



NSSL Briefings

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A newsletter about the employees and activities of the National Severe Storms Laboratory

Fire destroys NSSL field research equipment

NSSL's 4,000-square-foot leased equipment storage facility, known as the "Balloon Barn," was destroyed in a late afternoon fire on July 3, 2001. No one was injured since the warehouse was unoccupied at the time. The estimated cost to replace the unique research equipment is \$2.16 million. "This fire is a major setback to our research and development efforts," said Dr. James F. Kimpel, NSSL Director. "What we learn through our field campaigns--basic knowledge of storm structure, testing of new detection and measuring devices, and development of new forecasting techniques--will be significantly impacted."

Equipment lost includes one of two SMART-Radars, a brand new lightning mapping array system, a new mobile laboratory, a mobile mesonet instrumented vehicle, all 12 mobile mesonet roof instrumentation racks, varying numbers of individual mobile mesonet sensors, a Ford Expedition, the entire tool and shop inventory, three atmospheric sounding systems and a large inventory of balloons and radiosondes.

The SMART-Radars, mobile C-band doppler radars mounted on a truck, were near completion and scheduled to be used to



Utility vehicle inside the facility.

study hurricanes this fall. The second SMART-Radar was not at the site and was unharmed. The two radars were to be used together to obtain highly detailed three-dimensional pictures of thunderstorms and other severe weather.

NSSL, Texas A&M, Texas Tech University, and the University of Oklahoma are collaborators on this project.

The destroyed lightning mapping array equipment was to be installed during late July. The system was created by engineers at New Mexico Institute of Mining and Technology for NSSL and OU researchers. It was expected to provide 3-D lightning data over a portion of central Oklahoma, and 2-D data over most of the state. Preliminary research indicates the lightning data provided by this system could improve the quality of computer-based forecast models and lead to better forecasts.

NSSL's newest mobile lab, NSSL5, was also destroyed in the fire. Scientists in the field use mobile laboratories to launch, track and receive data from weather balloons.

The complete story and more pictures can be found at: <http://www.nssl.noaa.gov/headlines/fire.html>. ♦



Fire fighters work to put out the fire at NSSL's equipment storage facility. Photo by Bill Carter of The Norman Transcript

NOAA and OAR will fund fire recovery

Seven weeks after the devastating equipment storage facility fire, officials from NSSL's parent organizations, OAR and NOAA, announced that they will provide nearly \$1.2 million to replace NSSL's share of what was lost.

Dr. Kimpel said, "All of us at NSSL are very grateful for the leadership in OAR and NOAA to allow us to recover as quickly as possible from the July 3 fire." Initial funding was made available immediately to begin rebuilding some of the equipment. Scientists, technicians and support staff expect to have everything replaced in about two years. ♦



NSSL's equipment storage facility after the fire.



NSSL, CIMMS, and OU staff show their appreciation by saying "Thank You" to NOAA management for their quick response.



Employee Spotlight: Mike Douglas

Mike Douglas is on a mission to solve a worldwide problem: to develop an affordable global observing system that will support global numerical weather prediction. Mike's first step is helping to develop regular observing systems in Latin America as part of NOAA's Pan American Climate Studies (PACS) program. Two to three people manage the logistics of 22 observing sites in 12 countries from Norman, OK on a small budget. Mike travels 4-5 months a year to visit the sites, teach training courses, and work with various governments. Mike also uses this opportunity to bring foreign students to train in the U.S. with the hope they use their knowledge when they return to their native country. His goal is to solve the observing system problems in Latin America before taking on Africa.

In elementary school, Mike, his brother, and a neighbor, built a weather station and took readings three times a day for 90 days without missing an observation. Mike was a geophysics major at UC-San Diego and UC-Berkeley until the last quarter of his senior year when he took a climate course that both intrigued him and answered many of his questions. He decided to pursue meteorology in graduate school and earned his M.S. at the University of Miami and his Ph.D. at Florida State University.

International travel is not new to Mike. His first overseas experience came during graduate school as he participated in a summer monsoon project in India and became an expert in P-3 flight based observations. Later, at the Wave Propagation Lab (now Environmental Technologies Lab) in Boulder, he participated in five field programs in the Arctic. Mike also ran the Mexican side of the SouthWest Area Monsoon Project (SWAMP), and when the opportunity opened up, he moved to Norman and NSSL.

Relaxing makes Mike feel guilty, he says. He has a greenhouse in his backyard where he grows cactus and succulents, an interest that began in high school in San Diego. He likes to do "natural history" travelling with his wife Rosario and tries to add vacation to his business trips to explore and photograph new vegetations and habitats. ♦



Bim Wood and Jim Purpura demonstrate the paging system.

NSSL employee advocates for better ways to alert Oklahoma deaf and hard-of-hearing people to hazardous weather

Bim Wood, a research meteorologist, is aware of the challenges deaf and hard-of-hearing people face; he has been deaf since infancy. Following the tornadoes that struck Oklahoma on May 3, 1999, Bim conducted a nine-month survey that

revealed 81 percent of deaf and hard-of-hearing people have experienced fear about being unprepared for weather emergencies. He also found they have relatively limited ways of knowing severe weather is imminent. One deaf couple reported they were unaware of the approaching F5 tornado on May 3 until they looked outside and saw neighbors fleeing their houses. Another person interviewed took shelter after lip reading only the word "closet" during a televised weather alert.

Bim has helped initiate a new program to address this issue. The Hazardous Weather Pager Program sends life-saving weather messages via alphanumeric pagers to subscribers with hearing disabilities. The program is a partnership of the NWS Norman Forecast Office, the state Department of Rehabilitation Services, the state Department of Civil Emergency Management, and Weather Affirmation, LLC, and The School for the Deaf in Sulphur, OK who is financing, overseeing, and implementing the pilot project. Bim says, "Alphanumeric pagers are an ideal notification method for those who cannot afford to be tied down to a personal computer or other weather data source, who are concerned

(continued on the next page)

News briefs

Comings and goings

Matt Pipkin, an engineer, has joined NSSL to work on ballooning instrumentation. He will also assist with the Oklahoma Lightning Mapping Array and other projects.

Thomas Vaughn has left NSSL--he worked on the WDSS-II for two years.

Receptionist **Anji Kirkwood** moved with her new husband to Fort Worth, TX.

Remaining SMART-R intercepts T.S. Gabrielle

The SMART-Radar that was not damaged by the fire intercepted Tropical Storm Gabrielle as it made landfall near Venice, FL. The radar collected at least 12 hours of data as the eye passed directly over the SMART-Radar position. Look for a full article in the Winter issue of NSSL Briefings.

Forecast Demonstration Project--Sydney 2000

Scientists from NSSL travelled to Munich, Germany in July to participate in the 30th International Conference on Radar Meteorology. During the conference, a special session was devoted to the Forecast Demonstration Project--Sydney 2000. Four different international groups provided experimental warning, nowcast and forecast information to the Sydney Bureau of Meteorology during the 2000 Olympics. NSSL presented several papers on the performance of WDSS, a part of the project.

NSSL/CIMMS Scientist on Olympic Weather Team

NSSL/CIMMS's David Schultz will be a forecaster as part of the Olympic Weather Support Team in Salt Lake City during the Olympic Winter Games of 2002. The forecasting team is made up of government and private meteorologists and academic experts. They will provide forecasts for each venue to ensure the safety of the athletes and the general public. The Olympics will be held from February 8-24, 2002, with the VIII Paralympic Winter Games following from March 7-16.

News briefs

Register for the National Severe Weather Workshop

The National Severe Weather Workshop will be held March 1-3, 2002 in Norman, OK. If you are interested in participating, early registration is encouraged! More information is available at: <http://www.nssl.noaa.gov/nsww2002>.

Weather Center schematic design completed

The scoping phase and schematic design for the National Weather Center in Norman have been completed. The building will house both government and university entities including NOAA's National Severe Storms Laboratory, Storm Prediction Center, local Forecast Office, Warning Decision Training Branch and the Radar Operations Center's Application Branch. Look for an expanded article in the next issue of NSSL Briefings.

AUUTI (Acronyms Used In This Issue)

- AMS - American Meteorological Society
- CAPS - Center for the Analysis and Prediction of Storms
- CIMMS - Cooperative Institute for Mesoscale Meteorological Studies
- NOAA - National Oceanic and Atmospheric Administration
- NSSL - National Severe Storms Laboratory
- NWS - National Weather Service
- NWSFO - National Weather Service Forecast Office
- OAR - Oceanic and Atmospheric Research
- OU - University of Oklahoma
- SMART-R - Shared Mobile Atmospheric Research and Teaching Radars
- SPC - Storm Prediction Center
- WDSS - Warning Decision Support System

NSSL Briefings is a publication from the National Severe Storms Laboratory intended to provide federal managers, staff, and other colleagues in the meteorological community with timely information on activities and employees. If you would like to be added to the NSSL Briefings mailing list, or have a change in your address, please forward requests to Kelly Lynn, NSSL, 1313 Halley Circle, Norman OK, 73069; by phone: (405) 360-3620; or by email: kelly.lynn@nssl.noaa.gov.

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NEWSLETTER

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about hazardous weather." Bim hopes the program will serve as a model for other states.

The standard NOAA Weather Radio has been modified to meet the weather alerting needs of deaf and hard-of-hearing users. The special-needs weather radio receiver is available with visual or vibrating alarms and simple text readouts. Bim also partnered with Jim Purpura of the NWS-Norman to take the program a step further by providing weather safety training for program participants. The training was designed to help participants know what to do once they receive hazardous weather alerts.

Bim recently received the "Public Personnel Employee Award" from the Oklahoma City mayor's Committee on Disability Concerns for his work. ♦



Joan O'Bannon honored as NOAA Research Partner of the Month

CIMMS computer graphic artist Joan O'Bannon was honored by NOAA Research as the October Research Partner of the Month. Joan is part of the NOAA Research Web Committee that created the current OAR web site. She also designed the logo that is currently being used for NOAA research. Over the years, Joan

has been invaluable in her design and development capabilities with graphics, publications, hand-outs, inserts, signs and certificates and more. ♦

NSSL and outreach

NSSL hosted a number of high school and college students this summer. The students were sponsored by the National Science Foundation's (NSF) Research Experience for Undergraduates (REU), Practical Hands-On Application to Science Education (PHASE) supported by NOAA's Office of Oceanic and Atmospheric Research, and NSF's Collaboratives to Integrate Research and Education (CIRES) in Earth System Science program. Daphne Zaras is the project director for REU and coordinates NSSL/CIMMS's involvement in PHASE. Here is a summary by program:

REU students, mentor, school, topic:

- Sara Bruening**, NSSL-Brooks/SPC-Kay, UW-Milwaukee, "A New Perspective of the Climatology of Tornadoes,"
- Nettie Lake**, NSSL-MacGorman, Lyndon State College, "A Relationship Between Surface Equivalent Potential Temperature and the Dominant Lightning Polarity of Severe Thunderstorms in the Great Plains,"
- Mario Lopez**, NSSL-Howard, UT Pan American, "Are Biological Hotspots Dependent on Climate?,"
- Alison Marr**, NSSL-Elmore, Murray State U. (KY), "The Effects of an Ice Parameterization Scheme on Ensemble Cloud Model Storm Lifetimes,"
- Cathryn Meyer**, NSSL-Brooks, Boston College, "A Statistical Model for Significant Tornado Hazards in the United States,"

Jason Tomlinson, NSSL-Rust, Valparaiso University, "Procedure for Refurbishing Balloon-Borne Electric Field Meters."

PHASE students, mentor, school:

- Sarah Brown**, NSSL-Zaras/Rasmussen, OU,
- Kathleen Roberts**, NSSL-Zaras/Rasmussen, Casady School, OKC,
- Chelsea McEntire**, NSSL-Zaras/Rasmussen, May graduate of Moore H.S.,
- Justen Brown**, NSSL-Rabin, May graduate of Norman North H.S.

CIRES students, mentor, school:

- Sirneika Fraser**, NSSL-Krause, Clark Atlanta University (there are three additional CIRES students at OU).

Summer volunteers:

- David Droescher**, NSSL-Zaras, Norman North H.S.,
- Zachary Dufran**, a May graduate of Norman H.S., worked on a climatology of severe storms that produce positive cloud-to-ground lightning.

NSSL staff frequently speak to local schools and several are EARTHSTORM mentors for schools around the state. In addition to the students, we have hosted international visitors from China, Canada, Argentina and Japan.

NSSL gave tours and presentations about our work to over 550 children and adults during the months of April, May and June. ♦



Fig. 1. Daily activity in the NSSL/SPC Spring Program. Pictured (left to right) are Don Burgess, Lou Wicker, Greg Carbin, Paul Janish and Mike Foster.

Numerical guidance products evaluated in NSSL/SPC spring research program

From 17 April to 8 June 2001, a real-time forecast and research experiment was conducted in the Science Support Area of the NSSL/SPC facility. This program was a collaborative effort, organized by Mike Baldwin and Jack Kain, CIMMS colleagues within NSSL's Mesoscale Applications Group, and Paul Janish and Steve Weiss of the SPC. A diverse group of forecasters and scientists participated from NSSL and SPC, the Norman NWS/WFO, NCEP's Environmental Modeling Center (EMC), NOAA's Forecast Systems Laboratory, the University of Oklahoma, and Iowa State University.

The primary goal of the program was to investigate whether operational and experimental numerical weather prediction (NWP) models could be utilized more effectively to predict the initiation and development of severe convection. This overriding objective was mutually beneficial to NSSL and SPC because it incorporated important mission priorities from both sides. Specifically, it promoted NSSL's efforts to evaluate and improve NWP models while it supported the SPC's exploration of ways to reliably increase the projection time for severe thunderstorm and tornado watches.

Daily operations in the program involved three scientists and/or forecasters: 1) an SPC forecaster, 2) an NSSL/CIMMS scientist, 3) an "external" scientist or forecaster (Figure 1). In addition, a number of visiting scientists

participated at different times. These teams were responsible for issuing two forecast products and providing an extensive evaluation of numerical guidance products. The next day, the same group was tasked with providing a detailed subjective verification of both the forecast products and the model guidance.

Model evaluation became a core component of this program because NSSL and SPC collaborators have developed the perception that popular objective verification metrics often yield numbers that are inconsistent with the subjective impressions of SPC forecasters. Specifically, these metrics often fail to reflect the value of model forecasts to human forecasters. This deficiency has far reaching implications because model development strategies are guided largely by these verification standards. This implies that the needs of the SPC (and mesoscale forecasters in general) may not be well represented in development strategies unless different verification measures are applied.

As part of a larger goal to develop new verification metrics, one focus of this year's program was to document the disparity between prominent objective verification measures and the subjective impressions of severe weather forecasters and scientists at NSSL/CIMMS/SPC. Preliminary results from the program show success in this regard. For example, statistics show that an experimental version of EMC's Eta model, configured at NSSL in collaboration with SPC forecasters, typically provides better guidance for convective initiation and evolution than the operational Eta model (Figure 2). Meanwhile, the equitable threat score, a bellwether verification metric at EMC, favors the operational model (Figure 3).

Details about the 2001 NSSL/SPC Spring Program can be found at http://www.spc.noaa.gov/exper/Spring_2001/.

◆ By Jack Kain

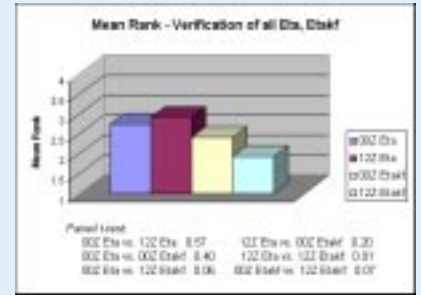


Figure 2. Selected results from subjective verification of quantitative precipitation forecasts, including 00 and 12 UTC runs of the operational Eta model and NSSL's experimental version of the same model (Eta_{kf}). Models were ranked from 1 (best) to 4 (worst) every day during the Spring Program based on agreement between model forecasts and observed precipitation. Note that the Eta_{kf} runs ranked higher on average. Statistical significance can be inferred from results of paired t-tests.

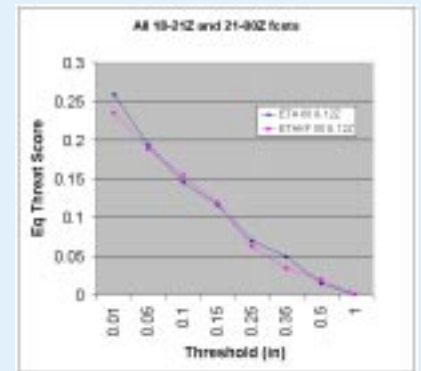


Fig. 3. Equitable threat score as a function of precipitation threshold for the same model runs and spatial and temporal domains as the subjective verification statistics. Note that the scores are very close but appear to favor the operational Eta model (higher scores are favored).