Poster Session I

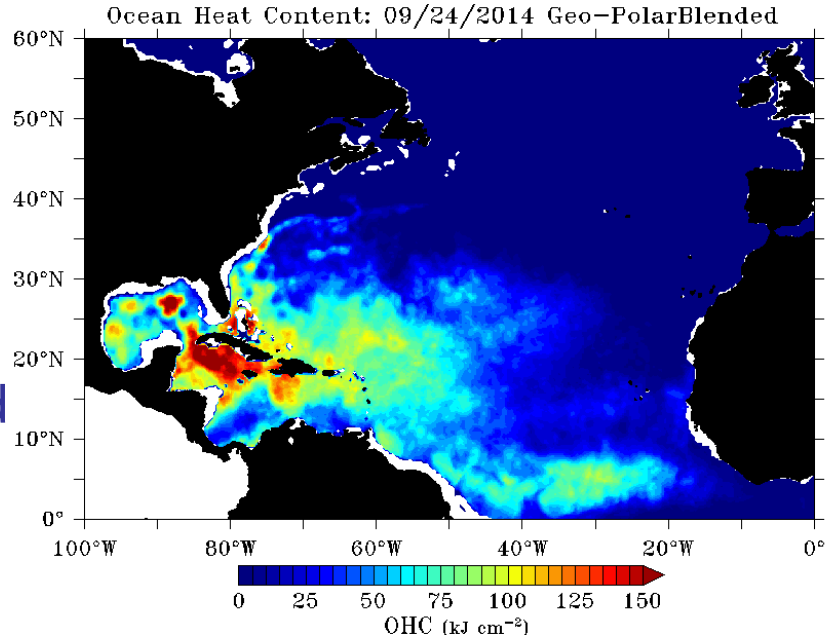
Tuesday April 28, 2015

10:30 AM & 3:00 PM

NOAA Operational Oceanic Heat Content Product Suite

David R. Donahue
NOAA/NESDIS/OSPO/SPSD Satellite Products Branch (SPB)
College Park, MD

- Satellite derived Ocean Heat Content is a measure of integrated vertical temperature from the sea surface to the depth of the 26°C isotherm.
- OHC is an important input to hurricane/typhoon forecast models.
- Uses GOES-POES blended SSTs and altimeter derived Sea Surface Height Anomalies.
- Currently operational over the North Atlantic and Pacific. Soon to be operational over the South Pacific.



Satellite derived Ocean Heat Content in the North Atlantic

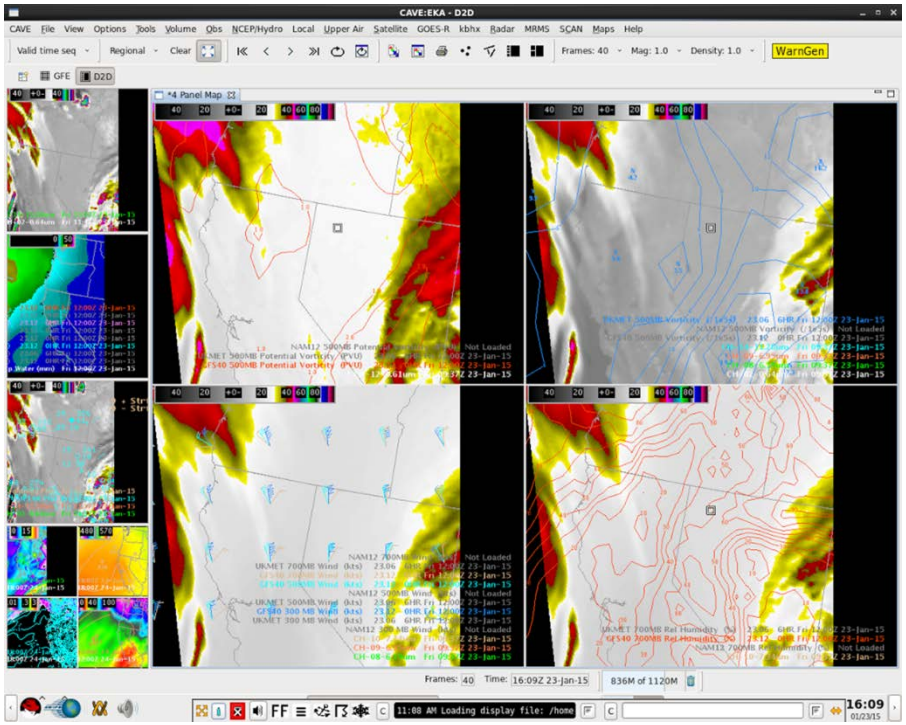
Poster # 1-2

Total Operational Weather Readiness – Satellites (TOWR-S) Project

Eric M. Guillot, Michael W. Johnson, Joseph K. Zajic, R. Bradley Pierce, and Brian S. Gockel

NWS Office of Observations/Integrity Applications Incorporated/NESDIS STAR

- TOWR-S is the NWS' User Readiness project for GOES-R and JPSS
  - Focus on AWIPS-II development
  - Approach begins with forecaster and works backward to the satellite
  - Use cases from NWS directives
  - Developed and tested representative AWIPS-II procedures using simulated GOES-R data



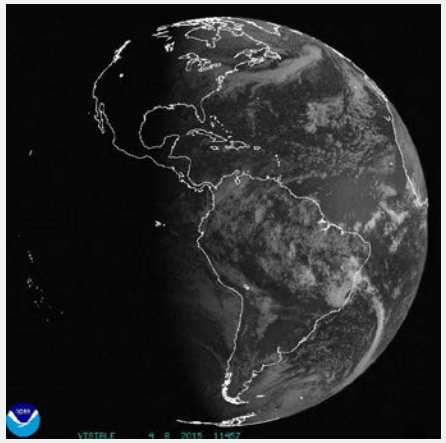
AWIPS-II CAVE displaying simulated GOES-R imagery in real-time

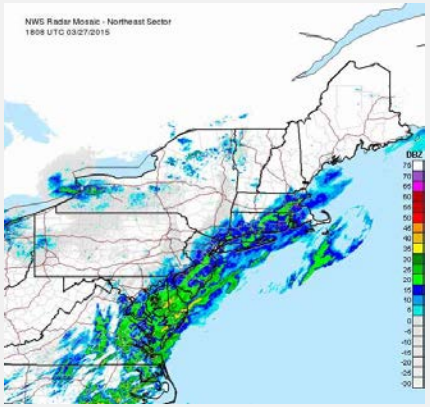
Poster # 1-5

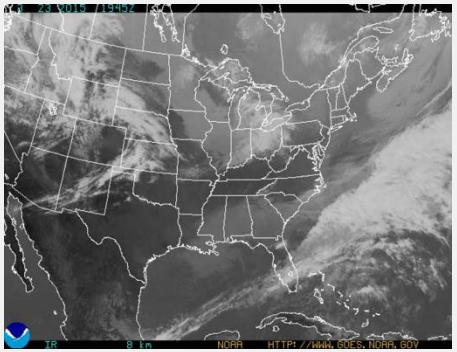
Overview of the GOES-R HRIT/EMWIN System and Impacts to the User Community

Steve Britton, Andrew Krepps, Jonathan Terrell
Solers, Inc.

- The HRIT/EMWIN system combines LRIT and EMWIN into a single satellite broadcast service and serves as the primary satellite rebroadcast of DCS data
- The combined service provides a transmit data rate of 400kbps representing an increase from legacy systems.
- Increased bandwidth enables the distribution of enhanced content over HRIT/EMWIN compared to LRIT and EMWIN.
- Current LRIT and EMWIN distribution to be maintained through the life of GOES N-O-P spacecraft
- HRIT/EMWIN to become available when GOES-R becomes operational
- Dedicated EMWIN feed will no longer be available on GOES-R
- Frequency, modulation, and data formatting changes will require end user receive system upgrades for full compatibility







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Poster # 1.6

Comparison of CloudSat and TRMM Reflectivities

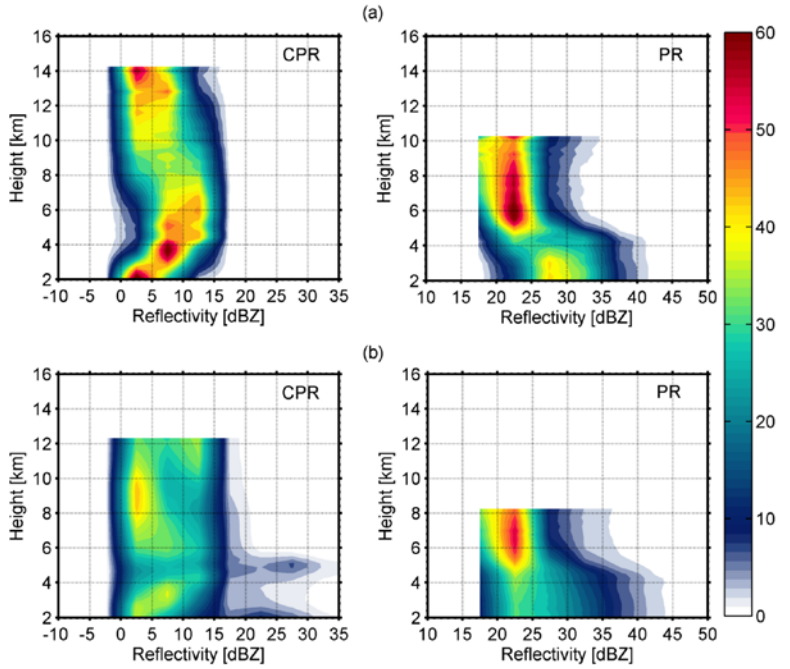
Authors: Kapil Dev Sindhu and G.S. Bhat

(Email id: kapil@caos.iisc.ernet.in)

Centre for Atmospheric and Oceanic Sciences, Indian Institute of Science, Bangalore
Bengaluru-560012, INDIA

- CloudSat-CPR (cloud profiling radar) and TRMM-PR (precipitation radar) are space-borne radars which measure cloud's characteristics.
- The convective clouds' towers are well captured by TRMM-PR while CloudSat-CPR can capture the spatial extent well while in convective region, the CPR signals get attenuated.
- Although their technical specifications shows overlap with in range 17-40 dBZ while it is not a case. Both radars' reflectivities show a little overlap (~ 2-5 dBZ).

Full published article is accessible here:
(www.ias.ac.in/jess/aug2013/947.pdf)



Contoured Frequency by Altitude Diagrams (CFADs) of CloudSat-CPR and TRMM-PR reflectivities

Poster # 1-7

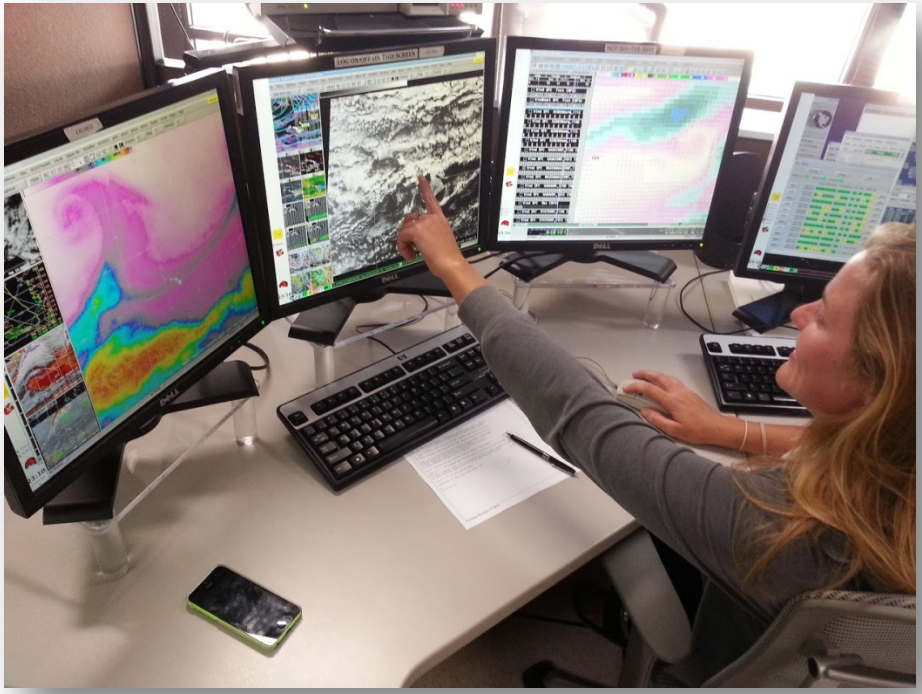
R2-Whoa

Challenges and solutions for executing best practices in transferring NOAA's research to NWS operations

Jordan J. Gerth
CIMSS/Univ. of Wisconsin, Madison, WI

- Operational user requirements now guide many satellite science activities under established and formalized proving grounds, but are they achieving the desired result?

- Topics include:
  - Oversight and Strategic Direction
  - Operational Demonstrations
  - Research Proposals



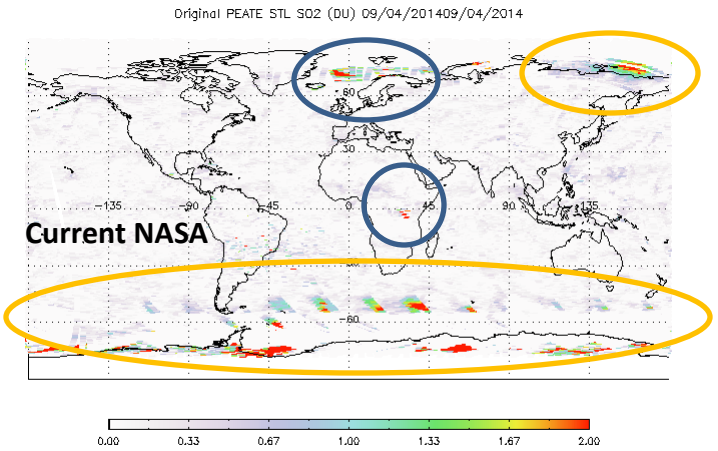
A meteorologist at the Honolulu forecast office uses VIIRS imagery while preparing an aviation forecast

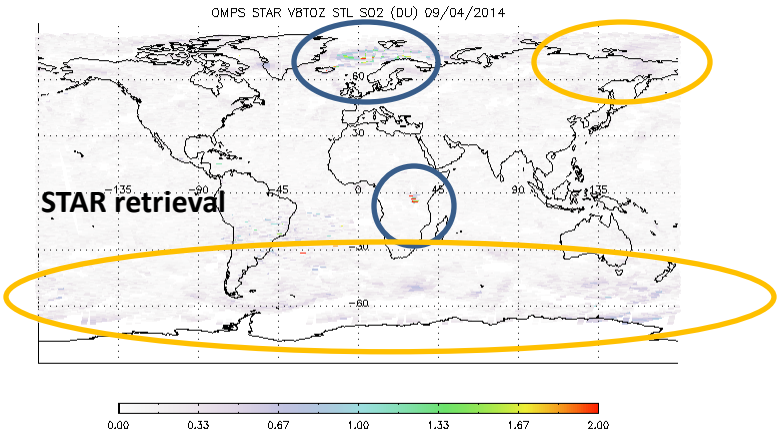
Poster 1-8

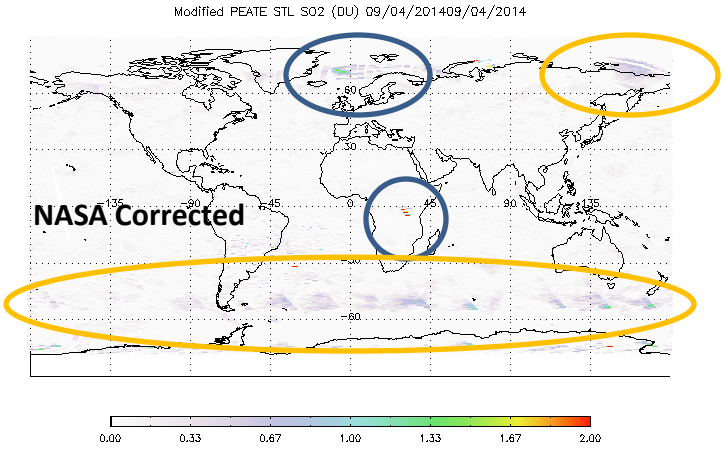
Operational implementation of the Linear Fit SO2 algorithm for use with S-NPP OMPS NM

Jianguo Niu[1], Zhihua Zhang[2], C. Trevor Beck[3], Lawrence Flynn[3], Kai Yang[4]
[1]SRG@STAR/NESDIS/NOAA, [2]IMSG@STAR/NESDIS/NOAA,[3]NOAA, [4]University of Maryland

- We adapted the current NASA Linear Fit SO_2 total amount retrieval algorithm to be compatible with the NOAA STAR Version 8 total ozone program.
- We tested a 16-granule window residual adjustment approach for providing products for near real time disaster monitoring purpose.
- Comparisons identified and corrected a small typographical error in the NASA algorithm coding improving its SO_2 estimates by a factor of three in regions with high SO_2 loading.
- Developed a new scheme to improve the determination of residual adjustment which will determine the final retrievals.
- These retrieval results show that almost all artificial structures in NASA current products have been significantly reduced.







Poster # 1.11

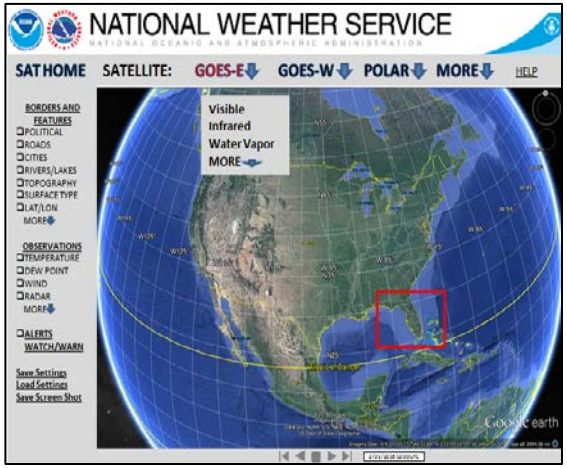
Display and Access Ideas for Future Earth Satellite Imagery

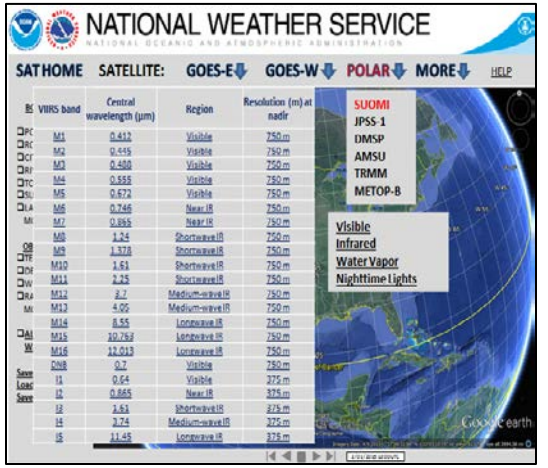
Robert Gillespie, Bill Bergen, Sterling Weems, Stacey Williamson
Carr Astronautics, Greenbelt, MD

The goal of this project is to present more accessible Satellite Imagery to decision-makers and the general public, funded under NOAA SBIR contract WC-133R-14-CN-0077.

- The Earth Observer product is a general Earth Image viewing system with powerful localization and visual analytic tools
- Provides near real-time display of Imagery and related data
- Can be customized for Earth Imaging use, including National Weather Service Satellite Imagery
- Scalable information display system
- Integrates with map or globe display
- Automatically ingests imagery and other Earth data
- Intuitive, easy to use interface
- Powerful localization and visual analytic tools
- Platform agnostic – will run on any client/server
- Supports GIS capabilities/functionalities

Earth Observer





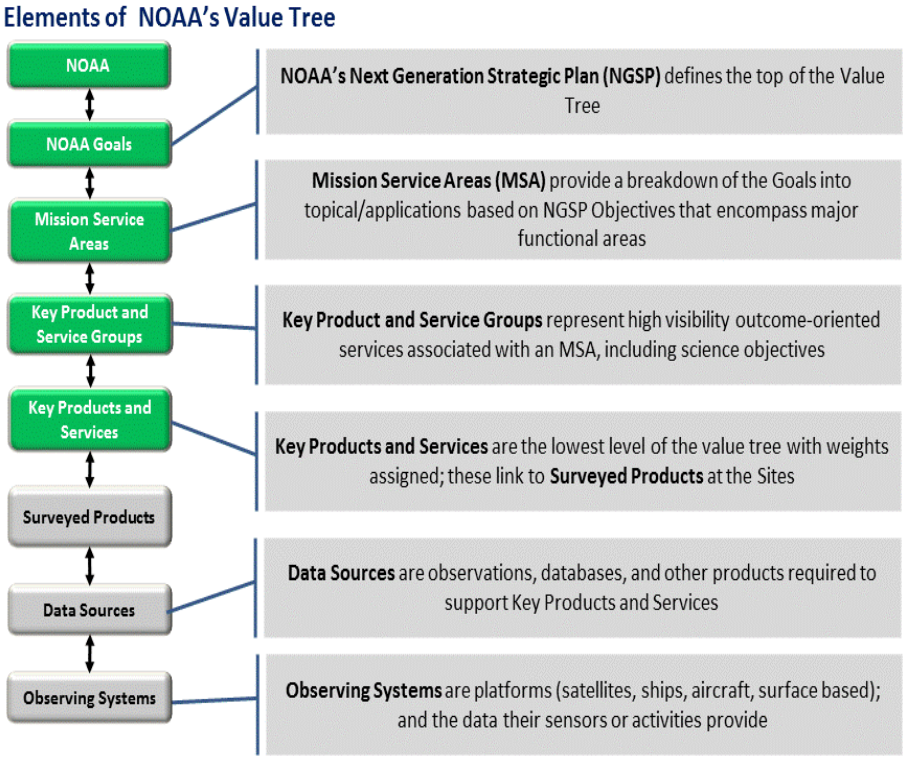
CARR ASTRONAUTICS
Science at work

Poster
#1-12

Assessment of GOES-R Product Potential Benefits using the NOAA Observing System Integrated Analysis II (NOSIA-II)

Louis Cantrell, David Helms, Robert Reining, and Aaron Pratt
NOAA/NESDIS Technology, Planning and Integration for Observation program (TPIO)

- NOSIA-II Value Tree can translate incremental improvements in data sources for NOAA's key products and services into measurable benefits to each of NOAA's Mission Service Areas
- TPIO and GOES-R program offices working to measure improvements enabled by GOES-R



NOSIA-II Value Tree

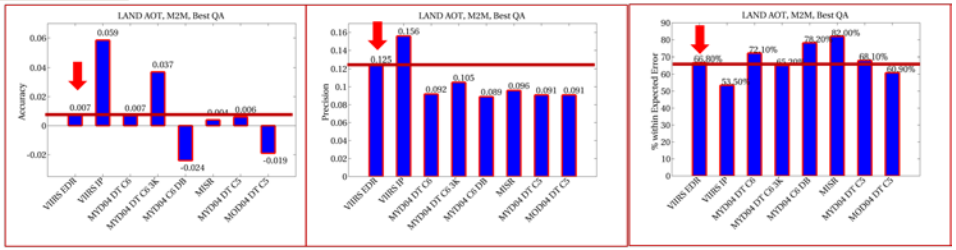
Poster # 1.14

Spatial and Temporal Characterization of the Difference between Satellite Aerosol Retrievals and AERONET

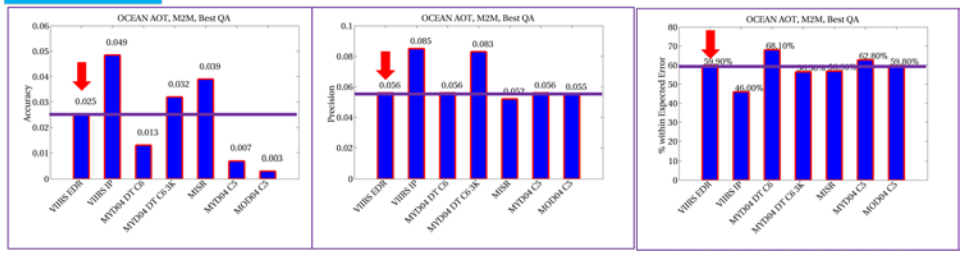
Jingfeng Huang (NOAA @ UMD ESSIC), Hongqing Liu, Istvan Laszlo, Shobha Kondragunta, Lorraine A. Remer, Ho-Chun Huang, Hai Zhang, Stephen Superczynski, Maksym Petrenko, Brent N Holben, Robert C Levy, Ralph A Kahn & Charles M Ichoku

- VIIRS Aerosol EDR achieves competitive performance to heritage sensors
  - Accuracy and precision meet the JPSS1 Specification Thresholds
  - Very competitive ocean AOT and AE retrieval performances
  - Good accuracy but relatively higher uncertainty for Land AOT

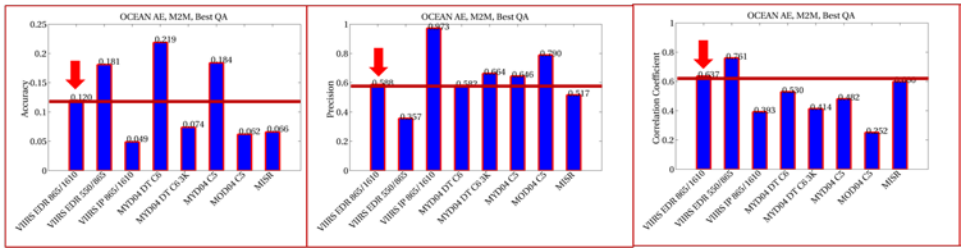
LAND AOT:



OCEAN AOT:



OCEAN AE:



VIIRS EDR and IP vs. Aqua/Terra MODIS DT (C6&3K), DB (C6) and Terra MISR

LAND AOT:

OCEAN AOT & APSP:

Poster # 1.16

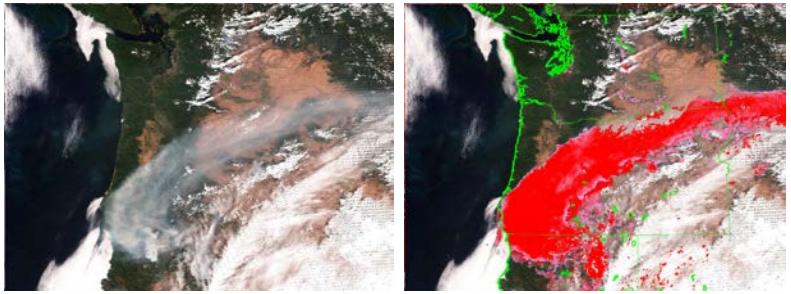
Algorithm to Detect Dust and Smoke in Suomi-NPP VIIRS Imagery

Pubu Ciren [(1)] and Shobha Kondragunta [(2)]

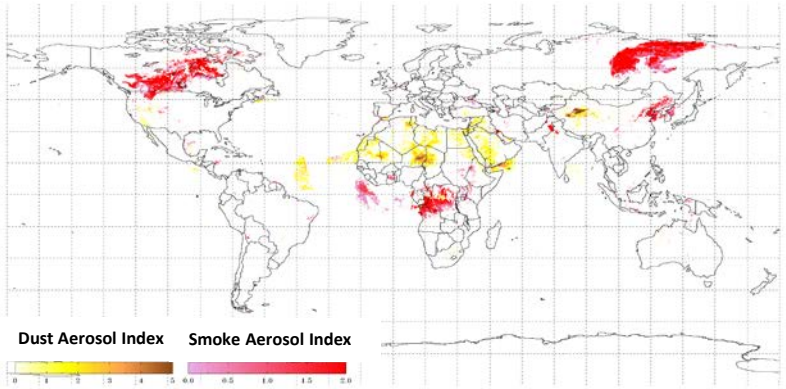
(1). I.M. Systems Group, Inc.

(2). NOAA/NESDIS/STAR

- An algorithm based on observations from deep-blue and shortwave-IR developed for MODIS has been adapted for VIIRS.
  - The developed algorithm is simple, fast, and easy to be implemented operationally.
  - Validations against AERONET observations and CALIOP VFM products indicated that accuracy and POCD for dust and smoke detection can be as high as 80% and 75%, respectively.



VIIRS RGB image (left) and the detected smoke (right) on August 3, 2014 over west coast of U.S.



Global VIIRS smoke/dust detection on July 16,2014

Poster # 1-17

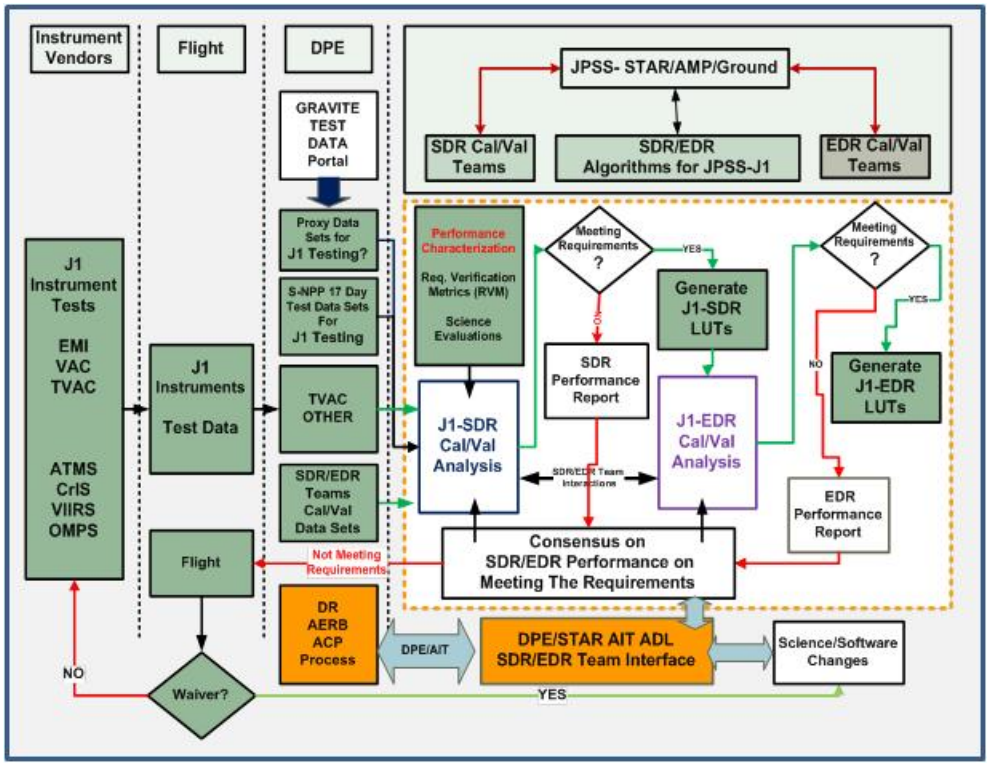
JPSS-1 Science Data Product Verification and Validation: Pre-Launch to Post-Launch Plans

Murty G. Divakarla[1], Lihang Zhou[2], Xingpin Liu[1], Walter Wolf[2], Eric Gottshall[2], Janna Feeley[2], Tom Atkins[1], Robert Steadley[2], and Ray Godin[2]

IM Systems Group@NOAA/STAR; [2]NOAA/JPSS, College Park, MD 20740

The JPSS STAR (JSTAR) science teams in association with DPES and AMP assure an unmitigated success for JPSS-1 science data product verification and validation

- The JSTAR science teams have the S-NPP experience and have all the expertise needed to develop, improve, and refine xDR science product algorithms to meet J1 science requirements.
- ✓ The JSTAR science teams and JPSS-AIT/DPES team have all the infrastructure in place for routing J1/Uppers xDR algorithm(s) in compliance with the Algorithm Change Management Plan (ACMP).



Pathway for the J1 xDR Product Realization

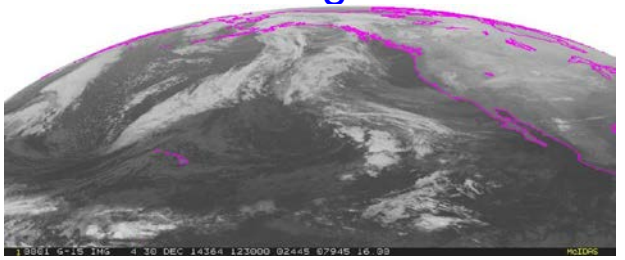
Poster # 1.20

Subtropical and Tropical Frontal Passages: A Hawai`i Perspective

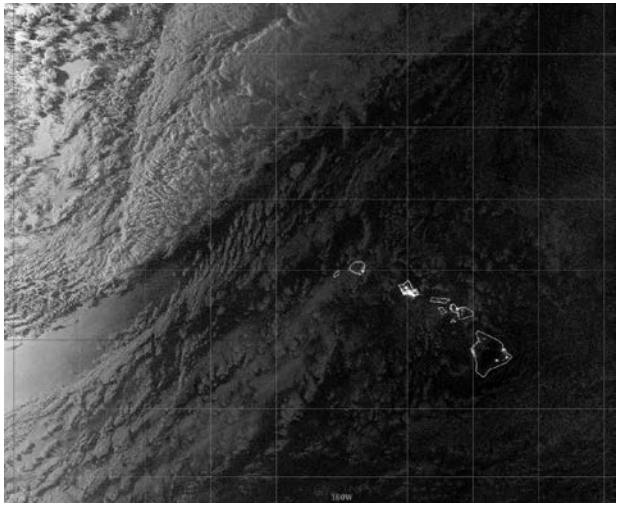
Jordan J. Gerth and Eric K. Lau

University of Wisconsin SSEC and NOAA/NWS/Pacific Region

- Polar orbiting satellite data provide added value when used in conjunction with geostationary satellite data.
  - Often times, frontal passages across Hawai`i are very weak, especially over the eastern portion of the Hawaiian Island Chain.
  - Suomi NPP VIIRS Day Night band provide “night time” visible imagery and fills the gap of GOES-15 at night.



GOES-15 Imager 10.7 µm IR window
December 30, 2014 2:30 am HST



Suomi NPP VIIRS Day Night Band
December 30, 2014 2:18 am HST

Poster #
1-21

Facilitating JPSS-1 Algorithm Development using EPL Review Process

V. J. Mikles[1], K. Sprietzer[1], B. Das[1], W. Wolf[2], and the STAR Algorithm Integration Team
[1]IMSG, [2]NOAA/NESDIS/STAR

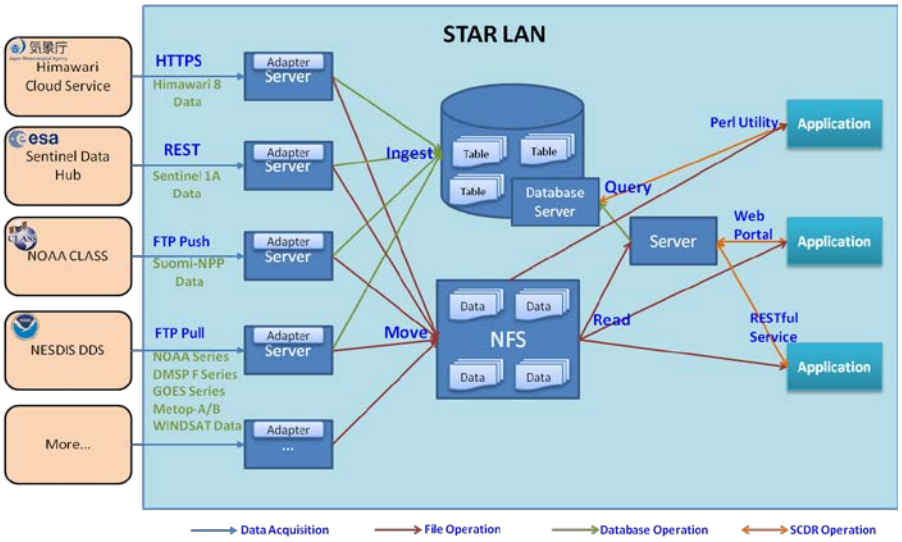
- Enterprise Lifecycle Review Process
  - Follows JPSS and SPSRB standards
  - Ensures consistency in design, documentation, and delivery
  - Identifies and involves stakeholders at all stages
- Quality Assurance
  - AIT documentation is centrally located and managed
  - AIT tracks and traces product requirements
  - SASQUATCH and RiskQUATCH tools allow us to communicate requirements and risks in a controlled fashion
- Algorithm Development
  - Configuration Management in Clearcase ensures common baseline for all developers
  - AIT-developed Chain Run tool facilitates efficient and consistent tests of interdependent algorithms

Poster # 1-22

STAR Central Data Repository (SCDR): An Integrated and Effective Framework for Satellite Data Acquisition and Dissemination

Weiguo Han[1], *Joseph Brust*[2]
[1]UCAR VSP at NOAA/NESDIS/STAR, [2]NOAA/NESDIS/STAR
College Park, MD

- SCDR provides a stable, reliable, and continually available near real-time satellite data source for calibration, validation, simulation, production, and monitoring activities
  - Retrieve and ingest large amount of near real-time satellite and ancillary data from various providers
  - Offer multiple easy and consistent interfaces to obtain satellite data of interest in a timely manner
  - Save time and cost on data collecting, storing, and searching, and reduce data latency and data duplication



System Architecture

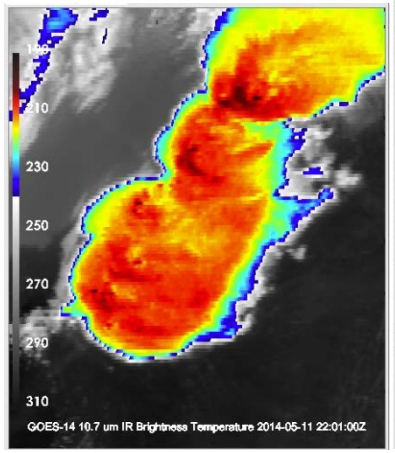
Poster # 1.23

Advancement of Satellite-Imager Based Overshooting Top Decision Support Products

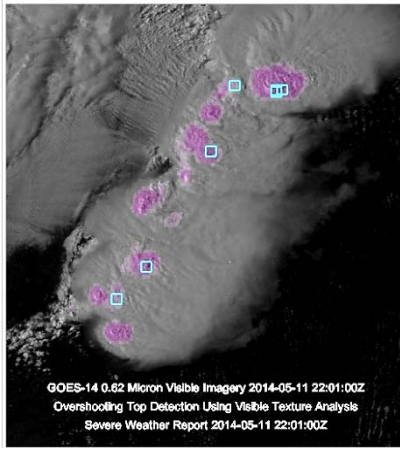
Kristopher Bedka
NASA Langley Research Center

- **A 2nd generation probabilistic overshooting cloud top (OT) detection product has been developed, with improvements based on GOES-R Proving Ground feedback**
  - Detection algorithm uses enhanced visible & IR pattern recognition and additional NWP fields
  - Algorithm trained and validated using a database of 2000+ global MODIS OT events
  - Probabilistic framework eliminates fixed detection thresholds which improves detection capability
  - Can be applied to any satellite imager, enabling both weather and global climate applications
- **An improved method for OT height assignment has also been developed using CloudSat, MODIS, and GEO imager observations**

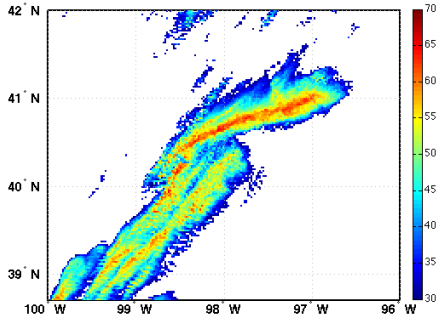
GOES-14 IR



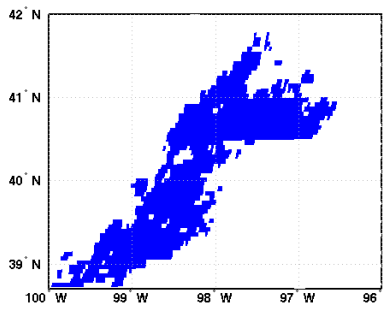
GOES-14 Visible With OT Texture Detection and Severe Wx Reports



Reflectivity at 4 km > 30 dBZ 2000-2259 UTC



GOES-14 OT Detection 2000-2259 UTC



Poster # 1-26

Adaptive Trending and Limit Monitoring Algorithm

Zhenping Li[1], Dave Pogorzala[2], Ken Mitchell[1], J. Paul Douglas[1],
1. ASRC Technical Services, Lanham, MD.
2. Integrity Applications Incorporated, Chantilly, VA

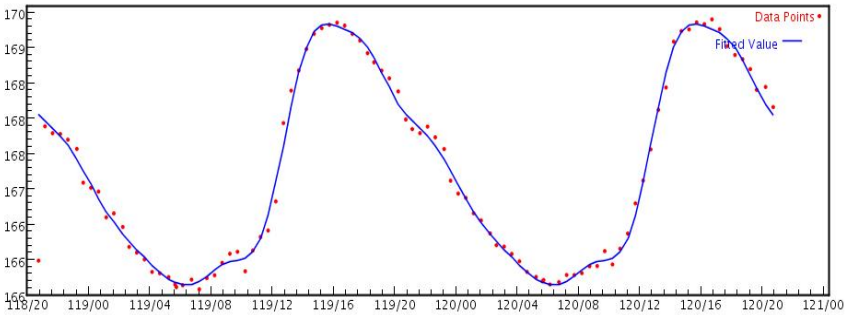
- The radiometric calibration data $d(t_i)$ with a diurnal behavior can be expressed as a Fourier expansion function:

$$f(t) = a_0 + \sum_{n=1}^{m}\left(a_n \cos\frac{2n\pi t}{24} + b_n \sin\frac{2n\pi t}{24}\right)$$

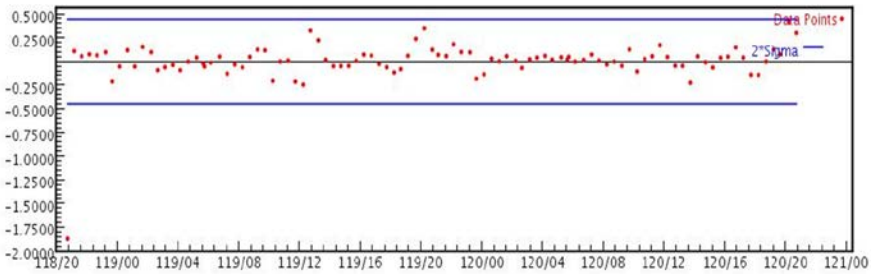
- The coefficients (a_n, b_n) can be obtained through an iterative weighted least square fit to minimize:

$$\chi^2 = \sum_{i=1}^{N}\left(f(t_i) - w_i d(t_i)\right)^2$$

- The function $f(t)$ provides the trending of the radiometric calibration parameters.
- The outliers can be easily identified that would otherwise remain unidentified by a simple mean and standard deviation-based trending approach.
- Implemented for trending the GOES-R ABI radiometric parameters



The trending for GOES13 channel 4 detector 1 bias term



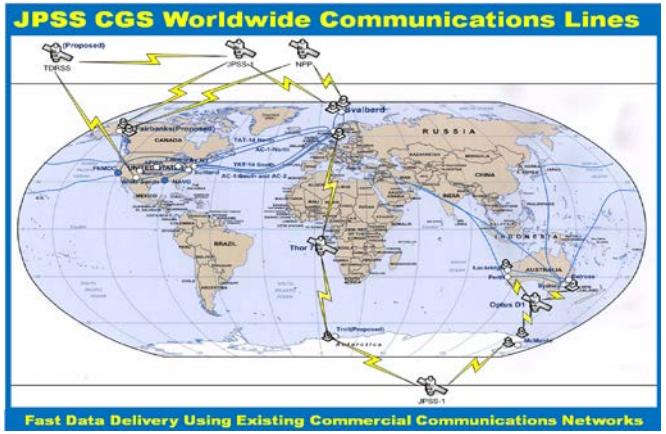
The difference $f(t_i) - d(t_i)$ the blue line represents 2σ deviation

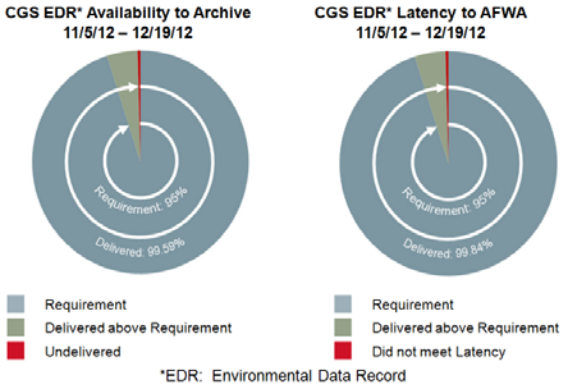
Poster # 1.27

Assured Weather Satellite Information Delivery

Kerry Grant, Shawn Miller, Shawn Cochran
Raytheon Intelligence, Information and Services
Aurora, Colorado

- The CGS plays a key role in facilitating the movement and value-added enhancement of data from satellite-based sensor data to delivery to the consumers
  - Architecture advances implemented for JPSS-1 increase data availability and reduce latency for end user
  - Improvements directly benefit user applications, such as the Global Forecast Models, Cloud Cover Analysis, and various unique missions, such as Forest Fire management and Post-Event Power Outage Assessments





Poster # 1-29

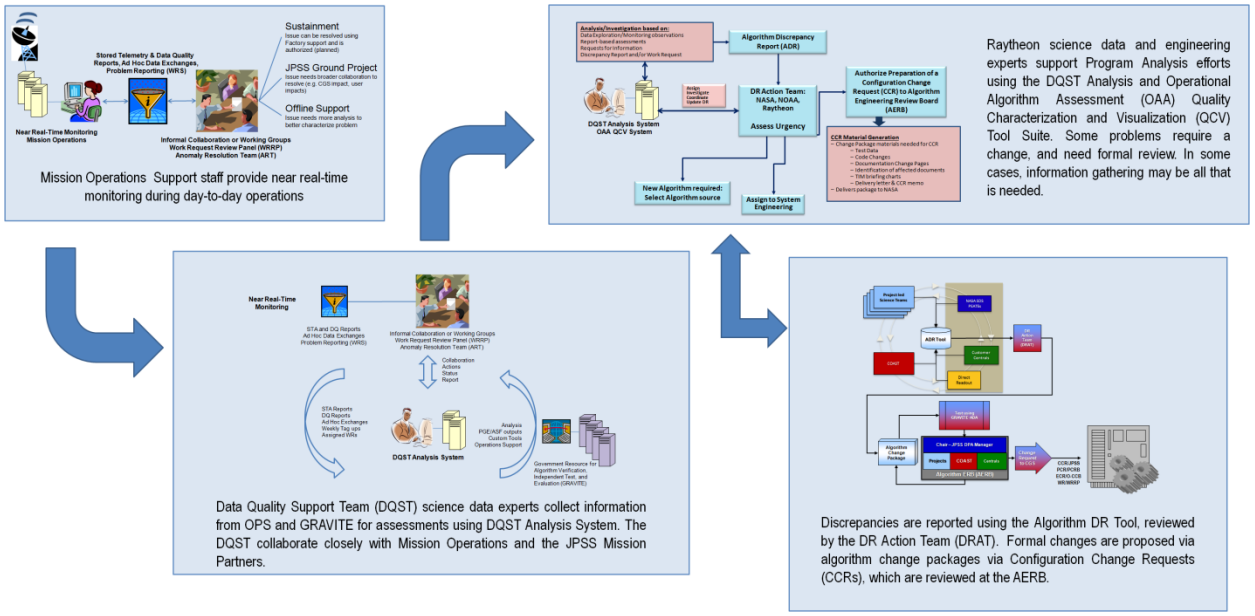
Maintaining JPSS Product Quality

Kerry Grant, Wael Ibrahim, Paula Smit, Kurt Brueske

Raytheon Intelligence, Information and Services

Aurora, Colorado and Omaha, Nebraska

- Detecting, identifying, and resolving quality issues in a timely fashion is essential for operational systems
  - Tools, techniques, and processes are in place to detect changes in product quality, identify root causes, and rapidly implement changes to the operational system to bring suspect products back into specification



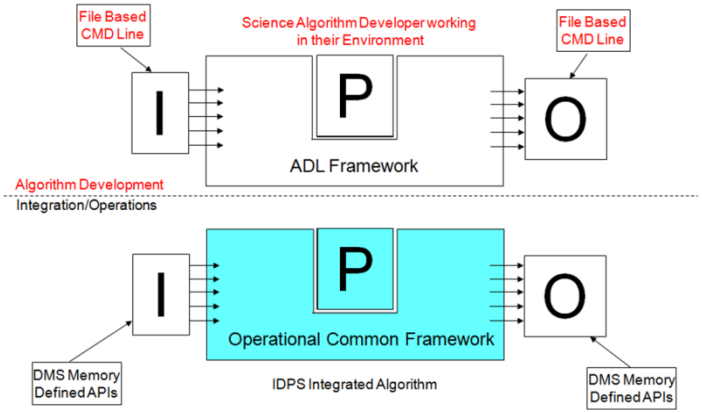
Process to detect and analyze quality issues and initiate changes

Poster # 1-30

Rapid Algorithm Integration in JPSS CGS

Kerry Grant, Shawn Miller, Michael Jamilkowski
Raytheon Intelligence, Information and Services
Aurora, Colorado and Greenbelt, Maryland

- Raytheon has developed tools, processes, and techniques to significantly shorten the time and effort required to implement algorithm changes into operations
  - The Algorithm Development Library allows scientists to easily work in their home environments then drop production code directly into IDPS
  - The Algorithm Integration Framework facilitates integration of binary or non-ADL source directly into IDPS

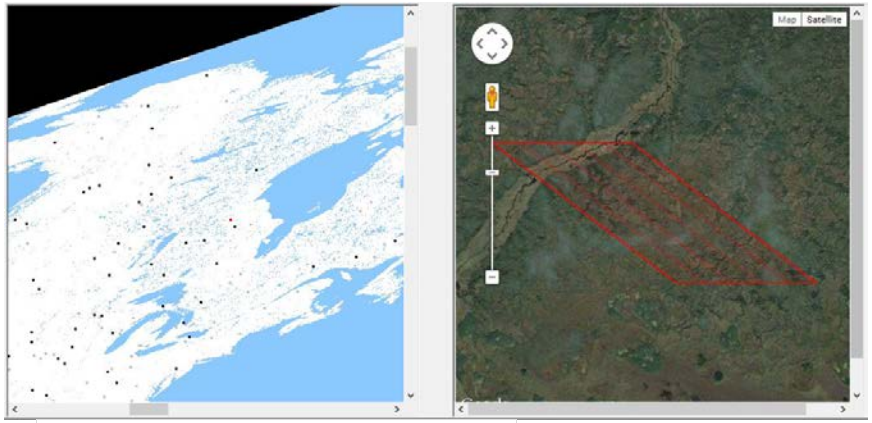


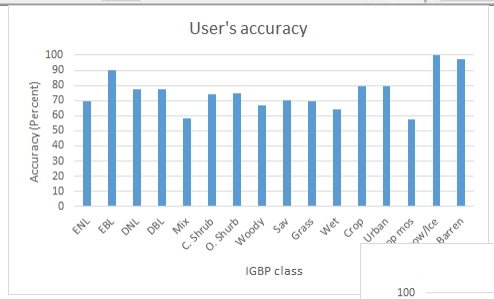
Poster # 1-31

Validation of JPSS S-NPP VIIRS Surface Type EDR

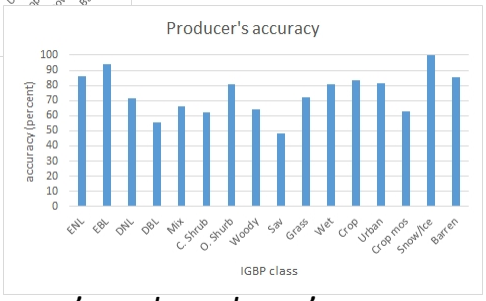
Rui Zhang[1], Chengquan Huang[1], Xiwu Zhan[2]
1. Department of Geographical Sciences, University of Maryland, College Park, MD 20742
2. NOAA/NESDIS Center for Satellite Applications and Research (STAR), College Park, MD 20740

- A new validation has been conducted on JPSS S-NPP Surface type EDR
  - An integrated validation interactive tool has been developed for the validation.
  - Approximate 5000 pixels were validated based on stratified random sampling.
  - 73.92% of overall classification accuracy has been obtained, which exceeds 70% requirement.





Poster # 1-32



Validation tool, user's and producer's accuracy

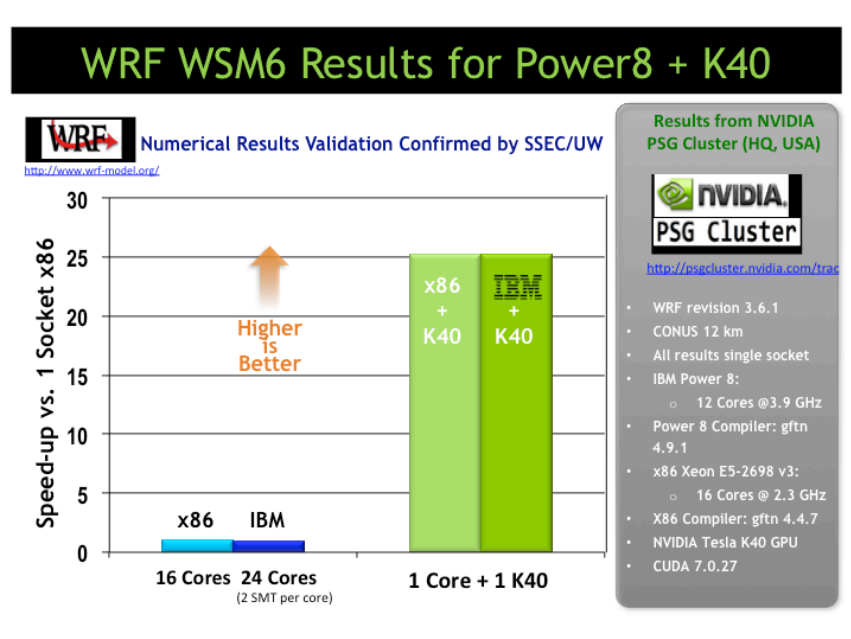
Innovating Accelerated Use of NOAA Satellite Data – The Development of Accelerator-based Models and Applications

Allen Huang, Bormin Huang, Jarno Mielikainen, and Melin Huang

Space Science and Engineering Center, University of Wisconsin–Madison

Will greatly benefit high resolution regional forecasting real-time capability

- Intel awarded SSEC a two-year grant to develop Intel MIC Xeon Phi Coprocessor based WRF using open ACC common architecture
  - SSEC becomes one of the Intel Parallel Computing Center (IPCC)
- NVIDIA, world largest GPU chip maker, is funding SSEC to develop a GPU-CPU Hybrid WRF prototype using CUDA architecture
- IBM Power architect, WRF experiment with POWER CPU+ NVIDIA GPU
- TQI, GPU/CUDA based WRF for Low Latency Wx Forecast applications

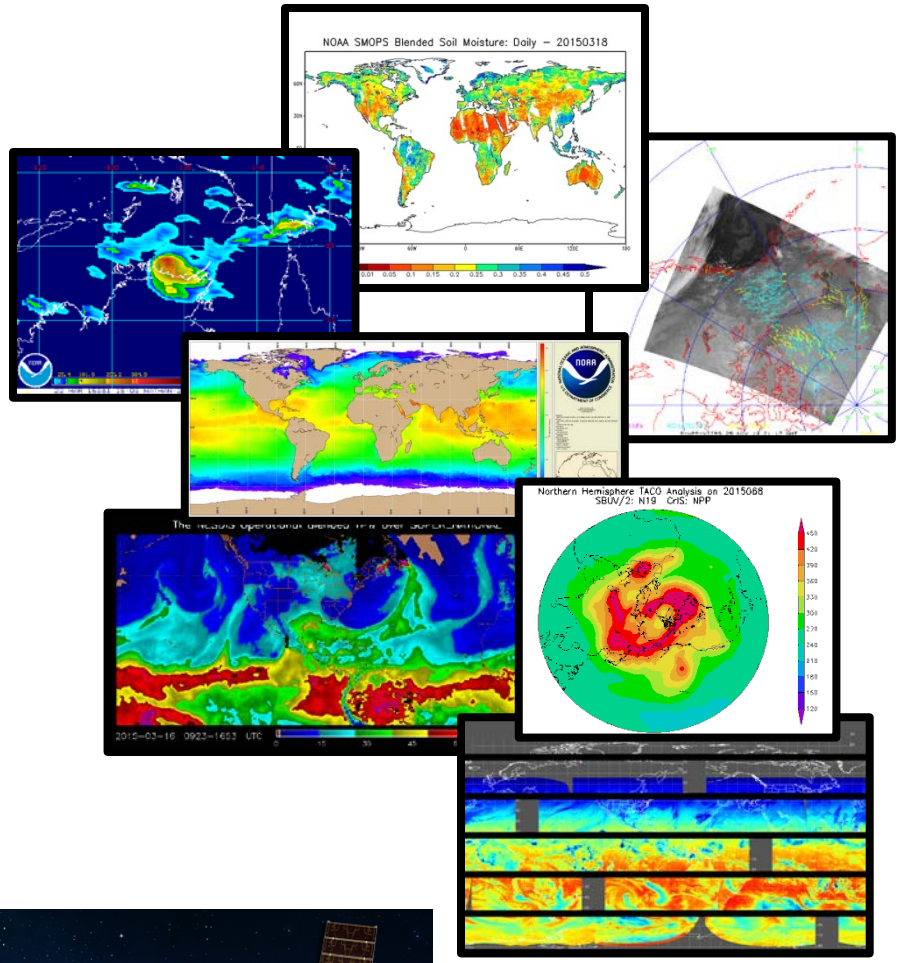


Poster # 1-33

Research to Operations of New and Enhanced NESDIS Satellite Products

Stacy Bunin[1], Tom Schott[2], Bonnie Reed[3]
[1] Noblis, Falls Church, VA
[2] NOAA/NESDIS/OSGS, Suitland, MD
[3] Science and Technology Corporation, Columbia, MD

- Atmospheric, oceanic, and land surface satellite product development efforts transitioning to operations include
  - Continuity products for replacement satellites
  - New and enhanced capabilities from existing satellite systems
  - New products from new satellite systems

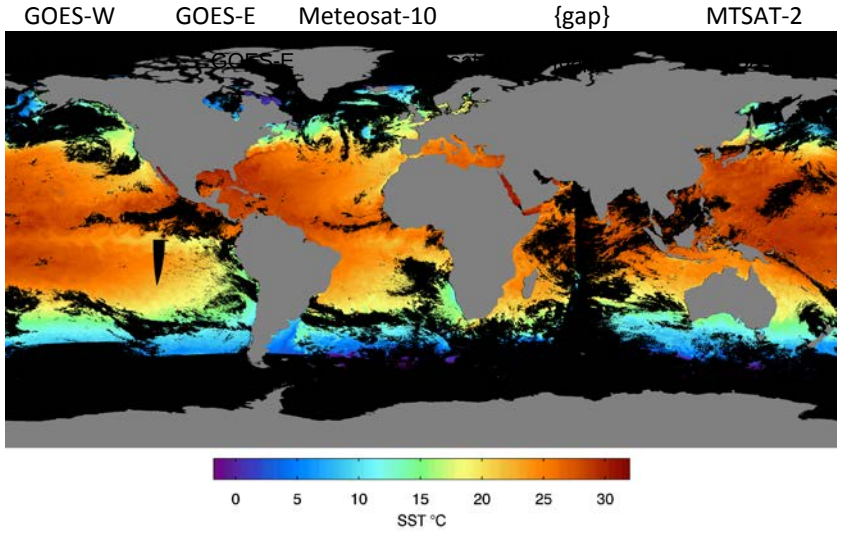


Poster # 1.36

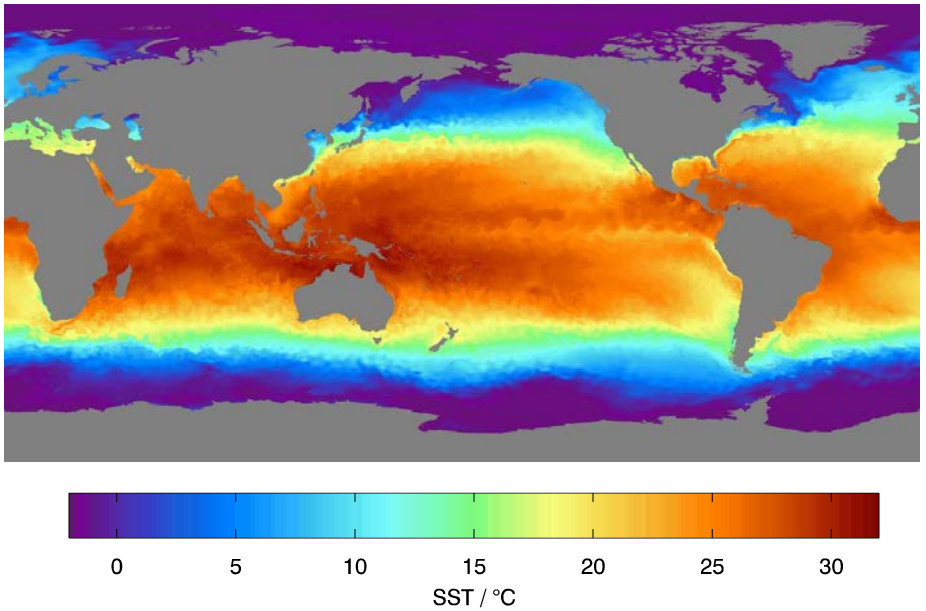
NOAA's Operational Sea Surface Temperature Products and Applications

Eileen Maturi-NOAA/NESDIS/STAR/SOCD-College Park, Maryland

Geostationary SST Product Coverage



5km Blended SST Analysis



APPLICATIONS

Oceanic Heat Content Products
Ocean Forecast Products
Coral Reef Watch Products
CoastWatch Products
Marine Fisheries Products

Poster #
1-37

NOAA STAR CENTER FOR SATELLITE APPLICATIONS AND RESEARCH
Careers • Intranet • Contact • Skip navigation
Greenbelt, MD, April 27 - May 1, 2015
National Oceanic and Atmospheric Administration
2015 NOAA SATELLITE CONFERENCE
Preparing for the Future of Environmental Satellites

Improving Noah LSM Performance using Near Real Time Surface Albedo and GVF

Jifu Yin, Xiwu Zhan, Christopher R. Hain, Li Fang, Jicheng Liu (NOAA/NESDIS/STAR, College Park, 20740 MD USA)

Experiment Details:

- *OLP—static GVF and Al;*
- *DA01—weekly GVF and static Al*
- *DA02—static GVF and monthly Al*
- *DA03—weekly GVF and monthly Al*

Major Results:

With respect to *in-situ* (179 SCAN sites and 7 SURFRAD sites) measurements, the improvements of assimilating the near real time (NRT) GVF and Al data on Noah LSM performance could be up to:

- ❖11.04% for root-zone SM
- ❖3.2% for root-zone ST
- ❖9% for net radiations

for time period longer than one week. And the drought monitoring capacity of the Noah LSM is significantly enhanced using NRT GVF and Al.

Poster # 1-38

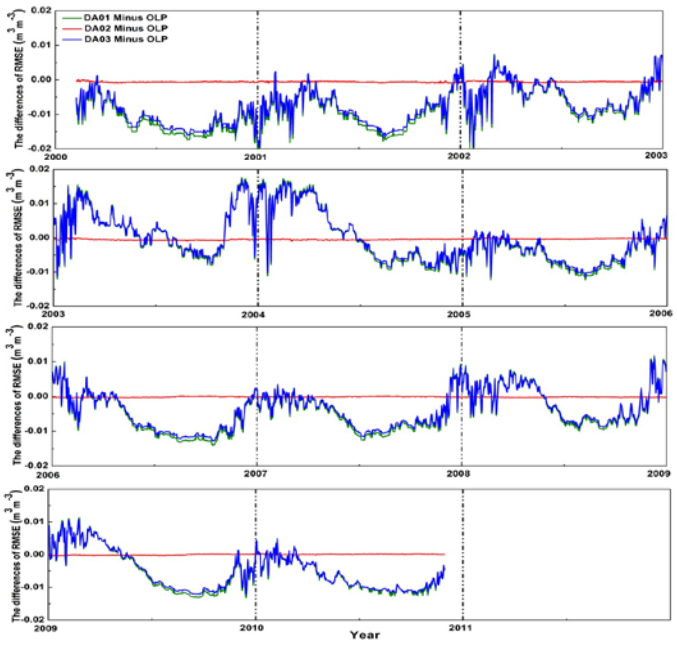


Figure 1. Time series of daily differences in 60-100 cm soil moisture (SM) RMSE between OLP case and each of three DA cases. The positive (negative) values indicate DA cases increase (decrease) RMSE in comparison with OLP case.

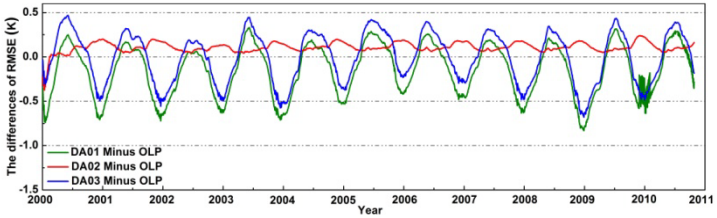


Figure 2. As Figure 1, but for 60-100 cm soil temperature (ST) .

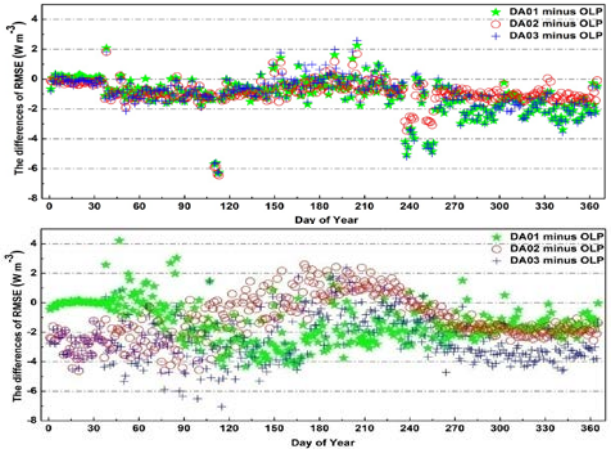


Figure 3. As Figure 1, but for LWnet (top) and SWnet (bottom).

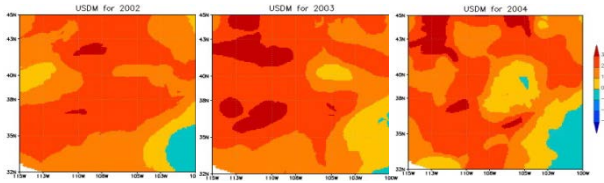


Figure 4. USDM patterns during 2002-2004.

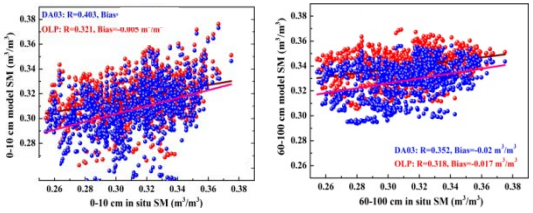
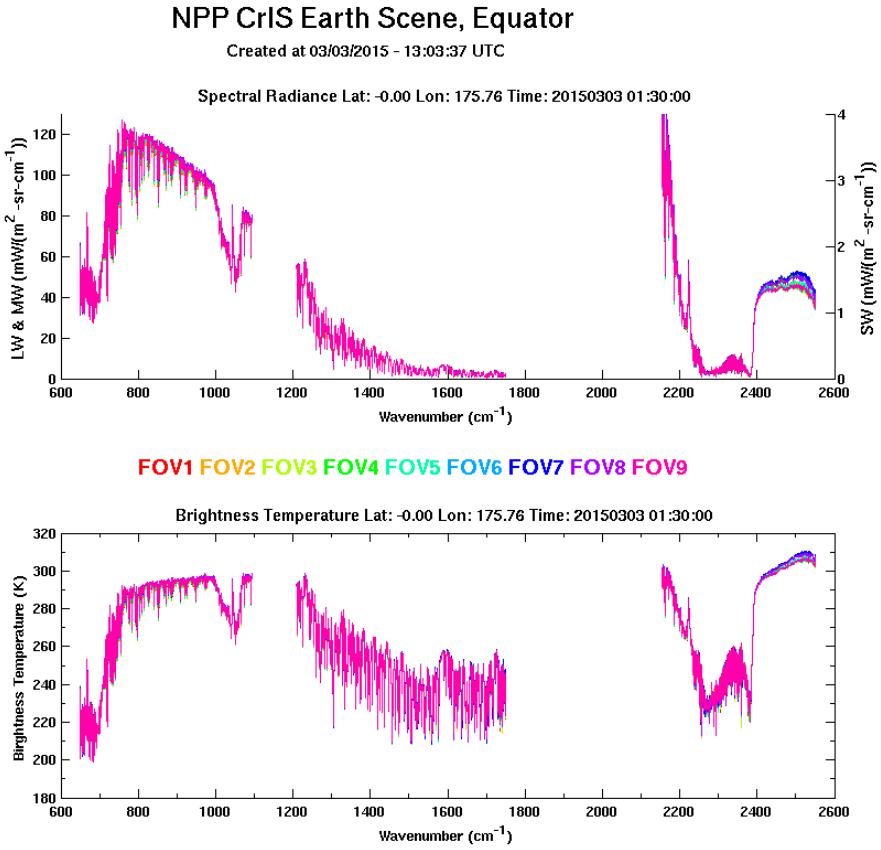


Figure 5. Domain (in Figure 4) averaged OLP/DA03 cases model 0-10 cm (left) and 60-100 cm (right) SM compared with in-situ Observations during 2002-2004 periods.

Evaluating the inter-FOV radiance difference of S-NPP CrIS Full Spectral Resolution (FSR) Data Product

Xin Jin et al.
NOAA/NESDIS/STAR and ERT, Inc., College Park, MD

- NOAA/STAR provides the CrIS FSR SDR since last Dec 4. One critical issue is to evaluate the inter-Field-Of-View radiance difference
  - Nadir-view clear sky pixels over tropical oceans are selected for evaluation
  - Comparing to normal-resolution SDR products, the FSR SDR inevitably has higher noise. But improved calibration algorithm reduces at least part of the increased uncertainty.
  - This study will help to establish a hyper-spectral radiance dataset with climate-level quality



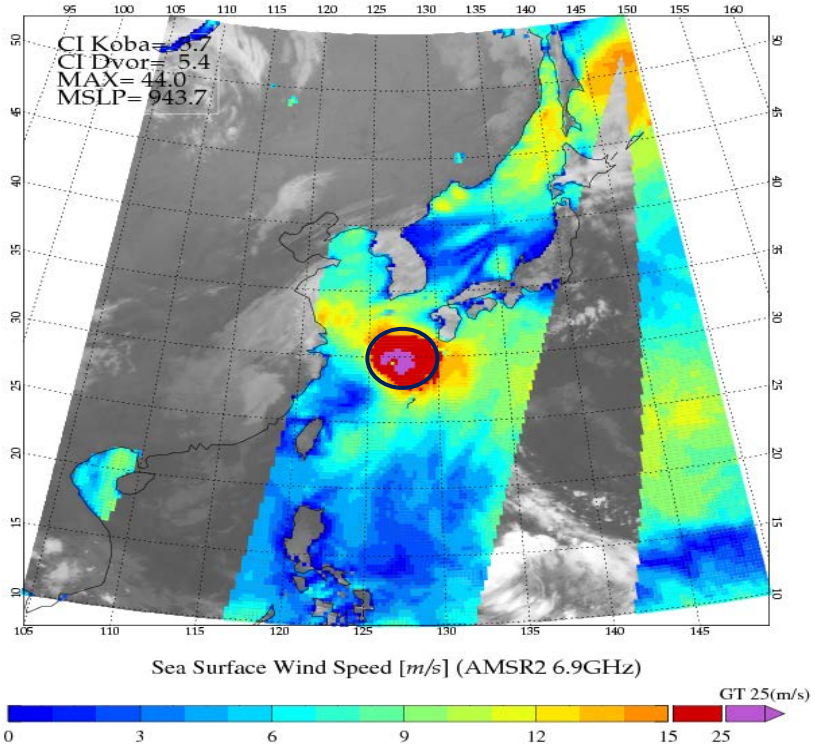
Poster # 1.39

Physical retrieval of ocean surface wind speed and its application to Typhoon analysis using microwave satellite remote sensing

Sungwook Hong[1] ,Hwa-Jeong Seo[2] ,Inchul Shin[2] and Sang-Jin Lyu[2]

1. Sejong University, Korea, 2. National Meteorological Satellite Center, Korea Meteorological Administration

- A unique sea surface wind speed retrieval method (Hong and Seo algorithm) from passive microwave satellite observations is developed for use in both rainy and rain-free conditions.



- This algorithm is based on a combination of satellite-observed microwave brightness temperatures, sea surface temperatures, and horizontally-polarized surface reflectivities from RTTOV model, and surface and atmospheric profiles from ECMWF.
- The retrieved wind speed(W_S) shows the improved results (low bias and RMSE)
  - W_S was directly validated with the TAO buoy data and indirectly validated with the TCs intensity.

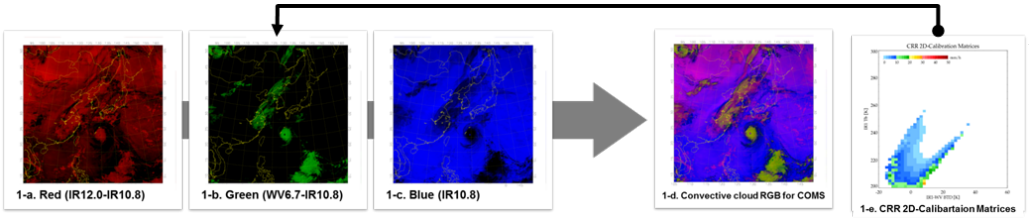
Fig.1 Sizes (radius of 15 m/s wind speed) of Typhoon DANAS using GCOM-W1/AMSR-2 6.9GHz(Hong & Seo algorithm) on 17:10 UTC Oct. 7, 2013 .

Poster
1-40

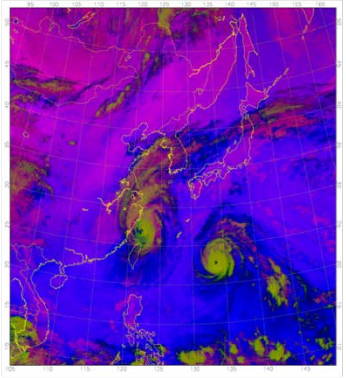
RGB product for convective clouds using COMS

Sungwook Hong[1] ,Yuha Kim[2] and Sang-Jin Lyu[2]

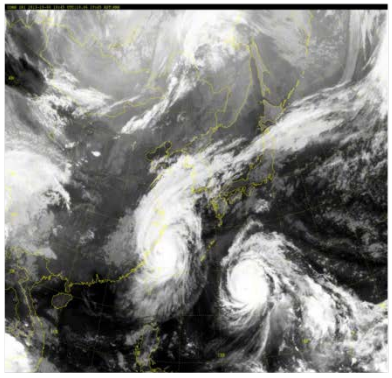
1. Sejong University, Korea, 2. National Meteorological Satellite Center, Korea Meteorological Administration



Case of Typhoon Danas (2013.10.06.10:45UTC)



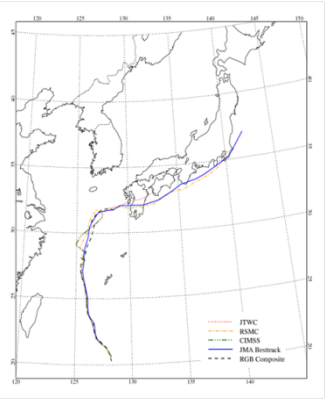
2-a. Convective Cloud RGB for COMS



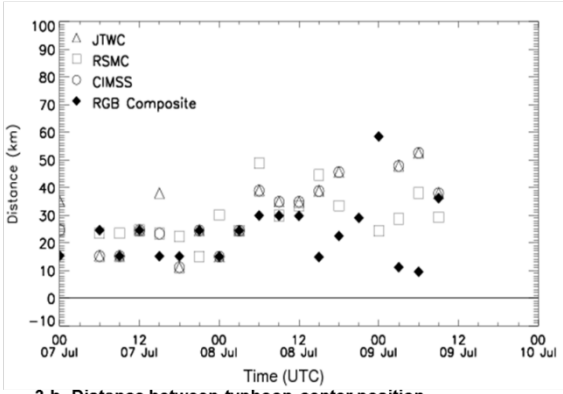
2-b. IR Image for COMS

2-c. Colour Interpretation

Case of Typhoon Neoguri (2014.07.07.00:00 ~ 2014.07.11.00:00 UTC)

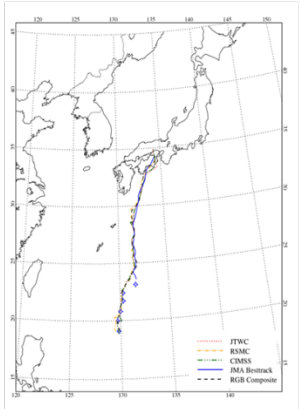


3-a. Track of Typhoon Neoguri

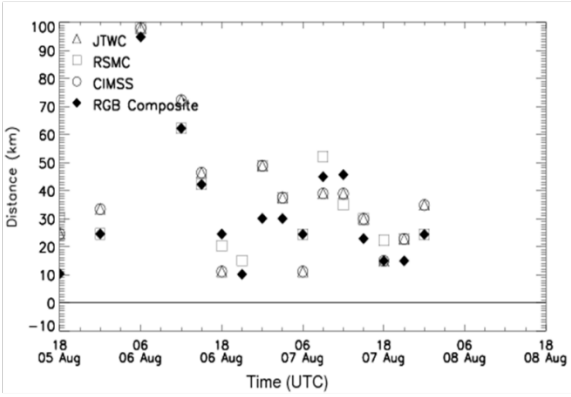


3-b. Distance between typhoon center position from RGB composite and Besttrack

Case of Typhoon Halong (2014.08.05.00:00 ~ 2014.08.10.00:00 UTC)



4-a. Track of Typhoon Halong



4-b. Distance between typhoon center position from RGB composite and Besttrack

- The convective cloud RGB is composed from a combination of 12.0-10.8μm, 6.75-10.8μm,10.8μm (Fig 1).
- The threshold values of the RGB product for detection of convective clouds are taken from LUT of Convective Rainfall Rate(CRR) (Fig 1-e).
- Typhoon center positions from the RGB convective cloud product shows comparable or even better result relative to the best track data (Fig 3~4) implying that the RGB convective cloud product can be used to improve the accuracy of typhoon center position analysis.

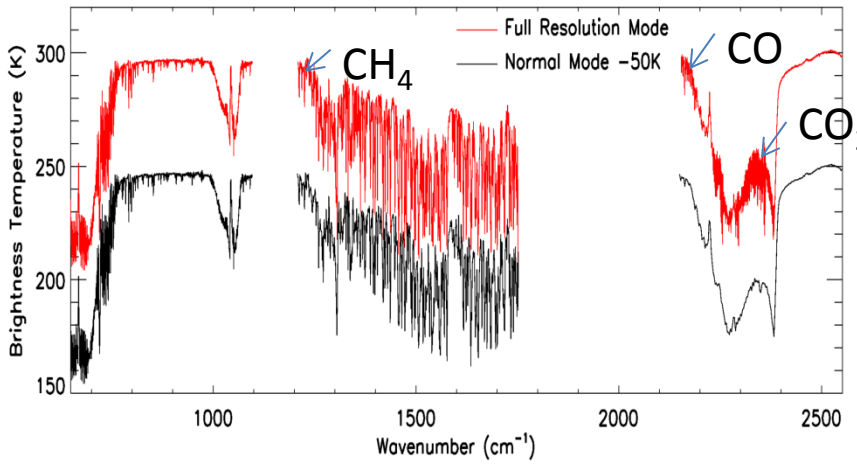
Poster 1-41

NOAA/STAR S-NPP CrIS Full Spectral Resolution SDR Processing

Xiaozhen (Shawn) Xiong[1,2], Yong Han[2], Yong Chen[2,3],
Likun Wang[2,3] , Denis Tremblay[2,4], Xin Jin[1,2], Lihang Zhou[2]
[1]Earth Resources Technology, Inc, MD; [2]NOAA Center for Satellite Applications and Research, College Park, MD; [3]University of Maryland, MD; [4]Science Data Processing Inc.

The CrIS full spectral (FRS) data on S-NPP and J-1 will greatly improve trace gases observation over normal resolution

- ✓Data is available since Dec.4, 2014;
- ✓A modified ADL code made by STAR SDR group is used to generate the data with a latency within 12 hours;
- ✓Data is delivered on STAR FTP site (ftp://ftp2.star.nesdis.noaa.gov/smcd/xxiong/) and GRAVITE (https://gravite.jpss.noaa.gov/).



CrIS full spectrum with 2223 channels (non apodized, red) vs current normal resolution mode with 1317 channels(black).

Poster # 1-43

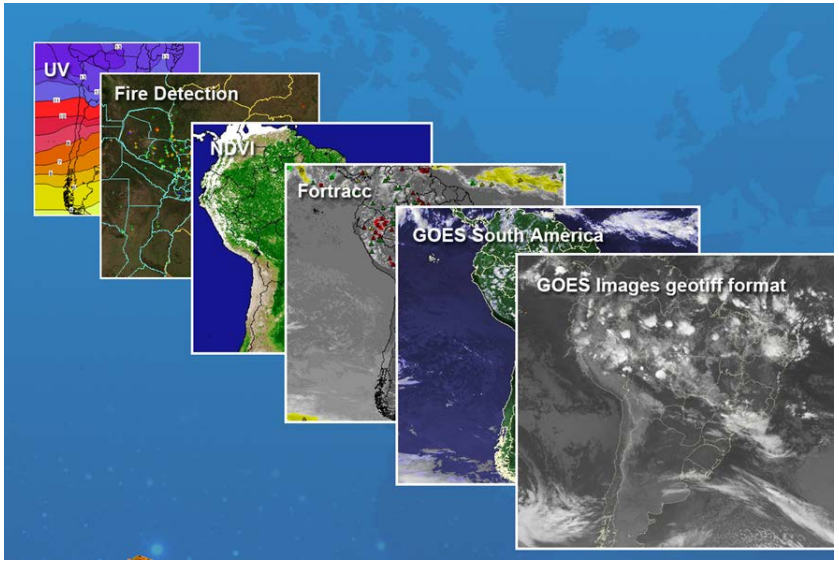
Applications of GOES data in Brazil

Nelson J. Ferreira

DSA/CPTEC Brazilian Institute for Space Research – INPE

Cachoeira Paulista, SP, Brazil

GOES-13 has been successfully used in Brazil providing imagery data every 30 minutes in routine mode and every 3 hours in RSO mode. This reception routine enabled to improve weather forecasts, disaster management, drought, fires warnings and to monitor extreme weather events. Also training material on the use of GOES over South America was designed to increase the forecasters' skill in incorporating satellite data in the short-range forecast, and warning decision makers processes.



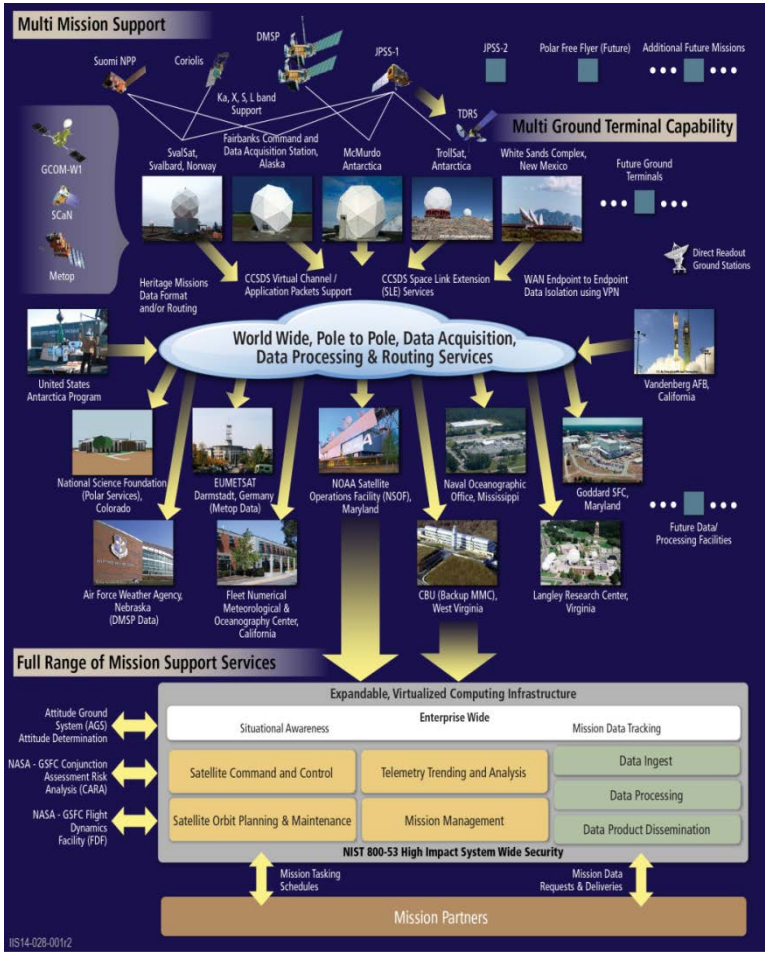
GOES Products available at CPTEC/INPE

Poster # 1-44

Joint Polar Satellite System (JPSS) Common Ground System (CGS) Multimission Support #1-45

Mike Jamilkowski, Shawn Miller and Kerry Grant
Raytheon Intelligence, Information and Services
Greenbelt MD & Aurora CO

- CGS design tenants emphasize ability to incorporate multiple missions
  - Modular functionality
  - Flexible interfaces
  - Improved information integration across missions
  - Generalized capabilities rather than point solutions
- Support for new missions can be tailored to specific needs
  - Data acquisition and routing
  - Command and control
  - Data processing and delivery
- Block 3.0 will provide opportunity to align the CGS with the NOAA Enterprise Ground vision

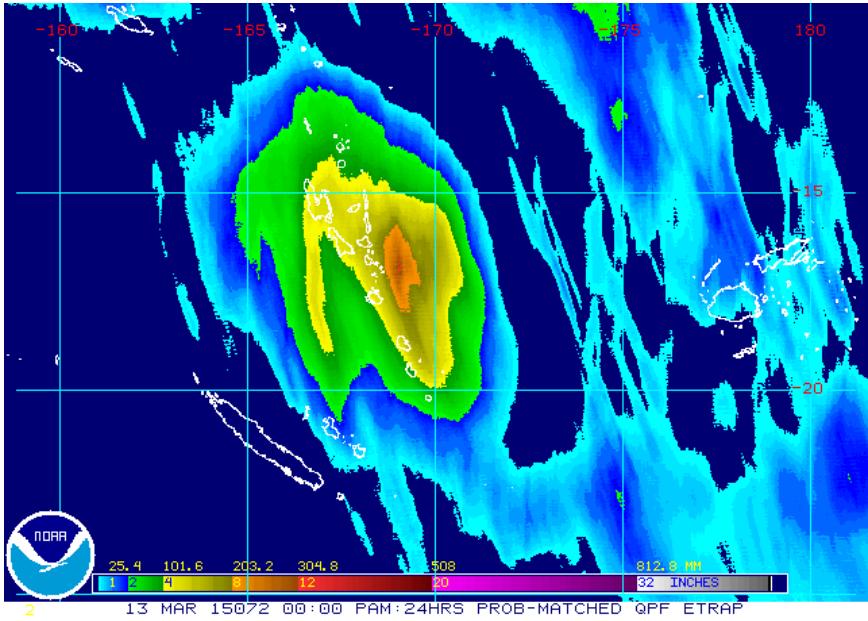


CGS Block 2.0: Operational, Multi-Mission Enterprise Ground

Improvements to Ensemble Tropical Rainfall Potential (eTRaP)

The eTRaP team: Robert J. Kuligowski, Stan Kidder, Liqun Ma, Robert Glassberg, Clay Davenport, Rachel Hatteberg, Mike Turk, Sheldon Kusselson, and Beth Ebert

- An operational forecast of rainfall from tropical cyclones:
  - Based on extrapolating satellite-retrieved rainfall along the predicted storm track
  - Uses an ensemble of rainfall retrievals and forecast tracks
  - Accumulations and exceedance probabilities in 6-h segments out to 24 h
  - Used by forecasters worldwide
- Recent and ongoing improvements:
  - Removed biases in probabilities
  - Additional ensemble members to improve forecast quality and reliability



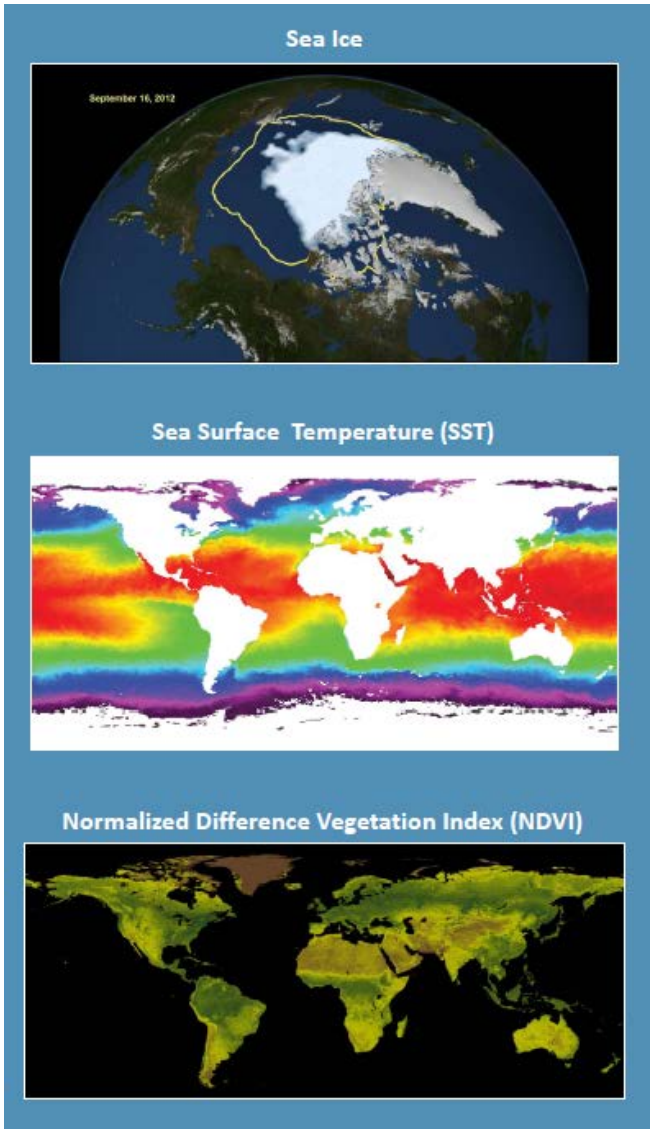
eTRaP for Cyclone Pam at 0000 UTC 13 March 2015

Poster # 1-46

A Systematic Approach to Building and Maintaining NOAA's Climate Data Records (CDRs)

Daniel Wunder
NOAA/NCEI Asheville, NC

- NOAA's CDR Program office has transitioned 28 satellite CDRs to initial operational capability (IOC)
  - Research to Operations (R2O) is a six phase process which culminates with an Operational Readiness Review (ORR).
  - The source code, documentation and data are available to the public, ensuring a transparent and scientifically defensible CDR.
  - A follow on commitment to sustained Operations and Maintenance (O&M) provides routine product generation extending the record.
  - Specific applications are developed to help end users and decision makers better understand the CDR data and potential applications.



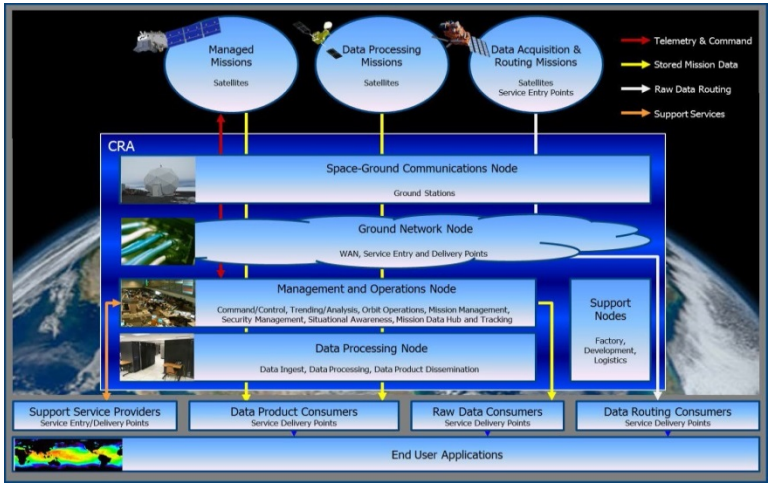
Sample CDR Products

Poster # 1.49

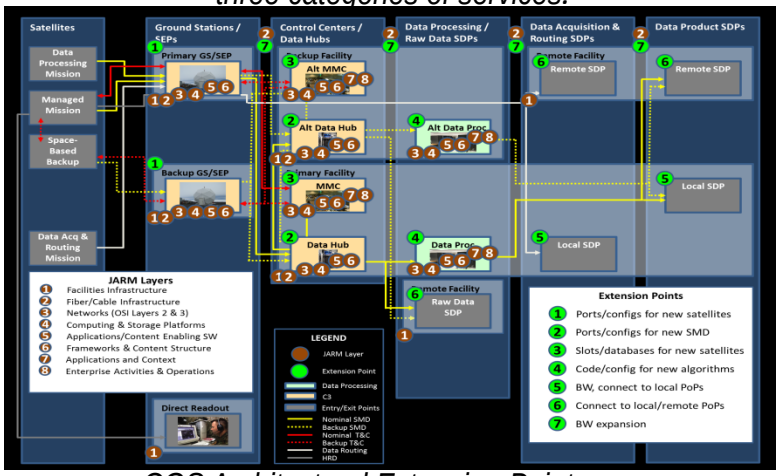
Adding a Mission to the Joint Polar Satellite System (JPSS) Common Ground System (CGS) #1-50

Shawn Miller, Kerry Grant and Mike Jamilkowski
Raytheon Intelligence, Information and Services
Aurora CO & Greenbelt MD

- CGS Provides three different categories of services:
  - **Managed Mission Services**: CGS flies the satellite, manages mission resources, acquires and/or routes the raw data, and generates and distributes data products.
  - **Data Processing Mission Services**: CGS acquires and/or routes the raw data, generates and distributes data products.
  - **Data Acquisition and Routing Mission Services**: CGS acquires and/or routes the raw data.
- **Scalability** is a key tenet of the CGS. The CGS architecture, mapped to the Joint Architecture Reference Model (JARM) and locations of CGS extension points for scalability, enables the addition of new missions to the CGS, and essentially serves as a "checklist" per each new mission, which has been demonstrated in expanded CGS multi-mission support to date.



High-level architecture of the CGS as it applies to the three categories of services.



CGS Architectural Extension Points

Soumi NPP CrIS Radiometric Calibration Stability Assessment: A Perspective from Two Years' Inter-Comparison with AIRS and IASI

Likun Wang and Coauthors
UMD/ESSIC/CICS, College Park, MD

- **Radiometric and spectral consistency of four IR hyperspectral sounders is fundamental for inter-calibration and climate application.**

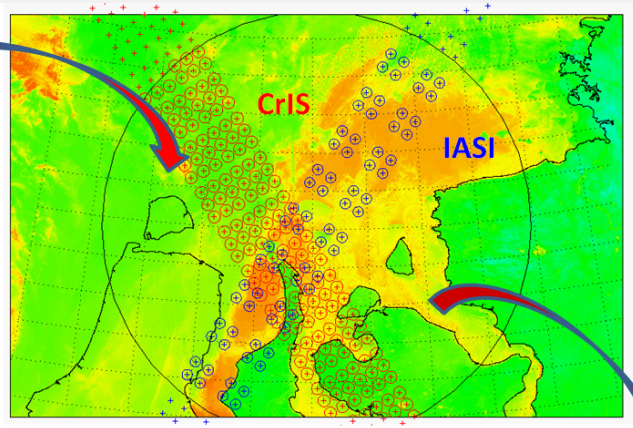
- **Inter-comparison of CrIS with IASI on Metop-A and –B as well as AIRS on Aqua have been done for two year's of SNO observations to access Suomi NPP CrIS radiometric calibration stability.**

- **CrIS vs. IASI (on MetOp-A and –B)**
  - **IASI spectra are converted into CrIS spectral grid and the comparison is along CrIS spectral grid.**
  - **CrIS and IASI well agree to each other at LWIR and MWIR bands with 0.1-0.2K differences**

- **CrIS vs. AIRS (on NASA Aqua)**
  - **CrIS and AIRS are integrated within 25 spectral regions.**
  - **CrIS and AIRS agree to each other at LWIR and MWIR bands with the differences of 0.1-0.2 K .**

From Changyong Cao

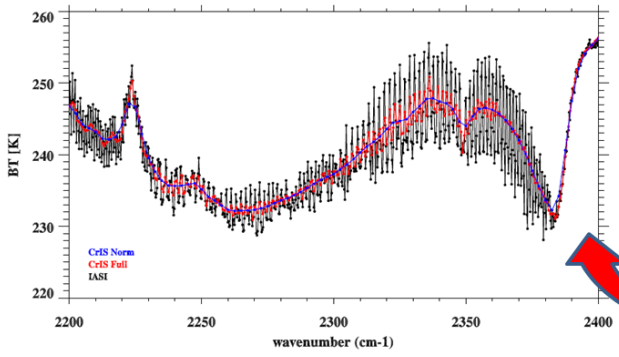
CrIS: Afternoon orbit
IASI : Morning orbit

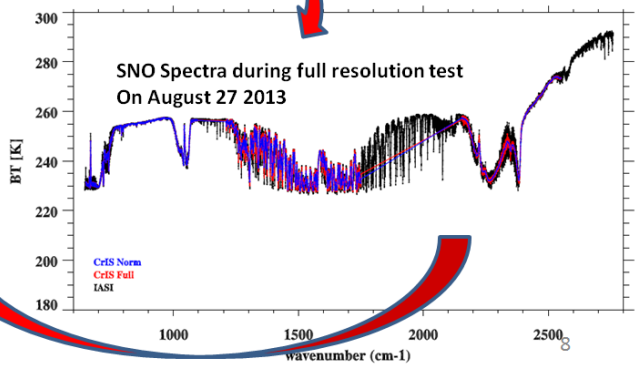


Time Difference: <= 120 Sec

FOV distance difference: <=(12+14)/4.0 km = 6.5 km

Angle Difference: ABS(cos(a1)/cos(a2)-1) <= 0.01





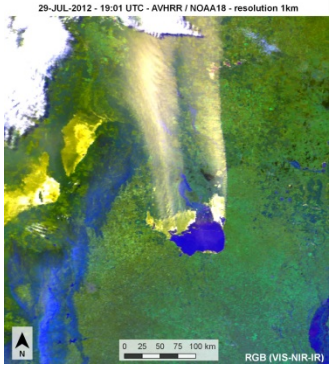
Wang, L, Y, Han, X. Jin, Y. Chen, and D. A. Tremblay, 2014: Inter-Comparison of Suomi NPP CrIS Radiances with AIRS and IASI toward Infrared Hyperspectral Benchmark Radiance Measurements, *Journal of Atmospheric and Oceanic Technology (submitted).*

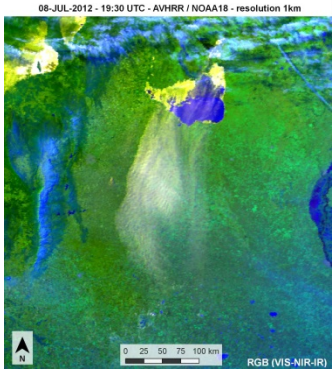
Poster # 1.52

Characteristics of detected salt storms by AVHRR sensor on NOAA satellites from 2006 to 2014 in Argentina

Diana Rodríguez
National Weather Service
Buenos Aires, Argentina

- The occurrence of salt storms near the Mar Chiquita Lake (Argentina) from 2006 to 2014 is documented using satellite images captured by sensor AVHRR on NOAA 17, 18 and 19 satellites.
  - The images reveal that these storms have occurred with varying degrees of development, from a weak plume to a thick cloud of great extent.
  - These forms of expression are linked to hydrological and meteorological factors.
  - The number of storms varies throughout the year and from one year to another.
  - Most storms recorded occurred during the winter months, with winds almost exclusively south or north, but more with northerly winds
  - The observed 11μm minus 12μm brightness temperature difference (BTD) is always negative for these clouds.





Poster # 1-53

The impact of the high temporal resolution GOES/GOES-R moisture information on severe weather systems in regional NWP model

Pei Wang, Jun Li, Yong-Keun Lee, Zhenglong Li, Jinlong Li, Zhiquan Liu, Tim Schmit, Steve Ackerman

SDAT – Satellite Data Assimilation for Tropical storm (CIMSS/SSEC/UW-Madison)

http://cimss.ssec.wisc.edu/sdat/

WRF-ARW v3.6.1: 4 km horizontal resolution (400*280) , 52 vertical layers from surface to 10 hPa

GSI v3.1: 3-Dvar Data Assimilation Method

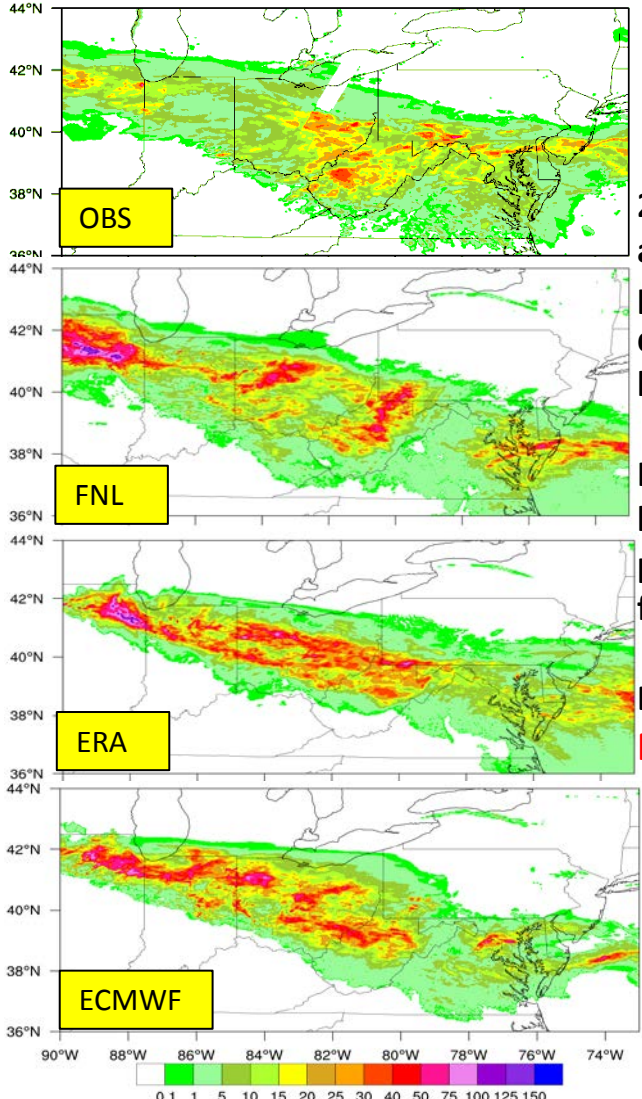
- NAM background error covariance matrix
- Cycled bias correction
- Conventional Data – from GTS
- Satellite radiances: AMSU-A from AQUA, Metop-A, NOAA-15 and NOAA-18
- LPW: Layer Precipitable Water (three layers)

2012 June Derecho

- Jun 29 12z to Jun 30 12z, 2012
- Impact from different background fields
- Total three layers PW; separate layer PW

Background sensitivity

- NCEP FNL: 1-degree, 26 vertical levels
- ECMWF ERA-Interim: 0.7-degree, 37 vertical levels
- ECMWF Operational: 0.14-degree, 25 vertical levels



24-hour accumulated precipitation with different background fields.

High resolution helps get better precipitation forecasts

Details in Poster # 1-55

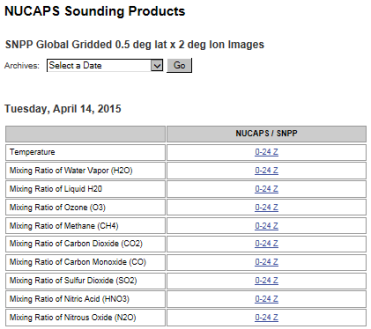
NOAA/NESDIS SOUNDING DATA PRODUCTS FROM THE NEXT GENERATION OF SATELLITES

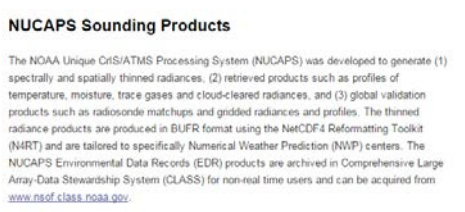
A.K. Sharma

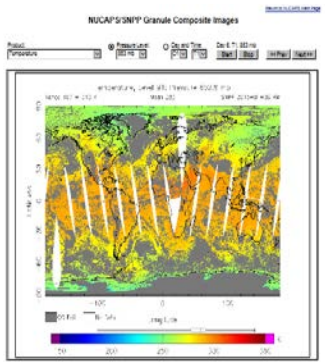
NOAA/NESDIS Office of Satellite and Product Operations (OSPO)

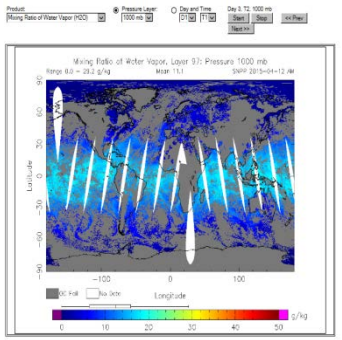
http://www.ospo.noaa.gov/Products/atmosphere/soundings/index.html

This poster presentation will include several of the tools developed and deployed for the sounding products monitoring and data quality assurance which lead to improve the maintenance and sustainment of the Environmental Satellites Processing Center (ESPC) processing systems. The presentation will include the discussion on the ESPC system architecture involving sounding data processing and distribution for CrIS, IASI, and GOES sounding products. Discussion will also include the improvements made for data quality measurements, granule processing and distribution, and user timeliness requirements envisioned from the next generation of JPSS and GOES-R satellites. There have been significant changes in the operational system due to system upgrades, algorithm updates, and value added data products and services.

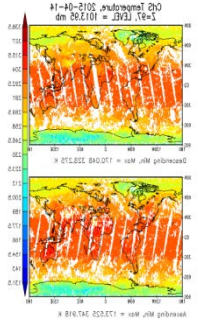


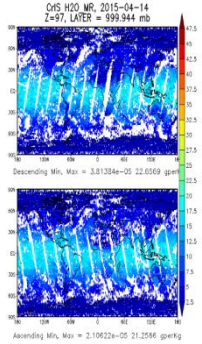


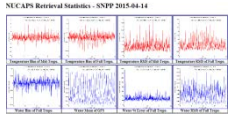




NUCAPS





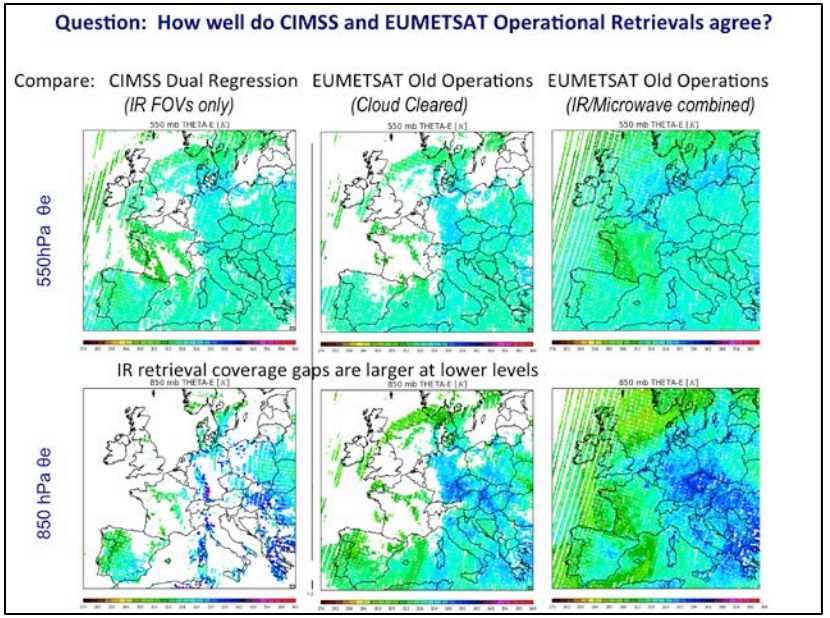


Poster # 1-56

Using hyper-spectral sounding products to improve short-range forecasts in the Alaska Region

Ralph A. Petersen[1], Lee Cronce[1], William Line[2], Robert Aune[3], Carven Scott[4]
[1]CIMSS, University of Wisconsin-Madison, Madison, WI
[2]CIMMS, University of Oklahoma (and SPC), Norman, OK
[3]NOAA/NESDIS Advanced Satellite Products Branch (ASPB), Madison, WI
[4]NWS, Alaska Region, Anchorage, AK

- Improving Alaska Region Forecasts by Adding Predictive Component to JPSS Soundings
  - Assess accuracy of JPSS moisture retrievals over high latitude land through compares with GPS Total Precipitable Water (TPW) observations
  - Provide forecasters tools to identify, track and anticipate extreme horizontal and vertical variations in the atmosphere (especially moisture fields).



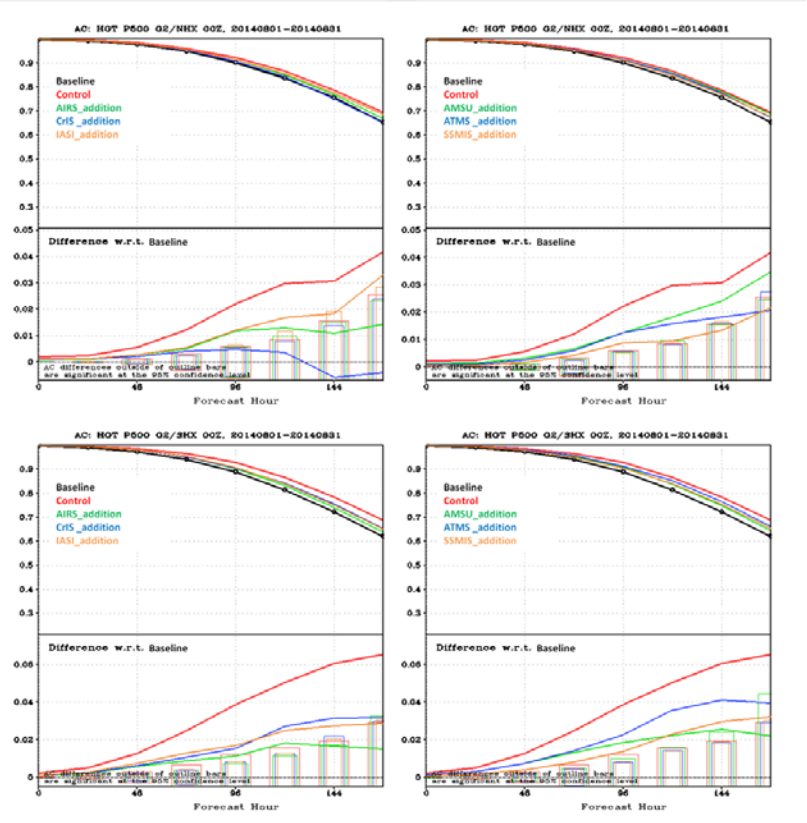
Comparison of NearCasts using CIMSS, NESDIS and EUMETSAT Retrievals

Poster # 1-59

Infrared and Microwave Data Addition Observing System Experiment Impacts Using the NCEP Global Forecast System

James Jung[1] and Mitch Goldberg[2]
[1]CIMSS/UW, Madison WI
[2]NOAA/NESDIS/JPSS, Greenbelt MD

- Specific sensors (AIRS,IASI, CrIS, ATMS, AMSU, SSMIS) were added to a baseline of observations
  - Infrared and Microwave sensors have relatively similar impacts (AIRS = AMSU).
  - Microwave sensors ATMS and AMSU show similar and mostly equivalent improvements.
  - IASI shows more overall improvements than the other infrared sensors.



Poster # 1-60