



SPoRT Quarterly
Apr. – Jun. 2012

The SPoRT REPORT

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Short-term Prediction Research and Transition (SPoRT) Center
NASA Marshall Space Flight Center (MSFC), Huntsville, AL
<http://weather.msfc.nasa.gov/sport/>

The SPoRT Center is a NASA- and NOAA-funded project to transition unique observations and research capabilities to the operational community to improve short-term weather forecasts on a regional scale. While the direct beneficiaries of these activities are Selected Weather Forecast Offices (WFOs) and National Centers, the research leading to the transitional activities benefits the broader scientific community.

Quarterly Highlights

SPoRT Participates in 2012 HWT Spring Forecast Experiment

The SPoRT Center once again participated in the annual Spring Forecast Experiment at Norman, OK, which was held this year from 7 May to 8 June. Mr. Jonathan Case attended the Experimental Forecast Program (EFP) during the week of 21 May, in which he participated in assessing various convection-allowing deterministic and especially ensemble numerical models to determine severe weather probabilities and location/timing of convective initiation. The NOAA Hazardous Weather Testbed (HWT) EFP is a yearly experiment that investigates the use of convection-allowing model forecasts as guidance for the prediction of hazardous convective weather. A variety of model output is examined and evaluated daily and experimental forecasts are created and verified to test the applicability of cutting-edge tools

in a simulated forecasting environment. In conjunction with the EFP is the Experimental Warning Program (EWP), which seeks to improve the nation's hazardous weather warning services by bringing together forecasters, researchers, trainers, technology specialists, and other stakeholders to test and evaluate new techniques, applications, observing platforms, and technologies. Components of both programs also involved GOES-R Proving Ground activities through simulated satellite imagery and experimental EWP products.

There were two opportunities to highlight SPoRT products and capabilities during the week in which Mr. Case attended. First, a unique convective initiation event occurred on 21 May in the western Texas Panhandle associated with a differential

heating gradient that came about from localized antecedent rainfall patterns. This case was documented in a SPoRT blog post at <http://nasasport.wordpress.com/2012/05/23/convective-initiation-event-during-the-hwt-experimental-forecast-program/>, along with a follow-up post at <http://nasasport.wordpress.com/2012/05/23/follow-up-to-hwt-ci-event-in-tx-panhandle-radar-loop/>. In addition, Mr. Case had an opportunity to highlight the SPoRT green vegetation fraction product during a daily weather briefing.

SPoRT also sent several products that were used and evaluated as part of the EWP objectives. Two of these products aided the Colorado Institute for Research in the Atmosphere (CIRA) in transitioning their GOES Sounder Red-Green-Blue

(RGB) airmass composite. These RGB products came about from a partnership between SPoRT and CIRA to demonstrate a future capability of GOES-R. This RGB combines multiple channels of information into one image, using various colors to indicate warm, cool, dry, and moist air. One evaluation indicated that, "it was interesting to see the initiation occurred along the sharp moisture gradients that were associated with the strong short-wave troughs." Additionally, SPoRT in partnership with the University of Alabama in Huntsville (UAH) transitioned UAH's SATCAST product. SATCAST is another real-time demonstration product of future GOES-R capabilities. Utilizing several satellite-derived parameters, SATCAST produces a strength of signal product that indicates the likelihood that convective initiation will occur in a particular region within the next 90 minutes.

In addition to supporting partners, SPoRT also provided its pseudo-geostationary lightning mapper (PGLM) product suite along with the 2012 update of the original 2010 PGLM training module. The update incorporated new products (such as the maximum flash density) and graphics derived from AWIPS II. One of the best praises for the PGLM came from the week of 12 June, when a participating forecaster commented, "At a Center Weather Service Unit (CWSU), if I had these data everywhere it would be huge because you may not have any 'ground truth' from cloud-to-ground data with storms that may still have tops up to 32 kft and be producing intra-cloud flashes that you don't want any planes flying into." The forecasters also provided excellent feedback on how to improve the visualization of the product, which is one of the primary goals SPoRT had in developing the PGLM. One forecaster requested "... to have a value of total flashes in the upper corner of the AWIPS II display much like NLDN does and if possible, a ratio of intra-cloud to cloud-to-ground flashes as well." SPoRT has already been working to address that specific request with the AWIPS II tracking tool, built off of the total lightning plug-in for AWIPS II designed with WFO Huntsville partners. SPoRT will demonstrate this capability with WFO Huntsville this fall as they convert to AWIPS II, and plan to provide this feature to the Spring Forecast Experiment in 2013.

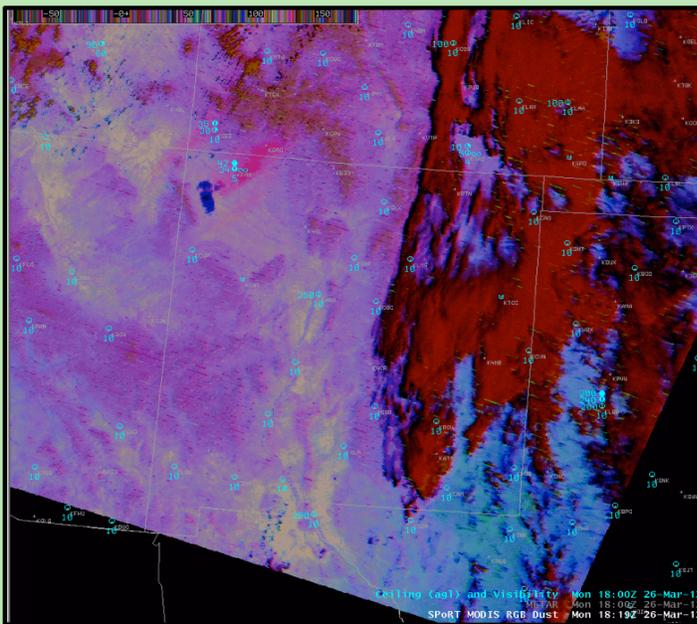
WFO Corner

This section reflects contributions directly from forecasters at the various WFOs.

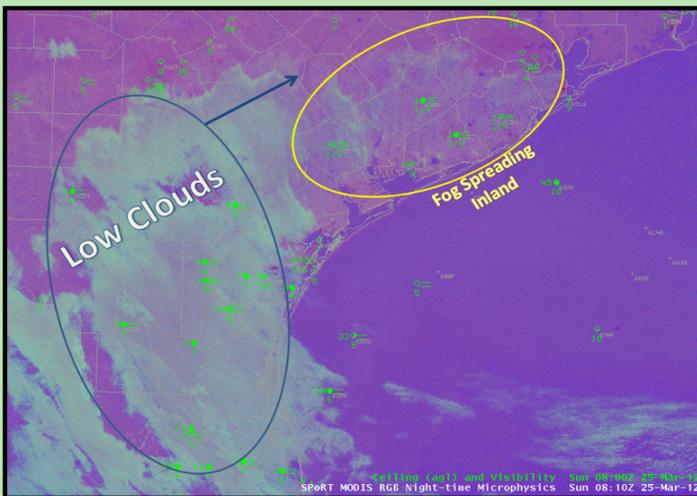
ABQ - Albuquerque

In early April ABQ staff informed SPoRT of an application of the Dust RGB Imagery to support aviation and public forecasts. On March 26, visibility observations at the Farmington, NM TAF site (FMN) suddenly decreased from around 10 miles to nearly IFR conditions. Without active storms in the area, initial examination of visible imagery by the duty forecaster showed a mountain wave upstream of FMN but little else. Then the forecaster thought to examine the RGB Dust imagery from MODIS. A magenta streak downstream of the

mountain wave indicated that air borne dust was impacting the FMN area, which is a fairly rare event for this location. The visibility and ceiling forecast in the TAF product was able to be quickly amended. While this event directly affected aviation issues, other impacts of using the RGB imagery would be to notify State agencies issuing public health statements, to inform Department of Transportation for motorist hazards, and to provide information to downstream recreational facilities. In addition to RGB imagery from MODIS, ABQ is intending to evaluate SPoRT-provided imagery from the new VIIRS instrument on NPP as well as the GOES-R proxy product for Convective Initiation developed by the University of Alabama Huntsville.



AWIPS D-2d display of RGB Dust Imagery from MODIS at 1819Z on 26 March 2012. Blue object in northwest NM is a mountain wave and the magenta streak extending to the northeast is air borne dust. The observation in northwest NM is the Farmington airport which is an ABQ TAF site.



MODIS Night-time Microphysics RGB imagery in AWIPS D-2d with ceiling and visibility observations (green text) overlaid in the southeast Texas coastal region. CRP forecasters were able to differential the low clouds (blue circle) from the thin fog (yellow circle) based on color differences in the imagery. Observations confirmed thin, low fog in the yellow area while ceiling restrictions were the main concern with the low clouds depicted in the blue circle region.

CRP – Corpus Christi

While staff at CRP continue to use the SPoRT hybrid imagery that uses MODIS (and soon VIIRS) imagery to demonstrate future GOES-R capabilities, they also have been applying RGB imagery products. On March 25 at 810Z, a Night-time Microphysics RGB image indicated low clouds in aqua coloring near Victoria with IFR ceiling restrictions confirmed by hourly METAR observations. Just to the southwest of Houston a gray and dull aqua shading highlighted an area with low, thin fog that had both visibility and ceiling conditions at low IFR levels. While more hazardous conditions existed near Houston, the differing color in the image helped to indicate that this would area would likely dissipate more quickly than the low ceilings near Victoria. Hence, this RGB imagery provided value of standard “fog imagery”.

Alaska and Pacific NWS Regions to Receive Suite of Products

As part of its GOES-R Proving Ground efforts, SPoRT has been actively working to establish data feeds to the NWS Alaska and Pacific Region in order to provide an initial suite of products. These include the SPoRT SST Composite as well as several GEO-LEO “hybrid” imagery products. The hybrid takes imagery from existing instruments, such as MODIS, and integrates it into the existing GOES imagery products. This allows forecasters to see a real-time example of what the future GOES-R will be able to provide. In addition, once users have the product, other polar-orbiting instruments can be added to the product. In fact, this is occurring with the VIIRS instrument. Therefore, forecasters in these vast data void regions will be able to utilize GOES-R type of imagery through this hybrid product whenever there is a MODIS or VIIRS swath over their area of interest. In addition, SPoRT is supporting other GOES-R AWG product transitions, such as the NESDIS Quantitative Precipitation Estimate product. Both Alaska and Pacific Regions have expressed high interest in this product and SPoRT has already worked with the AK RFC to provide this product to their hydrometeorologist for evaluation at high latitudes.

First NOAA Satellite Science Week Workshop

Several members of the SPoRT team attended the First NOAA Satellite Science Week workshop held on April 30 through May 4, 2012 in Kansas City, Missouri. The workshop was attended by over 150 scientists from NASA, NOAA, the university community and the private sector and focused on the use of current and future satellite sensors such as GOES, GOES-R, MODIS, and VIIRS (on the recently launched Suomi NPP satellite) and for weather and climate applications. Session topics included a program overview, use of imagery, soundings, and derived products, wind and lightning applications, hydrology, cloud processes, remote sensing of the land surface, ocean dynamics, aviation applications, aerosols and air quality, remote sensing of the cryosphere, and space weather applications. Additional sessions focused on use of satellite data in data assimilation activities, on-going risk reduction studies, special applications of red-green-blue (RGB) image products, and the use of satellite data in AWIPS II. Numerous breakout meetings focused on “satellite champions” activities at the National Centers and on satellite integration into AWIPS II. During the later meeting, SPoRT proposed to expand its Experimental Products Development Team (EPDT, see article in the previous SPoRT Quarterly Report) to include proving ground partners. Integrated in each session was a discussion of the particular training relevant to the topical area. A listing of SPoRT team member presentations is listed later in this newsletter. The full viewing of workshop presentations and posters can be viewed at the GOES-R site (<http://www.goes-r.gov/users/past-2012-science-week-abstracts.html>).

Recent Accomplishments

Eastern Region Collaboration

During the NOAA Satellite Science Week in Kansas City and following the 2012 Hazardous Weather Testbed in Norma, OK, researchers from UAHuntsville were approached by various forecasters interested in examining the SATCAST

product designed to identify favorable locations for convective initiation. SPoRT is collaborating with UAHuntsville’s SATCAST team and members of the Eastern Region Science Services Division to support the use and evaluation of the SATCAST product within selected forecast offices. In addition, SPoRT continues to develop new AWIPS II display plugin capabilities to support the dissemination of products to NWS forecast offices that are in the process of transitioning to the new AWIPS II system.

Andrew Molthan visited the National Hurricane Center on April 5 to give a seminar titled “The NASA SPoRT Center: New and Continued Opportunities for Collaboration with the National Hurricane Center”. The presentation gave a review of SPoRT’s recent activities and future planned participation within the GOES-R and JPSS Proving Grounds. In addition, Andrew briefed NHC staff on collaborations between SPoRT and the Naval Research Laboratory that provide for the display of popular web-based passive microwave brightness temperature products within their N-AWIPS decision support system. Andrew also spent time meeting with forecasters to hear feedback about ongoing collaborations with SPoRT and the role that NHC plays within NOAA’s Proving Ground activities.

GOES-R Visiting Scientist Program

Michael Folmer, GOES-R Satellite Champion at HPC/SAB in Camp Springs, MD, visited SPoRT during the week of June 4-8, 2012 as part of a Visiting Scientist Program opportunity. During his visit, Michael participated in several technical meetings with the SPoRT team. Michael was briefed on current efforts underway at SPoRT to develop user requirements for future multispectral (RGB) satellite image processing within AWIPS II. He also spent time with SPoRT’s “Decision Support System” team members Kevin McGrath and Matt Smith regarding future data dissemination to HPC/SAB following their move to a new facility in College Park, MD. Given the successful collaboration between Michael and the SPoRT team, Michael has requested supplemental data sets from MODIS that the SPoRT team will begin to provide over the next several months. In addition to his GOES-R Satellite Champion activities, Michael is collaborating with SPoRT in a NASA Summer Intern project to look for new

ways of improving dust detection, and a NASA DEVELOP Program project at Saint Louis University that is evaluating the RGB “Air Mass” product within the context of ozone retrievals provided by AIRS. Michael met with Brad Zavodsky to talk about the AIRS instrument to better understand how stratospheric air intrusions manifest as ozone signatures within vigorous extratropical cyclones, and how these intrusions themselves manifest within the multispectral “air mass” RGB product. Michael is also collaborating with Kevin Fuell to develop a comprehensive training module featuring the use of multispectral (RGB) products in the analysis of a tropical cyclone. Michael provided Kevin with several examples and input for a narrated Powerpoint presentation that will be developed into a complete “Articulate Presenter” module to be made available on the SPoRT web page.

RGB Imagery Training

In an effort to help forecasters with the use of RGB imagery, SPoRT has created several “Quick Guides” to support training efforts at the WFO. Specifically, training has been created for the Air Mass, Dust, and Night-time Microphysics RGBs. These 2-page documents describe the main purpose of the RGB image, the channels that make up the individual R-G-B components and the physical meaning behind a given color. An example image with annotations is provided. The Quick Guides have been provided to the WFOs for use on their intranet or in the operations area as a

quick reference as it can be difficult to recall from memory all the channels and resulting color interpretations. The guides are meant as a reminder to forecasters of the more extensive training materials that they have already taken from sources like EUMETSAT and UCAR/COMET. In addition to the Guide Guides, SPoRT is collaborating with others in the GOES-R Proving Ground to develop a web-based training module on the use of the Air Mass RGB at National Centers as applied to the monitoring of tropical cyclones and their transition.

Research and Transition Updates

As part of our ongoing Southern Region Modeling Collaboration, SPoRT has completed transition and training on Meteorological Evaluation Tools (MET) software including hands-on GoToMeeting with Mobile and Houston offices. The end goal here is for WFOs to do objective validation of their own local models for strengthening case study evaluation (specifically for evaluating impact of SPoRT data sets).

AIRS total ozone data now being ingested in real-time via LDM to HPC/OPC in N-AWIPS format. A draft journal article outlining the use of the product at HPC/OPC is in the works.

SPoRT Visit to the Aviation Weather Center in Kansas City, Missouri

As part of the GOES-R visiting scientist activity, Geoffrey Stano visited the Aviation Weather Center in Kansas City to

conducted science sharing and training sessions for AWC forecasters, introducing the concepts of total lightning, the Geostationary Lightning Mapper (GLM), and how these tools may best be integrated into the national center. More importantly, Geoffrey had the opportunity to shadow forecasters during operations, gaining a valuable perspective of forecaster concerns with the use of available total lightning data. The AWC’s region of operations is huge covering massive tracks of the data sparse oceans and some land masses. In AWC parlance, any electrified storm is severe and the detection of total lightning where there is little to no data beyond satellite imagery confirms this. The AWC issues significant meteorological (SIGMET) information products for strong convective systems. Currently, over the oceans there are cases where no SIGMETs are issued. However, based on the satellite imagery, if the storm were over the continental United States, there would be SIGMETs for the entire line of storms. Total lightning observations from the GLM would provide the confirmation that these are electrically active storms. On a shorter timescale, the AWC issues the Collaborative Convective Forecast Product (CCFP) every two hours. Here, total lightning would be extremely useful with nighttime decay and morning initiation of storms. Since these visits, SPoRT is actively working to provide the pseudo-geostationary lightning mapper (PGLM) products in a unified mosaic product for evaluation and use by the AWC and SPC staff.

Satellite Proving Ground Activities

JPSS Proving Ground Activities
SPoRT continues to make strides in working with the new VIIRS instrument, launched in October on the NASA/NOAA/DoD Suomi National Polar-orbiting Partnership (NPP) platform. SPoRT has added VIIRS imagery to its popular hybrid product for testing at select WFOs. This includes Visible, Infrared (11 μm), and Shortwave (3.9 μm) channels. VIIRS infrared data (375 m) will help both infrared channel hybrid products (1 km) tremendously, as the MODIS resolution at those

frequencies is only 1 km. The Water Vapor (6.7 μm) hybrid product remains unchanged, as VIIRS has no corresponding channel. This new instrument will allow several more opportunities for high resolution data over any particular region each day. The SNPP orbit was designed to mimic the Aqua orbit, and they are within 15 minutes of each other about 30% of the time.

SPoRT’s efforts with RGB imagery continue with VIIRS. While there are some RGB products that cannot be generated

due to the lack of water vapor and ozone channels, we will soon be generating true and false color RGB images, and the dust product. We plan to use the water vapor channels on the Cross-track Infrared Sounder (CrIS) to provide the information necessary to create the Airmass, Nighttime Microphysics, and several other RGB products. Both the hybrid and RGB products will be distributed to selected WFOs in the Southern Region, then to our Western and Alaska Region WFO partners.

Blog Summary for the Second Quarter of 2012

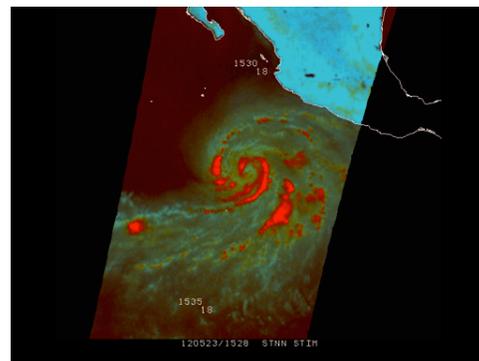
The Wide World of SPoRT blog saw a lot of activity during the quarter, with topics ranging from the use of passive microwave products to depict structure within Tropical Depression Aletta in the eastern Pacific, to use of the 1 km LIS over Alabama to diagnose drought conditions, to the burgeoning use of RGB imagery to detect wildfire locations and fog development. Posts involving the use of RGB imagery were the most prevalent perhaps since this exciting new product was just introduced to collaborative NWS offices at the start of April. An initial post by Brian Guyer of the Albuquerque WFO detailed early usage of the RGB product. He noted that the early morning clouds and fog were detected “exceptionally well” by the new RGB Nighttime Microphysics Product. In subsequent posts by Kevin Fuell and Kris White, this same product showed perhaps superior utility for monitoring fog development and fog depth when compared to the standard 3.9 or 11-3.9 μm imagery. Another interesting case showed the usefulness of the RGB Dust Product in monitoring dust plumes off the Sierra Madre in the Chihuahuan Desert. In mid-April, dry air and strong low to mid-level winds combined to produce broad swaths of dust across portions of southern New Mexico and West Texas. Several MODIS passes during this event made it possible to observe the evolution of the area of dust as it merged behind a developing dry line. Late in May and early June, as the Whitewater-Baldy Fire in New Mexico grew to record large proportions for the state of New Mexico, the Nighttime Microphysics RGB detailed the locations of the fire and the heated terrain.

An interesting post from Brian Carcione, SOO at NWS Huntsville, showed that even after one year, the MODIS instrument still was able to detect some of the more distinct tornado paths from the April 27, 2011 outbreak. In particular, paths from the “Hackleburg-Phill Campbell” and “Tuscaloosa” tracks were still quite visible through the MODIS natural color imagery. Other posts describing the use of MODIS imagery came primarily from the Albuquerque NWS office again, where

the superior resolution of the instrument was used to diagnose hot spot locations with the Whitewater-Baldy Fire complex and also the lack of snowpack and early “greenup” across portions of the adjacent southern plains. Jon Case, the modeling expert behind the LIS, participated in the Hazardous Weather Testbed Experimental Forecast Program in late May and made an interesting post about severe convective development on the periphery of a large wet patch of soil in the Texas panhandle. The MODIS instrument showed the area of wet soils (from previous day’s rain) quite well and it was noted that convection downstream of this patch grew to severe limits late in the afternoon. Further research will be required to determine the extent this feature played in helping convective development that day, but Jon plans to follow up with WRF simulations using the LIS.

The use of the NASA LIS 1-km domain over the state of Alabama and adjacent state counties continues at the NWS Huntsville office, in particular to help diagnose drought for feedback to the U.S. Drought Monitor. One such post detailed how the LIS helped to quickly diagnose soil moisture impacts leading to the expansion of moderate drought across an area of northeastern Alabama in early May. The LIS can also be useful for monitoring soil moisture in contrasting situations; when flooding creates very wet or saturated soil conditions. Such uses for the LIS have been described by the Huntsville NWS office in past blog posts. During this quarter, Jon Case made a post about the rapid increase in soil moisture over much of the state of Florida with the passage of Tropical Storm Debby. Column integrated (0-200 cm) relative soil moisture values increased significantly due to the heavy rains received from T.S. Debby. Indeed, changes in soil moisture and streamflows were enough in some areas of the Florida panhandle to completely erase the long period of severe to extreme drought that had affected the parts of the area for more than a year.

The SPoRT group, in collaboration with the Naval Research Laboratory, has been instrumental in porting passive microwave products into the N-AWIPS platform at various national centers. These data are particularly useful to tropical and marine forecasters for diagnosing structure in developing tropical systems where radar



coverage and in-situ observations are lacking. These types of data are available from the full constellation of Defense Meteorological Satellites and from NASA’s Tropical Rainfall Measuring Mission.

To see these and future posts, please visit the Wide World of SPoRT blog at <http://nasasport.wordpress.com>

Publications and Presentations

NOAA Satellite Science Week Posters

- SPoRT JPSS (VIIRS) Activities: Matt Smith and Gary Jedlovec
- NASA GOES-R Proving Ground Activities: Kevin Fuell, Geoffrey Stano, and Gary Jedlovec
- Transition and Evaluation of RGB Imagery to WFOs and National Centers by NASA SPoRT: Kevin Fuell and Andrew Molthan
- SPoRT AWIPS II applications: Matt Smith and Jason Burks

Presentations

- SPoRT: Transitioning Research Data to the Operational Weather Community: Gary Jedlovec
- AWIPS II Future Applications: Jason Burks
- SPoRT AWIPS II Applications: Jason Burks
- RGB Activities for the GOES-R Proving Ground: Gary Jedlovec
- RGB Imagery Transition to WFOs for AWIPS I and AWIPS II: Kevin Fuell
- NOAA Testbed : Zavodsky, B., SPoRT: Overview, Paradigm, and Product Examples. Presentation. 3rd NOAA Testbed and Proving Ground Workshop, Boulder, CO. [Available online at <http://www.testbeds.noaa.gov/events/2012/workshop/agenda.html>].

- Case, J.L., F.J. LaFontaine, S.V. Kumar, and C.D. Peters-Lidard, 2012: Using the NASA-Unified WRF to Assess the Impacts of Real-Time Vegetation on Simulations of Severe Weather. Preprints, 13th Annual WRF Users Workshop, Boulder, CO, NCAR, P69. [Available online at: http://www.regionline.com/AttendeeDocuments/1077122/43418383/43418383_1045166.pdf]
- Molthan, A.L., 2012: "The NASA SPoRT Center: New and Continued Opportunities for Collaboration with the National Hurricane Center," seminar, presented at the NHC on April 5, 2012.
- Fuell, K.K. and A.L. Molthan, 2012: "Transition and Evaluation of RGB Imagery to WFOs and National Centers," poster, presented at the NOAA Satellite Science Week, Kansas City, MO, April 30 to May 4, 2012.

Publications

Goodman, S.J., J. Gurka, M. DeMaria, T. J. Schmit, A. Mostek, G. Jedlovec, C. Siewert, W. Feltz, J. Gerth, R. Brummer, S. Miller, B. Reed, and R.R. Reynolds, 2012: The GOES-R Proving Ground: Accelerating User Readiness for the Next-Generation Geostationary Environmental Satellite System. *Bull. Amer. Met Soc.*, 93, 1029 -1040.

SPoRT Seminars

May 14, 2012: NASA's Earth Venture-1 (EV-1) Airborne Science Investigations by Anthony Guillory, Earth System Science Program Office, Langley Research Center, VA.

Summary: In 2010, NASA announced the first Earth Venture (EV-1) selections in response to a National Research Council recommendation for low-cost investigations fostering innovation in Earth science. The five EV-1 investigations span the focus areas of atmospheric composition, weather, climate, water and energy cycle, and carbon cycle and represent Earth Science researchers from various NASA centers, as well as other

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NP-2012-08-85-MSFC
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government agencies, academia and industry from around the world. Mr. Guillory described the various EV-1 missions 1) Airborne Microwave Observatory of Subcanopy and Subsurface (AirMOSS), 2) Airborne Tropical Tropopause Experiment (ATTREX), 3) Carbon in Arctic Reservoirs Vulnerability Experiment (CARVE), 4) Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality (DISCOVER-AQ), and 5) Hurricane and Severe Storm Sentinel (HS3). He also discussed some of the challenges in managing these Earth Venture missions.

May 17, 2012 : Soil Moisture Assimilation in the Land Information System (LIS) by Dr. Clay Blankenship, USRA, Huntsville, Alabama.

Summary: The use of soil moisture satellite observations may greatly benefit land surface hydrology modeling, allowing many observations per day with global coverage. Modeled soil moisture fields are used in agriculture and to supply boundary conditions for weather forecasts. X-band (10.65 GHz) soil moisture retrievals from the Advanced Microwave Scanning Radiometer-EOS (AMSR-E) on the NASA Aqua satellite have been assimilated into the Simulator for Hydrology and Energy Exchange at the Land Surface (SHEELS) land surface model using an Ensemble Kalman Filter. This was implemented within the Land Information System (LIS) software. To eliminate discrepancies between modeled and observed distributions, a bias correction is done using a cumulative density

function (CDF) matching technique with different corrections based on vegetation type and for day and night. Validation against in situ measurements proved problematic due to discrepancies in observation scale and the characterization of soil properties. Results from synthetic experiments with intentionally poor precipitation forcing were presented, showing that in this case the assimilation of AMSR-E data improves the soil moisture fields by comparison against the model run with the best available forcing data.

External Workshops/ Meetings Attend -

- NOAA Testbed Workshop – May 1-3, Boulder, CO (Zavodsky).
- NOAA Science Week – April 30-May 4, Kansas City, MO (Jedlovec, Burks, White, Fuell, Stano, Molthan, Smith).
- NASA Suomi NPP Science Team Meeting, May 10-11 – Greenbelt, MD (Jedlovec).
- Suomi NPP Applied Science Workshop, June 21-22, Washington, DC (Jedlovec).

Visitors

- April 4-6, Deb Molinar—collaborate with SPoRT on AWIPS II software development.
- May 14, Anthony Guillory, Earth Venture Program Office (Langley, VA)—give seminar presentation and to learn about SPoRT.
- June 28, David Smith, Raytheon, Intelligence and Information Systems (Aurora, CO)—learn about SPoRT.

Calendar of Events

- Gridpoint Statistical Interpolation Tutorial (8/21–8/23; Boulder, CO; Clay Blankenship to attend)
- WMO/EUMETSAT RGB Satellite Products Workshop, September 17–19, 2012, Seeheim (Darmstadt) Germany
- National Weather Association Annual Meeting (10/8–10/12; Madison, WI; Lance Wood (HGX NWS WFO) to attend on SPoRT's behalf)
- AMS Severe Local Storms Conference (11/5–11/8; Nashville, TN; Jeff Medlin (MOB NWS WFO) to attend on SPoRT's behalf, Brad Zavodsky to also attend)
- AGU Fall Meeting, December 3–7, 2012, San Francisco, CA
- AMS Annual Meeting, January 6–10, 2013, Austin, TX