



SPoRT Quarterly  
October – December 2015

# 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

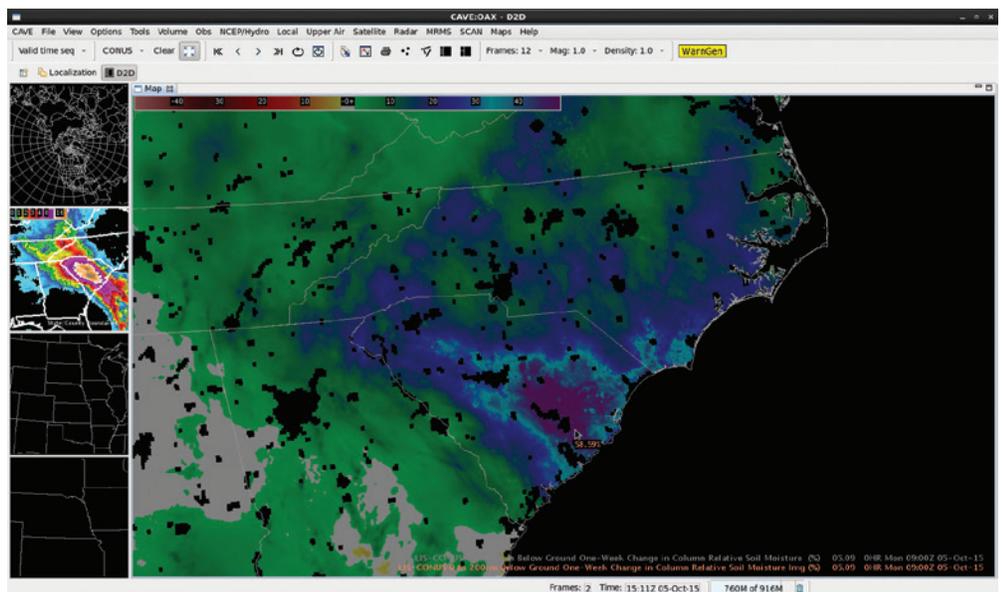
### LIS Output Used for Record Flooding in South and North Carolina

A closed upper low over the Southeastern U.S. combined with a deep tropical moisture connection from Hurricane Joaquin leading to historic rainfall and flooding over the Carolinas in early October. A wide swath of central South Carolina from the coast to Columbia received over 20 inches of rainfall, much of it over a 2-3 day period. This excessive rainfall erased the prevailing moderate to severe drought in the Carolinas by the 6 October U.S. Drought Monitor product.

SPoRT's real-time configuration of the NASA Land Information System (SPoRT-LIS) runs the Noah land surface model to generate a "best modeled" soil moisture estimate at ~3-km resolution for enhanced situational awareness and input to local/regional numerical weather prediction models. One output from the SPoRT-LIS used by forecasters is the relative soil moisture (RSM), which represents the volumetric soil moisture between wilting

(0%; vegetation can no longer extract moisture from the soil) and saturation (100%; no more infiltration is possible and precipitation goes to runoff). The

extreme rainfall event associated with the moisture from Hurricane Joaquin led to increases of well above 60% in the total column (0-2 m) RSM over



One-week change in SPoRT-LIS total column relative soil moisture for the week ending 5 October 2015, as displayed in AWIPS II. The maximum weekly change exceeds 60 units within part of the purple shading. Masked black areas represent water or urban pixels.

# Recent Accomplishments

## NISAR Workshop

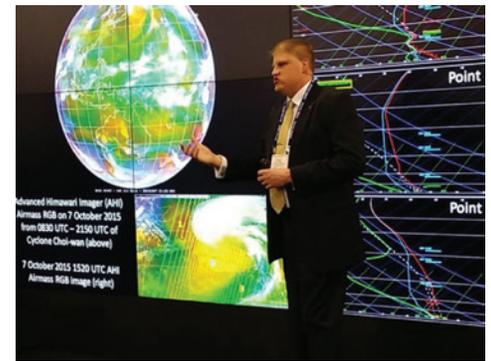
Andrew Molthan and Jordan Bell attended the NASA-Indian Space Research Organization (ISRO) Synthetic Aperture Radar (NISAR) Applications Workshop at NASA's Ames Research Center on 13-15 October. NISAR is a joint project between NASA and the ISRO that will launch in late 2020. This mission will feature a synthetic aperture radar instrument observing the Earth with a 12 day repeat cycle. SPoRT participated in discussions to identify potential weather and disaster-related applications of SAR observations and made connections with researchers and decision makers in the community who will benefit from NISAR's capabilities once launched.

## NWA Annual Meeting

Jonathan Case and Lori Schultz presented at the 40th National Weather Association annual meeting, held in Oklahoma City, OK on 17-22 October. Mr. Case presented a poster titled "Real-time Suomi-NPP green vegetation fraction for improving numerical weather prediction and situational awareness", which summarized the sensitivity of 3 years of VIIRS green vegetation fraction data on subsequent land surface and select numerical weather prediction model simulations using the LIS and WRF models. Ms. Schultz co-presented a talk titled "Application of Earth Remote Sensing Imagery in the NWS Damage Assessment Toolkit", that highlighted the improvements being realized in post-storm damage assessments by applying a variety of government and commercial high-resolution satellite imagery to supplement traditional storm surveys. Several points of contact were established throughout the course of the meeting that may foster new collaborations and partnerships.

## AGU Annual Meeting

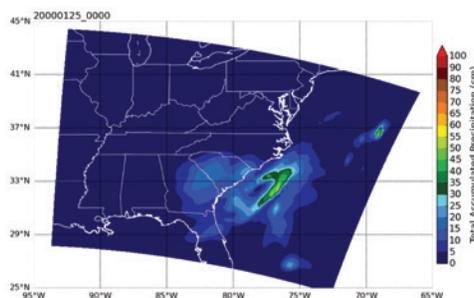
Five members from the SPoRT Team attended the AGU Annual Meeting. They gave poster and oral presentations on topics related to remote sensing, hydrology, and disasters. SPoRT Co-Investigator Bradley Zavodsky also gave a presentation on SPoRT's research activities at a well-attended presentation on the Hyperwall at the NASA Booth in the Exhibit Hall (right). A full list of presentations from AGU can be found in the Presentations section of this report. The AGU meeting also allowed SPoRT staff the opportunity to



meet with NASA and NOAA program managers as well as a number of our scientific collaborators.

## Arrival of sc1

In early October 2015, SPoRT accepted delivery of a new supercomputing resource, which has been named sc1 (or SPoRT Cluster 1). This machine has seven hundred and twenty-eight 2.6 GHz CPUs, two 3.1 GHz analysis nodes, and more than 220 TB of redundant RAID storage. It is housed at the NASA Data Center on Marshall Center, as SPoRT looks to mitigate risks to NASA IT investments by moving them into a 24/7 data center. In less than a full month, our dedicated IT staff built the system and the first model run was completed on 30 October using a test case from the latest version of the Development Testbed Center (DTC) Weather Research and Forecasting (WRF) model (v3.7.1). The image below shows 12-hour accumulated precipitation from this first run using sample data. System benchmarking performed in November indicated that for a single node test, that the new sc1 system is three times as fast as our previous Weather in a Box parallel computing systems. That



First WRF model output generated on sc1.

same benchmarking also revealed that the new sc1 system has nearly identical run-time performance to the new Haswell nodes on the NASA Center for Climate Simulation (NCCS) Discover cluster. Full completion of software and testing is expected to conclude early in 2016 to support a host of modeling research to operations projects in both atmospheric and land surface data assimilation and modeling.

## Selection as ICESat-2 Early Adopters

SPoRT and NWS Alaska Region collaborated to submit a successful application entitled "ICESat-2 Land and Sea Ice Depth Observations to Support Operational Weather Forecasting in Alaska" for inclusion as ICESat-2 Early Adopters. This application focuses on using ICESat-2 land ice depth observations to give forecasters in Alaska insight into potential early spring flooding potential by providing observations of land ice that has accumulated during winter. Additionally, the sea ice products can be used to verify ice models that are used for providing guidance to the fishing industry. SPoRT is working with ICESat-2 mission scientists to obtain pre-launch data to share with forecasters and discuss ways that reduced data latency may be accomplished to more closely meet the needs of operational forecasters.

# Progress on Collaborations with the NOAA/NWS Damage Assessment Toolkit

On 17-20 November, at National Weather Service (NWS) Central Region Headquarters in Kansas City, Missouri, members of the SPoRT team met with NOAA/National Weather Service (NWS) collaborators engaged in continued transition of satellite data imagery into the Damage Assessment Toolkit. Following a successful year of providing Weather Forecast Offices (WFO) with moderate and high resolution land surface imagery and derived products from NOAA, NASA, and commercial platforms, the team discussed the strengths and weaknesses of various remote sensing approaches and issues that will be a focus of continued development in 2016. Partners from NWS

WFO Des Moines, Iowa and Grand Rapids, Michigan presented on several cases where even low-end tornadoes appeared to be visible with tracks apparent in high-resolution commercial imagery, and members of the SPoRT team reviewed other cases where higher-end (EF2+) tornadoes were apparent on lower-resolution products from NASA's Landsat 8 and Terra ASTER imagers. Many issues were identified related to the organization and management of data requests originating at WFOs, their interaction with Regional Operations Centers (ROCs), and collections of data provided in cooperation with the USGS EROS facility in Sioux Falls, South Dakota. The primary

outcomes of the meeting were 1) development of a set of "best practice" approaches for requesting imagery and 2) a plan to transition processing capabilities for high-resolution data to the NWS as part of the plan outlined in the NASA Applied Science: Disasters proposal. Once implemented, this will allow the NWS to have greater control on the types of events they choose to respond to, data requested, and delivery of these products alongside other tools available through standard NWS data streams, such as hail swaths and rotation tracks generated by their Multi-Radar/Multi-Sensor (MRMS) precipitation processing system.

## Transitions and Assessments

### User Assessment Reports

Several product assessments that ended in fall 2015 have completed their reports summarizing user feedback. The Nighttime and 24-hr Microphysics RGB products impacted aviation and public forecasts by Alaska users. A report is now available that summarizes forecaster feedback on the operational value and recommendations going forward. Both Alaska and CONUS users participated in the evaluation of NASA Global Precipitation Measurement (GPM) Mission Level 2 and Level 3 precipitation products for use in data void regions to support hydrologic challenges. CONUS users also examined the SPoRT-LIS to analyze surface and soil conditions related to flood and drought. A summary of the trial assessment has been completed. Wider assessment of the GPM/LIS products are planned for Western

and Southern CONUS regions in summer 2016 as well as Alaska in fall of 2016. Lastly, SPoRT partnered with a subset of WFO/CWSUs to transition a web-based version of the GOES-R Convective Initiation proxy product for use on large situational awareness displays at these facilities to support aviation needs. A report of the user assessment results is also available for GOES-R CI. New CI products are being developed as a result of user input and work is underway for their transition and evaluation in spring 2016. Each of these reports can be found on the SPoRT webpage at <http://weather.msfc.nasa.gov/sport/evaluations/>.

### Training

SPoRT's training presence on the web and the way it interacts with forecasters is ever-evolving to meet the needs of our operational partners. Currently,

SPoRT is in the process of redesigning its Training webpage to include a new concept called an Applications Library. This new Applications Library will house short training items in several formats, including short videos (analogous to YouTube). User-submitted examples with product impact statements and images from the forecasters will provide an on-the-job quick training reference while the short videos and micro-lessons (5-8 minutes) provide more detail while remaining brief and digestible to forecasters focused on operations. Several forecasters have already submitted application examples of the Nighttime Microphysics RGB imagery for use in training materials to their peers. Additionally, access to these new training materials will be integrated the Just In Time Training tool within AWIPS II.

# Satellite Proving Ground Activities

## AHI Updates

With the launch of Himawari-8 and the new capabilities of the Advanced Himawari Imager (AHI) payload, meteorologists can monitor the Pacific Ocean basin and parts of Asia with increased temporal (every 10 minutes) and spatial resolution (2 km). RGB imagery allows forecasters to examine specific atmospheric and cloud properties through combining individual channels and channel differences. Activities this quarter focused on developing capabilities to calculate the 3.9  $\mu\text{m}$  reflectance in order to allow the development of additional imagery. The 3.9  $\mu\text{m}$  channel is sensitive to both reflected solar energy and earth's outgoing infrared energy; therefore, a technique can be used to separate the solar reflected component from the total radiance observed by the 3.9  $\mu\text{m}$  channel. Some RGB products such as the Day-time Microphysics use only the solar component of the 3.9  $\mu\text{m}$  channel in the composite; whereas, the Night-time Microphysics RGB uses the total radiance from the 3.9  $\mu\text{m}$  channel. Therefore, the Night-time Microphysics RGB is contaminated by solar radiation during the day and only valid for low cloud and fog analysis at night. The Day-time Microphysics RGB can be used as a complement to the Night-time Microphysics RGB to detect fog in the

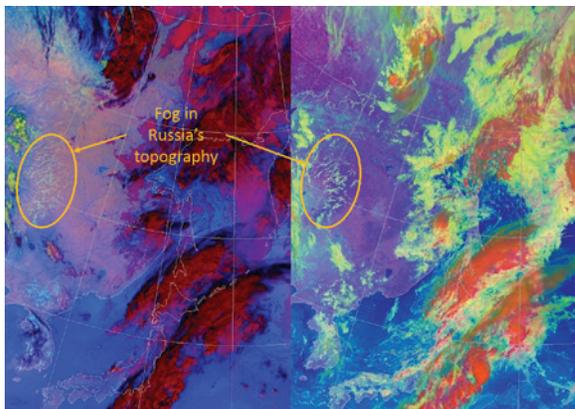
early morning hours when the Night-time Microphysics RGB is contaminated by daylight. The example below shows fog in Russia's topography observed by the Night-time Microphysics RGB (left) and still observed a few hours later in the Day-time Microphysics RGB (right). This and other RGB images will be evaluated as part of a targeted evaluation on RGB use by forecasters led by the NOAA Operations Proving Ground (OPG) in spring 2016.

## Just In Time Training

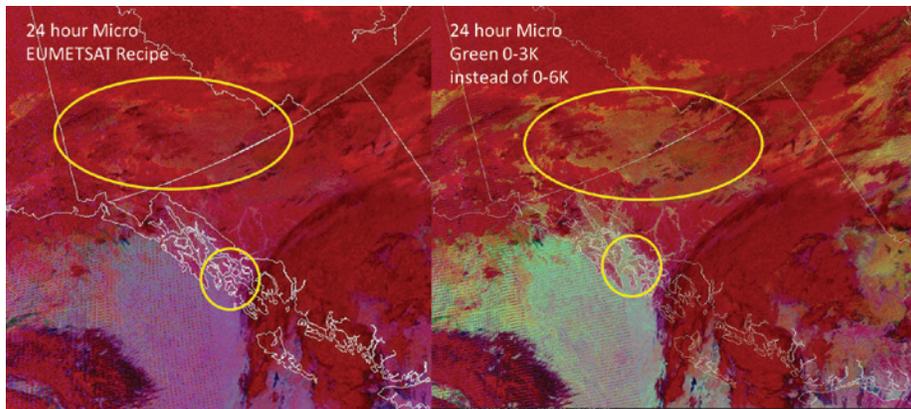
SPoRT is developing a Just In Time Training plug-in for AWIPS II that will integrate training directly into the AWIPS II platform to enable training developers to make a closer connection between the products displayed in AWIPS II and the training that is available for those products. This new plug-in will allow local training creators, as well as national training sessions, to be integrated into Common AWIPS Visualization Environment (CAVE) within AWIPS II. Work this quarter focused on further development of the plug-in capability and transition of current SPoRT training documents into a form that will be ingestible by the new plug-in. SPoRT has, also, demonstrated the prototype of the plugin to many groups to obtain feedback on the feature set required to make the integration successful.

## High-Latitude RGBs

SPoRT has been working to refine high-latitude RGB products. The 24-hour Microphysics RGB was evaluated in Alaska during both the winter and summer of 2015. Forecaster feedback indicated a lack of contrast between low cloud and fog and other features in the imagery. Due to the extreme conditions at high latitudes, the 24-hour Microphysics product looks quite different than it does at low latitudes. SPoRT investigated several case studies and found a slight shift in the green component of the EUMETSAT RGB recipe needed to add contrast to the product. An example of this work is shown in the figure below. Alaska region partners are now receiving the modified 24-hour Microphysics RGB derived from both MODIS and VIIRS. Additional product development to aid low cloud and fog analysis at high latitudes, includes deriving the Day-time Microphysics RGB from MODIS and VIIRS and developing the capability to use satellite cloud properties with the RGB products. Use of cloud properties such as cloud top temperature, pressure, optical depth, or particle phase/size can be used to provide more quantitative information to complement the RGB products.



Nighttime Microphysics RGB (left) and Daytime Microphysics RGB (right) showing fog over Russia observed before and after sunrise.

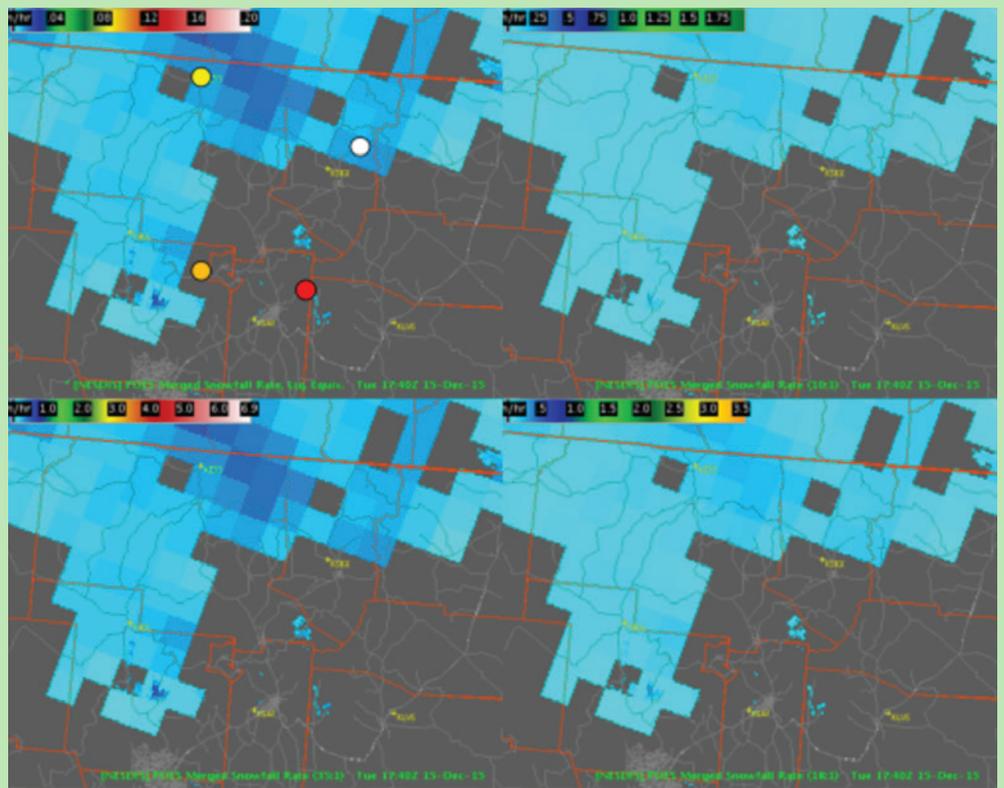


Example of adjustments made to 24-Hour Microphysics RGB based on forecaster feedback to add contrast to the imagery.

# Social Media Corner

## Wide World of SPoRT Blog

The Wide World of SPoRT Blog received 11 posts during the quarter covering a number of SPoRT expertise areas. Total lightning was showcased in a post highlighting the use of Vaisala’s GLD360 network to determine the location and intensity of lightning activity within Hurricane Joaquin. Several posts highlighted the application of SPoRT-LIS soil moisture variables for assessments of drought and risk of flooding, in the Carolinas (as described earlier in the report) and across North Alabama. Remote sensing topics were highlighted for various RGB imagery. One post dissected a tropical cyclone in the western Pacific and compared features observed in the Airmass RGB imagery to soundings from the Cross-track Infrared Sounder (CrIS) and Advanced Technology Microwave Sounder (ATMS). Other posts highlighted the use of Nighttime Microphysics and Day-Night Band RGBs for improved detection of low clouds at night versus standard 11-3.9 μm imagery. The use of these data in this manner has become standard practice at some SPoRT collaborative offices in preparation for GOES-R and JPSS. Another nice highlight was the use of the NESDIS/CIMSS GOES-R Fog and Low Stratus product that SPoRT is helping to promote as part of collaborative GOES-R Proving Ground activities. This product features probabilities of cloud-base heights (i.e., MVFR, IFR,



NESDIS SFR product filling in the radar gaps over northern NM, valid 1750 UTC 15 December 2015. The circles in the upper left image show locations of webcams used in the blog post.

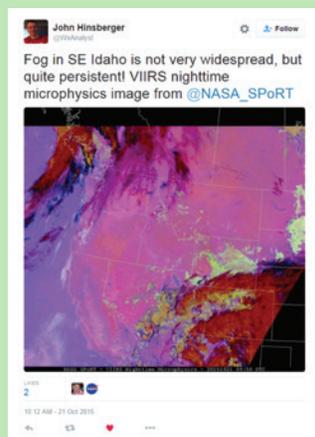
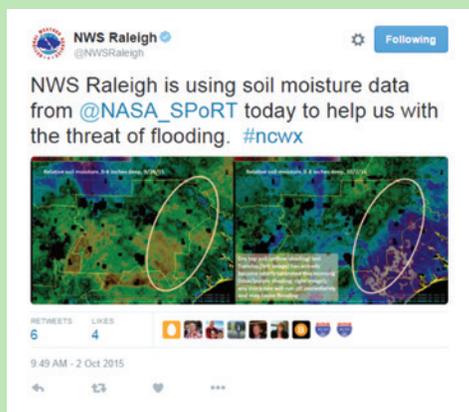
LIFR) at 4 km resolution, and shows a lot of promise for aviation forecasting.

Long-time SPoRT collaborator and senior forecaster, Brian Guyer, contributed the final post of the year entitled “Post Frontal Orographic Snowfall Impacts NM”. This post addressed the use of the latest iteration of the NESDIS Snowfall Rate (SFR) product, which is being sent to several SPoRT collaborators in the CONUS and Alaska for formal assessment this winter. In general, swaths are available somewhere over the CONUS with a frequency of about ten

per day. These data have proven very useful, especially in western and Alaska locations with poor or no radar coverage. Brian’s post highlights the use of the product in radar-void regions to improve situational awareness of locations and intensity of snowfall.

These and other informative posts can be seen on the SPoRT blog at <http://nasasport.wordpress.com>. If you would like privileges to post on the SPoRT blog, please send an email to Kris White ([kris.white@noaa.gov](mailto:kris.white@noaa.gov)). Thanks and we hope you’ll keep reading!

## Tweets of the Quarter



# Visitors

## Dr. John Grunsfeld

SPoRT had the opportunity to brief Dr. John Grunsfeld, NASA Associate Administrator for the Science Mission Directorate, on 2 October. SPoRT's presentation provided a brief overview of the history of the project, research to operations philosophy, and some recent examples of NASA products that have been transitioned to operational NWS forecasters.

## Dr. Huan Meng

Dr. Huan Meng (NOAA/NESDIS/STAR) visited SPoRT on 28-29 October to give a UAH seminar and work with the SPoRT Team on final logistics, display, and training for the NESDIS-developed Snowfall Rate (SFR) and merged Snowfall Rate products. Dr. Meng is funded by NASA through a NASA Data for Operation and Assessment ROSES proposal and has integrated ATMS observations into the SFR product suite and developed a radar/satellite blended product that allows forecasters to more easily use the product in data void areas.

## L. Seth Statler

SPoRT staff briefed L. Seth Statler, NASA Associate Administrator for Legislative and Intergovernmental Affairs, on 28 October as part of his visit to MSFC. Mr. Statler manages relations with the United States Congress, governors, state legislators and local governments and provides executive leadership, direction and coordination of communication between NASA and all of these governing bodies. SPoRT's presentation focused on recent applications where products were used by the operational community.

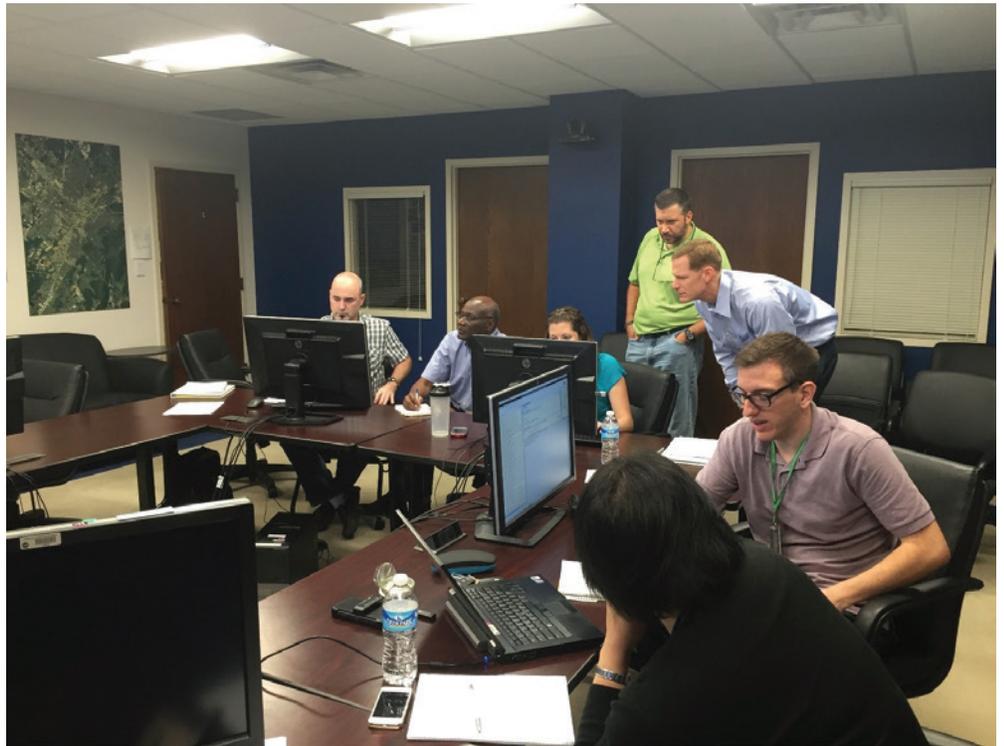
## EPDTs

SPoRT hosted two Experimental Products Development Team (EPDT) Code Sprints in the fall of 2015. On 3-5 November, SPoRT hosted a GOES-R focused code sprint. At the code sprint 8 participants from the spring 2015 EPDT Training worked on developing AWIPS plug-ins to assist with ingest and display of GOES-R data. AWIPS baseline was enhanced to better display GOES-R data and ensure that GOES-R data would be ready with AWIPS menu and configuration items for when the satellite launches. On 1-3 December, SPoRT partnered with CIRA to develop AWIPS plugins for JPSS. At this code sprint, teams developed plug-ins to better visualize NUCAPS sounding

data and VIIRS Active Fires. They also worked ensure that VIIRS data will be displayed correctly in AWIPS when new products are made available.

## Accuweather

On 3 December, Jonathan Porter, Vice President of Innovation and Development at AccuWeather visited SPoRT with his colleague, Dan DePodwin, Manager of Forecast Systems Optimization, to learn about SPoRT's ongoing efforts supporting the use of NASA products and imagery within near real-time weather forecasting, and their partnerships with NOAA in the GOES-R and JPSS Proving Ground and Risk Reduction efforts.



Experimental Products Development Team (EPDT) code sprint focused on GOES-R.

# Proposals

Using OLYMPEX Field Data, Satellite Simulators, and Unique Surface Instrumentation to Improve Cloud Microphysical Parameterizations (PI: Dr. Brian Colle, Stony Brook University;

Co-I: Dr. Aaron Naeger, University of Alabama in Huntsville/SPoRT; Collaborator: Dr. Andrew Molthan, NASA/MSFC/SPoRT)

# Presentations

- Angle, K.T., **A. Molthan**, P. Camp, **J. Burks**, and **L. Schultz**, 2015: Application of Earth remote sensing imagery in the NWS Damage Assessment Toolkit. *Preprints, 40th National Weather Association Annual Meeting, Oklahoma City, OK, National Weather Association*. [Available online at [www.nwas.org/annualmeeting/presents/2580.pptx](http://www.nwas.org/annualmeeting/presents/2580.pptx)]
- Bell, J.R.**, **A. Molthan**, **G. Jedlovec**, and M. Dabboor, 2015: Applications of SAR Data to Weather Disasters. *NISAR Applications Workshop*, San Jose CA., 15 October.
- Burks, J.E.**, **A. Molthan**, **L.A. Schultz**, **K. McGrath**, **J.R. Bell**, **T. Cole** and K. Angle, 2015: Applications of Earth Remote Sensing for Identifying Tornado and Severe Weather Damage, *AGU Fall Meeting, Near Real Time Data for Earth Science and Space Weather Applications II, Earth and Space Informatics Section*, San Francisco CA., 16 December.
- Case, J.L.**, J. Zhangyan, and M. Vargas, 2015: Real-time Suomi-NPP green vegetation fraction for improving numerical weather prediction and situational awareness. *Preprints, 40th National Weather Association Annual Meeting, Oklahoma City, OK, National Weather Association, AP-10*. [Available online at [www.nwas.org/annualmeeting/presents/2716.pdf](http://www.nwas.org/annualmeeting/presents/2716.pdf)]
- Cole, T.**, **A. Molthan**, and **L.A. Schultz**, 2015: Characterization of Nighttime Light Variability over the Southeastern United States. *AGU Fall Meeting, Emerging Issues in Nighttime Environmental Remote Sensing and Earth System Science Applications II Posters, Global Environmental Change Section*, San Francisco, CA., 15 December.
- Diaz, E., F. Webb, D.S. Green, T. Stough, D. Kirschbaum, H.M. Goodman, and **A. Molthan**, 2015: NASA Response to Nepal Quake. *AGU Fall Meeting, Near Real Time Data for Earth Science and Space Weather Applications I, Earth and Space Science Informatics*, San Francisco, CA., 16 December.
- Folmer, M.J., **E. Berndt**, J. Halverson, J. Dunion, and M. Goldberg, 2015: An Analysis of the Extratropical Transition of Hurricane Arthur (2014) from a JPSS Proving Ground Perspective. *AGU Fall Meeting, Space-Based, Operational Global Earth Observations from S-NPP and JPSS II Posters, Earth and Space Science Informatics Section*, San Francisco, CA., 17 December.
- Kim, J., B. Guan, D. Waliser, B. Tian, **J. Case**, T. Iguchi, E. Kemp, W. Putman., W. Wang, and D. Wu, 2015: Effects of resolution and spectral nudging in simulating the effects of wintertime atmospheric river land-falls in the Western US. *AGU Fall Meeting, Dynamical Downscaling: Methodology and Assessment Posters, Atmospheric Science Section*, San Francisco, CA., 17 December.
- Lee, H., D.E. Waliser, **J. Case**, T. Iguchi, and W. Wang, 2015: Are high-resolution NASA Unified WRF simulations credible tools for predicting extreme precipitation over the Great Plains. *AGU Fall Meeting, Dynamical Downscaling: Methodology and Assessment Posters, Atmospheric Science Section*, San Francisco, CA., 14 December.
- Molthan, A.**, **J.E. Burks**, **K. McGrath**, R. Ramachandran, H.M. Goodman, 2015: Challenges and Opportunities in Geocuration for Disaster Response (Invited), *AGU Fall Meeting, Geocuration: Issues, Challenges and Opportunities Posters, Earth and Space Science Informatics Section*, San Francisco, CA., 16 December
- Molthan, A.**, **J.E. Burks**, and **J.R. Bell**, 2015: Identifying Severe Weather Impacts and Damage with Google Earth Engine, *AGU Fall Meeting, Natural Hazards Research and Mitigation: Global Navigation Satellite System, Data Diversity, and Emerging Technology I Poster, Natural Hazards Section*, San Francisco, CA., 17 December.
- Morin, C., D. Quattrochi, **B. Zavadsky** and **J. Case**, 2015: Modeled Forecasts of Dengue Fever in San Juan, Puerto Rico using NASA Satellite Enhanced Weather Forecasts. *AGU Fall Meeting, The NASA Public Health and Air Quality Application Program: Integrating Remote Sensing, and Modeling for the Analysis of Environmentally Driven Human Health Risk I Posters, Global Environmental Change Section*, San Francisco, CA., 14 December.
- Schultz, L.A.**, **M.R. Smith**, **K. Fuell**, **G.T. Stano**, **A. LeRoy** and **E. Berndt**, 2015: JPSS Proving Ground Activities with NASA's Short-term Prediction Research and Transition (SPoRT) Center, *AGU Fall Meeting, Space-Based, Operational Global Earth Observations from S-NPP and JPSS II Posters, Earth and Space Informatics Section*, San Francisco, CA., 17 December.
- Stano, G.T.**, C. Schultz and W. Koshak, 2015: North Alabama Total Lightning Climatology in Support of Lightning Safety Operations. *AGU Fall Meeting, The Meteorology and Climatology of Lightning II Posters, Atmospheric and Space Electricity Section*, San Francisco, CA., 16 December.
- Wang, W., T. Iguchi, **J. Case**, E. Kemp, W. Putman, D. Wu, R. Ferraro, C. Peters-Lidard, and R. Nemani, 2015: Impacts of Lateral-Boundary-Condition Errors on Regional Climate Downscaling: Lessons Learned from the NASA Downscaling Project. *AGU Fall Meeting, Dynamical Downscaling: Methodology and Assessment Posters, Atmospheric Sciences Section*, San Francisco, CA., 14 December.
- Zavadsky, B.**, **J. Case**, K. White and **J.R. Bell**: 2015: Development of Objective High Spatial Resolution Soil Moisture Index. *AGU Fall Meeting, Hydroclimatic Extremes: Drought IV, Hydrology Section*, San Francisco, CA., 15 December.

## Publications

**Berndt, E B., B.T. Zavodsky,** and M.J. Folmer, 2016: Development and Application of Atmospheric Infrared Sounder Ozone Retrieval Products for Operational Meteorology. *IEEE Transactions on Geoscience and Remote Sensing*, 54 (2), 958-967. DOI: 10.1109/TGRS.2015.2471259.

**Fuell, K.,** B.J. Guyer, B.J., D. Kann, **A.L. Molthan,** and **N. Elmer,** 2016: Next Generation Satellite RGB Dust Imagery Demonstration Leads to Changes in Communication and Services by NWS Albuquerque Forecast Office. *Journal of Operational Meteorology*, in review.

**LeRoy, A., K.K. Fuell, A.L. Molthan, G.J. Jedlovec,** J.M. Forsythe, S.Q. Kidder, and A.S. Jones, 2016: The operational use and assessment of a layered precipitable water product for weather forecasting. *J. Operational Meteor.*, 4 (2), 22-33. DOI: <http://dx.doi.org/10.15191/nwajom.2016.0402>.

**Naeger, A.R.,** P. Gupta, **B. Zavodsky,** and **K. McGrath,** 2016: Monitoring and Tracking the Trans-Pacific Transport of Asian Aerosols Using Multi-Satellite Aerosol Optical Depth Retrievals, *Atmos. Meas. Tech. Discuss*, in press.

## LIS Output Used for Record Flooding in South and North Carolina...continued

most areas of central South Carolina, as displayed by the SPoRT-LIS RSM weekly change product (see figure on pg. 1). Most areas of SPoRT-LIS 0-2 m RSM exceeding ~60% change corresponded to areas of active minor to major river flooding across parts of southern Virginia and the Carolinas.

The SPoRT-LIS total column and near-surface layer RSM fields were provided to the U.S. Geological Survey Hazards Data Distribution System following this event. These data assisted with monitoring the threat of flash and longer-term flooding and were also used by staff at the South Carolina Forest Commission (SCFC)

to identify areas of standing water that may present a longer-term hazard to tree health in the area. Some species of trees are more susceptible to standing water than others, and long-term exposure to standing water may have negative impacts on tree health during the following growing season. Staff from the SCFC used analyses from SPoRT-LIS to corroborate areas where standing water was likely.

More details on this case is available in the Wide World of SPoRT blog post at <https://nasasport.wordpress.com/2015/10/05/from-drought-to-flooding-in-less-than-a-week-over-the-carolinas-as-depicted-by-sport-lis/>.

### Upcoming Calendar of Events

- January 10-14, 2016: American Meteorological Society 96<sup>th</sup> Annual Meeting, New Orleans, Louisiana
- February 1-5: Total Lightning Working Group Meeting, Norman, Oklahoma
- March 1-3: Satellite Liaison Training, Kansas City, Missouri
- March 7-11, March 21-25, and April 4-8: Himawari RGB Assessment at Operations Proving Ground, Kansas City, Missouri

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