The SPoRT REPORT

SPoRT Quarterly
Jul.–Sep. 2012

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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/

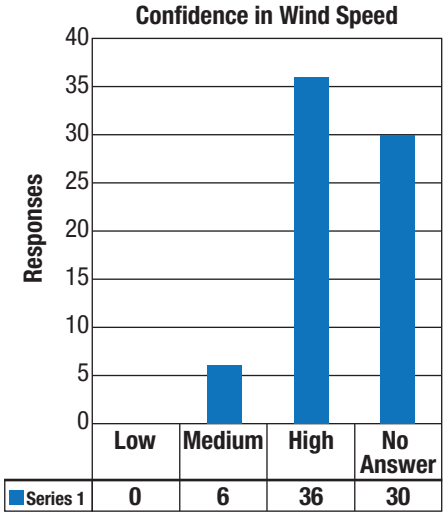
The SPoRT Center is a NASA- and NOAA-funded project to transition unique observations and research capabilities to the operational community to improve short-term weather forecasts on a regional scale. While the direct beneficiaries of these activities are Selected Weather Forecast Offices (WFOs) and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

Quarterly Highlights

WindSat Ocean Surface Wind Vector Evaluation

In the month of August, SPoRT conducted a comprehensive evaluation of WindSat ocean surface wind vector (OSWV) data with NWS offices in Monterey and Eureka, California and Medford, Oregon in order to better understand the utlity of this data in forecast operations. Positive feedback could encourage a braoder use of the data throughout the NWS forecast community. The WindSat instrument is a polarimetric microwave radiometer onboard the Coriolis satellite, which provides wind direction and speed over oceans and large lakes, in addition to several other meteorological parameters. In the previous decade, WindSat played a secondary role to the QuickSCAT satellite, but was pushed into more of a prominent operational role with the loss of QuikSCAT in 2009. Additionally, new retrieval methods implemented by the Naval Research Lab provided a more robust data set than the legacy product. While the swath width (1,000 km) and resolution (50 km) are lower than QuikSCAT, the WindSat instrument has nevertheless served an important role in observations over the open oceans since the loss of the former satellite. Since WindSat is a polar orbiter, data are available generally twice daily over a given location. However, data availability may be limited at times, due mainly to problems with downlink access.

Survey participants suggested an August timeframe for the evaluation because of the increased frequency of north flow wind events that are important to their forecast operations. By the end of the month, an astounding 72 evaluations had been submitted by the three NWS offices, of which 20 consisted of north flow wind cases. The was active participation by these offices was due in large part to the efforts of Science and Operations Officers Mel Nordquist (WFO Eureka), Warren Blier (WFO Monterey), and Michael Stavish (Medford). Not only did they provide feedback concerning the survey questions (their expertise helped us determine what questions should even be asked), they filled out surveys and encouraged the use of WindSat data and survey input from their respective staff members.



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Recent Accomplishments

SPoRT Project Lead Receives NASA Exceptional Service Medal

On August 16, 2012, NASA honored Dr. Gary Jedlovec with the NASA Exceptional Service Medal at an awards ceremony at Marshall Space Flight Center. The inscription reads "For outstanding and tireless efforts in developing the SPoRT project into a model for transitioning NASA's Earth observations for use in National Weather Service operations". Presenting the medal to Dr. Jedlovec were NASA Headquarters Associate Administrator Robert Lightfoot and the MSFC Associate Director Robin Henderson.

NWS Forecaster/Information Technology Office to Join NASA

Jason Burks (researcher, forecaster, decision support system development expert and Information Technology Officer (ITO) of Huntsville's NWS forecast office) has accepted an offer to join NASA and the SPoRT Team. Jason will lead SPoRT's activities to transition unique experimental and research data to weather forecast operations via AWIPS2 and other end user decision support systems. He will also lead the newly formed GOES-R Proving Ground (PG) Experimental Products Development Team (EPDT), an external (to Raytheon) collaborative product development team to support the transition of PG products to the operation weather environment. As SPoRT embarks on a new era of transitioning NASA, NOAA, and other experimental data to operational end users ,and prepares to integrate these unique measurements into the NWS's new AWIPS2 decision support system, Jason will be instrumental in establishing new pathways for data integration and exploring new opportunities. Additionally, Jason's unique talents and leadership skills will support numerous research activities in the NASA Earth Science and Science and Technology Offices at Marshall Space Flight Center. The transition from NWS to NASA will occur on October 22. Welcome Jason!

SPoRT participation in the EUMETSAT RGB Workshop

Kevin Fuell and Andrew Molthan of the SPoRT team participated in the Second WMO-EUMETSAT Workshop on RGB Satellite Products from September 17-19, 2012 in Seeheim-Jugenheim, Hesse, Germany. The 2012 workshop was a follow-up to a previous workshop held in 2007, to provide an update on the current status of operational use of multispectral red-green-blue (RGB) satellite image composites within EUMETSAT that are derived from the SEVIRI instrument aboard Meteosat-9. As a WMO workshop, guests were invited from several countries around the world, and presenters were given an opportunity to demonstrate the use of RGB satellite products within their respective agencies. On behalf of the SPoRT team and our activities in the GOES-R and JPSS Proving Grounds, Kevin and Andrew provided a presentation on the RGB-related activities underway at SPoRT and in collaboration with other organizations, such as CIRA. The presentation was well received and numerous questions were asked regarding SPoRT's experience in the development of product training, coordination with operational forecasters within the National Weather Service, and the potential for additional products provided by the future GOES-R and JPSS capabilities. The development of recommendations for new RGB products and future activities to be developed by the WMO and EUMETSAT was identified as a post workshop activity. SPoRT was invited to contribute viewpoints and suggestions in order to guide future activities and collaborations.

The 2012 SPoRT Partners Virtual Workshop

As the SPoRT program has expanded, there is increasing benefit of science sharing between collaborative partners using unique NASA and NOAA satellite products. To harness this potential, SPoRT hosted its first partner's workshop in Huntsville, Alabama in the Fall of 2010. Individuals from each office were able to visit and present their activities. Unfortunately, budget constraints and federal travel restrictions meant that an on-site workshop could not be repeated. However, for every crisis there is an opportunity and SPoRT hosted the first Partners Virtual Workshop in August 2011, which allowed any forecaster from our collaborating offices to participate and listen in as well as have non-collaborators "attend". Based on this success, SPoRT moved ahead with the Second SPoRT Partners Virtual Workshop on September 12-13 of this year.

Split into two half-day meetings to accommodate attendees from multiple time zones, the 2012 workshop was a great success. There were 14 presentations give in four sessions including "Operational Uses of Unique Satellite Imagery," "Initialization Data Sets and Modeling Collaborations," "Convection, Severe Weather, and Total Lightning," and "Operational Uses of Total Lightning." The workshop served its primary role in providing a forum for SPoRT's partners to present their activities and successes as well as outline projects for the future. A testament to the workshops success was that the original call for presentations was sent to SPoRT's 20 collaborative partners, but through word of mouth alone, about 40 unique attendees participated over the course of both afternoons.

All of the workshop's presentations are online in the SPoRT library.

Disasters funding awarded to SPoRT

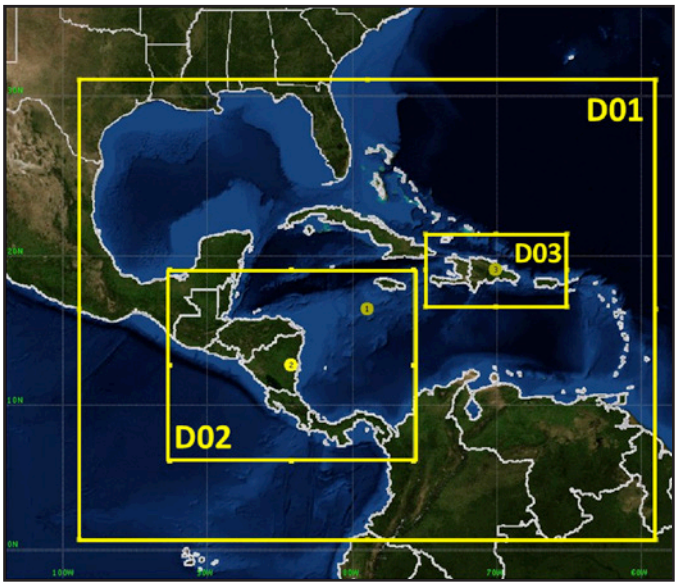
SPoRT has won a competitive peer-reveiwed award through the NASA Applied Sciences Disasters Program to conduct a feasibility study investigating the use of NASA, NOAA, and commercial satellite data sets to identify damage resulting from severe weather events, such as tornadoes, hail, and damaging winds. NASA, NOAA, and commercial data sets will be incorporated within the Damage Assessment Toolkit being developed by the National Weather Service, which uses GIS capabilities and mobile platforms such as tablets and cellular phones to support field assessments following severe weather outbreaks. Following the events of April 27, 2011, SPoRT used MODIS and ASTER data from NASA's Terra and Aqua satellites to identify tornado damage tracks, and it is envisioned that similar products developed in near real-time can support the damage assessment process. Higher resolution imagery from commercial data sets is expected to provide further improvements. The award supports a one-year feasibility study with potential funding to support joint NASA-NOAA-National Weather Service activities for up to three additional years. SPoRT plans to work aggressively with the NWS to meet the feasibility study's objectives with hopes to have subsequent collaborative activities funded in the coming years.

SPoRT-SERVIR modeling collaboration for Mesoamerica:

The SPoRT-SERVIR modeling collaboration provided the NASA/SERVIR team with a proof-of-concept capability for real-time modeling and verification over the Caribbean and Central America (aka Mesoamerica) using the WRF model, with the goal of upgrading the current operational PSU/NCAR Mesoscale Model version 5 (MM5) to WRF. SPoRT established an experimental configuration of the WRF model over the entire Caribbean region at 12-km grid spacing, with 4-km mesh nested grids over Mesoamerica, and the Dominican Republic/Haiti/Puerto Rico region. In developing this configuration, SPoRT consolidated two separate MM5 runs into a single nested WRF run, enhanced the horizontal resolution over the current MM5 runs made in Panama (from 9-km to 4-km grid spacing in nests), and included the 2-km SPoRT sea surface temperatures in the initial conditions.

As part of this collaboration, SPoRT completed a preliminary model verification study and produced a briefing package in both English and Spanish that described daily WRF model runs from October to December 2011, using the NOAA/NWS Science Training and Resource Center (STRC) Environmental Modeling System (EMS). The Spanish translation was handled by Max Moreno-Madrinan of SERVIR. The briefing package provided highlights of the SPoRT-SERVIR modeling collaboration, presented case studies of sample forecasts for a heavy rain and tropical cyclone event, and focused on interpretation of model output and an understanding of the sample verification statistics presented. Verification statistics were generated using the NCAR Model Evaluation Tools (MET) software and SPoRT-developed scripts, which managed the execution of the MET programs and summarized the MET output into composite results and charts. Point and gridded verification statistics were produced using point observations from the NCEP/EMC Global Data Assimilation System (i.e. GDAS) files for surface and upper-air verification, and the Climate Prediction Center Morphing (i.e. CMORPH) gridded product for precipitation verification. The preliminary model verification demonstrated a capability that could be transitioned into operational use for SERVIR in Mesoamerica.

SPoRT has also been producing real-time Mesoamerica WRF simulations during summer 2012 using NASA Cloud Services computing resources. SPoRT partnered with the NASA Cloud Services team at Ames Research Center to provide high-resolution, daily forecasts over Mesoamerica using the STRC EMS. The simulations are performed on a small cluster of virtual machine instances that operate in a manner similar to a research cluster, but are provisioned from resources provided by cloud hardware. Model simulations are performed, post processed, and resulting output data distributed to SPoRT, where additional processing is done to provide model data in the desired format to SERVIR for display in a web mapping service. Efforts are underway to fully emulate the cloud application by creating the cluster from cloud resources at the beginning of each model run and decommissioning the cluster to return hardware to the cloud when the model simulation is complete.



Experimental SPoRT-SERVIR nested grid setup for the real-time WRF simulations, where D01 is the outer Caribbean domain with 12-km grid spacing, D02 is the Central America nest with 4-km grid spacing, and D03 is the Dominican Republic nest with 4-km grid spacing.

Satellite Proving Ground Activities

Evaluation of the utility of the UAH Convective Initiation (CI) product

As part of its Proving Ground activities, SPoRT is helping to transition GOES-R Algorithm Working Group (AWG) baseline and future capabilities products to end users. One such AWG future capabilities product is UAH CI, a convective initiation nowcasting algorithm in the GOES-East domain that indicates the likelihood of tracked cloud objects becoming convective in the 0-2 hour timeframe.

This past spring, the UAH CI algorithm underwent substantial changes based on recommendations from participants at in Hazardous Weather Testbed (HWT) Spring Experiment. The UAH CI product previously produced a yes/no output, which gave forecasters little room to levy their own experiences or judgment. The new version, which is still based solely on six satellite interest fields, scales the likelihood of convection on a 1-100 scale and corresponding color bar. This pseudo-probabilistic "Strength of Signal" (SoS) display is now available to evaluation participants in AWIPS and N-AWIPS.

Four Weather Forecast Offices (WFOs) were selected to participate in an evaluation of this enhanced product based on their past operational experience with UAH CI or their interest from HWT. Overall, 31 feedback surveys were received from the Huntsville, Miami, Melbourne, and Albuquerque WFOs from July 10 to August 11. The forecasters also participated in a SPoRT coordination call to share their insights with UAH CI developers at the conclusion of the evaluation period.

The feedback on the enhanced product was very positive. The forecasters were satisfied with its appearance in AWIPS. Aside from some latency issues in AWIPS when loading many frames to loop or viewing larger areas, the SoS display was universally preferred over the previous version. Fifteen surveys said that UAH CI's numeric SoS indicated the likelihood of CI in the observed region most of the time, and 10 more said it did so all or nearly all of the time.The minimum strength of signal at which CI would occur was reported to be 60-70 in 11 surveys. Forecasters also described numerous environmental conditions that might have impacted this in their detailed comments, and indicated increased confidence in basing forecast decisions on SoS values if those values were high and sustained.

Most surveys (18 of 31) said the product missed 25% or fewer convective events. On the subject of "misses", there were questions regarding whether the product "missed" a forecast or if the algorithm simply does not track certain objects and why. This feedback resulted in a new section describing cirrus contamination being appended to the UAH CI training on SPoRT's website.

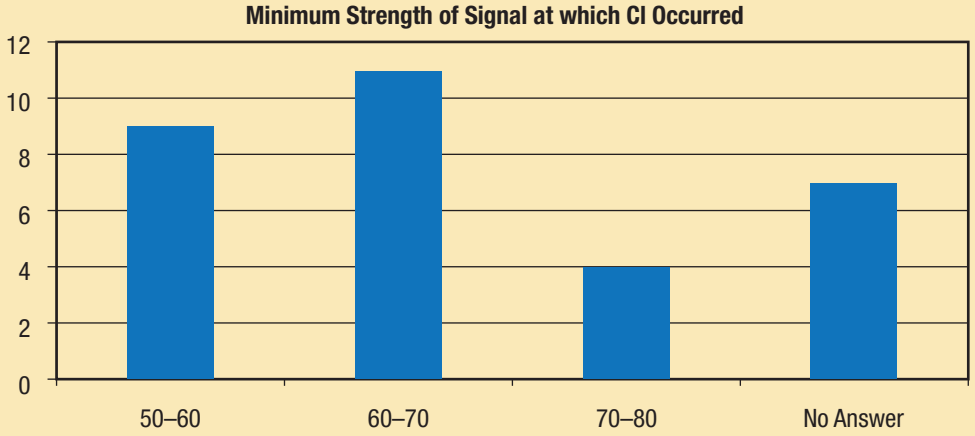
A number of surveys indicated that the product had some impact on the forecasting/nowcasting process. In four specific cases, forecasters stated UAH CI had a large impact and was factored into NOWCASTs, an Area Forecast Discussions, and aided in adjusting Probability of Precipitation forecasts. Forecasters cited 45+ minute lead times and information prior to/instead of radar as primary benefits in these cases. However, the SoS sometimes fluctuated between high and low likelihoods, impacting lead times; 21 surveys say they are as less than 15 minutes on average. A more detailed evaluation report is available on the SPoRT page. Thanks to everyone who participated in this evaluation!

Experimental Product Development Team (EPDT)

In response to internal needs and those of the NOAA GOES-R Proving Ground (PG) program, SPoRT has formed the Experimental Product Development Team (EPDT) for AWIPS 2. This team's focus will be on helping promote research-to-operations transition of data and techniques to the AWIPS 2 platform with emphasis on the needs of the GOES-R PG program. The team will encourage and aid in development through fostering a network of developers, compiling training on the AWIPS 2 platform and encouraging collaborative development. The team consists on members from SPoRT, GOES-R Proving Partners, GSD, and NWS from the office, regional, and national levels. SPoRT will lead this team and will hold the first developer's training workshop in Huntsville during February 2013.

Collaborations with the National Hurricane Center

In collaboration with NOAA's GOES-R Proving Ground activity, SPoRT continues to assist the community by transitioning select products for display within the N-AWIPS system used at NWS National Centers, including the National Hurricane Center (NHC). For the 2012 Proving Ground activity at the NHC, SPoRT continued to support the production of RGB dust and air mass products from Meteosat-9/SEVIRI, to facilitate N-AWIPS display of these products that were originally produced by CIRA for display in Google Earth. In addition, SPoRT collaborated



Upgrade of the real-time SPoRT LIS

SPoRT has been operating a real-time configuration of the NASA Land Information System (LIS) that runs the Noah Land Surface Model (LSM) since summer 2010. These LIS runs have been made on a domain that covers much of the eastern Continental U.S. at 3-km grid spacing. The SPoRT-LIS simulation consists of a long-term integration of the Noah LSM spanning multiple years, which is restarted four times each day and driven by atmospheric analyses from NCEP (i.e. the Global Data Assimilation System, North American Land Data Assimilation System phase 2, and Stage IV precipitation). The SPoRT LIS has been incorporating SPoRT's real-time high-resolution Green Vegetation Fraction (GVF) composites since April 2011, which are updated daily from MODIS Normalized Difference Vegetation Index swath data. The real-time LIS is designed to provide a high-quality modeled depiction of soil moisture and temperature, skin temperature, and snow-water equivalent at a resolution consistent with local model runs at NWS weather forecast offices.

Several upgrades were made to the real-time LIS during September, which are highlighted in the table below. The most noteworthy modifications and improvements are:

- Updated LIS software to support an upgrade from Noah LSM version 2.7.1 to version 3.2. This upgrade includes an improved look-up table methodology for some static fields and improved handling of heat fluxes over snow-covered regions.
- Changed land-use classification (vegetation type) from the U.S. Geological Survey database to the newer International Geosphere Biosphere Programme (IGBP)/MODIS database. The IGBP/MODIS database is more up-to-date, especially for recently-expanded urban areas.
- Switched from a coarse-resolution surface albedo climatology to a look-up table methodology for surface albedo based on (a) input GVF from the high-resolution SPoRT-MODIS real-time product and (b) the newer IGBP/MODIS land-use database.

The upgrades to the SPoRT real-time LIS will help to improve the representation of urban areas and the partitioning of surface sensible and latent heat fluxes through the use of the IGBP/MODIS land use database. There should also be a better representation of the surface energy budget through the use of surface albedo consistent with real-time SPoRT-MODIS GVF. These impacts will translate to benefits in the forecast 2-m temperature, dewpoint, and instability fields in local model forecasts using LIS initialization data, especially during the warm-season months.

List of configuration details of the real-time SPoRT LIS, notation as to whether the configuration is unchanged or modified, and specific noteworthy details.

Configuration Detail	Unchanged	Modified	Notes
Domain extent	X		Eastern United States
Grid spacing	X		3 km
Soil type	X		State Soil Geographic database
Land use		X	Upgraded to IGBP/MODIS 20-class vegetation type
Land surface model		X	Upgraded to Noah version 3.2 (formerly v2.7.1)
GVF database	X		Daily real-time SPoRT-MODIS Green Vegetation Fraction generated at native 0.01° resolution
Surface albedo		X	Improved look-up table methodology based on input real-time SPoRT-MODIS GVF
Atmospheric forcing (excludes precip)		X	Long-term Noah LSM integration driven by NLDAS-2 (formerly first-generation NLDAS)
Precipitation forcing	X		Hourly NCEP Stage IV precipitation analyses

with Jason Dunion of OAR/AOML to support the transition of a Saharan Air Layer and pseudo-natural color product within N-AWIPS. These products demonstrate future capabilities of the GOES-R satellite's Advanced Baseline Imager (ABI), helping to expose forecasters to future capabilities while providing ample lead time for product developers to further refine product capabilities. SPoRT has also continued collaborations with the Naval Research Laboratory (NRL) in Monterey, California to support the dissemination of popular passive microwave RGB composites that were previously available only on the web. Passive microwave RGB composites are produced by SPoRT using data provided by NRL, with output files provided for N-AWIPS displays at the National Hurricane Center.

WFO Corner — SPoRT Visits

Visit to WFO Corpus Christi, Texas

This past August, SPoRT team members Geoffrey Stano and Kristopher White had the opportunity to spend some time with our partners at the Corpus Christi Weather Forecast Office. The Corpus Christi office has been a strong partner with SPoRT and it was good to once again meet several of our collaborators, such as Waylon Collins and science and operations officer Michael Buchanan. The visit highlights SPoRT's effort to maintain collaborative partnerships through a variety of means, from the bi-monthly coordination calls, the virtual workshop, and on-site visits.

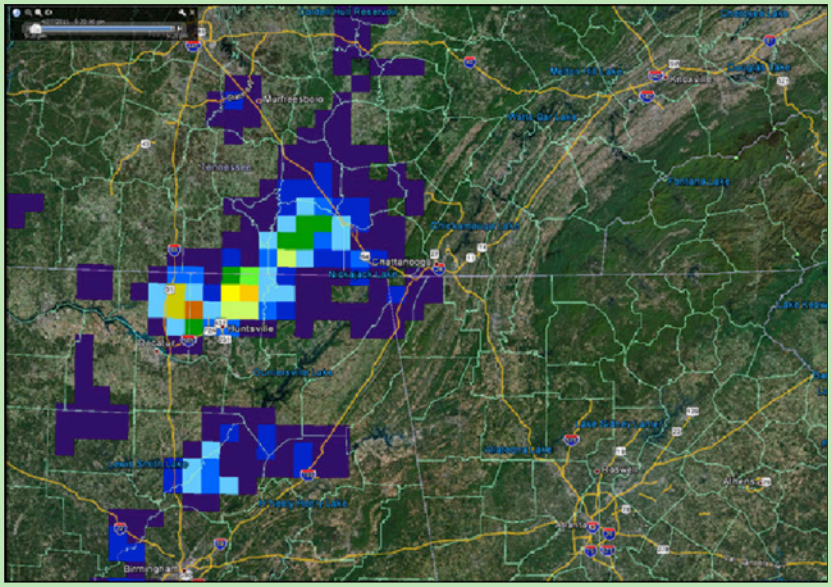
During the course of the visit Geoffrey and Kris had the opportunity to provide an overview of SPoRT's latest activities and discuss upcoming projects, such as the transition of Soumi NPP's VIIRS data. This proved to be a strong point of discussion as the VIIRS data have similar capabilities to the MODIS instruments on NASA's Terra and Aqua satellites and can be used to generate a nighttime microphysics red-green-blue composite. This product can be used to improve fog detection over current techniques. Furthermore, the VIIRS day-night band observations are a new tool available to forecasters. Relying on reflected moon light, the day-night band also will be used in an upcoming fog detection evaluation. For the Corpus Christi office, fog is one of the greatest challenges, particularly with respect to shipping in the marine environment.

The Corpus Christi staff also had the opportunity to discuss their interests. Out of these discussions, there was a great deal of interest in several SPoRT products in addition to the nighttime microphysics. In particular, the MODIS green vegetation fraction for modeling made a good impression along with the tornado damage tracks product demonstrated by using a difference image of before and after observations from MODIS. Discussion also focused on the Houston lightning mapping array being assembled by Dr. Orville from Texas A&M University and how that may be of use for the office's northern counties. Lastly, the forecasters strongly encouraged SPoRT's efforts to develop quick guides as additional training to help spin up new forecasters to the office.

Visit to WFO Morristown, Tennessee

The tag-team duo of Geoffrey Stano and Kristopher White hit the road again at the end of August to meet with SPoRT's partners at the Morristown Weather Forecast Office. It had been several years since the previous visit to meet with the forecasters, such and Douglas Schneider and science and operations officer David Hotz, and the time was good to discuss a new round of collaborations and evaluations. Much like the Corpus Christi visit earlier in the month, Geoffrey and Kris spoke to the forecasters about SPoRT's activities and new project proposals. In return, the Morristown forecasters were able to discuss topics important to their office and how to best continue to collaboration.

A major concern for the Morristown office is fog, particularly steam fog from several bodies of water across the county warning area. The forecasters were very interested in determining if the new nighttime microphysics red-green-blue composite product would be able to observe this phenomenon. The aim will be informally evaluated this fall and winter. Additionally, the Morristown office expressed a great deal of interest in the tornado damage tracks product and wishing to look for ways to collaborate with SPoRT's modeling efforts. Other discussions focused on the logistics of how SPoRT and Morristown will move forward into the AWIPS 2 era (the Weather



Sample image of NASA SPoRT's pseudo geostationary lightning mapper flash extent density product in Google Earth, centered on Chattanooga, Tennessee for the lightning safety assessment.

Service's new decision support system) and implement the software plug-ins SPoRT has developed.

A lengthy discussion focused on the North Alabama Lightning Mapping Array (NALMA). While the NALMA only covers the western third of Morristown's county warning area, the data have been popular with the forecasters. In fact, Morristown has provided one of the operational examples that will be used in an upcoming training module. The main discussion point was how to focus an evaluation given the limited spatial coverage of the network. The solution will be to evaluate NALMA's total lightning observations for lightning safety activities in collaboration with the Chattanooga/Hamilton County emergency managers. Where SPoRT considers the individual forecast offices its "end users", these offices in turn work very closely with emergency managers. This project will establish a collaboration between SPoRT, WFO Morristown, and the Chattanooga emergency managers that will provide training on what total lightning is (cloud-to-ground plus intra-cloud lightning), the potential benefits to lightning safety, and conduct an assessment of these observations. Furthermore, the effort will be tied into the GOES-R Proving Ground as the assessment will use SPoRT's pseudo-geostationary lightning mapper (PGLM) products. These products are designed to be a demonstration and training tool for future Geostationary Lightning Mapper (GLM) observations once launched aboard GOES-R. The reasoning for using the PGLM is to perform an evaluation on a type of data that will eventually be available to all offices with GLM's launch. As an added twist, the PGLM data will be provided via the Web as a Google Earth product as the emergency managers do not use the National Weather Service's AWIPS system. The initial plan has been established and a follow-up visit to Chattanooga will occur later this year. Lastly, this effort will likely include a parallel project with the Melbourne, Florida forecast office.

WindSat Ocean Surface Wind Vector Evaluation*...continued*

One of the goals of the evaluation was to determine the overall utility of WindSat OSWV data in a real-time operational environment. Data generally were considered useful if the swath fell somewhere within 300 nm of the coast, however, observations closer to the coast were, of course, desired. While WindSat data were not available or useful (i.e., outside of the desired range, downlink was too late, missing data, etc.) 27 times during the evaluation period, 42 surveys counted data availability, with 32 of these occurring during the 15Z satellite pass time. While most issues generally involved data latency, especially with regards to the need for current or recent data in the real-time operational environment, WindSat observations were often considered useful for enhancing situational awareness. In 20 instances, survey participants considered the observations to have at least a small change in situational awareness, with a large change noted in 8 surveys. Of the 44 times when data were available for evaluation, 9 helped with the issuance of an advisory product and 8 were used for later verification. Forecasters also expressed fairly high confidence in wind speed and direction as determined by WindSat, although exceptions were noted in a few cases.

Overall, the evaluation was deemed a great success and efforts are ongoing to work with these and other SPoRT collaborators on future use of the WindSat OSWV data. A more formal write-up of this survey will is available on the SPoRT web page. We would also like to extend thanks to those offices who take valuable time to provide the necessary feedback and collaboration that help make the SPoRT paradigm successful!

Travel

- Geoffrey Stano – WFO Huntsville and the Marshall Space Flight Center Emergency Operations Center (September)
- Geoffrey Stano – Chattanooga, Tennessee to visit with emergency managers and WFO Morristown science and operations officer David Hotz (October 12)

Visitors

- July 10 – William McNally, NASA HQs – learn about SPoRT
- July 30 – Jack Kaye, Earth Science Division, NASA HQs
- August 6 – Jennifer Wilson, Robert Brown, and Kristin Cummings, KSC Weather Office. Discuss modeling collaboration opportunities between SPoRT and the Applied Meteorology Unit (AMU) at Cape Canaveral, FL.

SPoRT Seminars

SPoRT hosted a seminar on July 24th from two NOAA Hollings Scholars students working out of the Birmingham NWS office for the summer. Brett Williams (Department of Atmospheric Sciences, University of Missouri – Columbia) gave an overview presentation on an ongoing study of convective initiation being conducted by the WFO. His presentation was titled "Summer Convection Across Central Alabama" and described the daily procedure used to identify boundaries, including the short-term forecast polygons, and the results of the enhanced forecasts. The second Hollings Scholar presentation was given by Chris Rohrbach (Department of Meteorology, North Carolina State University) on a "Preliminary Examination of QLCS Tornadoes Across Central Alabama. He highlighted portions of an ongoing study being conducted at the Birmingham WFO which focused on environmental conditions that lead to QLCS tornadoes. His presentation also explained the methodology used in developing the tornado warning statistics and examine several key environmental cues that may improve QLCS tornado forecasting.

August 31 – Burgess F. Howell (USRA/ Earth Science Office) gave a seminar on ISERV Pathfinder: A low cost, COTS-based, Earth imaging system aboard the International Space Station – SERVIR (a Spanish acronym for "the regional system for visualization and monitoring") is a project jointly operated by NASA and the US Agency for International Development (USAID) and transitions the outputs of NASA-funded research to operational science applications, and provides information and data products to decision-makers for a broad variety of environmental management and humanitarian purposes. In order to improve its access to supporting data, SERVIR has proposed a series of Earth observing instruments to be developed over several years and deployed on the International Space Station. This series of instruments, consisting of several inter-nal and external instruments capable of data acquisition across a broad range of wavelengths, collectively comprises the ISS/SERVIR Environmental Research and Visualization System (ISERV). Mr. Howell told the audience about the ISERV Pathfinder, the first instrument in this suite, which is a low-cost, COTS-based telescopic system, consisting of commercially available hardware, additional custom hardware, and custom software. The assembly is deployed in the Window Observational Research Facility (WORF), and observes the Earth through the nadir-facing window in the Destiny module. ISERV Pathfinder launched June 26, 2012 aboard JAXA's HTV3.

September 11 – Karthik Srinivasan (USRA/Earth Science Office) gave a seminar on SERVIR Wireless Sensor Network: Enabling real-time in-situ observations for environmental and disaster applications. Mr. Srinivasan discussed the need for and problems with systems to obtain more timely surface weather observations in remote areas of the world. Inadequate local scale ground observations inhibit an adequate description of actual environmental conditions that impact a number of phenomena such as landslides. The spatial and temporal resolution obtained with utilizing satellite data is insufficient for real-time early warning systems. Major challenges with in situ instruments lie in the prohibitive costs of installing and maintaining equipment for long duration deployments. Costs increase especially if instruments must be connected to the power grid and repeatedly visited for data logging in remote locations. Recently, wireless sensor networks (WSNs) have become much more practical for environmental scientists, providing more affordable monitoring and assessment capabilities. Mr. Srinivasan described an affordable and robust wireless sensor network requiring minimal maintenance to make distributed environmental observations with applications ranging from landslide monitoring to flash flood warning systems developed for a the Regional Visualization and Monitoring System (SERVIR) project, a joint venture between NASA, the US Agency for International Development (USAID) and other international partners.

Calendar of Events

- National Weather Association (NWA) Annual Meeting, October 8–11, 2012, Madison, WI.
- Joint Center for Satellite Data Assimilation (JCSDA) Workshop, October 10–11, 2012, College Park, MD
- SPoRT Seminar by Haiyang Chao (West Virginia University) – "A Low-Cost Multispectral Remote Sensing System Using Unmanned Aircraft Systems", October 16, 2012
- Severe Local Storms Conference, November 5–8, 2012, Nashville, TN
- GOES-R Proving Ground Experimental Products Development Team (EPDT) for AWIPS2 Workshop, November 13–15, 2012, Huntsville, AL
- AGU Fall Meeting, December 3–7, 2012, San Francisco, CA
- SPoRT Seminar by William Blackwell (MIT) – "New Techniques for High Resolution Atmospheric Sounding", December 12, 2012
- AMS Annual Meeting, January 6–10, 2013, Austin, TX

National Aeronautics and Space Administration

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NP-2012-12-127-MSFC
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