Aware is published by NOAA's National Weather Service to enhance communications within the Agency and with the emergency management community.

Aware

October 2010

Climate, Water, Weather

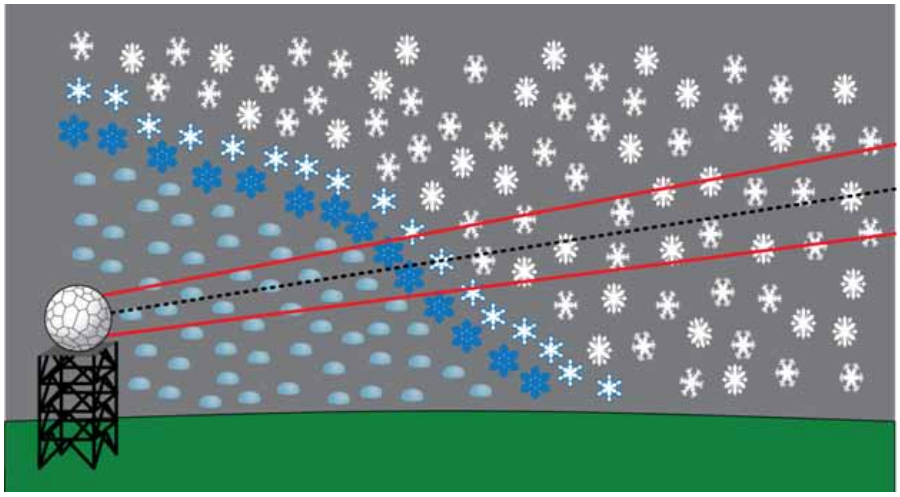
Dual-Polarization Radar Training for NWS Partners

By Andy Wood, University of Oklahoma, Cooperative Institute for Mesoscale Meteorological Studies; Paul Schlatter, NWS Warning Decision Training Branch

Between January 2011 and March 2013, the entire fleet of Weather Surveillance Radar-1988 Doppler systems (WSR-88D) is scheduled for a major software and hardware upgrade. This upgrade, known as dual-polarization technology, will greatly enhance these radars by providing the ability to collect data on the horizontal and vertical properties of precipitation, (e.g., rain, snow, hail) as well as other targets, such as insects and ground clutter. Prior to the official deployment, five radars will serve as beta-test sites for the new technology. These sites are:

- KICT, Wichita, KS
- KIWA, Phoenix, AZ
- KLOT, Chicago, IL
- KMHX, Morehead City, NC
- KPOE, Fort Polk, LA

In support of this technology upgrade, the Warning Decision Training Branch has developed online training to help NWS partners. The training



Schematic showing a radar beam sampling areas of pure snow, snow melting into rain, and all rain. After the dual-polarization technology upgrade, the WSR-88D will have the ability to explicitly detect layers of melting snow above the ground. Several other benefits of the dual-polarization WSR-88D are highlighted in the training available to NWS partners.

Inside Aware

will help those outside NWS learn about changes to the radars and will provide ideas on how they might effectively incorporate these new data into their decision-making processes. This training provides two separate tracks depending on your meteorology background: non-NWS Meteorologist or Non-Meteorologist. Learn more about this training initiative.

The current version of this training supports NWS partners impacted by the WSR-88D beta-test. The training will be updated based on feedback received during the beta-test and should be available in final form in March 2011; however, anyone interested in learning more about dual-polarization radar is encouraged to view this initial release of the training. ☼

ASOS Update

NWS Meets ASOS Sensor Deadline with Federal Teamwork

***By Sean Potter**, NWS Communications Staff*

NWS met a critical milestone for the Federal Aviation Administration (FAA) in September by completing installation of 34 new ceilometers, which use a laser to determine the height of cloud bases. NWS staff installed the new equipment at 32 of the several hundred Automated Surface Observing System (ASOS) sites nationwide. Some sites have more than one ceilometer. The FAA, Department of Defense and NWS operate the ASOS network, which is the nation's primary surface weather observing system.

The successful installation of these critical weather sensors—ahead of an already aggressive schedule—resulted from teamwork across all levels of NWS, including extensive coordination between headquarters offices, regional and local staff.

ASOS Unit at NWS Headquarters.

After deploying more than 70 ASOS ceilometers, questions arose concerning the height performance of the units under specific meteorological conditions. NWS began a series of tests in the field and at headquarters to better understand the problem. Initial results from these tests were presented to the FAA, which asked NWS to install the new ceilometer at an additional 30 FAA-sponsored ASOS sites by the end of September. NWS surpassed this goal, completing the additional 34 installations by September 28.

"To get this done in such a short amount of time was, in my book, a valiant effort," said David Caldwell, Director of the NWS Office of Climate, Water, and Weather Services, who led the NWS team.

To finish the installations before the FAA deadline, NWS Weather Forecast Office (WFO) staff dealt with logistical and weather-related challenges. For example, the installation of the new ceilometer at the Lumberton, NC, ASOS site required Mike Perdue, the Electronic Systems Analyst at NWS Wilmington, NC, to find a break in the weather during a record rain event that brought more than 20 inches of water from September 27-29.

The successful installation of the new ceilometers within such a tight deadline underscores the valuable partnership between NWS and FAA in ensuring Americans' safety in the air and on the ground. These newly installed ceilometers now are being evaluated for accuracy. Full-scale deployment will begin when the equipment shows acceptable performance. ☼

Aware

NWS
Office of Climate, Water and Weather Services

OCWWS Director
Dave Caldwell

Acting Branch Chief
Cindy Woods

Managing Editor
Melody Magnus
Melody.Magnus@noaa.gov

Editors
Darcey Dodd
Art Kraus
Nancy Lee

Aware online
www.weather.gov/os/Aware/

Subscribe
www.weather.gov/os/Aware/awarelist.shtml

ISSN 1936-8178

Beale Street Music Festival Responds to Weather Crisis

By Rich Okulski, Jonathan Howell, WFO Memphis, TN; Jon W. Zeitler, WFO Austin/San Antonio, TX

NWS Memphis, TN, has developed a close relationship with the Shelby County, TN, Sheriff's Office by providing on- and off-site decision support services for the Beale Street Music Festival (BSMF) since 2008. The BSMF attracts up to 50,000 people in Tom Lee Park, bordered by the Mississippi River and downtown Memphis.

Metropolitan Memphis experienced an historic flood and high impact tornado event over the weekend of May 1-2, 2010, when 10-15 inches of rain fell across the northern part of the metro area. Although rainfall amounts were closer to 5-6 inches at the BSMF site, the flood event diverted county emergency resources from the BSMF to more heavily impacted areas of the city. NWS Memphis deployed an emergency response meteorologist to the BSMF site on the night of April 30 to maintain continuous contact with and support for the Shelby County Sheriff's Office.

The Beale Street Music Festival dealt with record rainfall and a tornado threat safely thanks to NWS Memphis.

Due to the magnitude of the flooding and tornado events, and in collaboration with the Shelby County Sheriff, decision support moved offsite on May 1-2. The combined flood and severe event required every available WFO staff member's focus for continuous high impact operations over a 36-hour period.

Offsite support consisted of telephone briefings on May 1, as multiple rounds of supercell thunderstorms moved through Shelby County. Around 10 pm on May 1, WFO Memphis advised that a supercell thunderstorm over east-central Arkansas was tracking directly toward the BSMF site. The Shelby County Sheriff and BSMF organizers ordered an evacuation of the estimated 30,000 people attending the festival that night. The supercell did not produce a tornado as it passed over the site, however, it did produce two tornadoes later in its lifecycle, including one just 10 miles northeast of the BSMF.

Best Practices

But the story doesn't end there. Jon Zeitler and two forecasters from WFO Nashville, TN, were attending the BSMF that evening and witnessed the impacts of the evacuation. While the following observations are anecdotal, they offered a unique opportunity to observe weather impact emergency plans that can be offered to other event planners.

Tornadoes or flooding had occurred throughout the previous week, leading to a high level of awareness among the BSMF attendees. Nearly all had rain gear and many anticipated severe weather. To highlight the potential for hazardous weather and to engage public, media and Emergency Management (EM) awareness, the WFO used Hazardous Weather Outlooks, Graphicasts, conference calls, Webinars and heads-up emails.

The WFO's decision support services helped BSMF staff execute a plan, which led to decisive action by law enforcement and event organizers. This was evident to attendees, who were given a short explanation of the need to cancel the event and to leave immediately. Attendees were told to move to a nearby parking garage. The evacuation process was started when

Mobile Emergency Operations Vehicles helped ensure smooth operations during this major event.

WFO Memphis issued a tornado warning approaching the maximum effective lead time of 1 hour. Lightning flashes and civil defense sirens helped reduce initial evacuation complaints from attendees and ensure a calm, orderly movement toward the park exits.

The BSMF security infrastructure was in place to sweep up stragglers, including use of a bullhorn to repeat the evacuation order and the shelter location. At the conclusion of each BSMF event night, local law enforcement, fire and EMS swept attendees toward exits at the other end of the park. Many attendees are used to this practice from prior years and thus were familiar with the process, which expedited the evacuation. In other words, the evacuation was just like the end of a routine BSMF event night.

Large venue managers should consider how evacuation could be practiced through normal end-of-event activities. For example, an announcement could be made at the end of a football game that attendees should immediately exit the stadium as a drill for a potential future evacuation. Such high fidelity drills would allow venue managers to test plans and correct deficiencies in staffing, identify choke points, etc. The evacuation was successful due to many factors:

- Effective forecasts and heads-up messages
- Decision support provided directly to public safety officials
- A pre-set evacuation plan
- Decisive decision-making
- Clear evacuation instructions
- Familiar end-of-event sweep procedures
- Environmental cues such as lightning

In one case, a concert attendee was able to give a 15-minute warning to relatives in the suburb where the tornado actually touched down. Some concert attendees knew to seek shelter on the lowest floor or basement of buildings and parking ramps. Many of the attendees were under 25, suggesting weather safety training in schools or through media is effective since that age group is less likely to have lived through a similar event.

Evacuation Challenges

- Handling a generally younger crowd, with an estimated 25 percent legally intoxicated
- Controlling foot and motor traffic to ensure attendees' safety during severe weather
- Working with the high proportion of attendees who did not know how to access or interpret weather data, despite having smart phones. What is the risk/reward for event organizers providing earlier notice of a potential evacuation?
- Using civil defense sirens for large areas

Severe weather offers social scientists a great opportunity to observe public safety actions and societal impacts. Anecdotal responses can help NWS determine what areas need further research and action. ☼

WFO Recognized for Effective Communication

By Chad Omitt, WCM, NWS Topeka, KS

On September 1-2, NWS forecast offices in Kansas held a statewide Integrated Warning Team Workshop in Wichita that included Kansas television broadcasters and state and county EMs. The overarching goal of the workshop was to share information that will improve

communication between NWS and EMs and media partners, specifically to improve the consistency and clarity of NWS products.

Local and state EMs have set up a statewide 800 mhz radio system. Over the past 6 months, this system has become one of the primary means of decision support services to NWS partners in the EM community. Combining this new means of communication with WFO Topeka's "tell them what we know when we know it" philosophy, WFO staff continues to improve services to core partners. The hard work is paying off: the Kansas EM Association recently recognized the office for outstanding service at its state conference.

"We appreciate and would like to recognize NWS Topeka for the proactive approach to severe weather threats and initiatives in support of outreach and educational efforts with Emergency Management," said a Kansas EMA staff member.

Integrated Warning Team Workshop in Wichita gave EMs and media a look at the latest NWS outreach technologies.

The NWS offices serving Kansas continue to use a range of technologies including NWSChat, 800 mhz radio and Web software in combination with a customer first attitude. All of these options help our partners improve their situational awareness. This closer working partnership ultimately leads to improved services to our communities in northeast Kansas. ☼

Just Another Day at NWS Pohnpei

*By **Sean Potter**, NWS Communications Office*

THE NATIONAL WEATHER SERVICE HAS ISSUED A DROUGHT INFORMATION STATEMENT FOR KAPINGAMARANGI ATOLL IN POHNPEI STATE FOR THE NEXT FEW MONTHS.

What?!? Where?!? When people think of the NWS, local weather is the first thing that often comes to mind. The 122 local Weather Forecast Offices are supported by 13 River Forecast Centers, 9 National Centers for Environmental Prediction and 21 Center Weather Service Units as well as regional and national offices.

Looking out toward Pohnpei Airport. Photo by Banyanman.

Among the **six administrative regions that make up NWS**, the **Pacific Region** covers the largest area, stretching from Hawaii to Guam and the Northern Mariana Islands, to the Federated States of Micronesia, the Republic of the Marshall Islands, the Republic of Palau, and American Samoa.

Weather, water and climate events can have significant local impact on this region. The strongest signals for **El Niño** and **La Niña** are in the western Pacific, where El Niño triples the typhoon threat to the Pacific Islands and causes severe droughts that can threaten lives in as little as 3-4 months. La Niña episodes tend to elevate sea levels, creating high waves that can inundate low islands, destroying food and fresh water sources.

La Niña conditions have intensified over recent weeks with an equatorial wedge of cold ocean water continuing to push westward toward the western Pacific. While heavy rain showers and thunderstorms were occurring north of 5 degrees latitude, dry conditions dominated the area along the equator, prompting NWS Guam to issue a drought information statement.

The drought information statement is an example of the impact-based decision support services NWS is providing to transform its services from a product centered focus to a more collaborative decision support focus. ☼

Dissemination News

FEMA Formally Adopts Common Alerting Protocol

By Herb White, NWS Dissemination Services Manager, OCWWS Awareness Branch

Another major milestone toward implementing Common Alerting Protocol (CAP) as a means to significantly improve emergency alerting technologies was met September 30. On that date the Federal Emergency Management Agency (FEMA) announced the adoption of CAP for Integrated Public Alert and Warning System (IPAWS) and the nation's next generation emergency alert and warning network.

The goal of IPAWS is to expand on the traditional Emergency Alert System (EAS) by allowing EMs to reach as many people as possible over as many communications devices as possible, such as radio, television, mobile phones, personal computers and other communications devices. The current EAS relies largely on radio and television to reach the public.

FEMA's announcement starts a FCC 180-day countdown clock for broadcast facilities to have CAP-compliant EAS encoders/decoders. Broadcast industry partners have stated that does not provide enough time for manufacturers to produce units and broadcasters to put them in place. Speaking at the annual National Association of Broadcasters Radio Show just hours after FEMA's announcement, Federal Communications Commission (FCC) Commissioner Robert M. McDowell said he would support extending the 180-day clock but that the change would require further FCC action.

NWS is the largest originator of alert messages and has projects underway to more efficiently create and distribute CAP messages. ☼

Learn about Emergency Data Interoperability Online and at IAEM

By Patrick Gannon, Chair, OASIS Emergency Management Adoption Outreach Subcommittee

At the next International Association of Emergency Managers (IAEM) meeting, members of the Organization for the Advancement of Structured Information Standards (OASIS) will showcase applications and tools that support the OASIS Emergency Data Exchange Language (EDXL) suite of standards. The OASIS Emergency Interoperability Member Section will go over the following EDXL suite features:

- Common Alerting Protocol
- Distribution Element
- Resource Messaging (RM)
- Hospital Availability Exchange (HAVE)
- Situation Reporting
- Other standards related to emergency operations

IAEM attendees will have ample opportunities to view the interoperability demonstration throughout the event. Demonstrations will include both a HazMat event and a weather event as well as addressing the operational effectiveness and economic benefits enabling a more accurate, rapid and coordinated emergency response.

Stop by Exhibit Booth #101 at IAEM's 58th Annual Conference 2010, in San Antonio, TX, November 1-4, 2010.

OASIS also invites you to attend a free 1-hour Webinar on the EDXL-RM and HAVE standards on Thursday, October 21, at 11:00 am, EDT. The Webinar will show how implementing these standards can enhance interoperability and information

sharing capabilities in the EM, response and health care domains. During the presentation, you will have a chance for Q&A with a panel of experts.

Implementers, developers, vendors and experts in the design and implementation of XML-based standards, interoperability and information-sharing should plan to attend this event. Register online now. ☼

EMWIN Aids Caribbean and Central American Countries

By William Johnson, NWS Telecommunications Operations Center, Office of Operational Services

Timely communication of alert and notification messages remains a challenge in parts of the Caribbean and Central America. Often communications infrastructure is limited or vulnerable to damage from many of the same hazards, such as hurricanes, requiring a warning message. The Emergency Managers Weather Information Network (EMWIN) is a proven system for delivering such messages to rural and remote areas. With funding from the Office of U.S. Foreign Disaster Assistance and through an interagency agreement with the NWS International Activities Office (IAO), EMWIN staff will assist IAO with training and deployment of stations in early 2011.

The goals of this project include deploying 36 ground stations to support meteorological services and emergency management entities and developing EMWIN training and system support materials in Spanish and French. Following the training and deployment of stations, an assessment will be conducted to determine how best to integrate EMWIN with existing warning chains and operations, and what is needed in ongoing support infrastructure to maintain the systems.

Frequency Issues

The FCC is investigating the shared use of the 1675-1710 MHz band spectrum with commercial wireless broadband services. This spectrum currently is used by NOAA satellites for the following:

- Polar-orbiting Operational Environmental Satellite High Resolution Picture Transmission
- Low Rate Data (LRD) transmission
- Geostationary Operational Environmental Satellite (GOES) VARiable (GVAR)
- GOES Data Collection System
- Low Rate Information Transmission (LRIT) and NWS EMWIN Services

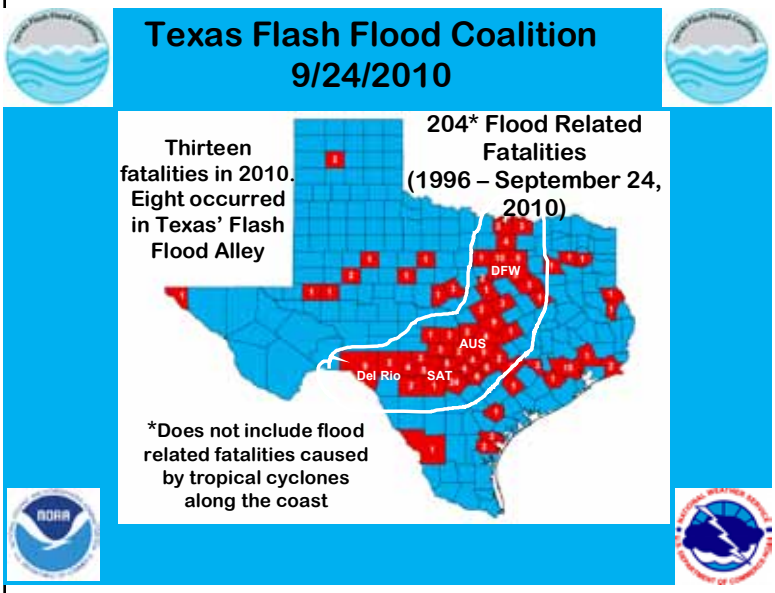
One option is to share only the 1695-1710 section of the band. This change likely would require rearranging frequencies for some services on the future GOES R satellite. NOAA is studying the likelihood of service disruption and interference that may result from this and other alternatives. To keep informed of EMWIN developments, visit the NWS EMWIN Website. ☼

Flooding/Hydrology

Texas Flash Flood Coalition Works to Reduce Fatalities

By Hector Guerrero, WCM, NWS San Angelo, TX

The Texas Flash Flood Coalition (TFFC) was formed in the fall of 2007 in response to an abnormally high number of flood events that year resulting in 46 deaths. To find real solutions, TFFC felt an urgency to build upon the Turn Around Don't Drown™ campaign by organizing strategic work groups in the areas of education, communication, research, geoscience,



social science and technology. Today the coalition is comprised of more than 30 stakeholders from academia, media, private business, and local, state and federal government. Many of these stakeholders are in the Texas Flash Flood Alley and Harris County, which includes Houston.

According to a recent study completed by Dr. Hatim Sharif of the University of Texas, San Antonio, from 1959-2008, Texas suffered more than twice the number of flood fatalities—840—as any other state. A significant number of these fatalities occurred in the Texas Flash Flood Alley, which extends along Interstate 35 from the Dallas/Fort Worth Metroplex through Austin to San Antonio and Del Rio. Another study by Dr. Pam Showalter, Texas State University at San Marcos, documents the millions of dollars spent in 2007 on swift water rescues.

In the last year, TFFC took part in two productive conferences, the results of which are enabling the coalition to leverage partnerships and resources. The coalition shares a similar passion to save lives from flash flooding. They have also promoted best practices such as the following:

- San Antonio SAFE Program
- Turn Around Don't Drown™ Public Service Announcements in both English and Spanish
- Austin Poster Contest

The TFFC holds periodic conference calls and an annual meeting. A new Website will be available by November 1. ☼

Unique Services Provided During the Rio Grande Flood of 2010

By Barry Goldsmith, WCM, Mike Castillo, Sr. Forecaster, NWS Brownsville, TX; John Metz, WCM, NWS Corpus Christi, TX

This summer, remnants of Hurricane Alex and Tropical Depression Two dumped several feet of rain across the east-facing slopes of northern Mexico's Sierra Madre Oriental mountains, primarily in Coahuila State, less than 100 miles south of the Texas Big Bend region. Not long after, 10-20 inches of rain fell in the foothills of Nuevo Leon State, also less than 100 miles southwest of Texas. These high volume rains flowed rapidly to the Rio Grande River, requiring massive releases of water from two major reservoirs. The rate of flow, peaking around 42 million gallons per minute, produced record and near record flooding along the Rio Grande and its reservoir pools, from near Laredo to Hidalgo County, TX.

Graphicasts graphics were one of many tools offered to visualize the flood situation.

The rates of flow required activation of the Lower Rio Grande Flood Control Project, known as the Floodway, a system of diversion dams and levee-and-gate-controlled channels on both sides of the border designed to mitigate devastating flooding. This event was the first time the Floodway had been used in 22 years. The amount of water coursing through the system was the highest in almost 40 years. River flooding and Floodway operations spanned

nearly 5 weeks from early July into mid August. In addition to the full suite of warning, watches and advisories, here's how the offices responded:

NWS Corpus Christi

- Provided personal phone briefings and conference calls with EMs to discuss and interpret the latest river forecasts
- Updated and posted Graphicasts depicting the flood situation in an easy-to-understand format
- Added link from the office home page headlining the Advanced Hydrologic Prediction Service (AHPS) Website
- Visited the Emergency Operations Center in Laredo and conducted a survey of the river, documenting the historic $5 million in flood impacts the river caused on the community

The city of Laredo issued mandatory evacuation orders for several subdivisions along the river and adjoining creeks due to backwater effects from the Rio Grande.

Laredo issued mandatory evacuation orders for several subdivisions along the river and adjoining creeks due to backwater effects from the Rio Grande. After the event, NWS Corpus Christi staff visited EMs again, answered questions about the flood event and documented lessons learned so improvements can be made before the next flood strikes.

NWS Brownsville/Rio Grande Valley

- Provided enhanced alerting services (see description below)
- Worked closely with the NWS West Gulf River Forecast Center, the International Boundary and Water Commission (IBWC) and EMs throughout the flood zone, provided a continuous flow of information via Web, NWSChat, email, Web-based news articles and more
- Provided Graphicasts highlighting the increasing threat for major flooding that were used on the front page of *The McAllen Monitor's* Website
- Added additional detail to the color-coded graphics throughout the event and provided Spanish versions
- Added a banner headline to keep users informed of breaking flood news, which included near real-time updates on flow rates from IBWC, and evacuation status and damage data from EMs
- Made real-time input to the AHPS Website using IBWC hour-by-hour reservoir pool levels and flow updates, ensuring current information when automatic data temporarily stopped flowing

Flooding was severe in deep south Texas.

The procedure for issuing a warning for downstream locations without forecast points is not always sufficient. To fill this gap, NWS Brownsville issued alerts using a flood advisory product which included an outline of the area being impacted. The alerts were issued for the portion of the river where a number of residences and other structures were deluged by up to 10 feet of flowing water. These products provided valuable data assisting the National Wildlife Refuge, Border Patrol, and irrigation pump operators. End users could map the polygon, drawn to best fit the location of the river and Floodways.

The Rio Grande Flood of 2010 likely resulted in hundreds of millions of dollars in property, infrastructure and crop losses. Substantial damage occurred to riverfront property. For the Lower Rio Grande Valley Flood Control Project, the levees held and damage was limited to structures built *within* the Floodways. Just one indirect fatality was reported. Teamwork between NWS and partners helped save lives and protect property during this historic event. ☼

Outreach

NWS Staff Teaches Scouts the Merits of Weather Safety

By Susan Buchanon, NWS Public Affairs Office and Communications Staff

Hundreds of boys aged 11-18 from across America are returning to their communities and schools more weather-wise, thanks to the efforts of a dozen NWS and NOAA National Environmental, Satellite, Data and Information Service staffers in the Washington, D.C., area. This summer, 50,000 scouts, scout leaders and scout parents descended on Fort A.P. Hill, VA, to take part in the Boy Scout Centennial Jamboree. Scouts who visited the NWS-sponsored weather booth in the merit badge midway could elect to complete 10 achievements and earn the Weather Merit Badge.

Boy Scouts complete some of the 10 achievements required to earn the Weather Merit Badge.

Led by Ron Gird, NWS National Outreach Coordinator and an Eagle Scout dad, 11 meteorologists and a public affairs officer from headquarters worked the weather booth. This team taught everything from severe weather safety to the options available in weather-related jobs. The NOAA employees returned to Silver Spring inspired too.

Gird said, "Each scout had a strong desire to learn about weather and weather safety, but it went beyond the 10 requirements of the merit badge. The Weather Merit Badge stresses knowledge of weather hazards and safety during those threats. Having scouts and their families be weather-safety conscious is core to the NWS mission." Boy Scouts are particularly vulnerable to extreme weather because they spend a lot of time outdoors hiking and camping, often in wilderness areas.

Other parts of the Weather Merit Badge curriculum include learning about frontal and pressure systems, clouds and the water cycle, climate, impacts of weather on different industries, pollution and why various weather phenomena occur. To earn the merit badge, the scouts must share all this knowledge with their troops and family by delivering a 5-minute speech.

Two years ago, the NWS team developed a weather course based on the 10 merit badge requirements and have since taught the course at three scout events and several troop events. For more information on how to host a Weather Merit Badge Day, or to obtain the course outline and materials, contact Susan Buchanan at 301-713-0622x110. ☼

Rip Currents

New Rip Current Awareness and Warning Program

By *Carol Christenson, WCM, NWS Duluth, MN*

On hot days of summer, the cool waters of Lake Superior beckon. Park Point, a 7-mile stretch of beach in Duluth, is a popular destination for locals and visitors who want to cool off in Lake Superior. Most of these folks know that Lake Superior has dangerously cold water but do not know another danger lurks: rip currents. As recently as September 3, a man lost

his life in Lake Michigan. On August 17, 2003, strong rip currents took one young man's life and resulted in numerous rescues off Park Point. The huge waves and hot temperatures drew vacationers into the water. They did not realize those waves also contributed to rip currents.

Since that tragedy, safety officials have been gaining momentum in their effort to eliminate this type of tragedy. The Rip Current Working Group, comprised of NWS Duluth, the Red Cross, Minnesota and Wisconsin Sea Grant, Duluth Parks and Recreation, Duluth Fire Department and the YMCA has been working to increase public awareness of rip current danger. The group also works on ways to alert beach goers of the likelihood of rip currents and warn of observed dangers. Their efforts include the following:

Jesse Schomberg of the Minnesota Sea Grant talks to workshop attendees about rip currents on Lake Superior.

- Posting educational rip current signs near beaches and beach houses
- Hosting a rip current-beach safety symposium featuring local and national experts
- Sponsoring a public water safety expo at the beach
- Setting up a three-color flag system to alert visitors to the risk of rip currents. Using the NWS Surf Zone Forecast, flags depicting the risk of rip currents for each day are flown at four beach locations. The flags are changed as necessary by Duluth firefighters based on Park Point. Using a flag system lets people know there are people watching the beaches and staying alert for rip currents.
- Recruiting and training beach observers. These volunteers not only monitor the beach for rip currents, but also take daily observations of water temperature, wind, wave height, type and period, surf zone, beach slope and cusp spacing. This data will be used for further rip current studies. ☼

Severe Weather Updates

Planning Underway for 2011 National Severe Weather Workshop

*By **Greg Carbin**, WCM, NWS Storm Prediction Center, Norman, OK*

The 11th annual National Severe Weather Workshop is scheduled for March 3-5, 2011, in central Oklahoma. This workshop will focus on hazardous weather information-sharing and the most effective methods to transmit messages about meteorological risk. EMs, weather enthusiasts, teachers, students, meteorologists, broadcasters and vendors in threat alerting, sheltering and communications will gather, present and discuss interrelated topics about weather hazards. Some of the subjects to be highlighted during the 2011 National Severe Weather Workshop include:

- Impacts of Hazardous Weather Events: Response and Recovery
- The Role of Law Enforcement in Weather Emergencies
- Progress in Prediction Technologies
- Siren Policy
- NWS Products, Services and Outreach

- Weather Radar Technology Updates and Training
- Media Relations
- Psychological Impacts and Issues of Significant Weather Events

The workshop banquet will take place Thursday evening, March 3, 2011. The speakers will be announced later this fall.

The conference also will feature booths and information kiosks set up at the conference Trade & Technology Expo. More information on the 2011 National Severe Weather Workshop is online. ☼

StormReady/TsunamiReady

Ready Campus+Disaster Resistant=StormReady University

By Greg Gust, WCM, NWS Grand Forks, ND

Being ready, being prepared, means being ***aware*** before, during and after big events. So how do you achieve a high level of situational awareness on a university campus, with its mix of students, faculty, staff and administrators off campus, on campus and somewhere around campus?

Questions like these were poised, hashed and rehashed over the past few years among a select group of investigators who were engaged in preparing the North Dakota State University (NDSU) campus in Fargo, ND, to become one of a handful of colleges in the nation both StormReady and Disaster Resistant. Some answers and achievements were shared at a recent Ready Campus Summit for Higher Education at NDSU, held September 30-October 1.

WCM Greg Gust presents Dustin Jensen, Ready Campus Initiative Project Director, and Jolene Peterson, Codirector of NDSU's University Police and Public Safety, with a plaque recognizing NDSU's StormReady achievement. Photo courtesy of the NDSU Department of Emergency Management.

Representatives from 27 universities, mainly from the upper Midwest, but including colleges on the East and West Coasts, discussed a variety of preparedness and awareness issues during this 2-day summit. Weather issues such as tornadoes, winds, floods and winter storms were assessed against other pressing issues such as student unrest, pandemic disease and activism/terrorism. Though responses to each of these issues vary, it was made clear that an active shooter alert has similar short-fuse characteristics to a tornado warning during which high levels of awareness and appropriate rapid response can save lives.

As part of its Ready Campus Initiative (RCI), NDSU completed core requirements under the FEMA Disaster Resistant University program and the NWS StormReady program. But NDSU didn't stop at the basic requirements. Instead, it applied to the federal Emergency Management for Higher Education grant program to complete a comprehensive program of campus awareness and exercises, which culminated in this Ready Campus Summit.

This grant funded nearly 400 weather radios, which were placed on each floor of dormitories and all other university facilities on campus. The grant also funded flat screen televisions in most public hallways that continually display a situational awareness composite of area weather, activities and bulletins, including storm warnings. NDSU supplements regular student and staff training with seasonal weather drills and other on-campus exercises.

During the RCI Summit, NDSU representatives shared their experiences involving tornadoes, winds and floods with counterparts from Brooklyn, NY. The Brooklyn crew mentioned that its urban campus was still partially shutdown due to cleanup efforts from recent tornadoes, damaging

winds and heavy rains. NDSU has the unfortunate distinction of being one of the few university campuses to have been hit by an EF5 tornado, (June 20, 1957). Numerous other tornadoes, blizzards and floods have affected the Fargo-Moorhead metropolitan area over more recent years. ☼

Verification/User Satisfaction

NWS 2010 Customer Satisfaction Survey Shows Progress

By Sal Romano, NWS Performance Branch Meteorologist

The 2010 Customer Satisfaction Survey undertaken by the NWS Office of Climate, Water, and Weather Services had 14,057 respondents. This survey was conducted, via a link from the NWS Websites, from June 28-July 19. The survey covered the following core areas:

- Hazardous Services
- Routine Climate, Water and Weather Services
- Decision Support Services
- Dissemination Services
- Outreach and Weather Education

There were three optional parts of this survey containing questions for specific NWS service areas:

- Aviation Weather Services
- Marine and Coastal Weather Services
- Routine Forecast and Hazardous Weather Services

NWS plans to commission similar Customer Satisfaction Surveys annually. The questions for the core areas will be similar to enable staff to compare customer satisfaction levels; however, the three optional parts of next year's survey will cover these NWS service areas:

- Hydrologic Services
- Climate Services
- Fire Weather Services

Top Climate, Water, and Weather Related Threats for the NWS Regions

Perceived Top Weather-Related Threats in Local Area	Central	Eastern	Southern	Western	Alaska	Pacific
Severe Thunderstorms	88%	85%	85%	47%	5%	18%
Winter Storms	76%	76%	20%	60%	85%	7%
Tornadoes	80%	33%	71%	3%	--	--
Flash Floods	17%	19%	34%	23%	8%	41%
Heat Wave	5%	13%	16%	27%	--	--
Hurricanes	--	16%	28%	--	3%	90%
River Floods	8%	10%	5%	17%	26%	--
Wildfires	4%	2%	7%	45%	44%	10%
Extreme Cold	10%	10%	2%	12%	46%	--
Drought	3%	5%	11%	18%	--	19%
Coastal Storms	--	14%	5%	13%	36%	19%
Air Quality	2%	7%	5%	12%	--	8%
Tsunamis	--	--	--	5%	33%	72%
Other	1%	2%	2%	6%	8%	1%

Figure 1: *The leading weather-related threats by NWS Region, with the leading two or three for each region in blue.*

Performance Branch staff would like to receive your comments concerning the results of this 2010 survey and suggested questions for next year's survey. NWS contracted with the Claes Fornell International (CFI) group to help develop and implement the survey. CFI, an expert in the science of customer satisfaction, uses the American Customer Satisfaction Index (ACSI) methodology. The ACSI was created by CFI under the auspices of the University of Michigan. ACSI is the only uniform measure of customer satisfaction in the U.S. economy and includes more than 200 companies and government agencies.

Key Survey Results

The NWS ACSI score was 85—16 points higher than the average federal government score: 68.7. This score is slightly higher than ACSI scores from other NWS surveys completed in the past couple years, such as hydrology and climate. This survey showed that dissemination services and safety/awareness information have the highest impact on satisfaction with NWS. Dissemination services survey questions included the perceived quality of satellite and radar data available through NWS Websites, ease of locating information on NWS Web pages, if the information is current, and dissemination options respondents would most likely use if offered by NWS in the next 1-5 years.

As **Figure 1** shows, respondents identified severe thunderstorms as being the top weather threat in the NWS Eastern, Southern and Central Regions; winter storms in the Alaska and Western Regions; and hurricanes in the Pacific Region.

Of those responding, 93% selected the correct definition to describe an NWS warning; 71% selected the correct NWS watch definition out of three possibilities but only 54% selected the correct definition for an NWS advisory. Approximately 40% confused NWS advisories with watches. NWS may need to provide additional outreach to educate the public on the meaning of these three product types. If this confusion is evident in the results of future NWS surveys, NWS may also need to consider exploring the effectiveness of its watch, warning and advisory terminology.

As seen in **Figure 2**, 78% of respondents need 15 minutes or less to prepare for a tornado and 69% need 15 minutes or less to prepare for a severe thunderstorm. No clear signal on lead times for flash floods and hazards contained in special marine warnings could be extracted from the survey results. ☼

	0 - 5 min	6 - 10 min	11 - 15 min	16 - 25 min	26 - 45 min	> 45 min
Tornado	33%	25%	20%	12%	6%	4%
Severe thunderstorm	20%	26%	23%	17%	9%	5%
Flash flood	16%	16%	19%	17%	15%	17%
Special marine	13%	14%	17%	19%	19%	18%
Tsunami	19%	7%	7%	10%	11%	46%

Figure 2: *Lead times needed by respondents to prepare for various short-fused hazards.*

Online Fall and Winter Awareness Resources Available

Fall is here and winter is approaching. You can find flood and winter weather tips to ensure you are ready. Check out these sites for posters, videos, animations, photos, survivor stories, children's and teachers' resources, policy statements and much more. If you know of additional resources, contact Melody Magnus. ☼

Climate, Water and Weather Links

- National Weather Service Home Page
- Aviation Weather, Information and Resources
- Weather Safety and Awareness Brochures, Booklets, Posters
- Education and Outreach Videos, Multimedia and More
- NWS Local Office Key Contact List
- NOAA Weather Radio All-Hazards
- HazCollect Information
- Past Weather and Climate from the National Climatic Data Center
- StormReady Home Page
- TsunamiReady Home Page
- Weather Fatality and Injury Statistics