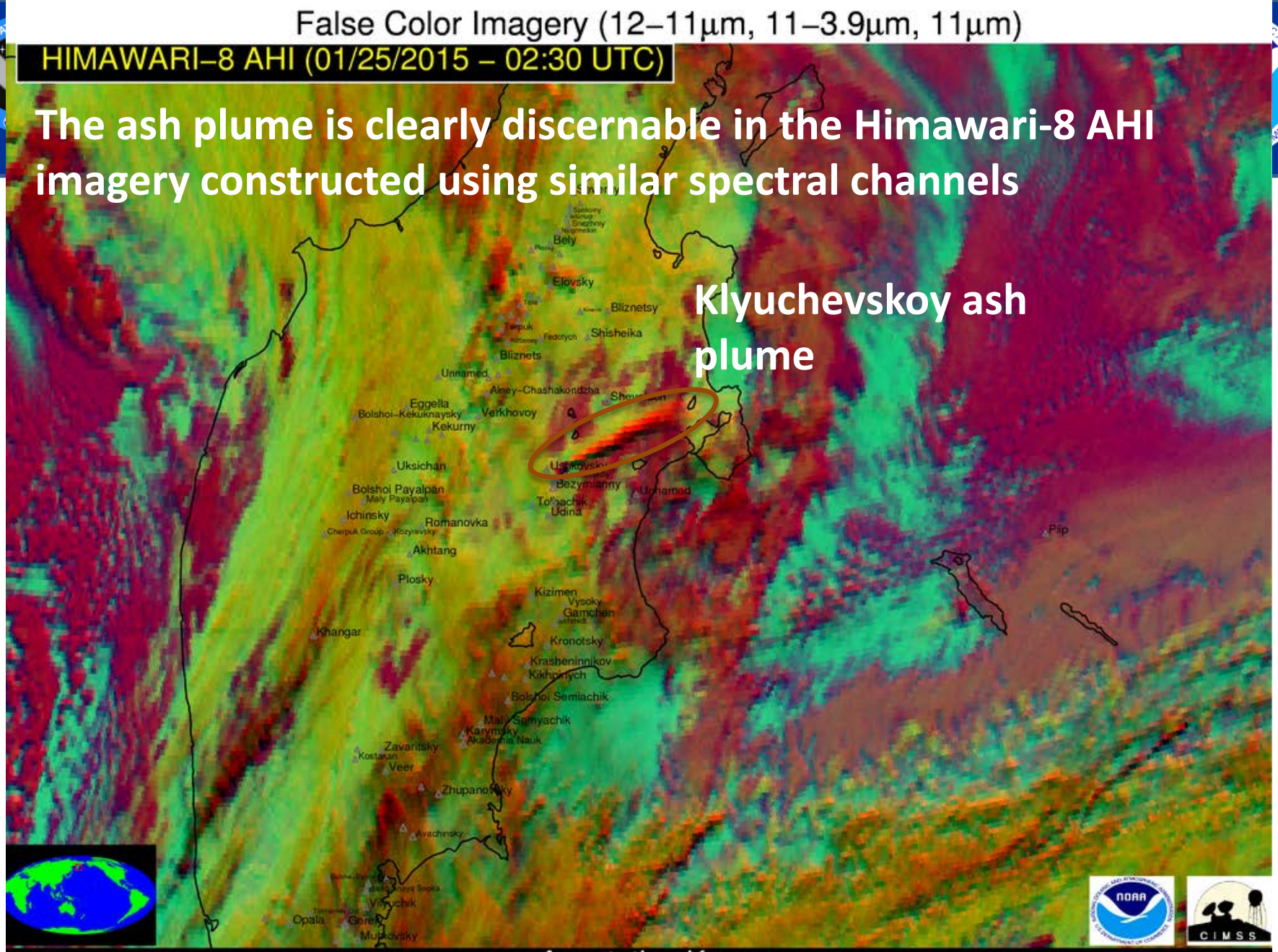
MTSAT and AHI (visible) comparisons: a glimpse into the ABI performance

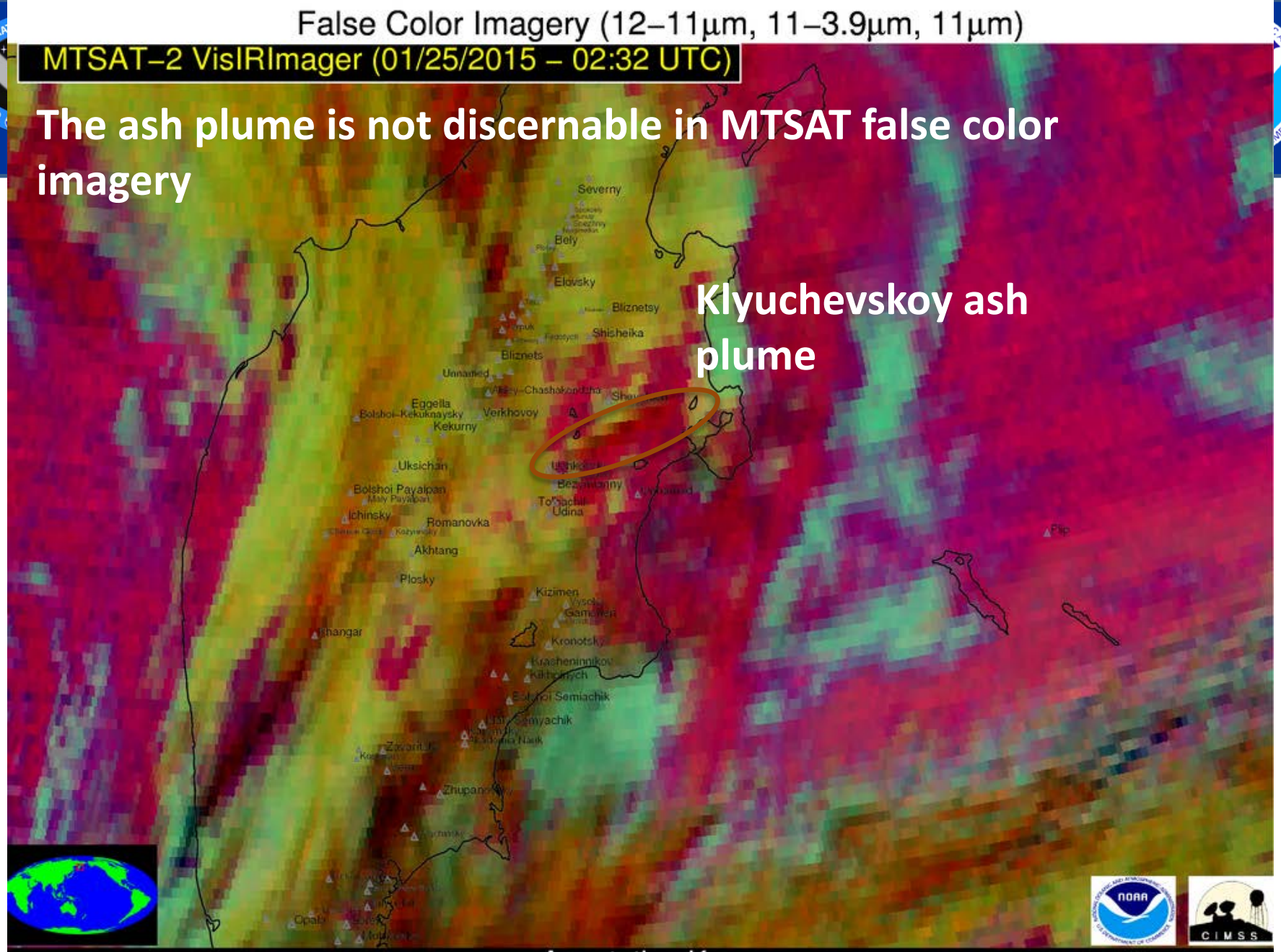
Much improved spatial resolution on Japan's ABI-like AHI.

MTSAT and AHI (longwave infrared)

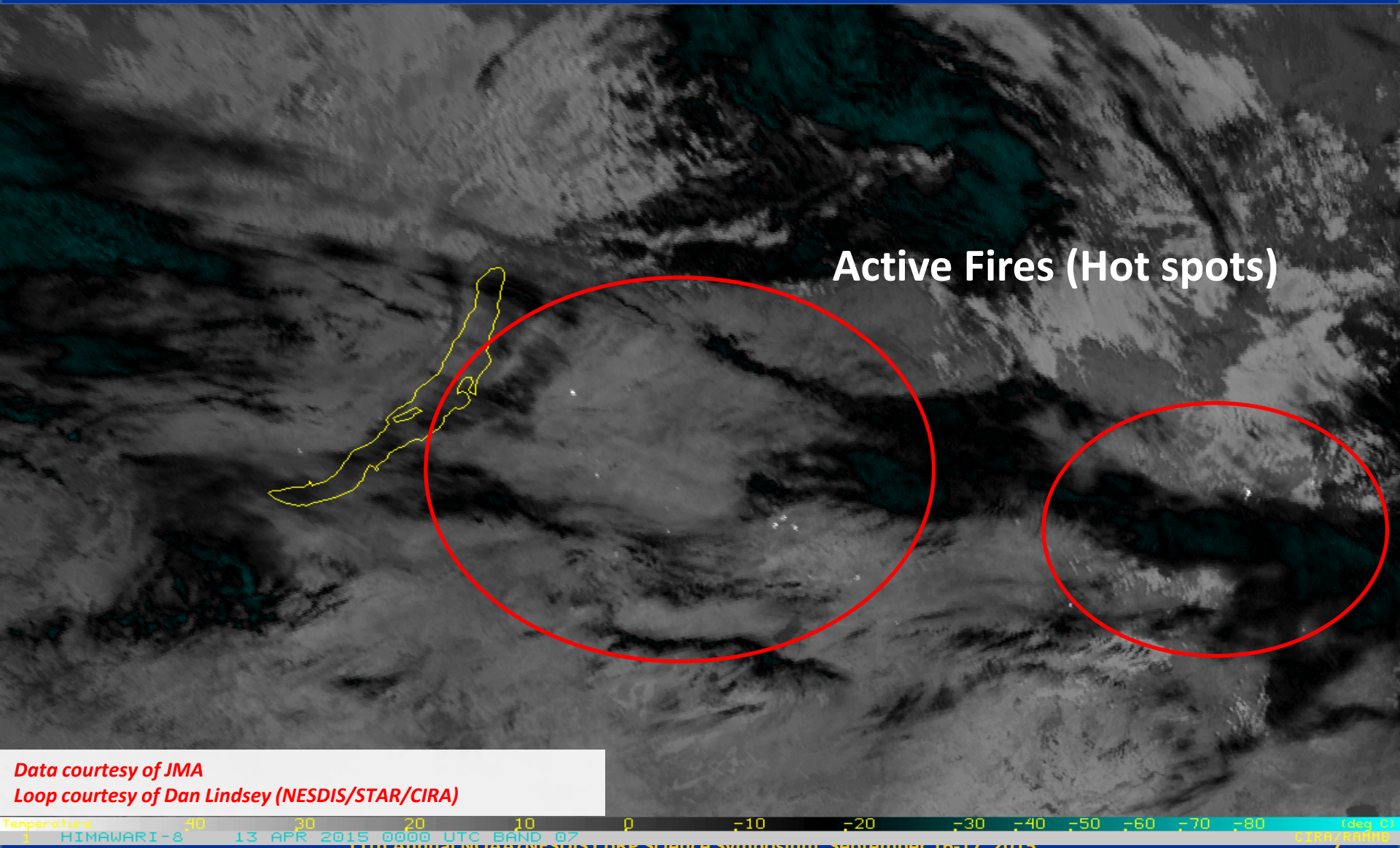





False Color Imagery (12–11μm, 11–3.9μm, 11μm)
HIMAWARI–8 AHI (01/25/2015 – 02:30 UTC)
The ash plume is clearly discernable in the Himawari-8 AHI imagery constructed using similar spectral channels
Klyuchevskoy ash plume
Bely
Elovsky
Bliznetsy
Shisheika
Bliznets
Unnamed
Eggella
Bolshoi-Kekuknaysky
Verkhovoy
Kekurny
Uksichan
Bolshoi Payalpan
Ichinsky
Romanovka
Akhtang
Plosky
Kizimen
Gamchen
Khangar
Kronotsky
Bolshoi Semiachik
Zavaritsky
Veer
Avachinsky
Opala
Piip
Annotation Key
(annotation colors are not related to colors in underlying image)
Ash/Dust Cloud
Volcanic Cb
Thermal Anomaly

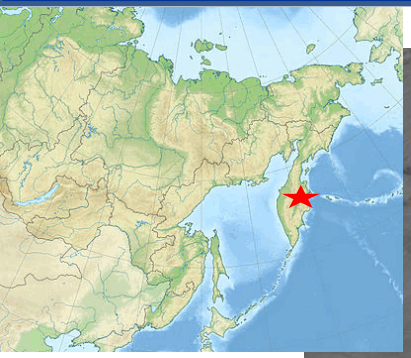

False Color Imagery (12–11μm, 11–3.9μm, 11μm)
MTSAT–2 VisIRImager (01/25/2015 – 02:32 UTC)
The ash plume is not discernable in MTSAT false color imagery
Klyuchevskoy ash plume
Severny
Bely
Elovsky
Bliznetsy
Shisheika
Bliznets
Unnamed
Eggella
Bolshoi-Kekuknaysky
Verkhovoy
Kekurny
Uksichan
Bolshoi Payalpan
Ichinsky
Romanovka
Udina
Akhtang
Plosky
Kizimen
Kronotsky
Bolshoi Semiachik
Zhupanovsky
Opala
Annotation Key
(annotation colors are not related to colors in underlying image)
Ash/Dust Cloud
Volcanic Cb
Thermal Anomaly

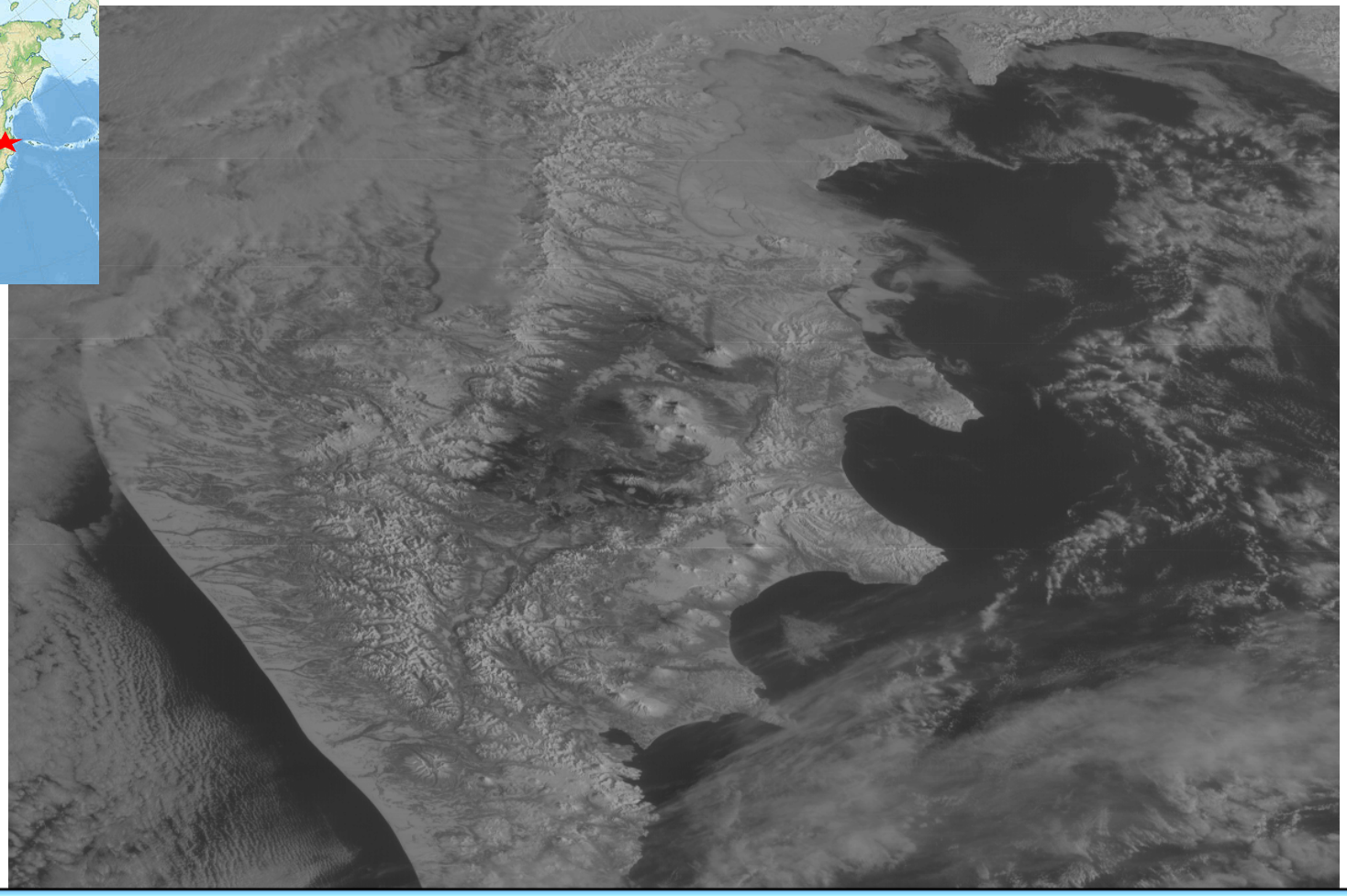
Himawari-8 Band 7 (3.9 µm; 2km) Loop, 4/13 @ 00 UTC through 4/15 @ 04 UTC



Data courtesy of JMA
Loop courtesy of Dan Lindsey (NESDIS/STAR/CIRA)

Himawari Imagery of Erupting Shiveluch Volcano





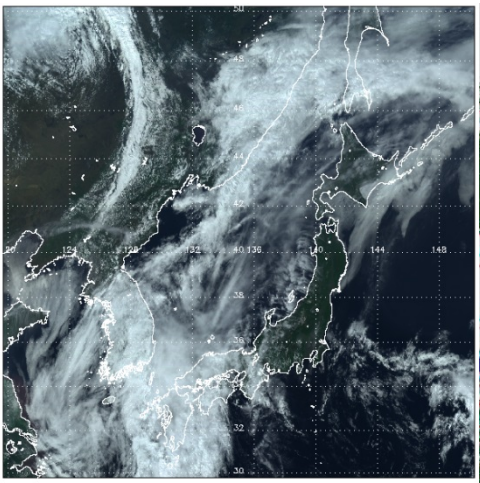
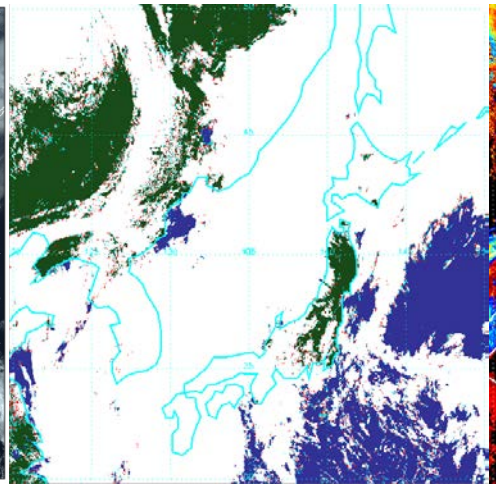
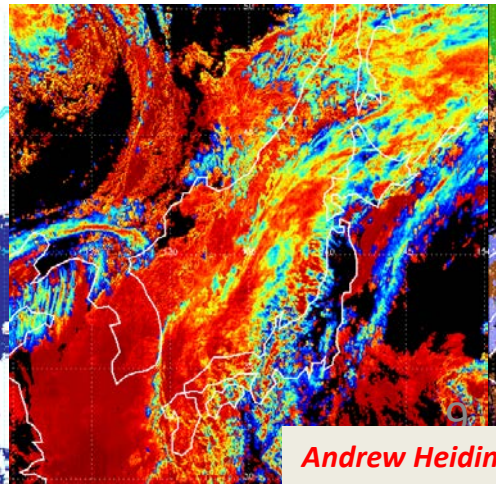
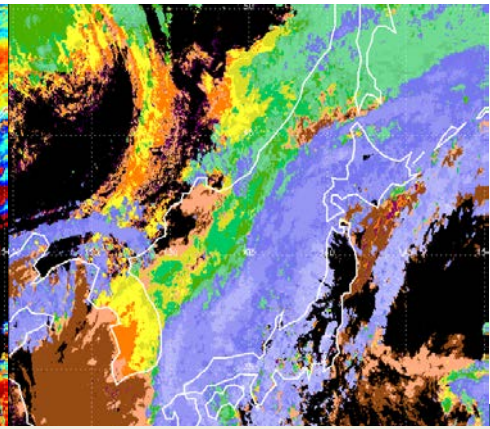
Shiveluch volcano on Russia's Kamchatka Peninsula. This is one of the first active eruptions viewed by Himawari. 10 minute data visible (0.64um) band at 500m resolution using the AHI is similar to what we will see on the GOES-R ABI. This will allow Volcanic Ash Advisories to be issued much more quickly.

Application of GOES-R Cloud Products to HIMAWARI-8 AHI

- JMA made data available to NOAA/NESDIS in January and February 2015.
- CIMSS developed tools to access this data.
- NESDIS CLAVR-x used to run GOES-R Algorithms on HIMAWARI-8.
- GOES-R Algorithms run without modification.
- We are now running routinely from data taken from the JMA Cloud Service
- Data provided to AMV, Land, Aerosol and Cryosphere Teams.
- GOES-R validation tools modified from HIMAWARI-8.

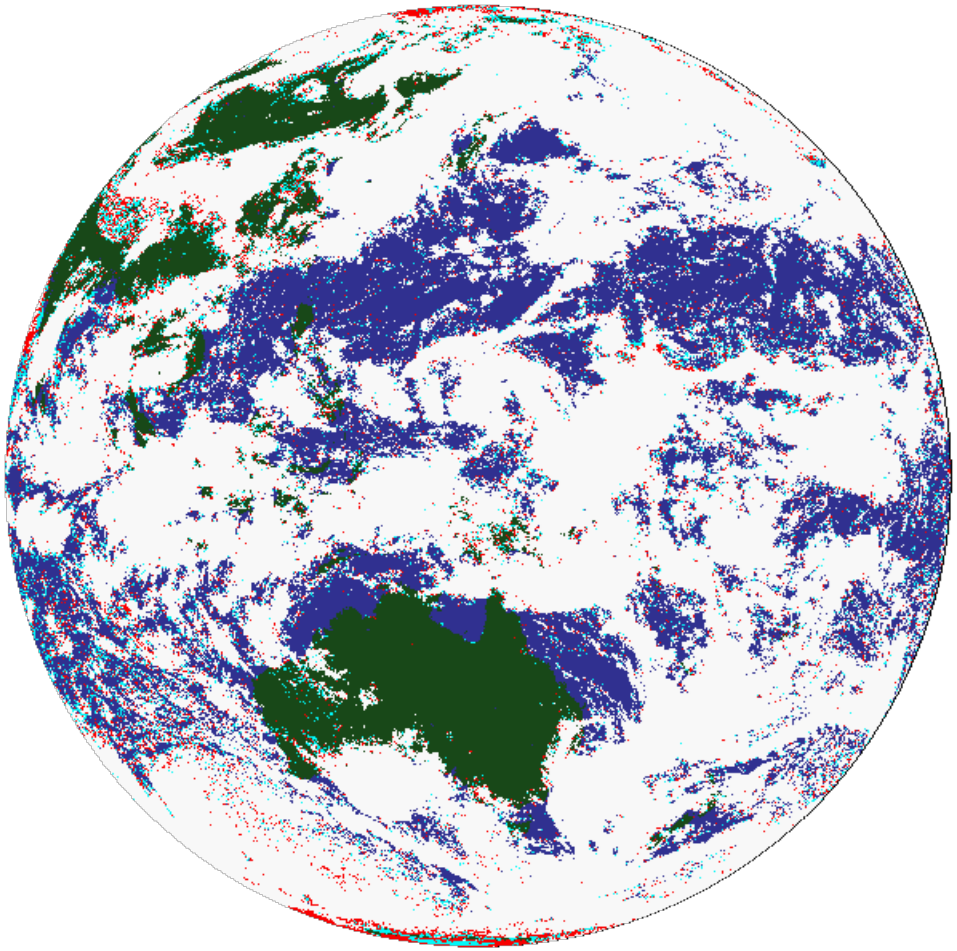
Examples of HIMAWARI-8 AHI Cloud Products from GOES-R Algs.

True Color | Cloud Mask | Cloud Emissivity | Cloud Height

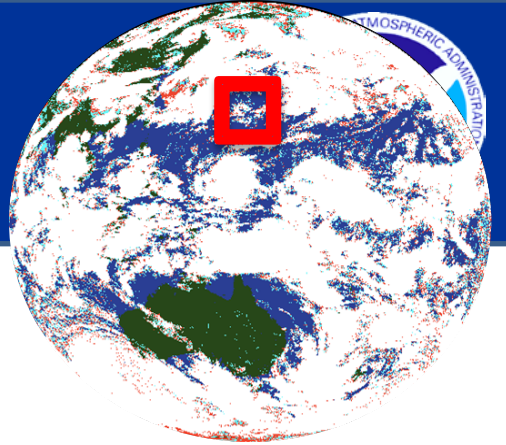
Cloud Mask (detection)

AHI 4-Level Cloud Mask

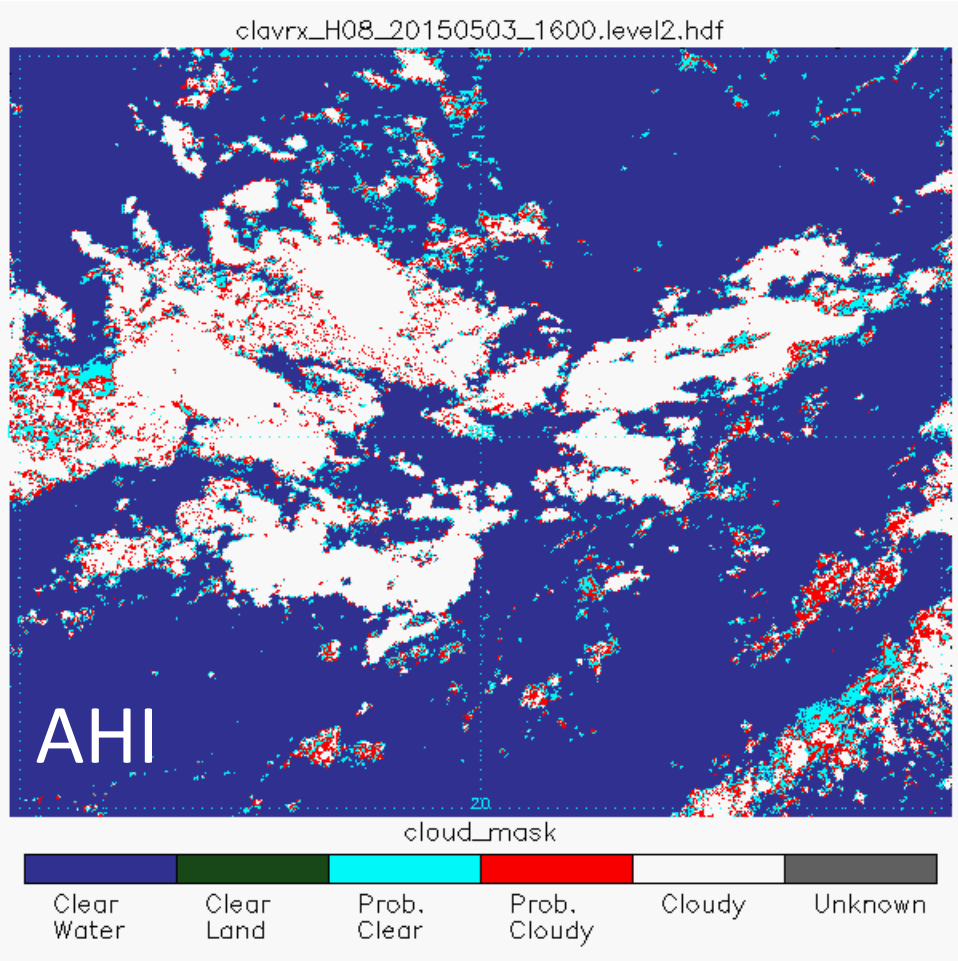


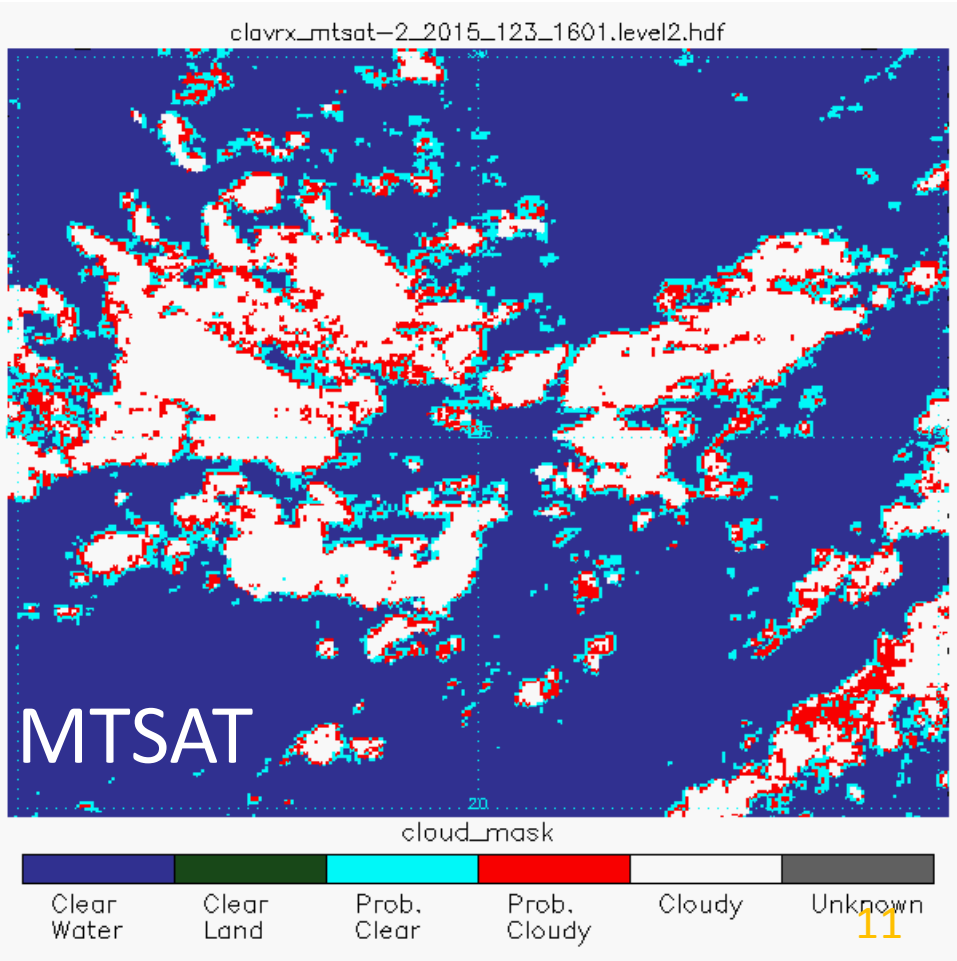
Andrew Heidinger (NESDIS/STAR/CIMSS)

Spatial Resolution Impacts



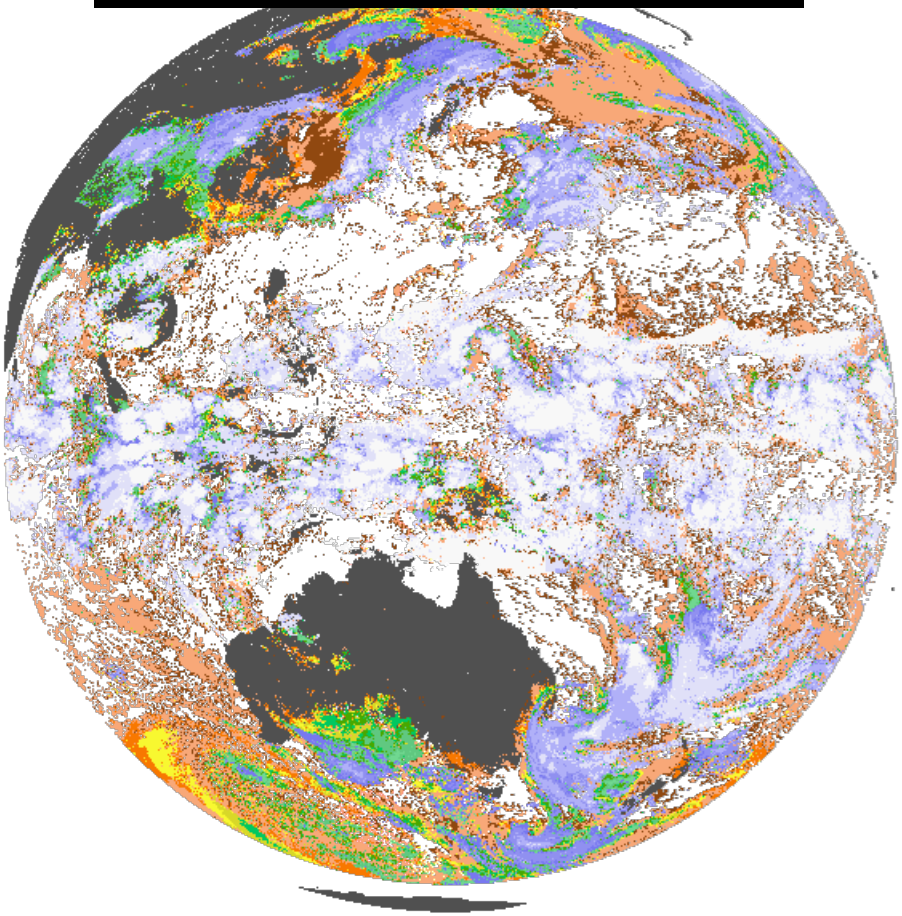
- We see a 50% reduction in the probably clear decisions
- Overall cloud fraction decreases and more holes detected
- MODIS-like resolution at AHI nadir in IR
- Example shows a nighttime animation (16Z - 17Z) on May 3





Cloud-top Pressure (vertical extent)

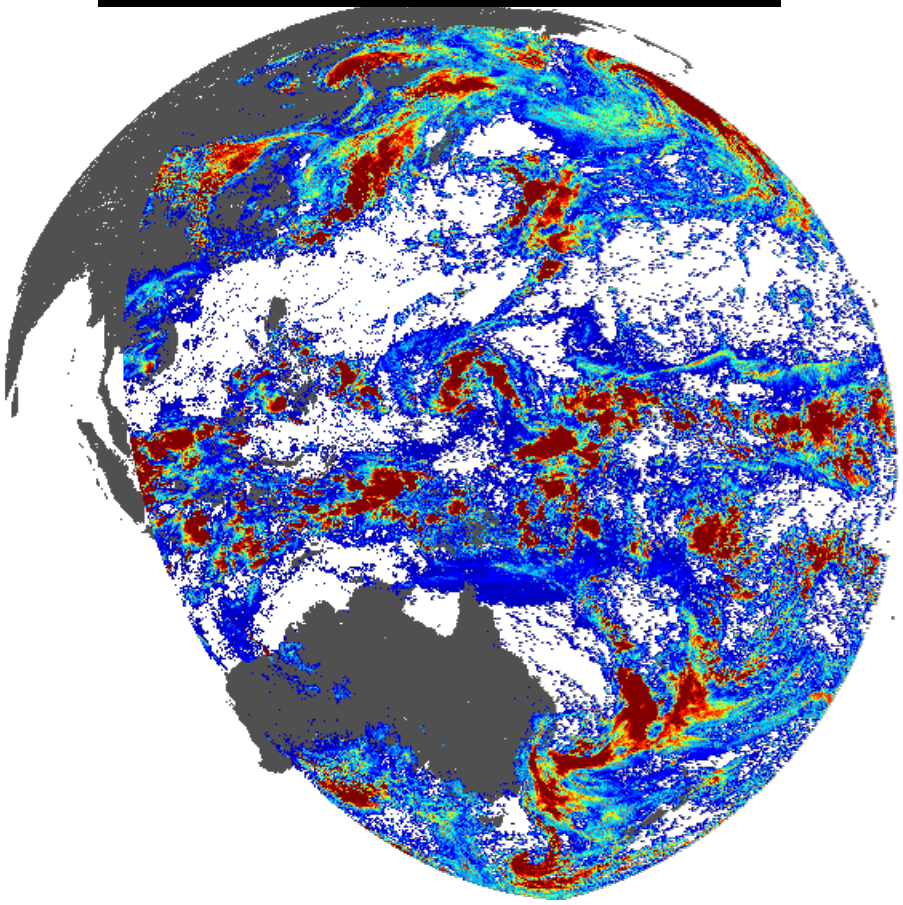
AHI Cloud-top Ptressure (hPa)



Andrew Heidinger (NESDIS/STAR/CIMSS)

Cloud Water Path (mass)

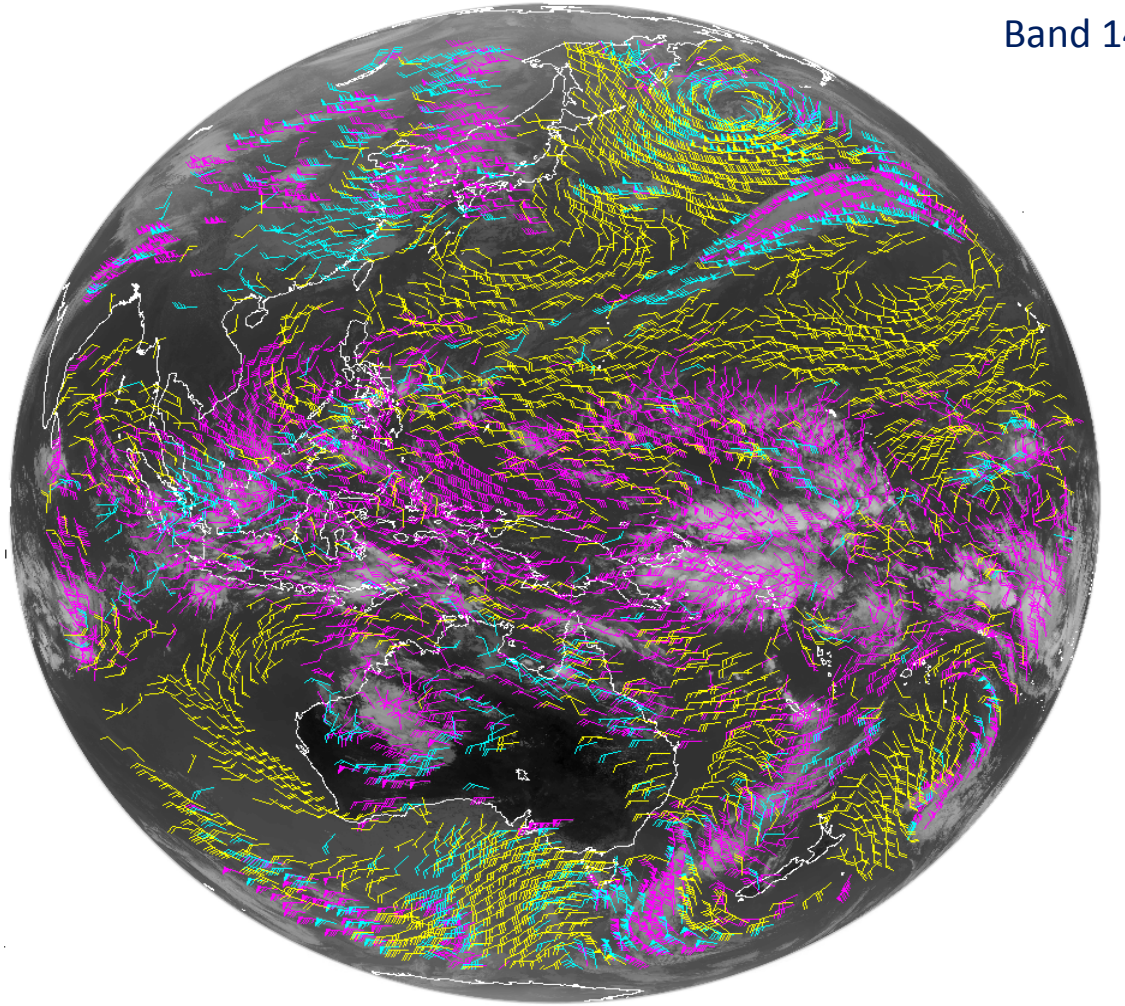
AHI Cloud Water Path (g/cm^2)



Andrew Heidinger (NESDIS/STAR/CIMSS)

H-8/AHI Winds

HIMAWARI-8 AHI 1/24/2015 2120 UTC



Band 14 (11um) Winds

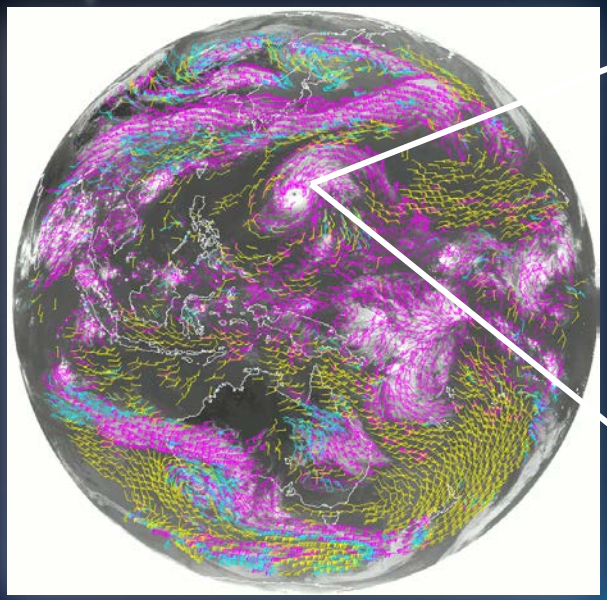
High-Level 100-400 mb Mid-Level 400-700 mb Low-Level >700 mb

Over 50,000 AMVS were generated over the FD (~ 4x increase from current GOES)!!!

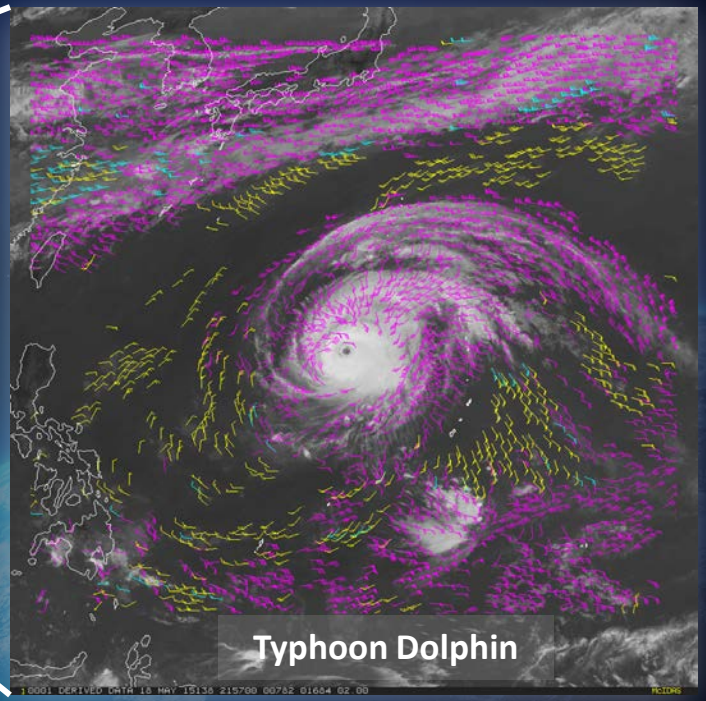
These winds were generated using 3 FD images separated by 10 minutes.

Image registration for these three images was quite good.

Himawari-8 AHI as a Proxy for the GOES-R ABI – Derived Motion Winds



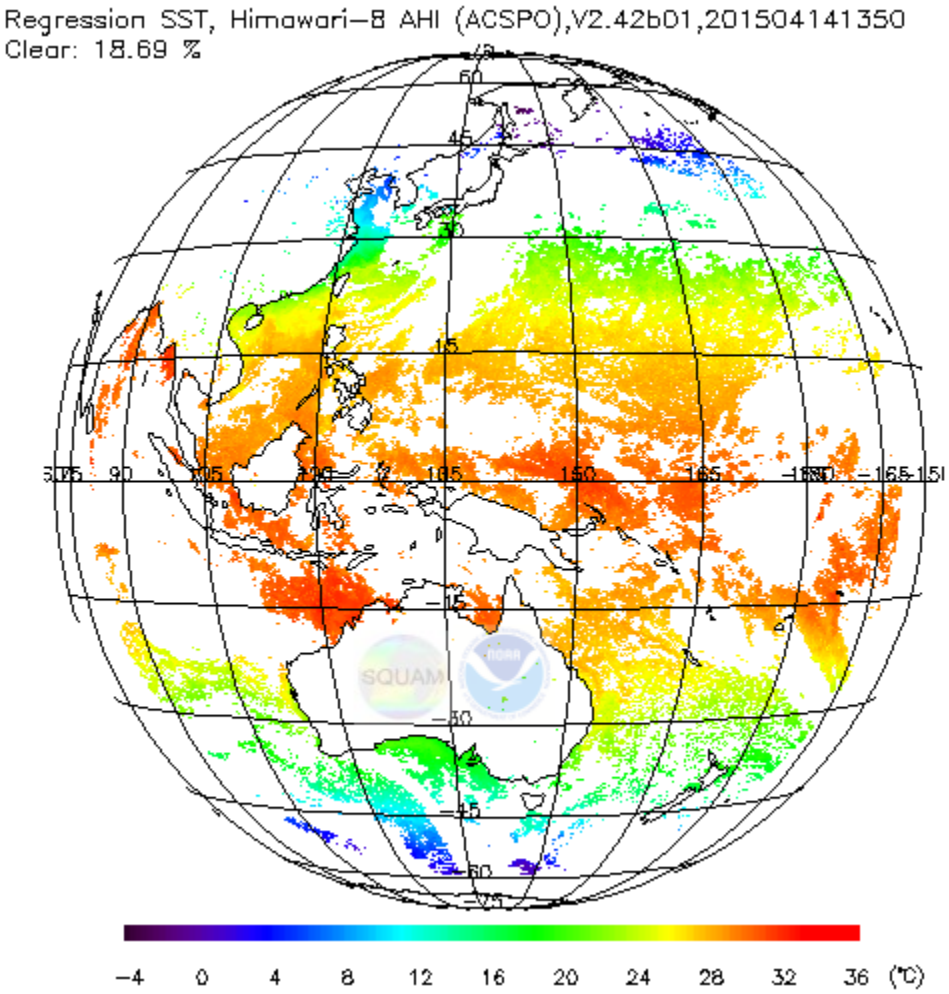
High-Level 100-400 mb | Mid-Level 400-700 mb | Low-Level >700 mb



- AHI data is the ideal ABI proxy data to perform pre-launch L2 algorithm testing and to assess L2 algorithm performance
- The AWG winds team began near real-time processing of H-8 AMVs on 8/12/2015 along with routine collocations with radiosonde observations. Work is ongoing to initiate routine collocations with aircraft wind observations .
- Exercised steps to read in L1b data for algorithm execution
- Exercised DMW validation tools
  - Visualization of DMW product over imagery
  - Collocation of DMW vs reference/ground truth wind observations (radiosondes, aircraft)
  - Computation of comparison statistics
- Will enable AWG teams to more precisely pin down the expected performance of the L2 products for both the baseline versions and most recent versions of the L2 algorithms

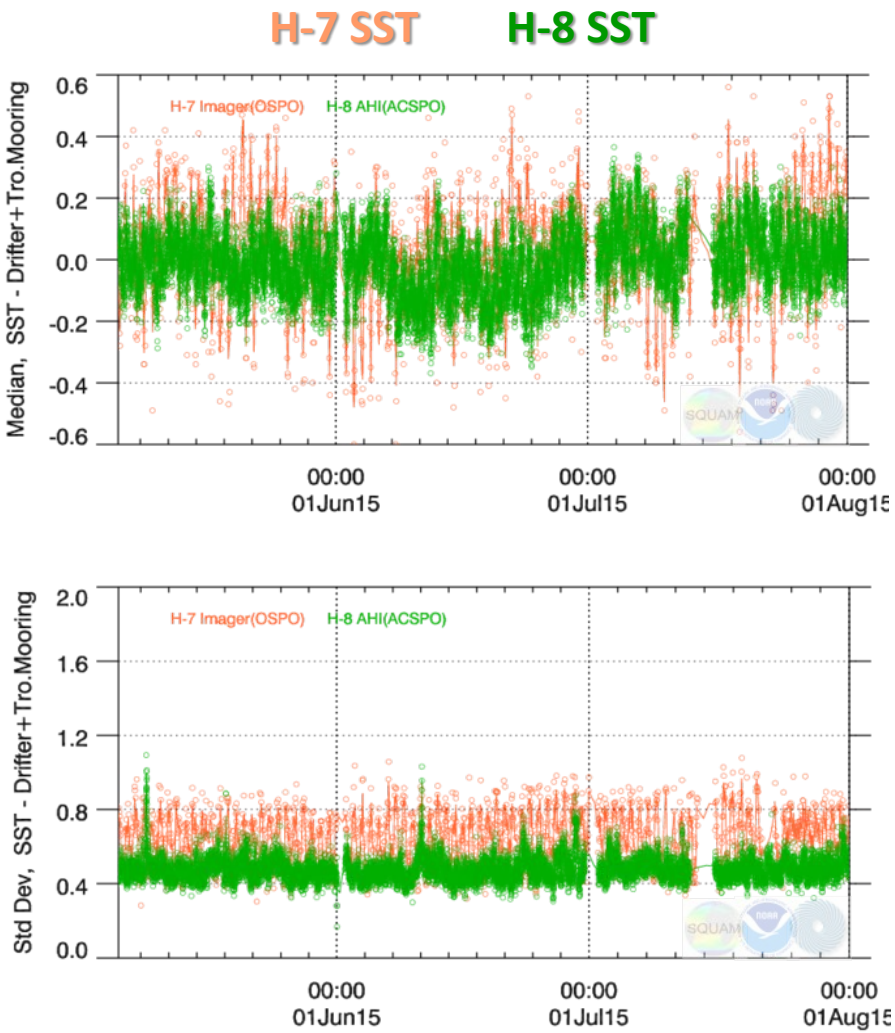
H-8/AHI SST

HIMAWARI-8 AHI 4/14/2015 1350 UTC



Alexander Ignatov (NESDIS/STAR)

Validation of H-8 SST

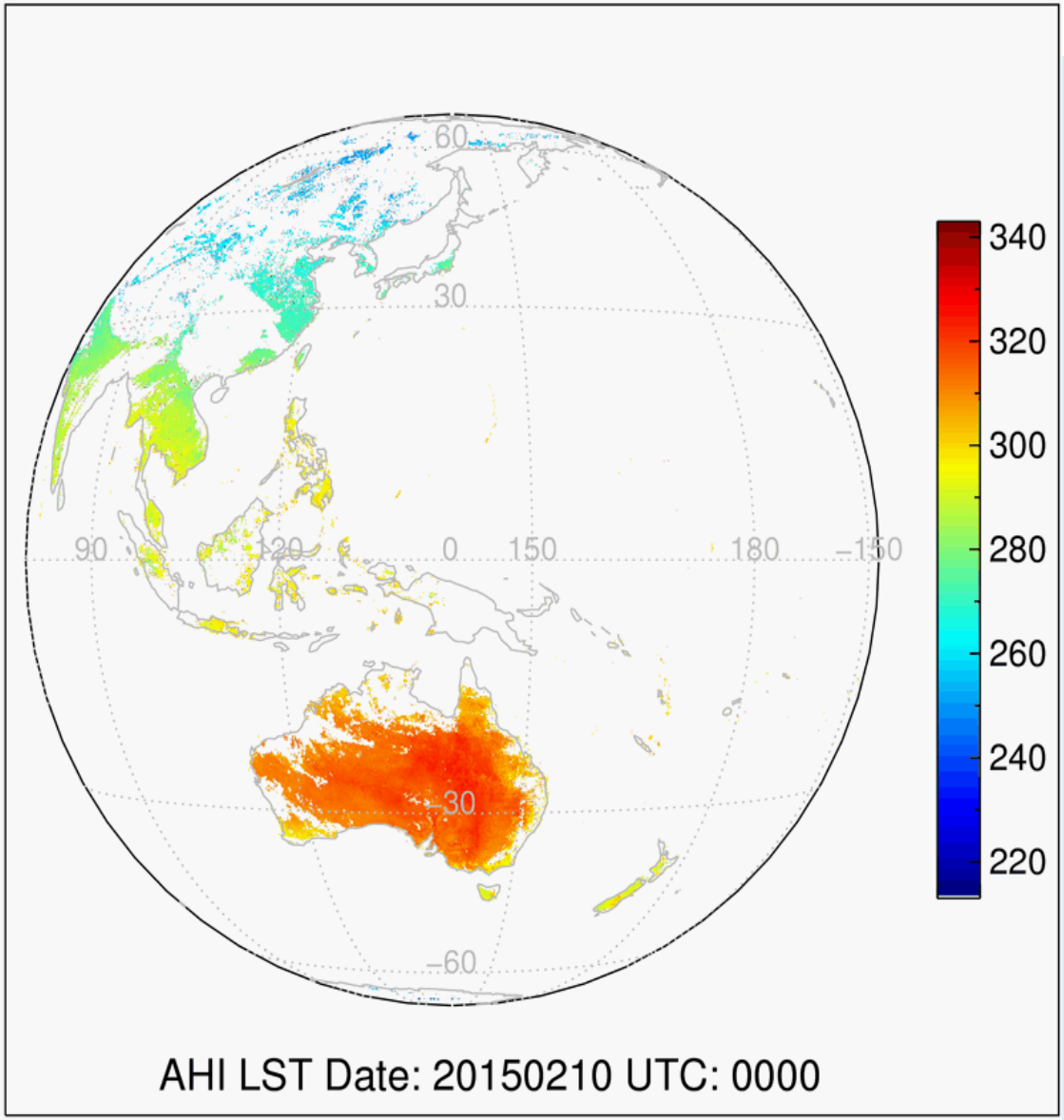


Typically, we compare with insitu SST to within ±0.2K (vs. ±0.4K for H7).

H8 makes 0.5-0.6K RMS, compared with 0.5-1K for H7.

Coverage of H8 SST is also better than H7 - fraction of clear sky ocean

Land Surface Temperature

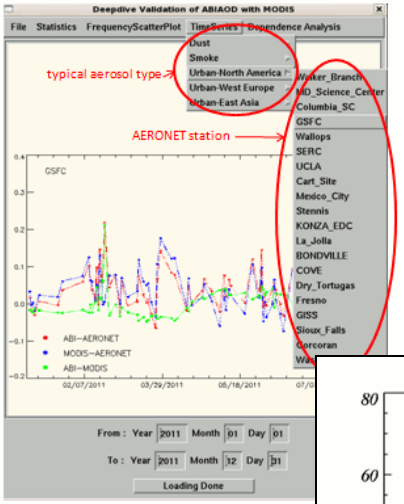


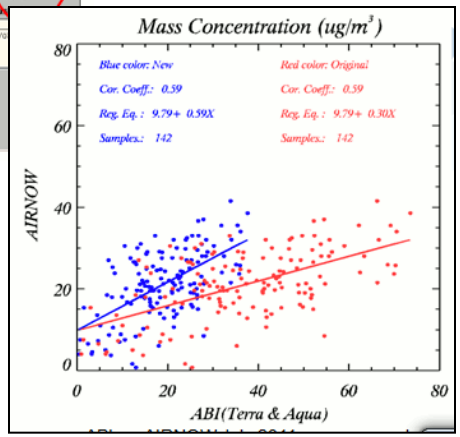
Test of ABI LST Alg on AHI Data

This animation is an example of land surface temperature generated from AHI data using the ABI LST algorithm, for the date Feb 10, 2015. The cloud mask for the day is provided by the ABI cloud team. In the animation there is a blank image at UTC time 19:30, due to non cloud mask data available then. Test runs using AHI data gave us confidence in the effectiveness of the ABI LST algorithm. We are now working on validating the ABI LST algorithm by comparing with VIIRS LST product since we do not have in-situ measurements for the validation yet. Meanwhile, we are trying to collect in-situ measurements through China Meteorological stations. Currently, we have 38 days AHI data that can be processed once the corresponding cloud mask data are available.

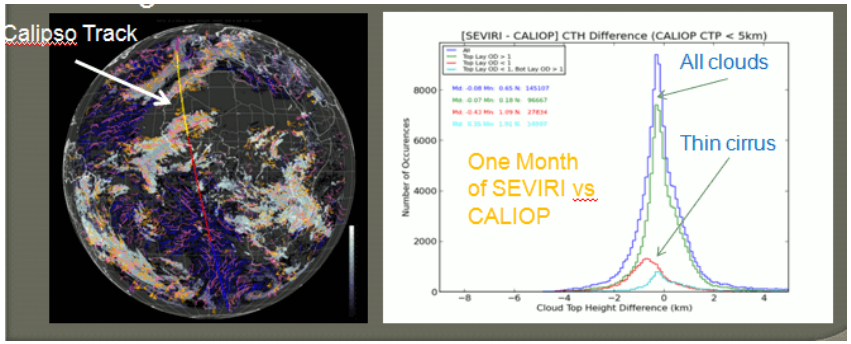
Product Validation Tools

AWG teams have developed a cadre of product validation tools as part of their ongoing product validation activities



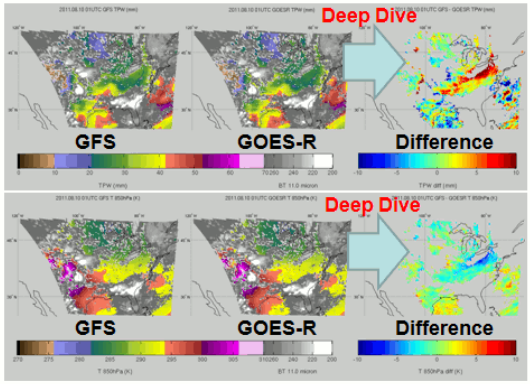


Aerosols



Clouds

Imagery of 2D variables in Validation Tool



TPW

Temp

Significance: The tools will enable the routine monitoring of L2 product performance and for "Deep-dive" assessments and analysis of products to resolve any issues/anomalies that may arise

Product Validation Tools

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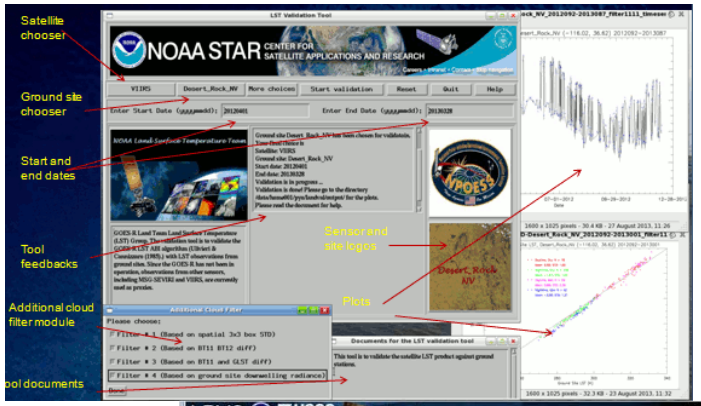
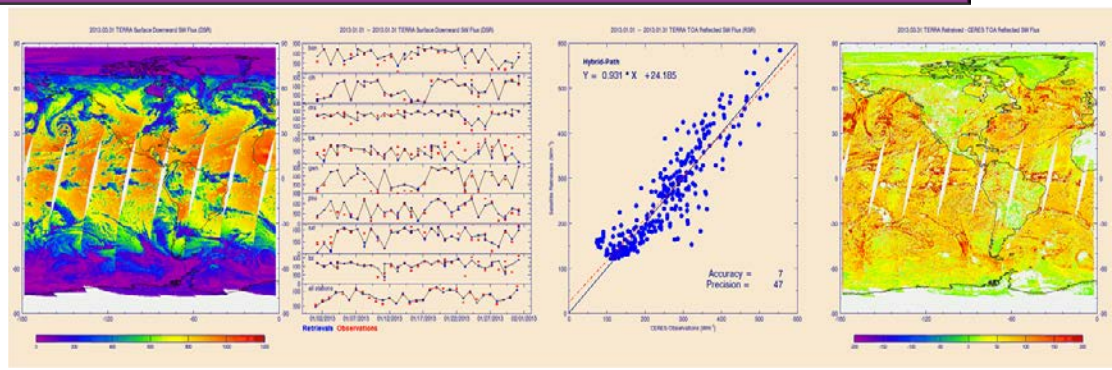
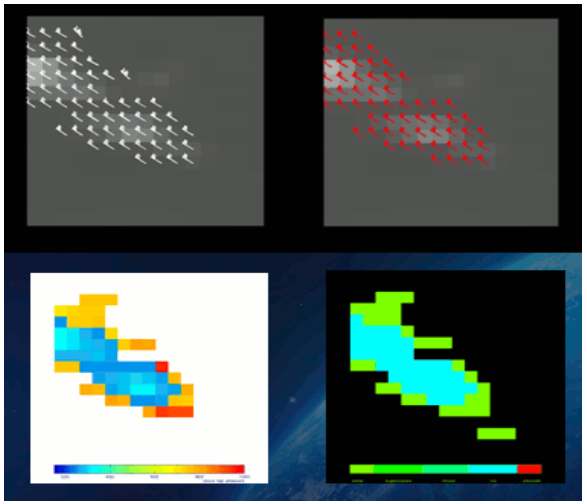


LST



Radiation



Winds

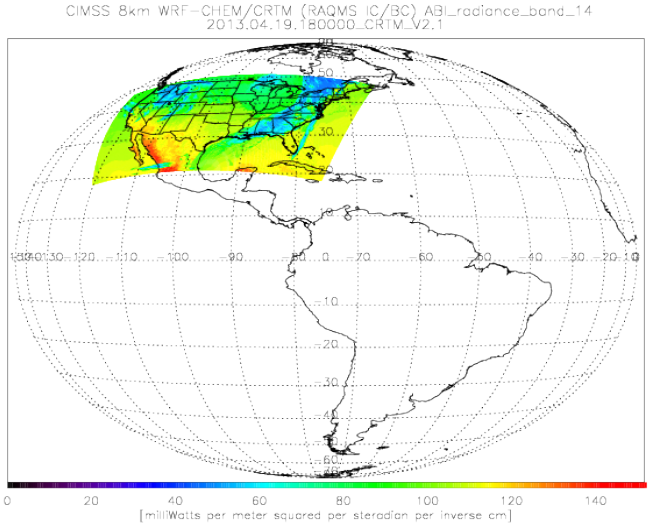
Significance: The tools will enable the routine monitoring of L2 product performance and for "Deep-dive" assessments and analysis of products to resolve any issues/anomalies that may arise

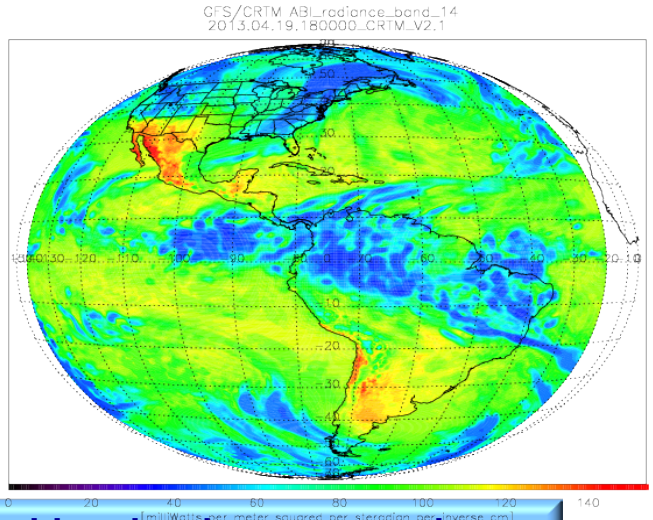
Preparing for GOES-R launch

- Preparing the user community
- Importance of Proving Ground demonstrations and training
- Future capabilities and the importance of the Risk Reduction Program

Simulated ABI Datasets for Ground System Testing

- AWG proxy team at CIMSS has been generating routine, near real-time simulated ABI imagery
  - WRF-Chem model met/aerosol forecasts (8km) over CONUS using the Community Radiative Transfer Model (CRTM) to simulate all 16 ABI bands.
  - NCEP/GFS model 3 hr forecast (T574L64, an effective grid point spacing of ~27 km) outputs used, together with CRTM (v2.1), to produce ABI simulated radiances (all bands) at 3hr intervals
  - Generate simulated ABI radiances at 1hr intervals via interpolation of 3hr GFS forecast output and running CRTM every hour
- Simulated data (all bands) are remapped from WRF-Chem & GFS grids to the GOES-R ABI fixed grid at their expected resolutions and converted to GRB
- Simulated imagery is then being sent over the NWS Satellite Broadcast Network (SBN) and displayed in NOAA's National Weather Service's (NWS) AWIPS-2 System





These high fidelity simulated datasets are important for algorithm development, testing, verification, and user readiness activities

Simulated ABI Datasets for Ground System Testing

- Provide the ground system with "atmospherically realistic data" that can be used for system verification and system validation by injecting these data into the ground system *(Formal testing ongoing in 2015)*
- AWG proxy team at CIMSS has been generating routine, near real-time simulated ABI imagery
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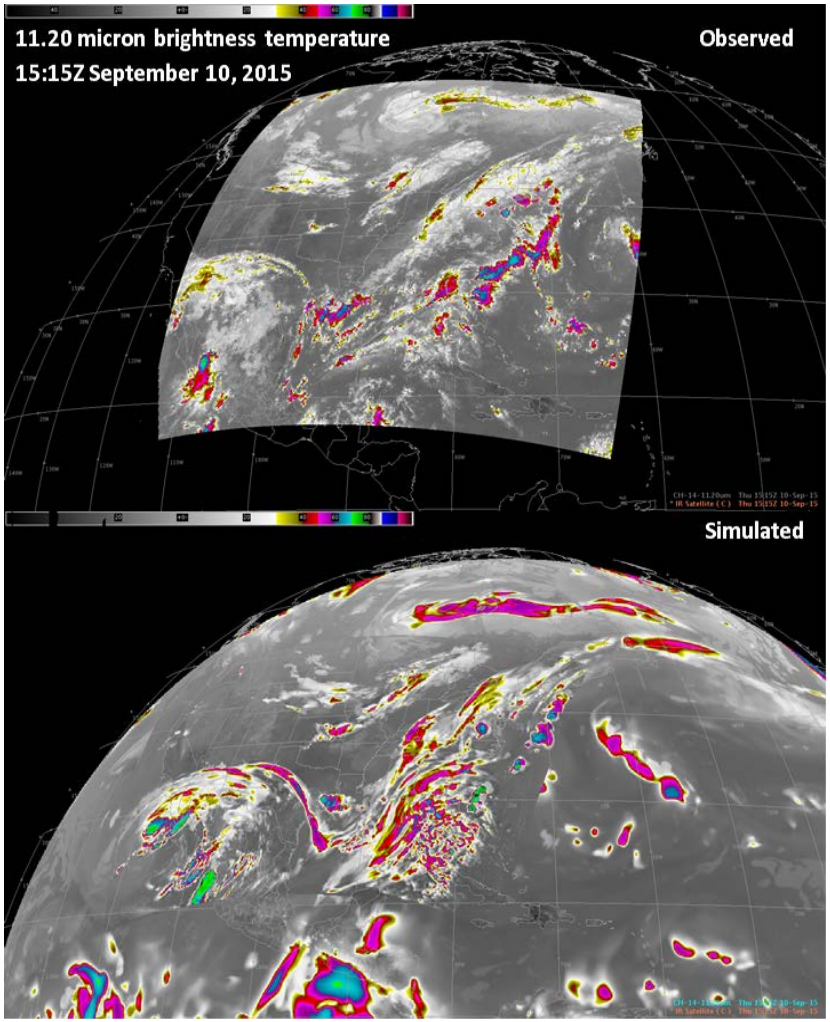


These high fidelity simulated datasets are important for algorithm development, testing, verification, and user readiness activities

Applications

- Applications utilize science and technology to provide products and services.
  - Weather forecasting is the application of science and technology to predict the atmospheric state for a given place and time.

- For GOES-R and JPSS, NESDIS provides sensor (L1b) and environmental data records (L2) , but the real value is realized when the data records are used in user applications. "Realizing the last mile…"

User Needs

"For GOES-R and JPSS, NESDIS provides sensor and environmental data records, but the real value is realized when the data records are used in applications."

- What do users need? Who are our users?
- What information do they need? When do they need it?
- And in what form do they need this information in
- We need to put ourselves in their shoes.
- It is absolutely critical that we talk to and work with our users to understand their needs.

Pathways to User Readiness for GOES-R

- GOES-R Proving Ground & Risk Reduction Programs
- User Education
  - COMET modules; VISIT; SHyMet; ESRC
- Conferences
- Provide updated information on GOES-R web page
- User Readiness Plan

GOES-R Proving Ground and Risk Reduction Programs

The GOES-R Program Science Office runs vibrant GOES-R PG and Risk Reduction Programs

GOES-R Proving Ground

- A collaborative effort between the GOES-R Program Office, NOAA Cooperative Institutes, a NASA center, NWS Weather Forecast Offices, NCEP National Centers, and NOAA Test Beds across the country.
- Simulated GOES-R products are tested and evaluated before the GOES-R satellite is launched into space.
- The simulated GOES-R products are generated using combinations of currently available GOES data, along with higher resolution data provided by instruments on polar-orbiting satellites such as MODIS on NASA's Aqua and Terra satellites as well as model synthetic satellite data.

GOES-R Risk Reduction

- Promotes applied research based on the use of GOES-R data.
- Scientists conduct research and outreach activities that are needed for users to fully exploit all GOES-R instruments and capabilities.
- The program strongly encourages projects that make use of data from multiple platforms (satellite, radar, numerical weather prediction output, surface observations, etc.), and whose overall goal is a product that directly benefits operational forecasters.

GOES-R Proving Ground

Proving Ground Mission Statement

The GOES-R Proving Ground program is being initiated to facilitate research-to-operations with the principal focus being on the forecaster/AWIPS-II environment; to prepare for the GOES-R information, to get real-world experience by leveraging existing resources, and to evaluate product tailoring. The GOES-R Proving Ground engages NWS, EPA, DoD, and other operational environments in pre-operational demonstrations of selected capabilities of next generation GOES with the objective to bridge the gap between research and operations by:

- Utilizing current systems (satellite, terrestrial, or model/synthetic) to emulate future GOES-R capabilities;
- Infusing GOES-R-like products and techniques into NWS operations with emphasis on AWIPS and transitioning to AWIPS-II;
- Engaging in a dialogue to provide feedback between developers and users.

The GOES-R project engages the National Weather Service (NWS) forecast and warning community in preoperational demonstrations of selected capabilities anticipated from the next generation of NOAA geostationary earth observing systems.

The goals of the Proving Ground are: training forecasters to use new products, identifying different utilities of each product, identifying weaknesses or errors with each product, and user-feedback development.

Intended outcomes are day-1 readiness and maximum utilization for both the developers and users of GOES-R products, and an effective transition to operations.

http://www.goes-r.gov/users/proving-ground.html

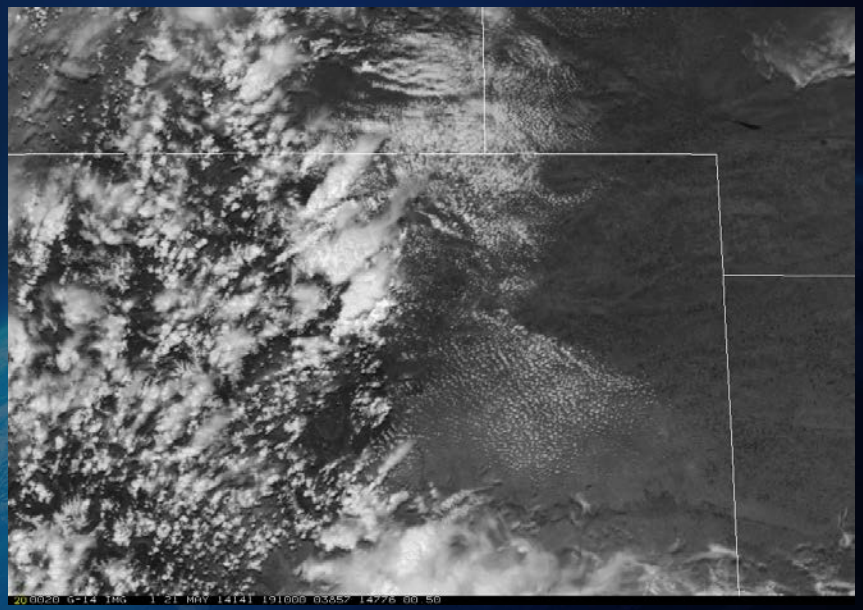
GOES-14 Super Rapid Scan Operations to Prepare for GOES-R (SRSOR)

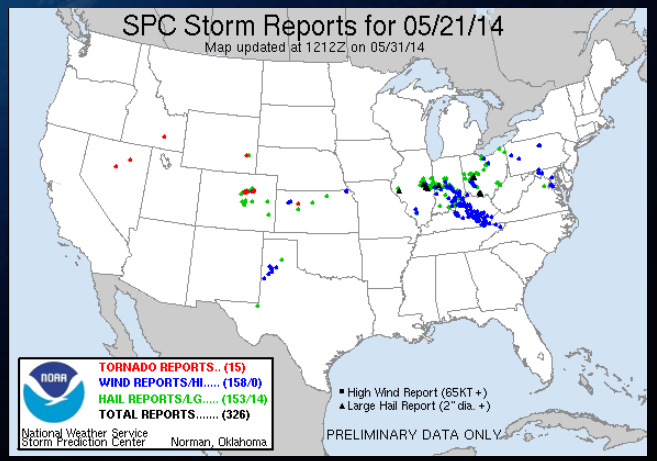
GOES-14 SRSO provided unique data and offered a glimpse into the possibilities that will be provided by the ABI on GOES-R in one minute mesoscale imagery

SRSOR for 2015 : May 18-June 12 and August 10-22:

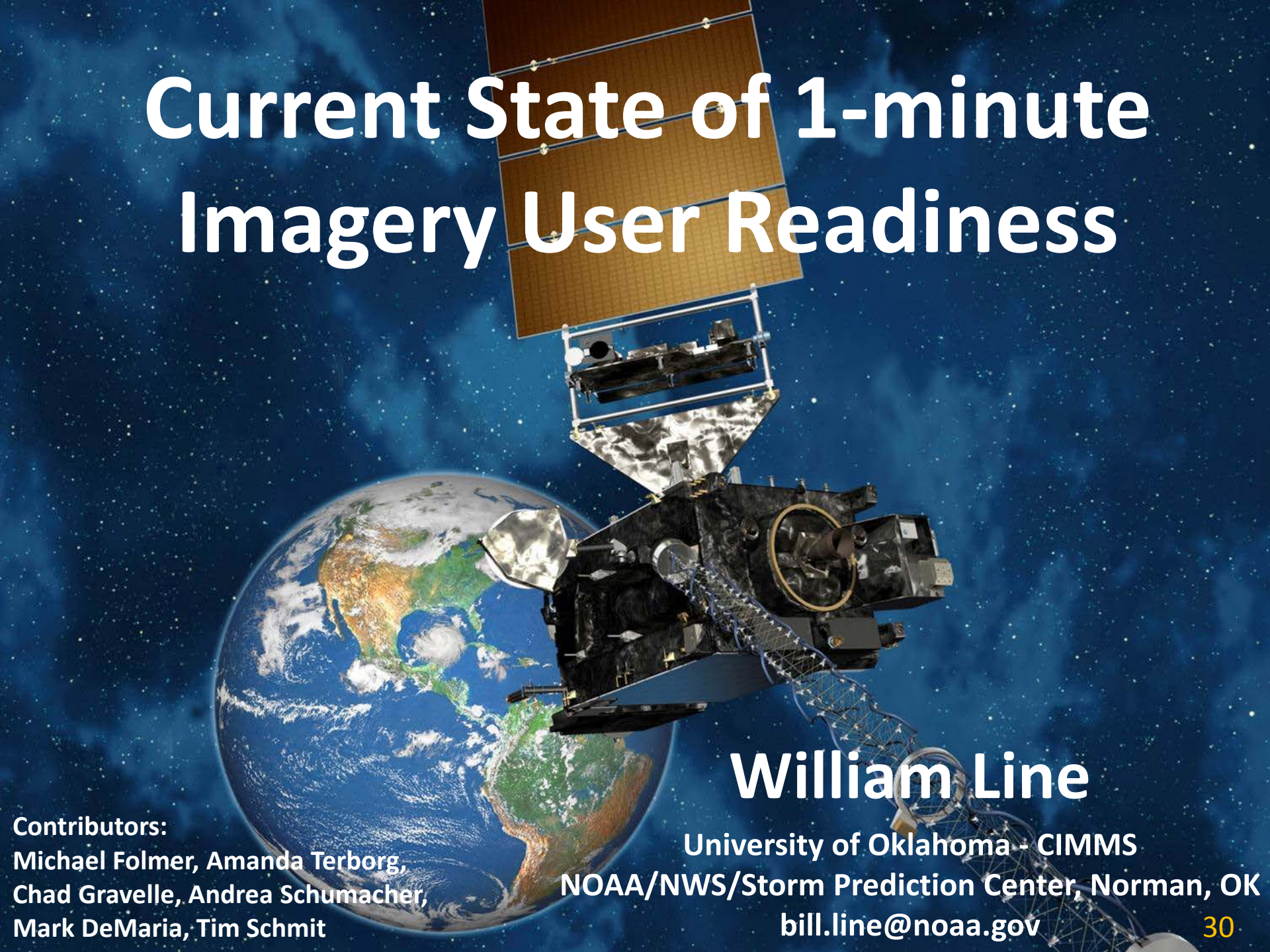
- *http://cimss.ssec.wisc.edu/goes/srsor2015/GOES-14_SRSOR.html*
- *SRSOR data for 2012, 2013, and 2014 also available*

DIA Tornadic Storm: 5/21/14





Current State of 1-minute Imagery User Readiness



William Line

University of Oklahoma - CIMMS
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Contributors:
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Chad Gravelle, Andrea Schumacher,
Mark DeMaria, Tim Schmit

Preparing the users for super rapid scan imagery

Weather Forecast Offices

Aviation Weather Center

National Hurricane Center

Ocean Prediction Center

Weather Prediction Center

Storm Prediction Center

Other

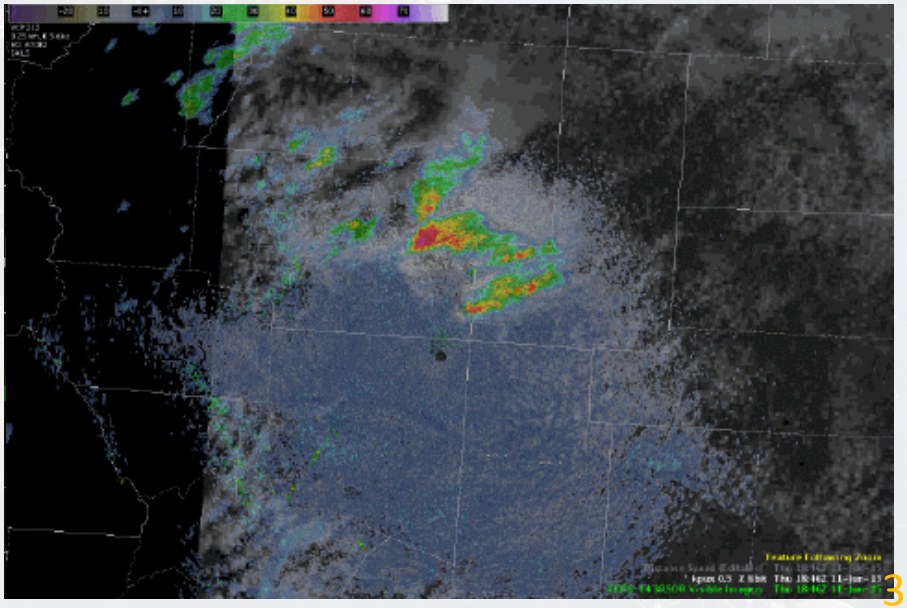
Hazardous Weather Testbed

- **G14 1-min imagery demonstrated in HWT during 2014 and 2015 Spring Experiments.**
  - NSSL Experimental Warning Program (EWP) (AWIPS-II) – Real-time experimental warning operations
    - 24 NWS Forecasters (22 WFO, 2 CWSU; all CONUS regions and AR)
    - 6 broadcast meteorologists – "viewers would love seeing this"
    - 91 SRSOR Blog posts: http://goesrhwt.blogspot.com/search/label/SRSOR
    - Operated in 32 unique CWA's during SRSOR 2015
  - HWT Experimental Forecast Program (EFP) (N-AWIPS) – Real-time experimental forecast/outlook
    - SPC, WFO forecasters, researchers
- **93% of days in 2015, forecasters found that the 1-min data provided them with significant information not captured in the routine satellite imagery.**
  - Monitoring cu development/evolution, moist inflow, i.d. of OTs and collapsing tops, i.d. and tracking of boundaries and gravity waves, boundary interaction, identifying new updrafts near mature storms, rapid cooling in IR, shear, features/processes under mid-upper clouds … all done quicker and with more confidence
  - See future utility for fire weather plume tracking, outflow/dust storm tracking, low cloud movement (esp. aviation), sea/lake breeze
  - 65% felt 1-min Overshooting Top overlay enhanced 1-min imagery

Forecaster Comments from the Hazardous Weather Testbed

- **All Forecasters agreed:**
  - 1-min satellite imagery NOT “overwhelming” at all
  - Will incorporate 1-min data into the warning process
  - There will be an operational use for it on most days in their CWA
  - What they most want to see in the GOES-R 1-min training are operational use examples from forecasters who experience with the data
  - Forecasters consider this base data (along with radar, lightning)
- **No AWIPS-II issues – forecasters loaded 100+ images alone or with OT, radar, lightning overlays**

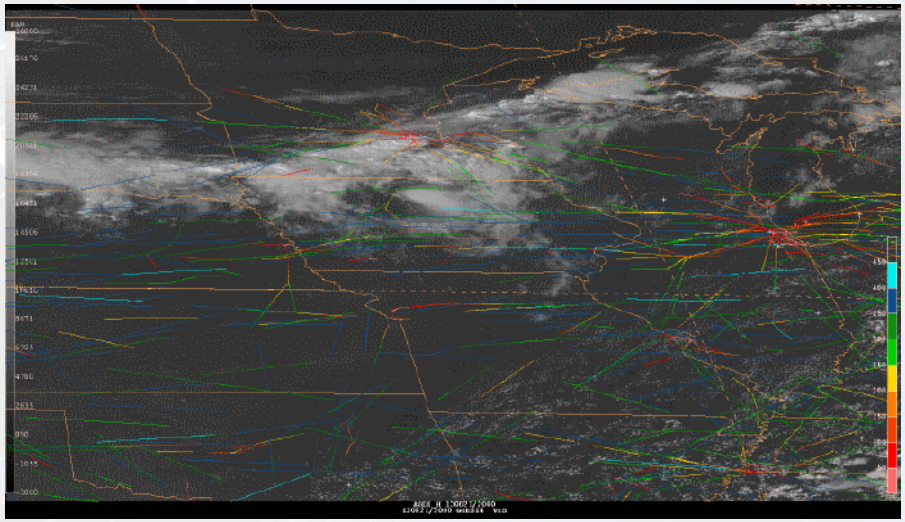
“I would love to have an Super Rapid Scan Satellite loop with reflectivity, and lightning somewhere on my D2D as a way to **stay grounded** with what is happening in real time during severe weather operations.” – WFO Forecaster



Aviation Weather Center

- GOES-14 SRSOR available to AWC forecasters in N-AWIPS since 2012
- Available during 2013 and 2014 AWT experiments
  - Participants have included: AWC, CWSU, FAA ops, airlines, Air Force, aviation researchers
- Primary uses thus far have included:
  - Convective SIGMET desk: Utilized when diagnosing convection and issuing products
  - Area Forecast (FA) desk: Monitoring ceiling and visibility (watching fog banks) and turbulence markers
  - National Aviation Meteorologist (NAM) desk: monitoring convection, ceiling and visibility (especially on west coast)

8/21/13 - Convection over Minneapolis airspace

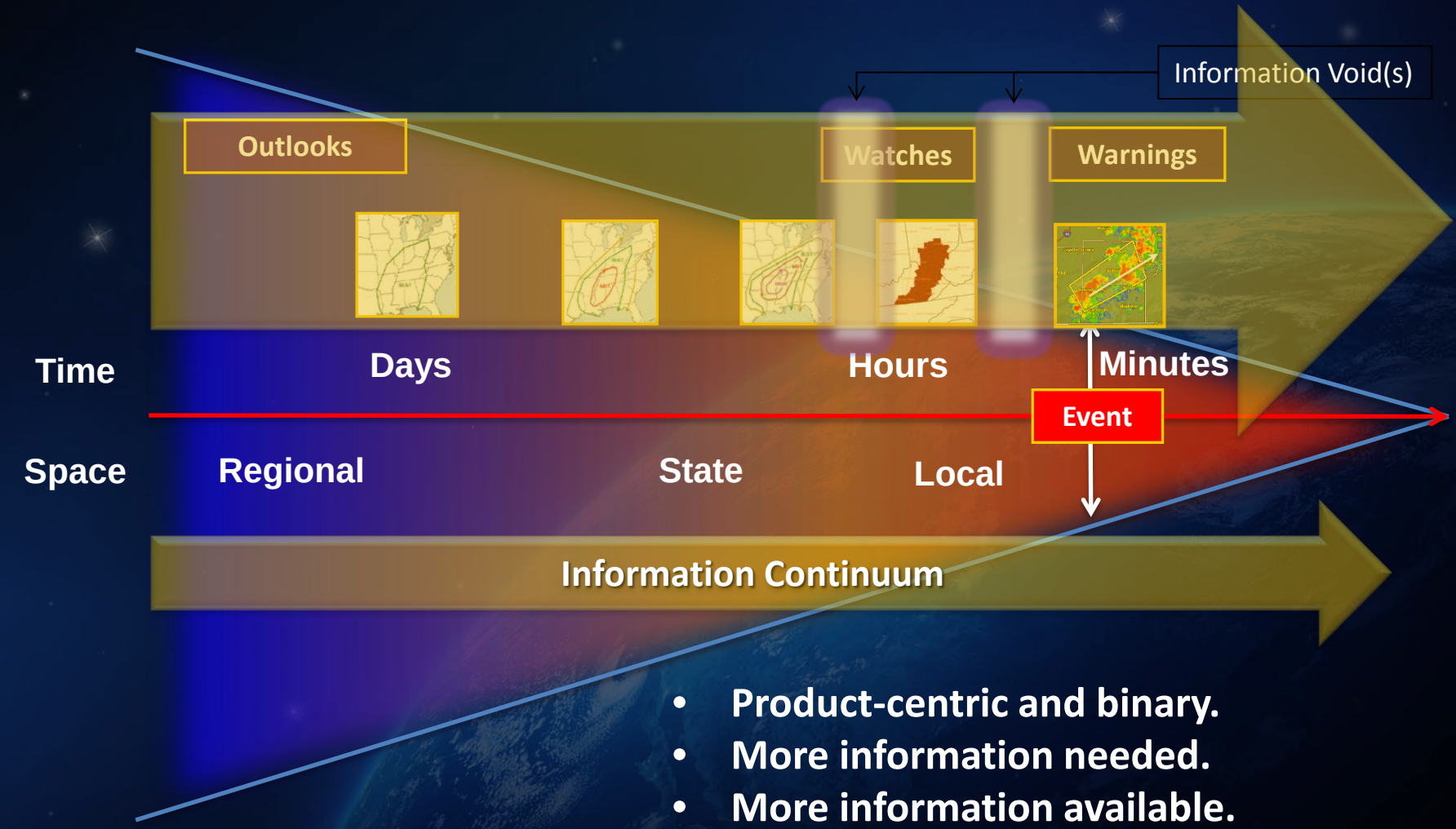


GOES-14 SRSOR in SPC

- "The one-minute imagery helped me to anticipate areas of new convective development as well, which was **useful** in developing short-term forecasts and mesoscale discussions for severe weather. "
- "… having the data available routinely would very likely, over time, allow forecasters to gain a **better understanding** of processes related to convective initiation, as these processes occurring within a cu field would be visually revealed in high temporal -resolution data in a way that 15- or 30-minute imagery cannot as clearly depict."
- "In the pre-storm environment, these data were **especially helpful** in monitoring the vertical growth of cumulus convection and in the identification of boundaries."
- "I found it to **be very useful** in… Using cloud character and trends to diagnose boundary locations and motion, and nowcast their potential for either CI or influences on upshear storms to interact therewith."
- "This has provided **extra confidence and lead time** for the issuance of two mesoscale discussions compared to the normal satellite update frequency/latency. … quite striking. It's analogous to the difference between watching high-def TVs vs. standard def, ... Satellite imagery at 1-min temporal resolution **needs to become the new standard for severe weather operations**."
- "Post-storm initiation, the high-resolution data allowed for **careful analysis** of overshooting and collapsing tops, the character of the storm anvils (ie. health of the storm) and the identification of convectively generated outflows."

http://satelliteliaisonblog.wordpress.com/category/spc/

Current Warning System "Challenges" Moving Towards Impact-based Decision Support System (DSS)



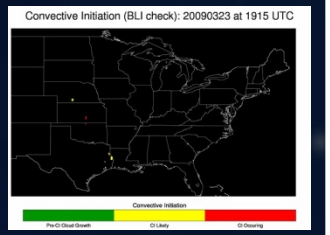
- Product-centric and binary.
- More information needed.
- More information available.

Adapted from Dr. Heather Lazrus (SSWIM)

NWS Vision to Integrate ABI and GLM Products with Other Data and Models

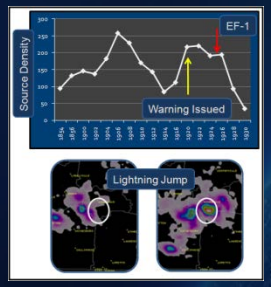
A Potential Operational Example: Convective Initiation/Severe Wx
How can we integrate the information in future tools?

CI

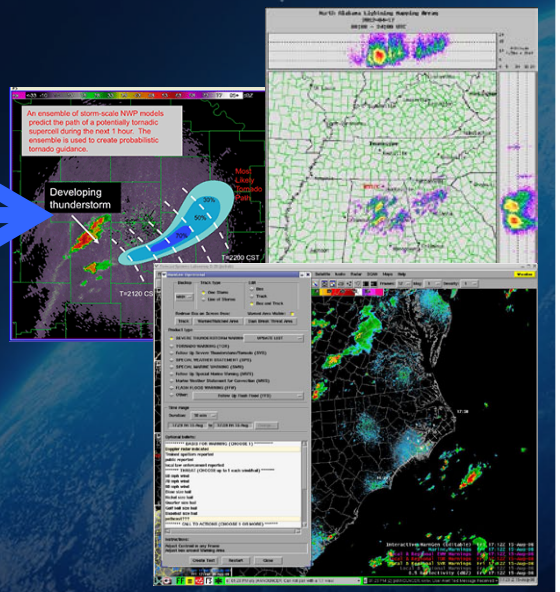


Over-shooting tops

Lightning Jumps



Next Generation Warning System



Why NWS needs this?

Situational Awareness
Warning confidence
Decision Support (venues)

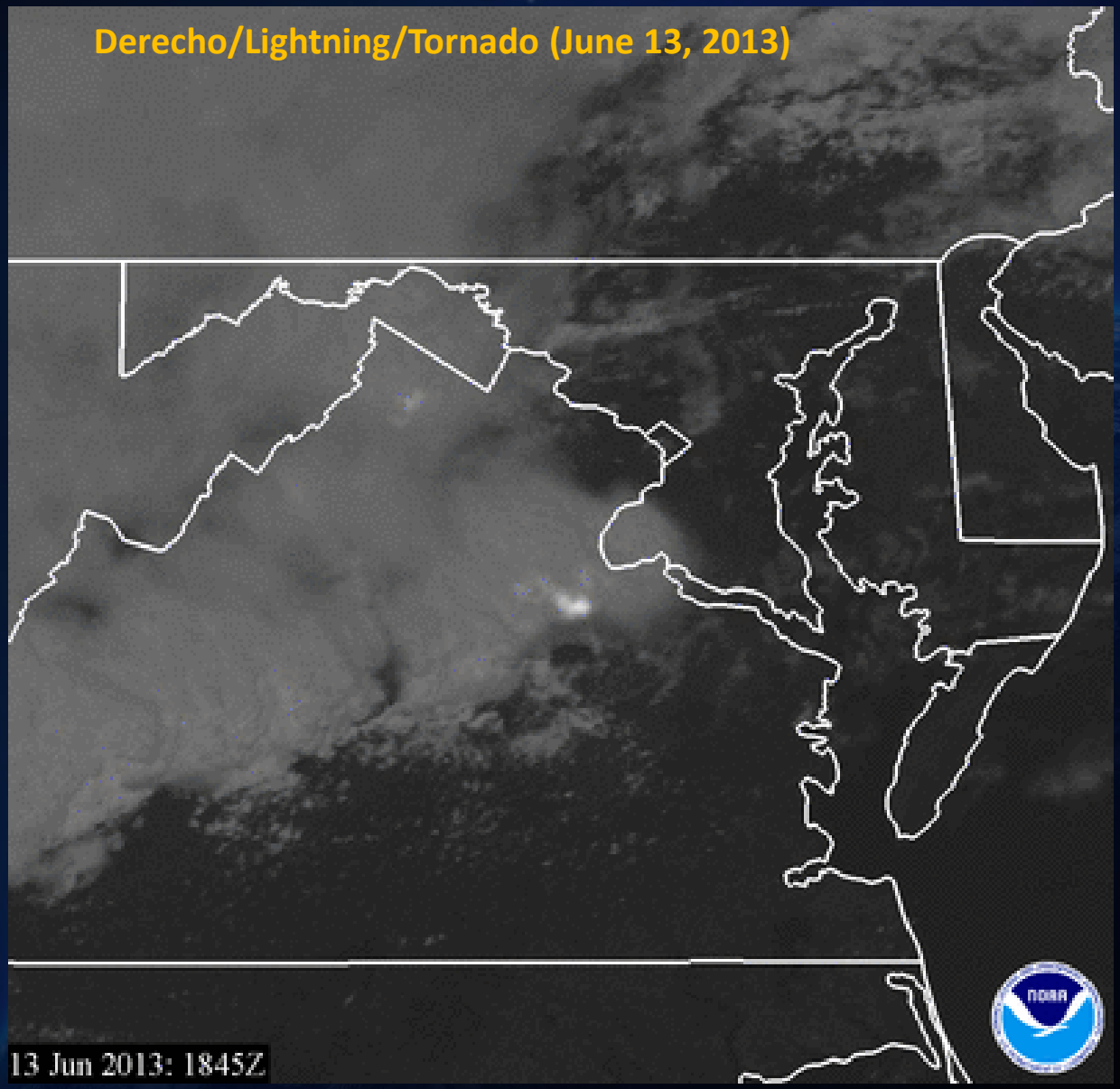
Situational Awareness:

User comment: 'Cloud Top Cooling product is an excellent source of enhancing the situational awareness for future convective initiation, particularly in rapid scan mode'.

AWC Testbed forecaster

(June 2012)

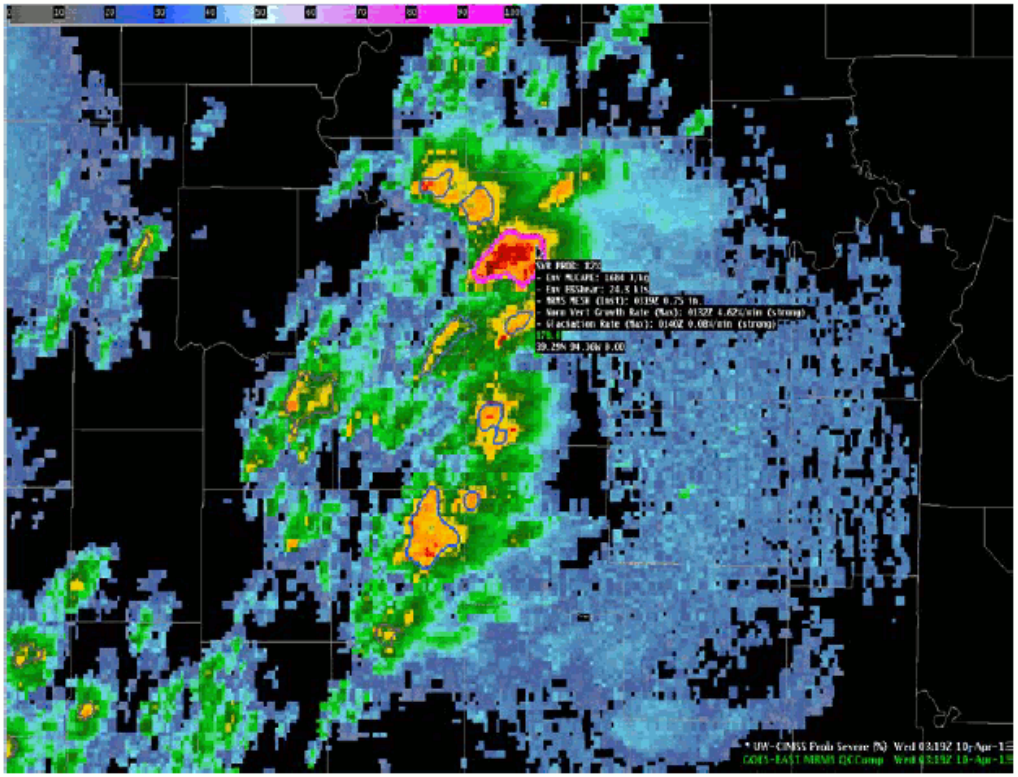
GOES-R Rapid Refresh- 1-min Imagery and Lightning



Courtesy of Scott Rudlosky, CICS-MD

Probabilistic Forecasting of Severe Convection through Data Fusion

- GOES-derived cloud growth rates, NEXRAD-derived products, and NWP-derived fields are used as input into a statistical model to compute the probability that a storm will first produce severe weather in the near-term
- Satellite and radar object-tracking are used to keep a history of storm development
- FY15-16 R3 project will investigate total lightning data and additional NWP sources, as well as advantages to be gained using super-rapid scan data
- The product display will complement NWS warning operations
- The product will be evaluated in testbeds and proving ground experiments



Merged radar reflectivity with model probability of severe contours. The highlighted storm had strong satellite growth rates, contributing to a high probability prior to severe hail occurrence. No warning was issued.

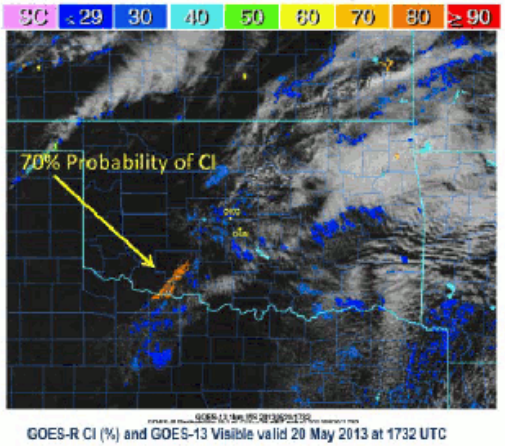
Help NWS forecasters skillfully increase warning lead time to severe hazards

M. Pavolonis (STAR/ASPB) and J. Cintineo (UW-CIMSS), J. Sieglaff (UW-CIMSS), D. Lindsey (STAR/RAMMB), D. Bikos (CSU-CIRA)

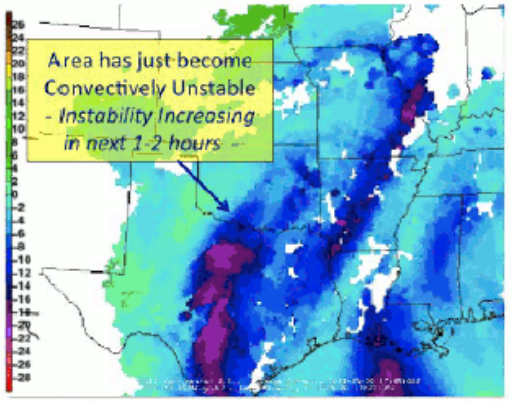
Development and Demonstration of the Fusion of GOES-R Legacy Sounding NearCasts with Convective Initiation Products to Improve Convective Weather Nowcasts

- GOES-R convective initiation (CI) algorithm is only product that provides CI information for convective storms
- CI algorithm currently over-forecasts due to little knowledge of convective environment parameters
- FY15-16 R3 project will improve CI algorithm nowcasts by incorporating GOES-R NearCast algorithm forecasts into the CI algorithm framework, effectively gaining the missing convective environmental information
- Methodology will maximize use of all GOES-R ABI capabilities
- Improved convective weather nowcasts will be available in formats compatible with AWIPS (II)/NAWIPS systems

GOES-R CI (% Probability Cloud Object Reaching 35 dBZ) and NearCast Convective Instability from 1500 UTC, both valid 1730 20 May 2013.



GOES-R CI (%) and GOES-13 Visible valid 20 May 2013 at 1732 UTC



GOES-R 2.5 hr NearCast of Convective Instability (Δθe) from 1500 UTC 20 May 2013

GOES-R CI analysis (left) and NearCast Convective Instability forecast (right) valid 1730 UTC 20 May 2013 illustrating the complimentary nature of the two algorithm datasets

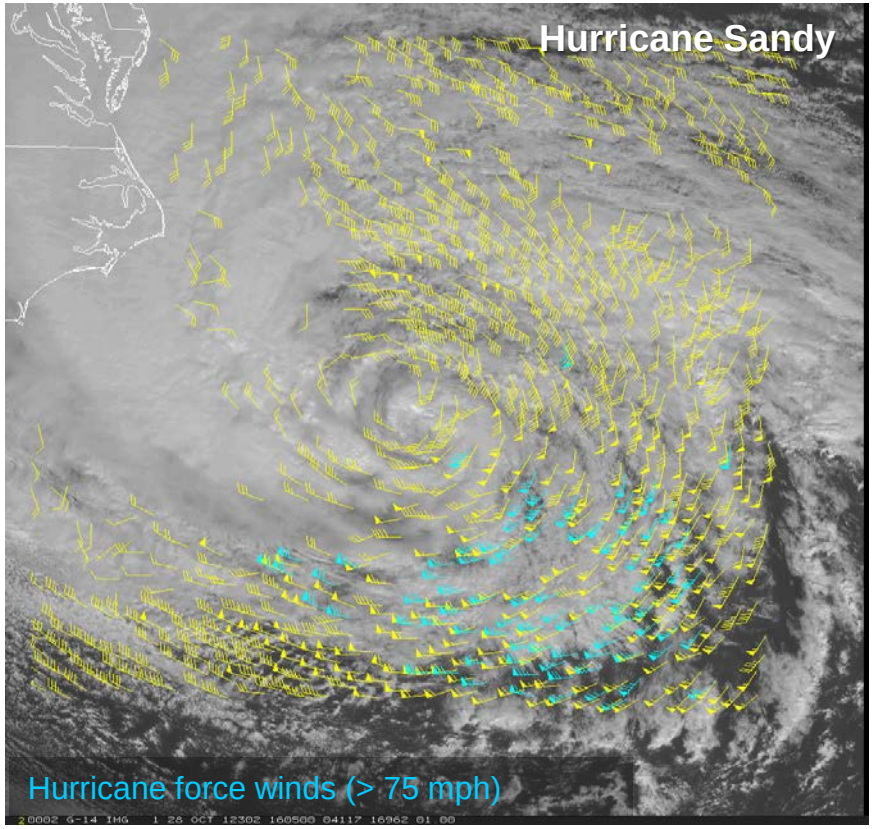
Improve convective initiation nowcasts via fusion of two established GOES-R algorithms

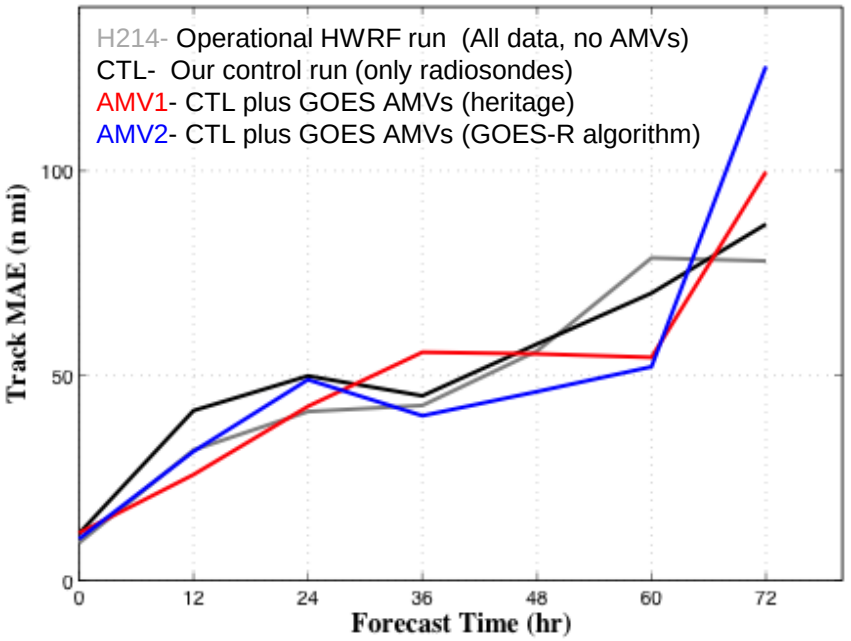
L. Cronce (UW-CIMSS), J. Mecikalski (UAH), and R. Petersen (UW-CIMSS)

High Resolution Atmospheric Motion Vectors (AMVs) for Application in High Impact Weather Events in the GOES-R era (2-59)

Christopher Velden, Jaime Daniels, Wayne Bresky, Steve Wanzong and David Stettner

Development and optimization of mesoscale Atmospheric Motion Vectors (AMVs) using novel GOES-R processing algorithms on GOES-14 SRSO imagery and demonstrating the impact of assimilating these AMVs in the NCEP HWRF/GSI System

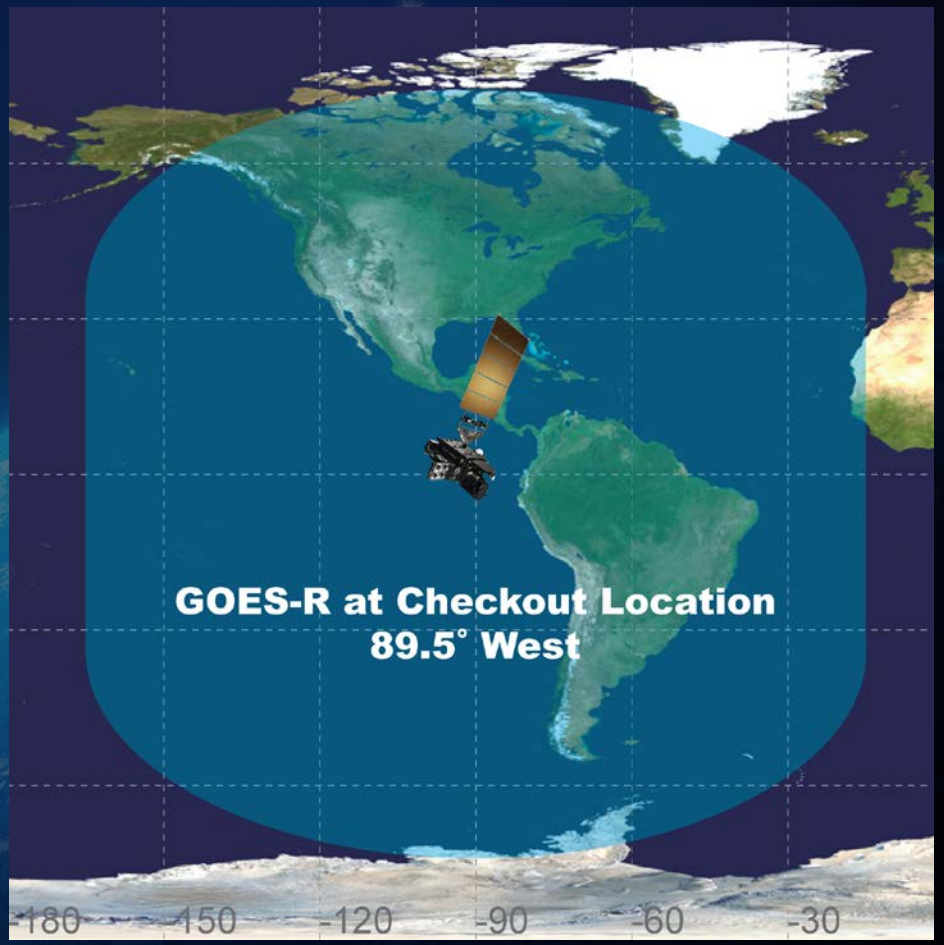




Hurricane Sandy 1-minute mesoscale AMVs (left), and results of Sandy assimilation experiments (above)

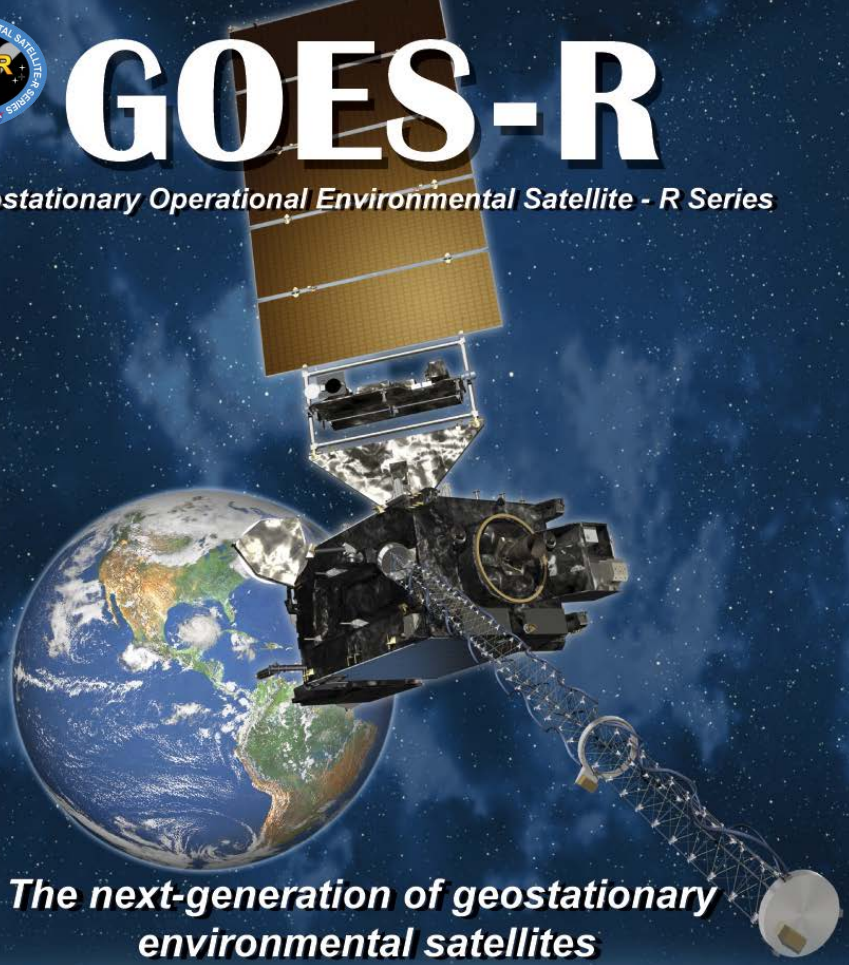
GOES-R Launch

- **GOES-R launch (October 2016)**
- Launch and orbit raising: 12 days
- Level 1b products will be validated during Post Launch Test (six months) and will be available through GOES-R Rebroadcast (GRB) service as products are certified
- Level 2+ product certification begins after L1b products and will be distributed on a product-by-product basis as they mature
- GOES-16 extended validation: 6 months beyond initial 6 month checkout period
- GOES-16 operational: Launch + 1 year at a TBD orbit location



GOES-R

Geostationary Operational Environmental Satellite - R Series



The next-generation of geostationary environmental satellites

Advanced imaging for accurate forecasts

Real-time mapping of lightning activity

Improved monitoring of solar activity

Spacecraft image courtesy of Lockheed Martin

Thank you!

For more information visit www.goes-r.gov

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https://www.youtube.com/user/NOAASatellites

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https://www.flickr.com/photos/noaasatellites/

Some Final Words to Students

- These are exciting times from the perspective of new satellite technologies, instruments, computing, etc, etc. (GOES-R, Suomi/NPP, JPSS, International satellite instruments, etc)

- I encourage you to think outside the box. Look for information gaps. Consider new approaches to fill these gaps for users. Know your user.

- We need new and innovative ways to utilize this information to solve problems to enable better understanding of our environment, make better forecasts, to provide the right information to decision makers, etc

- You are the future! Batter up!!

Applications for Severe Thunderstorms

- Pre-storm environment:
  - Mesoanalysis
    - Identification of air masses and boundaries.
- Monitor the changing environment during the nowcast to WDM time period.
  - Continue to identify boundaries and air masses.
  - Monitor interactions between boundaries / storms.
  - Consider storm-motion relative to boundary orientation.
  - Effects of outflow on the near-storm environment.
  - Identify potential satellite severe storm signatures.

http://rammb.cira.colostate.edu/training/visit/training_sessions/rso_3/video/

User Readiness Activities for GOES-R Winds

- Coordination with GOES-R PG Liaisons to acquire GOES-13/15 winds (generated via GOES-R Winds Algorithm) from STAR and bring them into OPC, AWC, and NHC

- Nearing completion of the GOES-R3 Project aimed at readying NCEP for Assimilation of GOES-R AMVs in NCEP's GFS/GSI
  - Project Title: "Development of Advanced Data Assimilation Techniques for Improved Use of Satellite-Derived Atmospheric Motion Vectors"
  - Participants: Sharon Nebuda (CIMSS), Jim Jung (CIMSS), Jaime Daniels (NESDIS/STAR), and Wayne Bresky (IMSG)
  - Work being done in close collaboration with NCEP personnel
  - Successful development and testing of GOES-R AMV quality control procedures that are being adopted at NCEP
  - Prepare NCEP for ingest of GOES-R wind products

- Application of GOES-R wind algorithm to Himawari-8/AHI
  - Completed modifications to winds software for H-8/AHI; successfully generated H-8 winds
  - Working to establish routine H-8 winds processing at STAR
  - Will provide NWS with H-8 AMV datasets for NWS testing of AWIPS-2 plug-in