National Aeronautics and Space Administration

SPoRT Quarterly
April – June 2017

The SPoRT REPORT

Join SPoRT on:
NWSChat @ nasa_sport or blog
with us @ http://nasasport.wordpress.com/

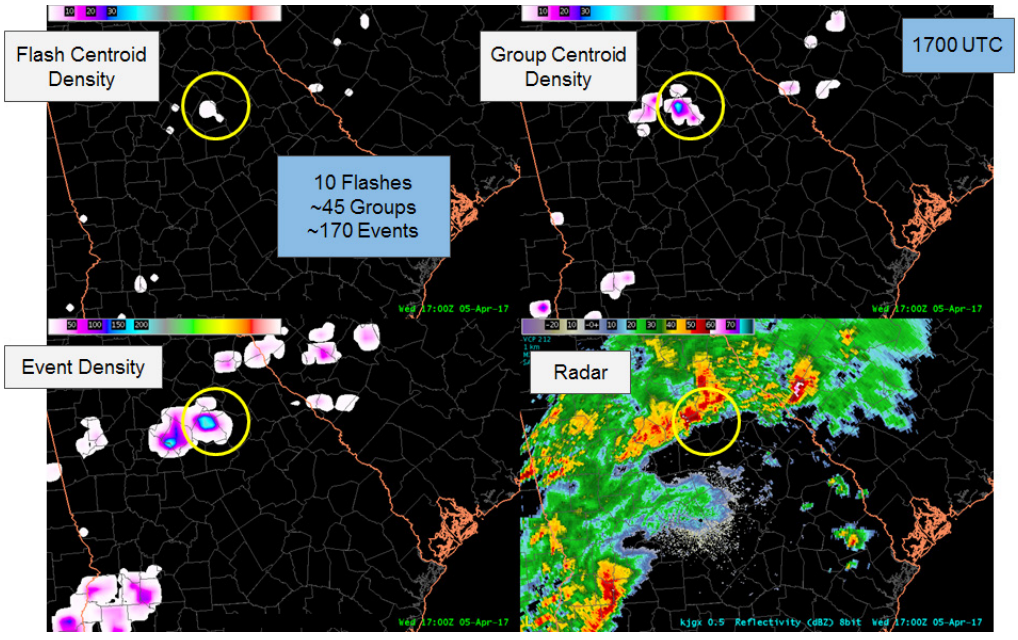
Short-term Prediction Research and Transition (SPoRT) Center
NASA Marshall Space Flight Center (MSFC), Huntsville, AL
http://weather.msfc.nasa.gov/sport/

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 NOAA Weather Forecast Offices (WFOs) and National Centers, the research leading to the transitional activities benefits the broader scientific community.

Quarterly Highlights

First Looks at GLM Imagery

SPoRT has been an active participant in the GOES-R Proving Ground since 2008. Among several tasks, SPoRT has played a leading role in preparing the National Weather Service (NWS) for the Geostationary Lightning Mapper (GLM) that launched aboard GOES-R (now GOES-16) on November 19, 2016. GLM will be the first opportunity to view hemispheric lightning observations from geostationary orbit. Ground-based systems have limited coverage to view total lightning. Lightning Mapping Arrays (LMAs) are extremely accurate but have a range of only 200 km. Commercial networks, such as Earth Networks or Viasala, can detect intra-cloud lightning over the continental United States, but with a moderate detection efficiency.



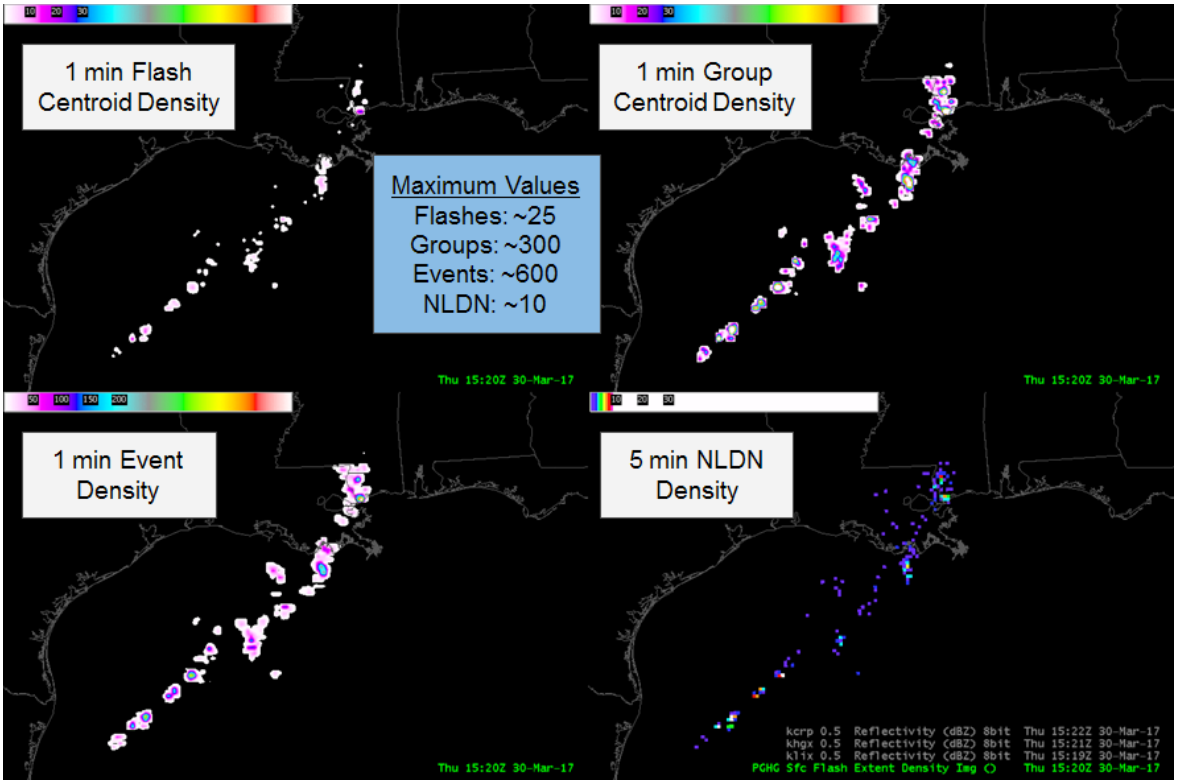
AWIPS four-panel display showing the GLM flashes (upper left), groups (upper right), events (lower left), and corresponding radar reflectivity (lower right) during the Georgia severe weather outbreak on 5 April 2017 at 1700 UTC.

Much of SPoRT's efforts supporting preparations for the GLM have focused on the long running activities to transition ground-based LMA data to partner weather service offices as a proxy for GLM products to demonstrate the expected temporal and spatial resolution and to establish a dialogue with the operational community. Using this proxy product, SPoRT developed and baselined a total lightning plug-in for the NWS Advanced Weather Interactive Processing System (AWIPS), the decision support tool used by operational forecasters. After receiving early-look GLM data, SPoRT was able to modify this existing plug-in to create the first displays of the data in AWIPS.

Applications range from warning decision support, lightning safety, and convective monitoring for aviation applications. The warning decision support forecast challenge is highlighted from a severe weather outbreak in Georgia in early April. The GLM highlighted a potential lightning jump as well as highlighting which storm cells across the region were the most electrically active and may require more attention (see figure on page 1). The aviation forecast challenge is highlighted for an event in late March showing a line of storms that had moved out over the Gulf of Mexico. This highlighted several features, such as a few long flashes and identifying the main storm cores. However, the true significance is the GLM's ability to observe lightning in data sparse regions where radar or other lightning networks are unavailable or operate at a reduced capacity (see figure below)

Since this very early approach, where snippets of sample data had to be hand delivered, SPoRT now has a real-time feed of GLM data provided by the GLM science team as part of their calibration and validation field campaign. Furthermore, the data format is that of the GLM data that will be sent operational to the National Weather Service allowing SPoRT to use the built in AWIPS plug-in. With this expanded access, SPoRT is now able to begin assembling imagery and cases to fulfill the tasks of providing operational training to the NWS. Additionally, access to real GLM observations allows SPoRT to recommend necessary changes to the AWIPS menu system and visualization to allow for more effective use and understanding of the GLM. These are extremely exciting times as SPoRT continues to play a leading role in the implementation of an exciting new satellite observational capability.

Note: NOAA's GOES-16 satellite has not been declared operational and its data are preliminary and undergoing testing. Users receiving these data through any dissemination means (including, but not limited to, PDA, GeoNetcast Americas, HRIT/EMWIN, and GOES Rebroadcast) assume all risk related to their use of GOES-16 data and NOAA disclaims any and all warranties, whether express or implied, including (without limitation) any implied warranties of merchantability or fitness for a particular purpose.



An early example of the GLM observations highlighting aviation forecast challenges over the Gulf of Mexico on 30 March 2017 at 1520 UTC. The observations are the GLM flashes (upper left), groups (upper right), events (lower left), and National Lightning Detection Network cloud-to-ground flash density (lower right).

Recent Accomplishments

Classic GOES Viewer Updated for GOES-16 Imagery

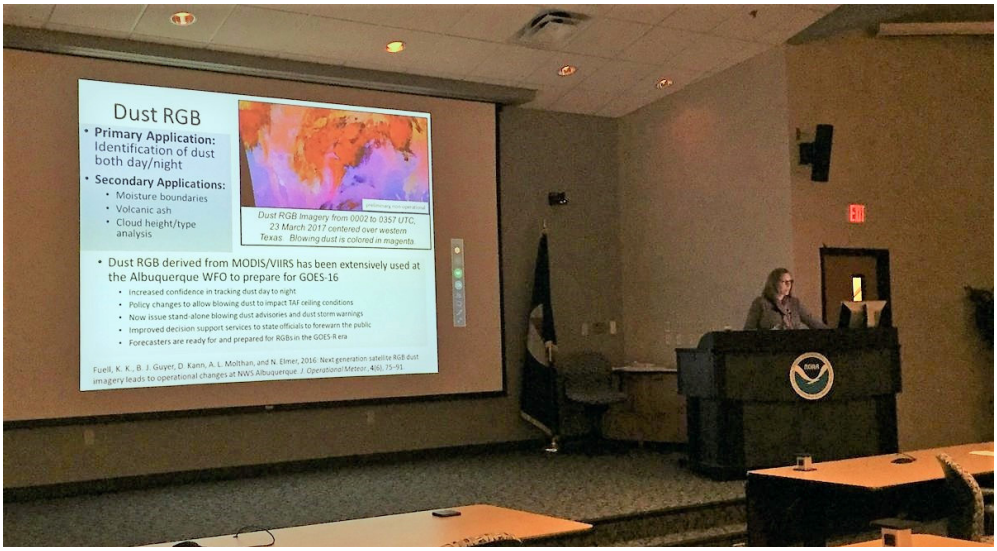
The Classic GOES imagery viewer has been updated to include GOES-16 Advanced Baseline Imager (ABI) data sets. This popular capability has been providing data to external users that include government, academia and industry for over twenty years. With the further addition of an applications programmers interface, users are able to continue to use the data for their own web pages, blog and twitter feeds.

NCAR Collaborative Visit for WRF-Hydro Development

Nicholas Elmer visited the National Center for Atmospheric Research (NCAR) in Boulder, CO from 12-16 June to facilitate collaborations with the Weather Research and Forecasting Hydrological extension package (WRF-Hydro) development team. The operational NOAA National Water Model (NWM) is an instantiation of WRF-Hydro, and NCAR plays an active role in supporting its development. SPoRT is currently working to assimilate NASA satellite mission datasets, specifically Soil Moisture Active Passive (SMAP) soil moisture, Visible Infrared Imaging Radiometer Suite (VIIRS) real-time vegetation, and future Surface Water Ocean Topography (SWOT) streamflow observations, into the NWM to improve national hydrologic predictions. This visit provided opportunities to gain expertise and hands-on training with the latest version of the WRF-Hydro model and experiment with the data assimilation framework for the NWM that will facilitate inclusion of NASA data.

NOAA Testbeds and Proving Ground Workshop

Emily Berndt attended the 8th NOAA Testbeds & Proving Grounds Workshop in Kansas City, MO in April. There, she presented a poster highlighting SPoRT's 2016 GOES-R and JPSS testbed activities as well as planned 2017 testbed activities. Fiscal year 2016 highlights include demonstration of (1) Pseudo GLM flash density at the Hazardous Weather Testbed, the Houston CWSU, and with emergency managers, (2) introduction and evaluation of the VIIRS Daytime Microphysics RGB in Alaska and (3) evaluation of gridded NUCAPS at the Anchorage, AK, CWSU for anticipating cold air aloft events, which are hazardous to aviation. Dr. Berndt also participated in the GOES-16 First Results Workshop held the same week. She gave an invited presentation on forecaster use and application of GOES-16 Multispectral imagery (Nighttime Microphysics, Dust, and Air Mass RGB).WRF-Hydro Development with NCAR.



Emily Berndt presents to the NOAA Testbeds and Proving Grounds Workshop on SPoRT-related activities.

Wildfire Imagery and Applications

Anita LeRoy attended the Alaska Fire Science Consortium's Remote Sensing Workshop at the University of Alaska, Fairbanks from 3-6 April. This NASA Applied Sciences-hosted event brought together remote sensing experts, wildfire scientists and ecologists, and fire managers to exchange ideas about needs and solutions in wildfire management. SPoRT gave an applications-based training talk on GPM and other SPoRT products at a training seminar hosted by ARSET, which preceded the formal meeting. Additionally, SPoRT presented a talk on research regarding the use of lightning observations and soil moisture models to assess fire threat. One of the results of this meeting is a new collaboration with Curtis Seaman (CIRA) to provide the VIIRS Fire Temperature RGB to fire managers in Alaska. Other potential collaborations among Alaska fire stake holders and SPoRT are being explored.

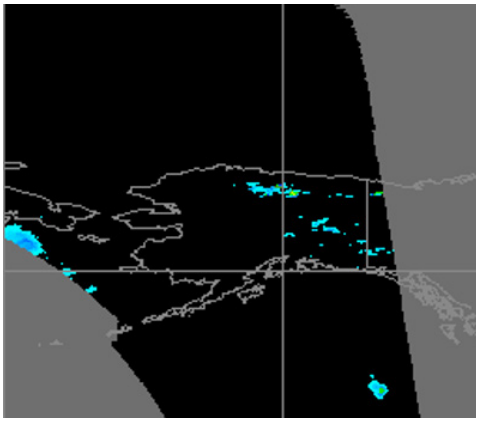
Integration of GLM into Lightning Safety Tool

Over the last year and a half Dr. Christopher Schultz, Dr. Geoffrey Stano, and Paul Meyer have worked with the Marshall Space Flight Center Emergency Operations Center (EOC) to incorporate lightning technology that detects 99% of lightning flashes within 100 km of Marshall. The team has analyzed 14 years of lighting mapping array (LMA) data from North Alabama and found that an additional 8 minutes (median) is realized by using this technology on the first cloud-to-ground versus the previous detection technology used by the center. The culmination of the project was development of a web-based tool for the EOC and all MSFC personnel to utilize when there is a threat of lightning. Data from both LMAs and the new GLM instrument have been incorporated into the tool.

Transitions and Assessments

New GPM Products for Alaska Users

SPoRT recently began disseminating a new Rain Rate product (a secondary rain rate parameter within GPM IMERG files). GPM personnel advised that the recent upgrade to version 4 Level 2 processing would make the parameter, called High-Quality Precipitation (HQPrecip), more useful. The product is of particular interest to our Alaska partners since it combines Level 2 passive microwave data poleward of 60 degrees. Since there are no geostationary data in those regions, it is a half-hourly product with significant temporal gaps over Alaska, but WFO and River Forecast Center partners there are excited to see gridded satellite-based rain rate data over the northern three-quarters of their state.



Display of HQPrecip variable in AWIPS

Re-Engagement with San Juan

SPoRT was recently asked to provide data products for the WFO in San Juan, Puerto Rico. Office staff there explained that in spite of some staffing issues, they are very interested in using SPoRT products. These products will include SPoRT's Land Information System, CIRA Layered Precipitable Water, GOES-R Convective Initiation (CI), NESDIS Quantitative Precipitation Estimation, SPoRT Sea Surface Temperature, and IMERG products.

Satellite Proving Ground Activities

STAT Meeting Participation

Drs. Geoffrey Stano and Emily Berndt have been participating in the GOES-R and JPSS Satellite Training Advisory Team (STAT) activities to create official training for forecasters at the National Weather Service. SPoRT team members are contributing Quick Guides (2-page product overviews with examples) and Quick Briefs (short 3-5 minute applications-focused modules) pertaining to RGB imagery, GLM, and GPM/IMERG. The official Quick Guides will be available in the AIR tool for NWS forecasters for viewing within their AWIPS systems.

Outreach Activities

GOES-16 Interview

Paul Meyer and Dr. Emily Berndt were interviewed as part of a GLM video to be released by Goddard Space Flight Center. They contributed information regarding the new GOES-16 receiving station at MSFC and uses of the data for unique forecasting applications and research within the SPoRT team.

Huntsville Chamber of Commerce Interview

Dr. Emily Berndt meet with The Huntsville Chamber of Commerce to discuss SPoRT's activities, research, and why Huntsville is a great place to be a scientist. The Chamber of Commerce was gathering input from a variety of MSFC scientists to create a video highlighting the benefits of living and working in Huntsville.

Lightning Safety Outreach to MSFC and Redstone Arsenal

During the months of May and June 2017, the team developed a Lightning Safety Training for all MSFC personnel and worked with the MSFC Safety Health and Environment team to distribute the material to all personnel at MSFC and a number of teams at Redstone Arsenal. The team performed a "roadshow" for various organizations within MSFC and Redstone Arsenal, including Redstone's Fire Department and the Medical Center at MSFC. The team performed 6 different events during the time period, with 2 additional events still to come in July and August. The goal of the roadshow is to make the personnel at MSFC more attune to the threat of lightning and provide understanding on how lightning works and tips to keep everyone safe from the threat.

Austin Peay State University Governor's School Presentations

On 9 June, the SPoRT team had the pleasure of presenting an overview to approximately 40 high school students from Austin Peay State University's Governor's School in Computational Physics. The (Tennessee) Governor's School programs offer intensive academic study in specific subjects to qualified high school students, hosted by public universities across the state. The SPoRT team gave these students a brief synopsis of our applied Earth science activities with a specific emphasis on how technology helps us solve forecasting challenges in research and operations.

Social Media Corner

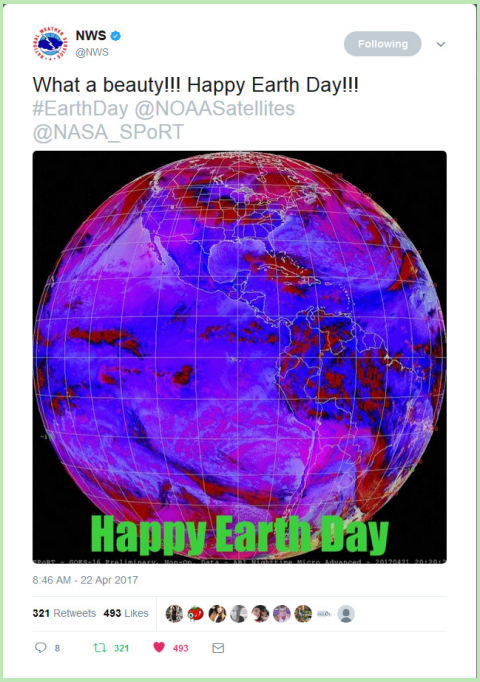
SPoRT engages with our partners in a number of ways, including through the use of social media. You can also follow us through Facebook (NASA SPoRT Center) and Twitter (@NASA_SPoRT). SPoRT also maintains the Wide World of SPoRT blog (http://nasasport.wordpress.com), where SPoRT scientists and our forecaster partners highlight interesting examples of product use. The SPoRT group is very appreciative of the efforts of all of our collaborative authors. If you would like privileges to post on the SPoRT blog, please send an email to Kris White (kris.white@noaa.gov). Thanks and we hope you'll keep reading!

Wide World of SPoRT Blog

Posts to the Wide World of SPoRT blog for the second quarter of 2017 were variable in scope, ranging from the use of the Dust RGB to detect blowing dust and a dryline event in the high plains of eastern New Mexico and west Texas to the use of synthetic aperture radar data to detect tornado tracks. Along with these were a number of posts highlighting the use of current total lightning data, but also future lightning data from the Geostationary Lighting Mapper on GOES-16. The following posts were highlights from the Wide World of SPoRT Blog this quarter:

- Kevin Fuell highlighted the use of the Dust RGB to analyze and forecast dust and a dryline moving across eastern New Mexico and west Texas in late March: https://nasasport.wordpress.com/2017/04/03/dust-rgb-analyzes-dryline-for-32317/
- Geoffrey Stano detailed a lightning jump in the Alabama Lightning Mapping Array during severe weather in the Tennessee Valley: https://nasasport.wordpress.com/2017/04/22/lightning-jump-in-the-north-alabama-lightning-mapping-array/
- Brian Carcione, the Science Operations Officer at the Huntsville, AL WFO and former SPoRT Applications Integration Meteorologist, showed how GOES-16 ABI and GOES-R CI products aided in decision support services for the Panoply Arts Festival in Huntsville, AL in late April: https://nasasport.wordpress.com/2017/05/01/goes-16-abi-and-goes-r-ci-aid-idss-over-the-weekend/
- Lori Schultz described an exciting new use of Synthetic Aperture Radar (SAR) Imagery to detect tornado damage tracks: https://nasasport.wordpress.com/2017/06/05/

Tweets of the Quarter



Publications

Berndt, **E**. **B**., **N**. **J**. **Elmer**, **A**. **L**. **Molthan**, and **L**. **A**. **Schultz**, 2017: A Methodology to Determine Recipe Adjustments for Multispectral Composites Derived from Next-Generation Advanced Satellite Imagers. *Journal of Oceanic and Atmospheric Technology, Submitted*.

Blankenship, **C**., **J**. **L**. **Case**, W. Crosson, and **B**. **T**. **Zavodsky**, 2017: Correction of Forcing-Related Spatial Artifacts in a Land Surface Model by Satellite Soil Moisture Data Assimilation. *IEEE Geosci. Remote S., In Review*.

Case, **J**. **L**. and **B**. **T**. **Zavodsky**, 2017: Evolution of 2016 Drought in the Southeastern United States from a Land Surface Modeling Perspective. *Results Phys., In Review*.

Davies, D. K., M. E. Brown, K. J. Murphy, K. A. Michael, **B**. **T**. **Zavodsky**, E. N. Stavros, and M. L. Carroll, 2017: NASA Data for Time-Sensitive Applications: Workshop Summary. *IEEE Geosci. Remote S., In Press*.

Lorenz, D. J., J. A. Otkin, M. Svoboda, **C**. **R**. **Hain**, M. C. Anderson, and Y. Zhong, 2017: Predicting US Drought Monitor (USDM) States using Precipitation, Soil Moisture, and Evapotranspiration Anomalies, Part I: Development of a Non-Discrete USDM Index, *J. Hydrometeor., In Press*.

Lorenz, D. J., J. A. Otkin, M. Svoboda, **C**. **R**. **Hain**, M. C. Anderson, and Y. Zhong, 2017: Predicting the US Drought Monitor (USDM) using Precipitation, Soil Moisture, and Evapotranspiration Anomalies, Part II: Intraseasonal Drought Intensification Forecasts, *J. Hydrometeor., In Press*.

Meng, H., J. Dong, R. Ferraro, B. Yan, L. Zhao, C. Kongoli, N.-Y. Wang, and **B**. **Zavodsky**, 2017: A 1DVAR-based snowfall rate retrieval algorithm for passive microwave radiometers. *J. Geophys. Res. Atmos*., 122, doi:10.1002/2016JD026325.

Mladevnova, I. E., J. D. Bolten, W.T. Crow, M. C. Anderson, **C**. **R**. **Hain**, D. M. Johnson, and R. Mueller, 2017: Intercomparison of Soil Moisture, Evaporative Stress, and Vegetation Indices for Estimating Corn and Soybean Yields Over the US, *IEEE J. of Selected Topics in Appl. Earth Obs. and Remote Sens.*, 10(4), 1328-1343.

Naeger, **A**. **R**., 2017: Impact of dust aerosols on precipitation associated with atmospheric rivers using WRF-Chem simulations. *Results Phys.*, In Review.

Schultz, **C**. **J**., **G**. **T**. **Stano**, **P**. **J**. **Meyer**, B. C. Carcione, T. Barron, 2017: Lightning Decision Support using VHF Total Lightning Mapping and NLDN Cloud-to-Ground Data in North Alabama. *J. Operational Meteor., In Press*.

Zhou, Y., X. Xaio, G. Zhang, P. Wagle, R. Bajgain, J. Dong, C. Jin, J. Basara, M. C. Anderson, **C**. **R**. **Hain** and J. A. Otkin, 2017: Quantifying agricultural drought in tallgrass prairie region in the US Southern Great Plains through analysis of a water-related vegetation index from MODIS images, *Agr. For. Meteor.*, 245, 111-112.

Presentations

Berndt, **E**., **G**. **Stano**, **K**. **Fuell**, **A**. **Leroy**, **K**. **McGrath**, **A**. **Molthan**, **L**. **Schultz**, **M**. **Smith**, **K**. **White**, **C**. **Schultz**, **B**. **Zavodsky**, 2017: An Overview of NASA SPoRT GOES-R & JPSS Proving Ground Testbed Activities. *8th NOAA Testbeds & Proving Grounds Workshop*, Kansas City, MO, 25-26 April.

Berndt, **E**., **K**. **Fuell**, **D**. **White**, **A**. **Burke**, and **K**. **White**, 2017: Multispectral (RGB) Imagery Applications. *GOES-16: The First Results Workshop*, Kansas City, MO, 27 April.

Hain, **C**. **R**., **B**. **T**. **Zavodsky**, **J**. **L**. **Case**, **C**. **B**. **Blankenship**, **K**. **D**. **White**, M. C. Anderson, J. A. Otkin and X. Zhan, 2017: Mapping Drought with Satellite Remote Sensing and Land Surface Modeling, *United States Drought Monitor Forum,* Keystone, SD, 3-5 April.

Naeger, **A**. **R**., **C**. **Blankenship**, **E**. **Berndt**, and **B**. **Zavodsky**, 2017: Using Multi-Sensor Aerosol Optical Depth Retrievals to Improve Infrared Radiance Assimilation, *15th JCSDA Technical Review & Science Workshop on Satellite Data Assimilation*, College Park, MD, 23-25 May.

Naeger, **A**. **R**., 2017: Using WRF-Chem to simulate the aerosol-cloud-precipitation processes associated with landfalling atmospheric rivers, *18th Annual WRF User's Workshop*, Boulder, CO, 12-16 June, P73.

Srikishen, **J**., **J**. **L**. **Case**, W. A. Petersen, T. Iguchi, W. Tao, **B**. **Zavodsky**, and **A**. **Molthan**, 2017: Short-term forecasts using NU-WRF for the Winter Olympics 2018. *18th Annual WRF User's Workshop*, Boulder, CO, 12-16 June, P38

Zavodsky, **B**. **T**. and **E**. **B**. **Berndt**, 2017: SPoRT Overview and Potential TEMPO Roles. *5th TEMPO Science Team Meeting*, Cambridge, MA, 31 May – 1 June.

Proposals

NASA Earth and Space Science Fellowship (NESSF)

Nicholas Elmer, a Ph.D. student at the University of Alabama in Huntsville (UAH) working with NASA SPoRT, was selected as a recipient of the prestigious and highly competitive NASA Earth and Space Science Fellowship (NESSF) for his proposal entitled "Assimilation of SWOT Observations into the Operational National Water Model." He will be funded for three years by NASA to develop a data assimilation strategy for upcoming observations from NASA's SWOT mission, with particular emphasis on the challenges of integrating data in the complex topography and data-limited environment of Alaska. His work will also support partnerships with NOAA's National Water Center to integrate SWOT data into NOAA's NWM for improved streamflow and hydrologic predictions.

NOAA Modeling, Analysis, Predictions, and Projections (MAPP)

Two proposals with SPoRT co-investigators were recently selected for funding through the NOAA Modeling, Analysis, Predictions, and Projections Program:

Bradley Zavodsky and Jonathan Case are co-investigators on a proposal entitled "Improving the Drought Monitoring Capabilities of Land Surface Models by Integrating Bias-Corrected, Gridded Precipitation Estimates" in collaboration with researchers from Texas A&M and Goddard Space Flight Center (GSFC). The PI for this project is Dr. Brent McRoberts, who is working as a summer faculty fellow with SPoRT. This project focuses on improving precipitation forcing in the North American Land Data Assimilation System-2 (NLDAS-2) and Multi Radar Multi Sensor (MRMS) QPE products by integrating bias-corrected, gridded precipitation estimates for more representative modeling of drought informative variables in land surface model (LSM) applications. The role of SPoRT will be to test the improved NLDAS-2/MRMS bias-corrected QPE within SPoRT's real-time Land Information System application. SPoRT will evaluate the sensitivity on the LSM output fields and derived objective drought (and wetness) classifications, and assess the benefit of a much higher-resolution QPE forcing by incorporating a spatiotemporally-reliable MRMS bias-corrected QPE product.

Dr. Christopher Hain is co-investigator on a proposal entitled "Representing human-managed influences through thermal product data assimilation in NLDAS: Impacts on the terrestrial water budget and drought estimation." The proposal is led by Dr. Christa Peters-Lidard at GSFC and is a collaboration with NOAA's National Centers for Environmental Prediction's Environmental Modeling Center. The project will focus on developing new methodologies to assimilate thermal infrared remote sensing products related to soil moisture and ingesting near-real-time remote sensing-based vegetation information to improve land surface models in the NLDAS-2. The assimilation of thermal infrared products, mainly surface flux and soil moisture information from the Atmosphere Land Exchange Inverse (ALEXI) model will aim to better represent impacts of human-managed agricultural water use (e.g., irrigation; tile drainage) and other human-managed influences.

SPoRT Seminars

25 April 2017: "Assimilation of Satellite Precipitation and Soil Moisture Data into the WRF-Noah Model," Liao-Fan Lin, Hydrology Research Group, Georgia Institute of Technology.

16 May 2017: "Space Weather and the Case for a National Strategy," William Murtagh, Program Coordinator for the NOAA Space Weather Prediction Center.

13 June 2017: "Unsupervised Multi-Scale Change Detection from SAR Imagery for Monitoring Natural and Anthropogenic Disasters," Dr. Olaniyi Ajadi, Alaska Satellite Facility, University of Alaska Fairbanks.

Congratulations

Congratulations to SPoRT undergraduate student Angela Burke on her selection as a 2017 Ernest F. Hollings Undergraduate Scholarship awardee. Ms. Burke is one of 110 rising juniors to be awarded this prestigious NOAA scholarship, which awards two years of tuition support and a paid summer internship at a NOAA facility.

Visitors

Dr. Gail Skofronick-Jackson

Dr. Gail Skofronick-Jackson, Project Scientist for the NASA GPM Mission visited MSFC on 12 April. She was briefed on SPoRT activities and held discussions related to the feedback that SPoRT has facilitated for GPM. Dr. Skofronick-Jackson provided feedback that the GPM Science Team had found SPoRT's interactions and feedback from NWS forecasters to be valuable for identifying and investigating algorithm issues.

Dr. Liao-Fan Lin

Dr. Liao-Fan Lin of Georgia Tech visited SPoRT on 25-26 April to present a seminar and to discuss common research interests with SPoRT scientists. Dr. Lin's recent Ph.D. dissertation demonstrated a combined assimilation process for precipitation and soil moisture from the SMOS satellite. We discussed potential areas of collaboration and intercomparison for soil moisture assimilation.

Dr. Nadia Smith

Dr. Nadia Smith from Science and Technology Corporation in Columbia, MD, an expert in hyperspectral infrared sounding retrieval, visited with SPoRT 2-4 May to enhance collaboration on the JPSS Proving Ground and Risk Reduction product involving Gridding NUCAPS Soundings for forecasters applications such as cold air aloft, the pre-convective environment, and winter weather. In addition, Dr. Smith gave a UAH seminar titled "What we do not measure Affects what we see – Thoughts on Sampling Uncertainty in Satellite Sounding Applications."

Dr. William Murtagh

Dr. William Murtagh, Program Coordinator for the NOAA Space Weather Prediction Center (SWPC), visited MSFC on 16 May to discuss space weather activities ongoing within the MSFC Science and Technology Office. During his visit, SPoRT briefed him on our research-to-operations/operations-to-research paradigm for transitioning experimental data products to the NWS. The objective of this presentation was to highlight successful interactions with operational forecasters as a method to transition experimental space weather products to SWPC.

National Weather Service Management Staff

Four members from NWS management: Greg Patrick and J.J. Brost (NWS Southern Region HQ), Bill Ward (NWS Pacific Region HQ), and Dave Myrick (NWS HQ) visited SPoRT on 14-15 June. They gave presentations regarding the evolving NWS towards for Incident Decision Support Services and the new National SOO position under the re-organized NWS Office of Science and Technology Integration. SPoRT presented updates on new products, including GLM, RGBs, and NUCAPS. The NWS staff was highly complimentary of SPoRT's engagement with forecasters and discussed a desire to find ways in which SPoRT can continue to work with NWS to accelerate experimental satellite products into operations.

Upcoming Calendar of Events

- Hazardous Weather Testbed (Norman, OK; June 19-July 21)
- Mid-South Wings and Weather Conference (Memphis, TN; July 7-8)
- Esri User's Conference (San Diego, CA; July 9-14)
- SMAP Weather Applications Focus Session and International Surface Working Group Meeting (Monterey, CA; July 18-20)
- 2017 National Geospatial Preparedness Summit (Tuscaloosa, AL; August 7-10)
- 2nd Synthetic Aperture Radar Workshop (Huntsville, AL; August 23-25)
- Disaster Risk Reduction Americas Working Meeting (Buenos Aires, Argentina; September 4-8)
- National Weather Association Annual Meeting (Garden Grove, CA; September 16-21)
- Joint Polar Satellite System 1 Launch Date (Vandenburg Air Force Base; September 21)
- EUMETSAT 2017 (Rome, Italy; October 2-6)

National Aeronautics and Space Administration

George C. Marshall Space Flight Center
Huntsville, AL 35812
www.nasa.gov/marshall

www.nasa.gov

NP-2017-07-07-MSFC
G-319132