

SPoRT Report



Science Mission Directorate
National Aeronautics and Space Administration

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

The SPoRT Center is a NASA 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) in the Southern Region, the research leading to the transitional activities benefits the broader scientific community.

Quarterly Highlights

Web Page Revamped and Updated

The SPoRT web page (<http://weather.msfc.nasa.gov/sport/>) has been overhauled to better reflect the ongoing activities of the program. The web page contains three major sections:

- operational products disseminated to WFOs
- the current research of the team
- transitional activities

Visitors can find general information on the program - mission, partners, and information on the SPoRT team members. The library has a complete list of publications and links to various training modules available to the public. A variety of other documents and reference information are available including the presentations from our recent Science Advisory Committee (SAC) review.

Science Advisory Committee Review of SPoRT Activities

The fourth SPoRT Science Advisory Committee (SAC) meeting was held on June 12-14 at the National Space Science and Technology Center (NSSTC) in Huntsville, Alabama. The two and a half day meeting featured a comprehensive review of ongoing research and transitional activities, a tour of the Huntsville NWS Forecast Office (collocated with SPoRT at the NSSTC), where SAC members observed forecasters using MODIS and AIRS data in AWIPS, and an evening social event at Joe Davis Stadium, during which the Huntsville Stars (AA affiliate of the Brewers) defeated the Birmingham Barons (White Sox) on a beautiful evening for baseball.

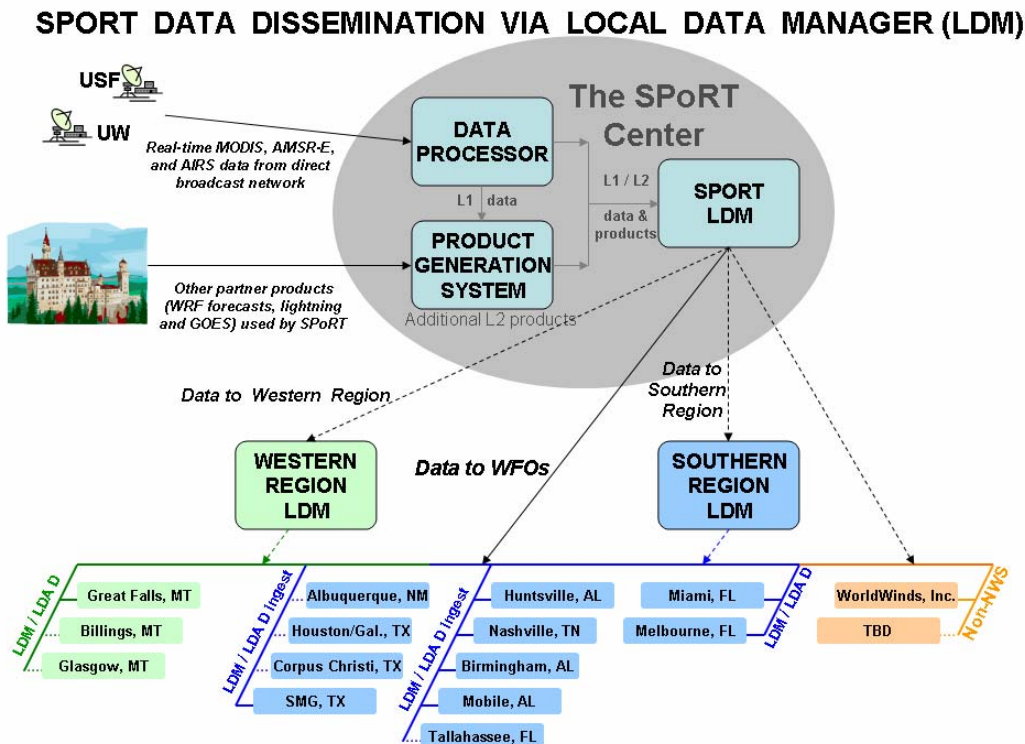
The SAC is composed of research scientists and forecasters representing government, university, and commercial organizations involved in the transition of emerging satellite and modeling technologies into the weather operational environment. The SAC serves as a knowledge resource for SPoRT and provides guidance and recommendations for the direction of future SPoRT activities. The SAC members in attendance were Ralph Petersen (UW), Bill Baumann, Chair (ENSCO), Ron Gelaro (GSFC/GMAO), Chris Barnett - attending for Mitch Goldberg (NOAA/NESDIS/STAR), Bernard Meisner - attending for Rusty Billingsley (NOAA/NWS/Southern Region Headquarters), Tsengdar Lee (NASA

SPoRT Quarterly Report: April – June 2007

Headquarters), and Allen White - attending for Marty Ralph (NOAA/ESRL/PSD).

The SAC meeting was structured to be an interactive forum where SPoRT team members discussed their work with Committee members. The formal presentations highlighted past research driven by recommendations of the previous SAC (which last met in November of 2005) and addressed current research activities of the team members. The accomplishments of the SPoRT program over the last 18 months were presented to the SAC (see list below).

One of the more significant accomplishments was the establishment of a more efficient process of disseminating data to WFOs. This process (see figure) includes staging data and products on a LDM server for immediate distribution to "subscribing" offices. This new dissemination methodology significantly reduces the product latency and allows more offices to access the data. A complete list of SPoRT accomplishments is presented below. The SPoRT SAC meeting agenda and full listing of the presentations are posted on the SPoRT web site under "[Documents](#)".



[Recent Accomplishments](#)

SPoRT Accomplishments -- 2005-2007
(*bold and italicized* items are in direct response to SAC 2005 recommendations)

General

- *Hosted a NASA/NWS SPoRT / Southern Region (SR) Science Operations*

Officer (SOO) workshop in the summer of 2006 - all 32 SR offices were represented

- Began several new collaborations to disseminate data to the operational weather community (WorldWinds, Inc.; NRL-Monterey; Sterling, Melbourne, and Billings WFOs; and NESDIS (NDE, STAR; OSDPD))
- *Established a new paradigm for data dissemination to WFOs using Local Data Manager (LDM) software*

SPoRT Quarterly Report: April – June 2007

- Published / submitted 8 journal articles
- Submitted 7 new proposals (1 funded, 5 pending) that leverage off of SPoRT activities
- Balanced workforce to address changing project requirements
- Revamped SPoRT web page
- Jointly developed a "white paper" with NESDIS on how SPoRT will collaborate with the NPOESS Data Exploitation (NDE) office
- Disseminated CIRA polar orbiting TWP products to WFOs (request from SOO workshop)
- Used CloudSat data to help validate GOES / MODIS / AIRS cloud detection and height assignment schemes
- ***Evaluated use of AMSR-E surface products for weather applications***

AIRS

- ***Completed AIRS profile assimilation impact for new east coast case study – demonstrated improvement in mid- to upper-level temperature and moisture patterns in 36-48h forecasts***
- Developed and demonstrated methodology to conduct near real-time profile assimilation with WRF
- ***Enhanced the working relationship with the AIRS science team to demonstrate utility of AIRS products in the operational environment***
- Obtained AIRS L1B / L2 data and products from University of Wisconsin direct broadcast
- Developed a technique to identify uncontaminated AIRS spectral channels in cloudy scenes for application to radiance data assimilation studies
- Applied GOES / MODIS cloud product algorithms to AIRS data (CO₂ height / cloud fraction)

MODIS

- Published an article (IEEE TGRS) describing the MODIS Sea Surface Temperature (SST) compositing technique
- Began real-time dissemination of MODIS SST composites in GRIB (gridded binary) format to community - SERVIR, WorldWind Inc., MAPO6, NAMMA, WFO/WRF studies
- Adapted the SST compositing technique to MODIS ocean color products

Other remote sensing

- Disseminated (at the request of NESDIS) GOES aviation products to WFOs in advance of the next AWIPS build

WRF

- ***Implemented a couple WRF/LIS at NASA/MSFC/SPoRT – early results show improved 2m temperatures and low level circulation patterns***
- Used CloudSat simulator (QuickBeam) to provide first comparisons between CloudSat observations of real clouds and the cloud systems simulated by WRF
- ***Collaborated with Mobile WFO on a WRF (with MODIS SST data) case study - demonstrated improved wind / temperature forecasts in coastal regions***
- ***Developed a collaborative project with Miami WFO to conduct a robust demonstration of the use of high resolution MODIS SST fields in WRF forecasts***
- ***Developed the capability to run the GSI / WRF at the JCSDA for AIRS data assimilation studies***
- Disseminated NSSL WRF forecasts to WFOs

Nowcasting

- Transitioned convective initiation product output to AWIPS for evaluation and operational usage – developed a corresponding training module and assessment survey
- ***Refined algorithms for the dissemination and display of LMA data in AWIPS***
- ***Conducted an assessment of LMA impact based on surveys / reports from forecasters***

Data dissemination

- ***Began dissemination of products via Local Data Manager for reduction in latency and broader dissemination***

SPoRT Quarterly Report: April – June 2007

Training modules and surveys

- Developed a SPoRT webcast on SPoRT activities
- Developed several new product training modules for use by WFO (GOES aviation products, ADAS fields in AWIPS, Convective Initiation (CI) products in AWIPS)
- Participated in NPOESS Training Development Workshop funded by IPO

Recent Publications and Presentations

Conferences

Zavodsky B., S-H. Chou, G. J. Jedlovec, and W. Lapenta, 2007: The Impact of Atmospheric InfraRed Sounder (AIRS) Profiles on Short-term Weather Forecasts. Preprints, SPIE Conference on Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XII, International Defense and Security Symposium, 9-13 April 2007, Orlando Florida

Presentations

Zavodsky B., S-H. Chou, G. J. Jedlovec, and W. Lapenta, 2007: The Impact of Atmospheric InfraRed Sounder (AIRS) Profiles on Short-term Weather Forecasts. Preprints, SPIE Conference on Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XII, International Defense and Security Symposium, 9-13 April 2007, Orlando Florida

Visitors

- Steve Friedman and Eric Fetzer - JPL AIRS Science Team
- Geoffrey Stano - Florida State University
- Kevin Fuell - formerly of UCAR/COMET
- Chris Barnet (NOAA/NESDIS/STAR) - SAC participation
- Ralph Petersen (University of Wisconsin) - SAC participation
- Allen White (NOAA/ ESRL/PSD) - SAC participation
- Bill Baumann (ENSCO) - SAC participation
- Bernard Meisner (NWS/SR) - SAC participation
- Ron Gelaro (NASA/GSFC/GMAO) - SAC participation
- Tsengdar Lee (NASA/HQs) - SAC participation

External Meetings

- **May 2007** - NPOESS Training Development Workshop, - Boulder

Calendar of Events

- **July 23-August 10, 2007** – College Park, Maryland -Center for Satellite Data Assimilation (JCSDA) Workshop
- **July 23-27, 2007** - Barcelona - IEEE Geosciences and Remote Sensing Society (IGARSS) 2007 - Sensing and Understanding Our Planet Conference
- **September 24-28, 2007** - Amsterdam - AMS Satellite Conference

SPoRT Points of Contact

Principal Investigators:

Gary Jedlovec - gary.jedlovec@nasa.gov

Bill Lapenta - bill.lapenta@nasa.gov

NASA Headquarters:

Tsengdar Lee - tsengdar.lee@nasa.gov