



## Climate, Water, Weather

### Progress on Commercial Mobile Alert System

By [John Ferree](#), [Mike Gerber](#) and [Herb White](#), NWS OCWWS  
[Wade Witmer](#), [Mark Lucero](#) and [Alfred Kenyon](#), FEMA IPAWS

Simultaneously broadcasting a text message warning of a tornado to all Commercial Mobile Alert System (CMAS)-ready cell phones in a warning area is part of the vision for the [Integrated Public Alert and Warning System \(IPAWS\) CMAS](#).

CMAS is one component within IPAWS, the next generation of emergency alert and warning networks. IPAWS CMAS is a joint effort of the federal government (primarily FEMA, Federal Communications Commission, and Department of Homeland Security Science and Technology) and cellular providers (who chose to participate) to provide customers with timely and accurate emergency alerts and warnings via their cell phones and other mobile devices.

IPAWS CMAS will provide federal, state, territorial, tribal and local government officials the ability to send 90-character geographically targeted text messages to participating mobile service providers for transmission to the public regarding:

- ◆ Imminent threats to life and property such as tornado warnings and hazardous materials warnings
- ◆ AMBER Alerts on child abductions
- ◆ Presidential emergency messages

The IPAWS CMAS interface specification was developed by a joint telecommunications industry standards group and officially adopted by FEMA on December 7, 2009. CMAS testing officially starts in February 2011. The nationwide system will be operational no later than April 7, 2012. To ensure persons with disabilities who subscribe to participating wireless services receive these emergency alerts, CMAS capable handsets will include both vibration cadence and audio attention signals.

#### How Does It Work?

IPAWS CMAS consists of an end-to-end system by which the FEMA IPAWS Alert Aggregator/Gateway receives, authenticates and validates alerts from designated alerting authorities and then forwards them to the appropriate Commercial Mobile Service Provider (CMSP) Gateways. The CMSP automatically processes the alerts and broadcasts them from the applicable cell towers to CMAS-ready handsets in the affected area. Users in an affected alert area will automatically receive alerts if they have

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a CMAS-compatible handset. There are no requirements to opt in or subscribe; however, mobile service users will be able to opt out of receiving Imminent Threat and AMBER Alerts. CMAS messages will not preempt calls in progress.

IPAWS CMAS alert messages are **not** delivered as standard cell phone text

messages, Short Message Service-Point to Point (SMS-PP). CMAS alert messages are broadcast messages, Short Message Service-Cell Broadcast (SMS-CB), delivered simultaneously to every CMAS capable cell handset communicating with a cell tower in an affected area. In other words; if a CMAS compatible handset shows signal bars from a tower in an affected area, that handset will receive CMAS messages. Since the messages will be geo-targeted, they will not necessarily include location information. This feature will help keep message length to the 90 character limit.

Since the CMSPs bear some of the infrastructure costs, what's in it for them? In addition to providing the emergency-alert capability, the cellular broadcast infrastructure can also be used for commercial purposes, such as advertising to targeted users. Users will have to opt-in to the advertising, which could become a potential revenue stream for the CMSPs.

For more information, see the [IPAWS presentation](#) from the recent NOAA Tech Day by Wade Witmer, FEMA IPAWS Deputy Division Chief. Slide 7 is a pictorial of the evolving public alerting architecture. Feel free to send any questions on public alerting to any of the authors. For more information, see the links below:

- ◆ [IPAWS NOAA Tech Day presentation](#), [IPAWS](#)
- ◆ [CMAS](#), [CMAS Consumer Facts](#)
- ◆ [NWS Aware Report, Summer 2010 edition](#) ✱

## Aware

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## Aviation

### NWS Improves Aviation Services in Golden Triangle

By [Marcie Katcher](#), NWS Eastern Region Public Affairs Officer

To reduce the cost of weather-related delays, reroutes and cancellations, NWS is now providing improved aviation forecasts at three of the largest U.S. airport hubs: New York, Atlanta and Chicago, which make up the corners of an area known as the Golden Triangle.

“Early planning for bad weather over the national airspace system—particularly with in the New York, Atlanta and Chicago routes referred to as the Golden Triangle—makes all the difference for air traffic managers, allowing them to reroute or cancel flights well in advance,” said NWS Director Jack Hayes. “About 70 percent of all flight delays are due to weather, so the National Weather Service is redoubling weather support in this area with our improved aviation forecasts to help minimize delays at airports, improve flight safety and potentially save the flying public valuable dollars this holiday season.”

As a starting point, NWS and the Federal Aviation Administration (FAA) chose the New York area—which combines active weather patterns and heavy air traffic—to test new services. The project has been a team effort that relied on the hard work and careful planning of many people at both agencies.

“The NWS test in New York and now the expanded effort within the Golden Triangle have demonstrated the value of dedicated forecasters focused on weather information critical to aviation and enabled a new suite of experimental products and services while improving forecast accuracy,” said Kevin Johnston, Chief Meteorologist at the FAA Air Traffic Control

System Command Center in Herndon, VA. “Together, we now need to go to the next step and objectively determine how these improvements are helping our Air Traffic Flow Management decision making process to improve system performance.”

NWS created a set of tools and an internal structure that allow it to communicate better and faster. “We learned the complexities of FAA’s operations and how they use our information,” said Jeff Tongue, NWS New York City, Science and Operations Officer. “We leveraged our technology so it’s quickly assimilated into the decision making process, but it’s the person-to-person relationship building that makes the difference to improving decision support services.”

“Working the aviation desk was a ground-breaking experience, without any precedent. There was a great excitement about it,” said Brian Cristantello, one of the first general forecasters on the new aviation desk. “I gained a deeper understanding of the detailed climatology around the airports that helps make local forecasting more accurate.”

New experimental aviation products also were developed by the NWS Center Weather Service Unit (CWSU) in New York City to better meet the special needs of the tri-state area. “We are continually trying to improve the program,” said William Scura, CWSU New York City Meteorologist-in-Charge (MIC). “In the spring of 2011, we’re launching the experimental Severe Weather Avoidance Plan in New York and Philadelphia, a new graphic to help make quicker rerouting decisions during thunderstorms.”

“By more frequently communicating with the FAA’s operational staff, we were able to better understand how the FAA uses our forecasts to make contingency plans for runway configurations and traffic patterns,” said Ross Dickman, WFO New York City MIC. “With more knowledge, we were able to integrate and enhance our forecasts to be more useful, easier to use with better forecast graphics providing decision makers the best choice of air routes.”

Providing innovative new products and services for the aviation industry is a multi-agency challenge and innovative ideas. One example is the real-time graphic of weather conditions, commonly referred to as a Tactical Decision Aid, originally developed at the CWSUs in Fort Worth, Atlanta and Seattle and now integrated into the new experimental weather aviation services in the Golden Triangle. ✱



*From left, Kyle Struckmann, Aviation Forecaster, NWS New York City, and James Barth, FAA Supervisory Traffic Management Coordinator at New York Terminal Radar Approach Control.*

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## Aviation Conference to Focus on Best Practices, February 25-26

By [Mike Bardou](#), Meteorologist, NWS Chicago, IL

The NWS office outside of Chicago, in Romeoville, IL, and the nearby Center Weather Service Unit (CWSU) will be holding a national Aviation Weather Workshop at Lewis University in Romeoville, February 25-26, 2011. As the home of one of the largest airports in the world and a major U.S. hub, Chicago makes an ideal location for an aviation best practices meeting.

The first day of the workshop will focus on nationwide customer needs and feedback as well as NWS aviation best practices. Panel discussions will include FAA traffic management officials, airline representatives and NWS forecasters. The second day will focus on General Aviation and provide pilots with information on interpreting weather information and products.



*Chicago O'Hare airport*

This year will be the second for this broad-based event. The 2010 workshop was instrumental in launching the Chicago Aviation Service Enhancement Initiative. Continuous improvement and evolution of the program continues with a focus on integrating science and service to provide customer-relevant aviation decision support service to the aviation community. ✧

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## Disaster Management

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### SPC Takes an Insider Look at FEMA

By [Greg Carbin](#), WCM, NWS Storm Prediction Center (SPC), Norman, OK

As part of a federal Executive Leadership Development Program (ELDP), I elected to complete a 120-day detail at FEMA's Region 6 office in Denton, TX, starting last October. SPC is in FEMA's Region 6, one of the regions with the most severe thunderstorms and tornadoes, encompassing New Mexico, Oklahoma, Texas, Louisiana and Arkansas.

Given my job at the SPC and my interest in severe weather forecasting and emergency management, I thought I knew what FEMA's role was as a federal agency, but I have been continually surprised at how extensive and complex their mission is.

I spent most of November at the Louisiana Recovery Office in New Orleans. This office is still deeply involved in Public and Individual Assistance projects in the wake of hurricanes Katrina, Rita, Gustav and Ike. While these storms are old news to most of us, the FEMA employees still face the results of Katrina's wrath every day. It was humbling and daunting to see the sheer magnitude of the work that is left to be done in Louisiana. Recovery work is still underway in Texas for Hurricane Ike and for last summer event, Hurricane Alex.

FEMA also is working with state and tribal government entities in New Mexico that are recovering from disastrous summer floods. In Oklahoma, FEMA is handling the fallout from winter storms and spring severe weather and flooding.

In addition to helping me appreciate FEMA's work more, I have seen ways NWS can better support the

impressive and difficult FEMA mission and vice versa. The primary mission of NWS is the protection of life and property. This mission is intrinsically linked to the FEMA mission of building resilience into American society. By working with FEMA, I hope to develop ideas on how the NWS can better conduct its primary mission. ✧



*Hattiesburg, MS, May 12, 2009 – Construction crews work on Hattiesburg's fire station. It is one of the few remaining projects in Forrest County's recovery from Hurricane Katrina. Courtesy of Jennifer Smits, FEMA.*

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## Dissemination

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### Conference on Weather Warnings and Communication Scheduled

By [John Ferree](#), NWS Public and Fire Weather Branch

- ◆ What are the best ways to get a weather warning to the public and encourage response?
- ◆ How can the weather enterprise capitalize on the precision of storm-based warnings?
- ◆ How will people react given longer lead times?

These are all questions that will be addressed at the Conference on Weather Warnings and Communication, sponsored by the American Meteorological Society (AMS) in conjunction with the 39<sup>th</sup> Conference on Broadcast Meteorology, June 23-24, 2011, in Oklahoma City, OK. A preliminary program and other information are on the [AMS Website](#).

Advances in weather forecasting and storm detection are improving the warning process and extending warning lead times for all types of hazardous weather. Upgrades to the WSR-88D radar network, improvements in storm analysis techniques, and a shift toward storm-scale modeling and forecasting all hold promise for improving warning accuracy and stretching lead times even further.

People now have more options for receiving warnings and are getting those warnings with more advance notice than ever. This leads to new questions about the most effective way to send hazardous weather warnings to our connected society and to get people to act on those warnings.

The conference is soliciting oral and poster presentations on topics related to the warning process, including communication and use of warnings:

- ◆ **New Developments:** Improvements in warning technology and techniques, including the shift toward Warn-on-Forecast
- ◆ **Getting Warnings Out:** On broadcast, via news and social media, and using GPS-enabled technology
- ◆ **Risk and Warning Communication:** How to get the warning out to maximize understanding and action
- ◆ **Warning Partnership:** The evolving roles of NWS, broadcast meteorologists and the EM community
- ◆ **How People Respond:** Studies of how people receive, internalize and react to warnings
- ◆ **Service Assessments:** What we have learned about the warning process by looking at past performance and public response

The deadline for submitting a presentation or poster abstract is February 7. You can register for the conference onsite June 23-24, but pre-registration discounts are only available through May 9. For additional information, visit the Web page or email [John Ferree](#). ✨

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## EMWIN and GOES Frequencies May Be Auctioned

By [Robert Wagner](#), NWS Telecommunications Center, Office of Operational Services

The [National Telecommunications and Information Administration \(NTIA\)](#) released a report titled *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675-1710 MHz, 1755-1780 MHz, 3500-3650 MHz, 4200-4220 MHz and 4380-4400 MHz Bands*. This report recommends “that various portions of the candidate bands totaling 115 megahertz be made available for geographic sharing with fixed and/or mobile wireless broadband use within 5 years.”

The frequencies would be auctioned for sharing with the commercial sector. Specifically, the “NTIA recommends that 15 megahertz of the 1675-1710 MHz (specifically 1695-1710 MHz) spectrum could be made available for wireless broadband use within 5 years, contingent upon timely allocation of funds to redesign the Geostationary Operational Environmental Satellite (GOES) R satellite and other costs that NOAA and other federal agencies will incur in connection with sharing this spectrum.”

The possible impact to NOAA will be a rearrangement of frequencies for some services in the future GOES R satellite generation. These services include GOES VARIable, GOES Data Collection System data, Low Rate Information Transmission (LRIT) and Emergency Management Weather Information Network (EMWIN) services. NOAA is continuing to perform studies and investigate the likelihood of service disruption and interference that may result.



## EMWIN Aid to Caribbean and Central American Countries Moves Ahead

The EMWIN training and station deployment across the Caribbean and Central America is making progress. A successful trial run was conducted in Costa Rica in October. The major goal of this initiative is to deploy 36 ground stations to support meteorological services and EM entities. 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, as well as the ongoing support infrastructure needed to maintain systems. A training workshop is tentatively scheduled for the week of February 20, 2011 in Puerto Rico.

To keep informed of EMWIN developments, visit the [NWS EMWIN Website](#). ❄

## Hydrology/Flooding

### NOHRSC Introduces Snow Product Improvements

By [Anne Sawyer](#), NWS National Operational Hydrologic Remote Sensing Center (NOHRSC)

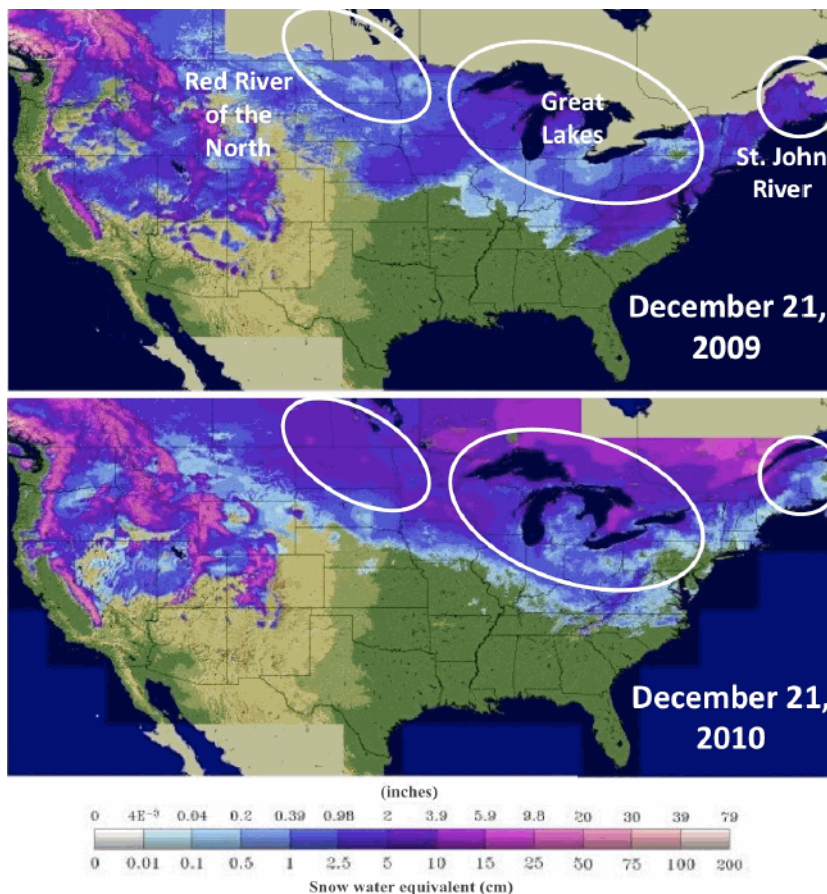
The [NOHRSC](#), which provides comprehensive snow observations, analyses, data sets and map products for the contiguous U.S. and parts of Canada, introduced two major improvements to its National Snow Analysis (NSA) snow model in 2010: Extending further into Canada to include several major drainages and generating 24-hour forecasts of snowpack variables.

The improvements are reflected in the hourly products and services generated by the spatially-distributed, 1 km, full-physics NSA snow model.

Accurate and timely information on snowpack conditions, particularly estimates of snow water equivalent, is critical to support government and private sector water managers who grapple with river, flood and water-supply forecasting and disaster preparedness. The expansion of the NOHRSC domain allows for improved monitoring of snow conditions around the Great Lakes, in the Red River of the North basin and in the Saint John River basin (**Figure 1**).

The NOHRSC is working with Canadian officials to coordinate data in the expansion areas. Observations of snow depth and snow water equivalent are critical to the NSA. The data are used to adjust the model where differences between modeled and observed snow states are consistent and can be explained.

The process of adjusting the model by using the observations, data assimilation (**Figure 2**), will push the model closer to the observations, without placing too much emphasis on any one observation. The system incorporates observations within a given



**Figure 1:** Expansion of NOHRSC Modeling domain to include drainages that are of strategic importance for commerce, flood preparedness and climate monitoring in the U.S. and Canada.

radius and makes spatial adjustments to the model, taking into account distance between stations, station elevation and the snow depth and/or snow water equivalent reports from all valid stations.

Adding observations in the areas of recent domain expansion will improve estimates of snow water equivalent that will, in turn, greatly assist water managers and emergency planners during spring snowmelt.

In addition to expanding the domain of the NSA, NOHRSC has added several experimental once-a-day, 24-hour forecasts of snowpack variables such as snow water equivalent and snow depth.

The products are online at the [NOHRSC Interactive Webpage](#). Users can zoom into areas of interest and query observing stations. Each observing station has a Webpage displaying observed and modeled snow states and weather for past, current and forecast time periods. \*

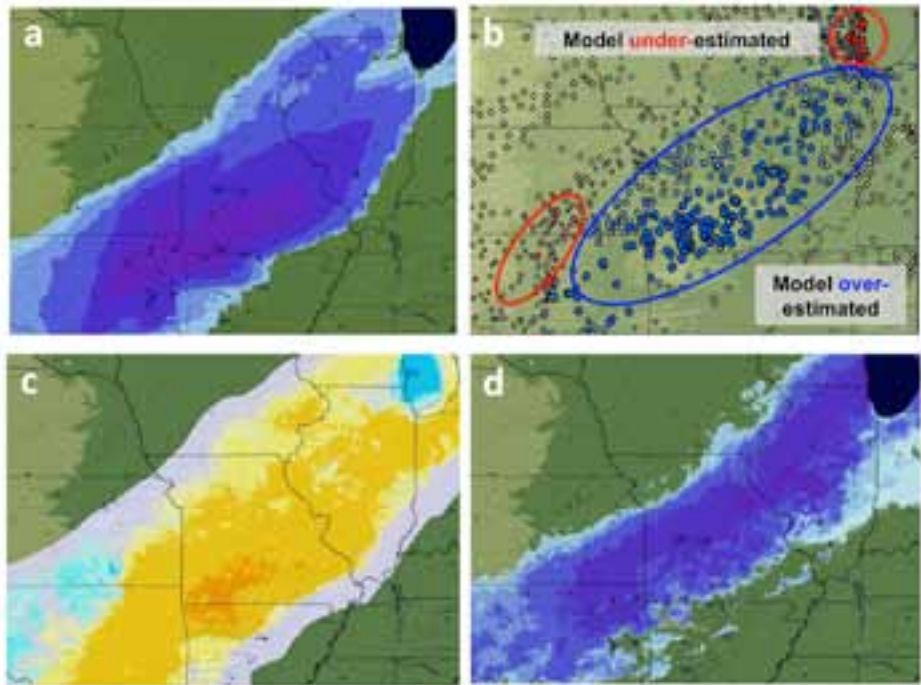


Figure 2. The NOHRSC assimilation process.

a. Modeled snow water equivalent following a November 30, 2006 event. Darker colors indicate more modeled snow on the ground.

b. Observations shown as differences between the observed and modeled snow water equivalent/snow depth: the larger the dot, the bigger the difference. Blue dots indicate that the model over-estimated snowfall. In this case, it was a band of rain/snow mix modeled entirely as snow. Red dots indicate that the model under-estimated snowfall. The lake effect snowfall near Chicago was underestimated, and rainfall, not snowfall, was modeled in central Kansas and Oklahoma.

c. The nudge created by the assimilation process. Warm colors indicate areas where snow will be removed from the model, and cool colors indicate where snow will be added to the model.

d. Modeled snow water equivalent after the nudge is applied to the model.

## Flood Safety Awareness Week, March 14-18, 2011

By Larry Wenzel, Retired National Hydrologic Outreach Program Leader  
Contact [Mary Mullusky](#), Chief, Hydrologic Services Branch for more information

Mark your calendars now for the next Flood Safety Awareness Week, March 14-18, 2011. Each year NWS promotes Flood Safety Awareness Week to bring attention to the hazards associated with floods. Floods and flash floods are the number one severe weather killer in the United States.

Flood Safety Awareness Week provides an excellent opportunity to promote your local flood safety messages and encourage citizens to purchase flood insurance, preparing for the spring snow and ice meltdown and for floods associated with tropical events. It's also a great time to highlight the Turn Around Don't Drown™ campaign and other NWS and local programs.

Flooding never takes a break. It remains a coast-to-coast problem and 2010 was no exception. When major rivers flood, smaller rivers and streams that feed into these arteries also flood, devastating communities along their banks. Take time now to plan for this important safety campaign. A wealth of print, multimedia and related resources to promote Flood Safety Awareness Week can be found at the [Flood Safety Website](#). \*



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## Colorado Battleground Joins High Water Program

By [Melody Magnus](#), *Aware Editor*

In September, Colorado became the 12<sup>th</sup> state to join the NWS High Water Mark Sign program. The Beecher Island Battle Ground in Yuma County, CO, is the scene of a historic flood. In 1935, the Arickaree River flooded, toppling the monument commemorating the battle.

The original 19-foot monument, commemorating a battle between the U.S. Army and the Plains Indian Nation, was never recovered, although the base was later pulled from the mud. A smaller monument was later erected in its place. The flood resulted in several deaths and a huge amount of property damage.

In addition to Colorado, new High Water Mark signs were added in Iowa, Michigan and Alabama in the last few months. The signs encourage visitors and residents to be prepared for catastrophic flooding by increasing awareness. ❄



*From left, Mark Mahlberg, President, Beecher Island Battle Ground Memorial Association; Scott Mentzer, MIC, NWS Goodland, and Joy Hayden, NWS Administrative Support Assistant.*

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## Outreach

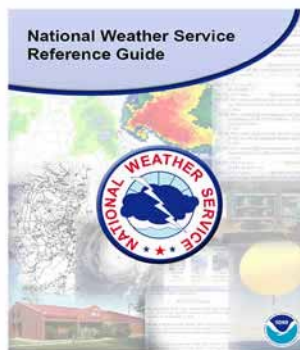
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### New NWS Reference Guide Now Available

Contact: [Chris Maier](#), *National Warning Coordination Meteorologist, Article by NWS News staff*

A new, comprehensive, national [NWS Reference Guide](#) for EMs and other decision support services customers is now available online. The new guide is a result of discussions at the 2009 International Association of Emergency Managers (IAEM) Conference.

The IAEM leadership requested a nationally produced document explaining all of the products and services provided by NWS. The guide's purpose is to enhance training within the EM community. The staff at NWS Milwaukee, WI, volunteered to take on this challenge and delivered this new reference guide in time for the 2010 IAEM Conference.



Although aimed at EMs, the guide also provides useful information for members of the media, academia, other NWS partners and NWS employees. In the future, NWS Weather Forecast Offices will be able to create local appendices to supplement this national guide.

NWS would like to thank the IAEM members that provided feedback on the draft this summer. We hope you find it a useful resource. ❄



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## Service Assessments

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### Assessment on Tennessee and Kentucky Floods To Be Released This Winter

By [Sal Romano](#), Meteorologist, NWS Performance Branch

Record rainfall affected parts of Tennessee and Kentucky on May 1-2, 2010, resulting in catastrophic flooding. The event also caused flash flooding in Middle Tennessee, including the Nashville area. Unprecedented flooding along the Cumberland River, which flows through metropolitan Nashville, occurred during this event. In Middle Tennessee, there were 17 weather-related fatalities. Nearly \$2 billion of damage occurred, primarily in the Nashville area.

A 10-person team assessed operations, products and services at the following NWS facilities: Ohio River Forecast Center (OHRFC), WFO Louisville and WFO Nashville. The team completed an assessment report that has already gone through a number of reviews. The assessment is in its final stages of review and is expected to be released this winter. ❄



*The flooding in Tennessee and Kentucky resulted in fatalities and numerous water rescues.*

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## Severe Weather

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### Register Now for the 2011 National Severe Weather Workshop

By [Greg Carbin](#), WCM, NWS Storm Prediction Center (SPC), Norman, OK

The SPC will hold its 11th Annual National Severe Weather Workshop (NSWW) at the Norman Embassy Suites Hotel and Conference Center from March 3-5, 2011.

The annual workshop focuses on sharing hazardous weather information and developing effective methods to transmit messages to the public and sophisticated users of weather information. EMs, weather enthusiasts, teachers, students, meteorologists, broadcasters and vendors in threat alerting, sheltering and communications technologies will present and discuss interrelated topics. Speakers at the workshop will include NWS and FEMA leadership, operational meteorologists and public safety officials. Some of the subjects to be highlighted this year include:

- ◆ Review of Recent Significant Weather
- ◆ Impacts of Hazardous Weather Events: Response and Recovery
- ◆ Role of Law Enforcement in Weather Emergencies
- ◆ Psychological Impacts and Issues of Significant Weather Events



### 2011 NATIONAL SEVERE WEATHER WORKSHOP

Predictions of Peril: Managing Hazardous Weather Information

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- ◆ Weather Radar Technology Updates and Training
- ◆ NWS Products, Services and Outreach
- ◆ Community Siren Policies
- ◆ Media Relations

The 2011 NSWW banquet will feature Ken Graham, Meteorologist-in-Charge at NWS New Orleans/Baton Rouge, LA, who will address the unprecedented demand for decision support services during the Deepwater Horizon Oil Spill. The NSWW will also include its annual Trade & Technology Expo. ✨

Rick Smith, WCM, NWS Norman, OK, will conduct the annual NSWW storm spotter training session. The session will focus on the challenges and dangers associated with being a spotter and provide tips for dealing with those challenges. The session also will highlight NWS products and information services that spotters should use as well as emerging technologies changing the way severe weather information is shared. More information on the [2011 National Severe Weather Workshop](#) is online. ✨

## Record-Breaking Hail Hits Arizona

By [Ken Waters](#), WCM, NWS Phoenix, AZ

October is a transition time for Arizona, with the summer monsoon a recent memory and the winter cold fronts, rains and gusty winds still ahead. In fall, it's possible, although not common, to have transitional low pressure systems affect the Southwest. On October 5, such an event appeared likely. NWS Phoenix informed its EM partners and the public about the upcoming event, anticipating thunderstorms and possibly small hail. Strong, veering winds with height and an unstable air mass caused numerous supercell thunderstorms to develop across central Arizona by afternoon.

At least two supercells swept across the Phoenix area moving towards the northwest. The first supercell



*A rapidly rotating wall cloud in a supercell thunderstorm. Photo courtesy of George Wolfmeyer.*

was around noontime and resulted in remarkable wall clouds and hail between 1"-2" in diameter, causing damage to roofs, windows, skylights and windshields.

A second supercell formed at about 4:30 pm about 40 miles southeast of Phoenix. This storm's path crossed the path of the previous storm. As a result, some locations were hit by both storms. The result was devastating to those areas: a major department store in a mall suffered nearly a million dollars in damage when its roof was destroyed.

For this event, NWS Phoenix was able to create a map using frame-by-frame analysis of the radar imagery with radar-generated



*Figure 1. Frame-by-frame analysis of radar imagery.*

Vertically Integrated Liquid (VIL) centers for each frame (Figure 1). The blue paths are buffered strips centered on the VIL maximums. The green triangles are the reported severe hail locations as supplied by the local weather spotters. It's easy to see where the two severe hail paths crossed near north Phoenix and Glendale.

Nearby, the hail storm dropped 3" hail stones on a football team practicing outdoors, resulting in at least one confirmed injury. The 3" hail report was the largest on record for the Phoenix area. An estimated \$100 million+ in damages was recorded in the Phoenix area just that day. The following day was just as remarkable because it brought a record number of tornadoes to northern Arizona in the Flagstaff vicinity.

This past year was an amazing year weather-wise for Arizona and the Phoenix office: rare Tornado Warnings, a confirmed tornado during the monsoon season, record sized hail in the Phoenix area and a dangerous tornado outbreak across northern Arizona. ❄



*The hail storm dropped 3" hail stones over a football team practicing in a field, causing at least one confirmed injury. Photo courtesy of Kevin Fulk.*

## Space Weather

### Effects of Space Weather on Critical Technology

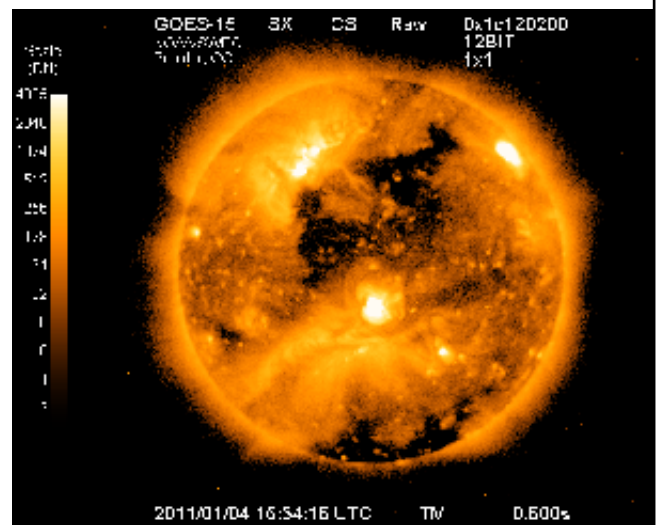
By [NWS News Staff](#)

Economies around the world have become increasingly vulnerable to the ever-changing nature of the sun. Solar flares can disrupt power grids, interfere with high-frequency airline and military communications, disrupt Global Positioning System (GPS) signals, interrupt civilian communications and blanket the Earth's upper atmosphere with hazardous radiation.

Monitoring and forecasting solar outbursts in time to reduce damage to space-based technologies have become national priorities. Taking on that task is the NWS [Space Weather Prediction Center](#) (SWPC), the nation's official source of space weather forecasts, alerts and warnings.

To monitor events on the sun, SWPC scientists and technicians use a variety of ground- and space-based sensors and imaging systems to view activity at various depths in the solar atmosphere. A worldwide network of U.S. Air Force optical observatories also provides space weather forecasters with detailed information about activity in and around sunspot groups, as well as other areas of interest on the sun.

Space weather forecasters also analyze the 27-day recurrent pattern of solar activity related to the synodic rotation period of the sun with respect to the Earth. Based on a thorough analysis of current conditions, comparing these conditions to past situations, and using numerical models similar to weather models, forecasters are able to predict space weather on times scales of hours to weeks.



*Satellite image of the sun, January 4, 2011*

With effective alerts and warnings, scientists can limit the effects of space weather on real-time technology. Satellites can be adjusted, power grids can be modified and polar flights can be rerouted.

Scientists and forecasters work closely with government and university partners to develop prediction models and other tools to improve services to the nation's space weather community. SWPC also helps move the latest computer models of solar dynamics and sun-Earth interactions into the daily operations of space weather prediction.

NOAA and partner agencies in the National Space Weather Program are leading the way in this new era of space weather awareness to provide timely, accurate information and forecasts to help keep our advanced technology global economy moving forward. ✨

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## ***StormReady/TsunamiReady***

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### **New Tsunami Training Modules Benefit Emergency Managers**

By [Audrey Rubel](#), NWS Alaska Region Communications Manager

Working closely with scientists at the NWS Tsunami Warning Centers in Alaska and Hawaii, the [COMET](#)® program is developing tsunami training that will benefit EMs and other NWS partners. Two recently released 90-minute online tutorials are now available:

“**Tsunami Warning Systems**” describes the processes involved in anticipating, detecting and warning for a tsunami. The module summarizes data collection, modeling, analysis and alert procedures used at NWS Tsunami Warning Centers. The tutorial uses a simulated event and past tsunamis to highlight warning system processes. The focus is on determining the tsunami threat based on seismic and sea level data as well as forecast models.

“**Tsunamis**” provides a scientific background for those interested in learning about tsunami generation, propagation and inundation.

As the courses illustrate, disasters are local events experienced at the community level. A federal and state partnership with local EMs is essential to effectively disseminate warnings issued by NWS Tsunami Warning Centers.

Tsunamis can strike with little or no warning if a strong earthquake happens near a shoreline. These rapid events are where the [TsunamiReady™](#) program become essential, making sure communities are prepared and citizens know [how to react](#) to the signs of an impending tsunami, with or without a formal warning.

The courses also are useful for NWS personnel and anyone seeking an understanding and appreciation of the tsunami warning delivery system and tsunami science. The modules are free at [Comet's MetEd website](#). NWS employees may take the courses through the NWS Learning Center.

COMET plans to release two more tsunami modules expected in 2011: “Tsunami Community Preparedness,” funded by the National Tsunami Hazard Mitigation Program and “Tsunami Strike,” tsunami education for middle school children. ✨



[The 2004 Indian Ocean Tsunami Strikes Ao Nang, Thailand](#), Source: Wikipedia

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## StormReady Program Gains 28 Sites Since New Fiscal Year

By [Melody Magnus](#), *Aware Editor*

The new federal fiscal year, which started October 1, already has welcomed 28 new StormReady sites, bringing the total to 1705 as of January 1. StormReady increased its count with new counties and communities in areas as distant as Washington and Puerto Rico. The program also gained its first zoo, the Detroit Zoological Society.

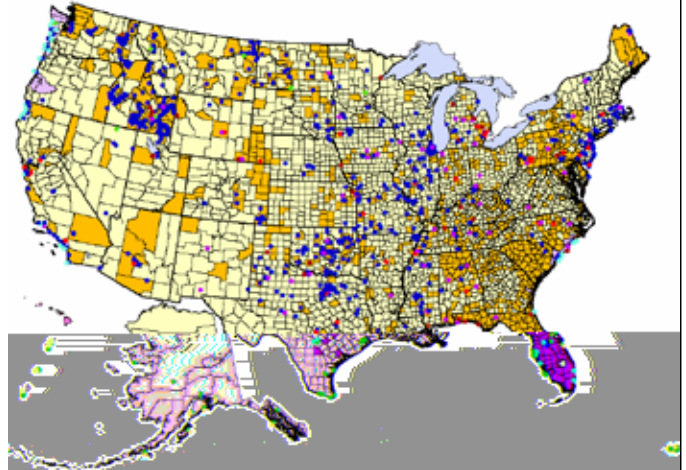
StormReady continues to move up the academic ladder with two more universities in the past 3 months: The University of Vermont in Burlington and Morgan State University in Morgan, KY. Metamora-Hadley State Recreation Area and Harrisville State Park, both in Michigan, joined the government contingent in StormReady, helping to bring Michigan to the lead for most new sites in the fiscal year, five, followed closely by Virginia with four.

The TsunamiReady program, which has separate criteria for recognition, gained two new sites in the last 3 months: Raymond and South Bend, WA.

The NWS Stormready Supporter program, which has fewer requirements, added four sites: Gallatin, TN, High School; Branson, MO, Airport; the Citadel Military College in Charleston, SC; and the Caterpillar Inc. Peoria, IL, campus.

To be recognized as StormReady, a community must commit to specific levels of emergency preparedness, including 24/7 communications and an active outreach and education program. [TsunamiReady criteria](#) are similar but include some differences.

For more information on becoming StormReady or TsunamiReady, contact your local NWS office or go to the [StormReady Website](#). ❄



Gold shading represents StormReady counties. Purple shading shows TsunamiReady counties. Dots are StormReady cities, universities, Indian Nations, commercial, government and military sites.

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## Winter Weather

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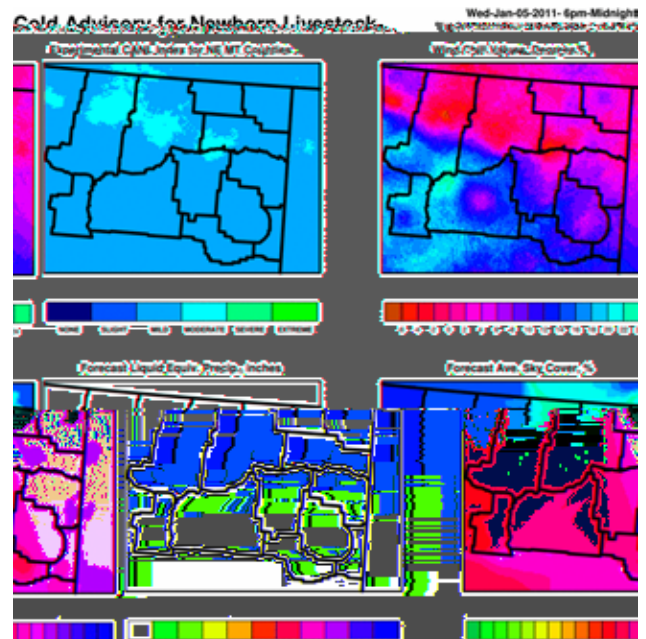
### Experimental Cold Advisory for Newborn Livestock Expands Nationwide

By [Tanja Fransen](#), *WCM, NWS Glasgow, MT*

This season, any NWS office can provide the Cold Advisory for Newborn Livestock (CANL) service for its county warning area. The graphics were developed at NWS Glasgow through a COMET Partnership Project and have been tested the past 2 years in northeast Montana.

Last winter, CANL expanded to include much of Montana, North Dakota, South Dakota and parts of Minnesota and Iowa. NWS is now considering expansion of the product on a nationwide basis to all offices serving users with this need.

A teleconference describing the system will be conducted in early January. E-mail [Tanja Fransen](#) or call 406-228-2850 if you have questions about the graphics or on about how to join the teleconference. ❄



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## NWS Testing New Extreme Cold Product

By [Paul Stokols](#), Meteorologist, NWS Public and Fire Weather Branch, OCWWS



From January 10-April 15, eight NWS Forecast Offices in the central U.S. will issue an Extreme Cold (EC) Warning product on an experimental basis. This product, which has been used experimentally in Alaska for the past few years, is being tested for use when temperatures may fall to well below zero but winds remain calm.

Currently the only way to headline extreme cold temperatures is with the use of a Wind Chill Advisory or Warning. The experimental EC Warning product will be issued in the rare situations when actual air temperature falls to the dangerous Wind Chill Warning criteria but there is little or no wind.

NWS is seeking comments on this experimental product through a short [online survey](#). EC warnings will be issued as Non Precipitation Weather (NPW) products and will use NWS Valid Time Event Code "EC.W" for dissemination. The WFOs that are participating in this experiment are as follows:

- ◆ Rapid City, Aberdeen, Sioux Falls, SD
- ◆ Bismarck, Eastern (Grand Forks), ND
- ◆ Minneapolis, Duluth, MN
- ◆ Little Rock, AR

A [Product Description Document](#) (PDD) for this experimental product is online. After the experimental period, NWS will evaluate all comments and determine whether to proceed with national implementation of the EC product. If you have questions about this experimental product, please contact [Paul Stokols](#).

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## Online Winter and Spring Awareness Resources Available

Winter is here and spring is coming. You can find [winter weather](#), [flood](#) and [severe 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](#)