

Aware

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

Volume 1, March 2006

Climate, Water, Weather

Severe Weather Season is Coming: Designate a Weather Watcher

By Dennis H. McCarthy, Director, Office of Climate, Weather and Water Services

I know many readers of *Aware* are well into preparations for this year's severe storm and flash flood operations. Spotter training is underway, government proclamations have been announced, awareness weeks have been or soon will be held and communications systems are being tested. Some states have already experienced severe storms—especially Missouri and Illinois—and other states, such as Hawaii, flash flooding. Texas and Oklahoma are trying to make severe weather preparations while continuing their battles with wildfires. Since the winter issue of *Aware*, more than 30 communities have been recognized as StormReady, bringing the national total to 1033 by mid-March. StormReady just welcomed Disney World in Orlando!

In the winter issue of *Aware*, I mentioned the November 15th tornado in western Tennessee, which struck a manufacturing plant near the town of Paris. Following a well-rehearsed plan, plant officials activated their warning system based on a tornado warning received on NOAA Weather Radio All Hazards. With employees in interior shelters before the tornado struck the plant, only two received minor injuries. What a great story!

Based on several similar stories over the past few years, it occurs to me that maybe it's time for all of us to push the Designated Weather Watcher concept a bit stronger. Emergency managers have filled this role for a long time in their communities, but the Designated Weather Watcher takes this responsibility down to the lowest level. The goal is to get those in charge of our schools, hospitals, businesses, nursing homes, mobile home parks, recreational vehicle parks, athletic parks and other facilities to make this Weather Watcher a regular part of their operation.

The Designated Weather Watcher is the person in the building or the park who pays attention to the weather for everyone else while they go about their work or play. This is the person with a NOAA Weather Radio All Hazards, a television, Internet access, a ham radio or a radio scanner. This person listens or watches for potential hazards. The Designated Weather Watcher knows how to stay up to date on the latest weather information, especially on days with severe weather or flash flood potential. He or she knows how to initiate local warning action or whom to notify and when to do it.

A great new tool available to Designated Weather Watchers and all of us this season is the upgraded RIDGE radar web site: <http://www.srh.noaa.gov/ridge/>. We reported in the winter that we were shooting for a January 31 implementation. It took a few extra weeks to tie up some loose ends, but on February 21, RIDGE became operational. Thanks to our implementation team for a great effort!

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Aviation News

NWS Aviation Program Overhauls Website for Better Access

*By Lisa Glikbarg, NWS Aviation Services Branch
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In February, the NWS Aviation Services Branch undertook a major overhaul of its home page. The change simplifies online access to key aviation information. On average each day, more than 85,000 planes transit the U.S. National Airspace System (NAS). To support these flights, thousands of pilots, dispatchers, air traffic controllers and traffic management units rely on accurate, timely weather forecasts from NWS. The NWS Aviation Weather Services (AWS) Program provides more than 4 million forecasts a year to support this mission. The [Aviation Weather Services](#) website provides access to the latest aviation weather information, with links to the 151 NWS offices, units and centers.

Located throughout the country these offices, units, and centers provide users with the most up-to-date information on severe weather watches and warnings affecting area aircraft and airports. Anyone with Internet access can review the latest severe weather predictions and forecasts for the United States and the surrounding areas by accessing reports specific to their region. These reports include significant meteorological reports, convection reports, center weather advisories and meteorological impact statements and are all available at the Aviation Weather Center's [Aviation Digital Data Service](#) Website.

The AWS mission is to couple the art and science of Meteorology to enhance the safe and efficient use of the NAS. Together with stakeholders, the AWS program continues to develop and manage new technology for the aviation weather industry. In addition, improved operating methods, dissemination techniques and transmission methods are leading to decreased lead times and increased preparedness. ✨

Digital Services

Two More NDFD Elements Became Operational March 15, 2006

*By Chris Alex, NWS Digital Services Transition Staff
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On March 15, NWS made operational the Apparent Temperature and Relative Humidity forecast elements in the National Digital Forecast Database (NDFD). These elements are available for the contiguous U.S. (CONUS), 16 pre-determined CONUS subsectors, Puerto Rico, the Virgin Islands, Hawaii and Guam.

With these additions, 10 of the 14 NDFD elements are operational. The remaining experimental forecast elements in NDFD are:

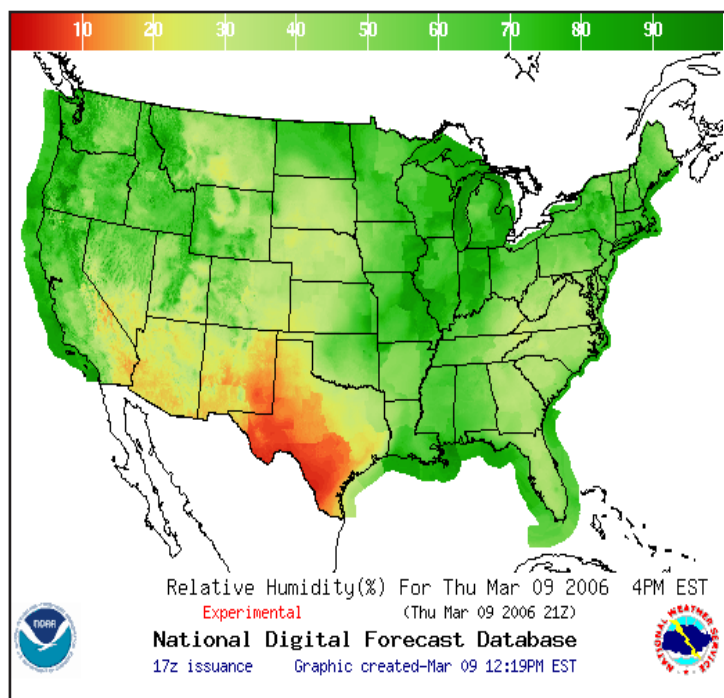
- Sky cover
- Significant wave height
- Quantitative precipitation forecast
- Snow amount

The status of each NDFD element is available online at http://www.weather.gov/ndfd/resources/oper_status_table.pdf

NDFD introduced Relative Humidity and Apparent Temperature as experimental elements in June 2005. NWS solicited comments about these elements via an online survey running through December 2005. The Digital Services Transition staff reviewed more than 2000 responses, which covered these and all NDFD elements. User responses were overwhelmingly positive.

Customers told us they use Relative Humidity and Apparent Temperature for wide-ranging applications, including fire weather management, whether or not to use air conditioning at night and heat health impacts on people as well as livestock!

The Digital Services Transition staff appreciates all these comments and is using them to plan suggested improvements for the remaining experimental and operational elements. Please continue providing feedback on NDFD elements via the brief online survey form posted at: <http://www.weather.gov/survey/nws-survey.php?code=ndfd-grids>. For more information, go to <http://www.weather.gov/NDFD/>. *



Dissemination/Weather Radio

HazCollect Test Reveals Rare File Duplication

By Herb White, NWS Dissemination Services Manager
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The last phase of the HazCollect Development Test and Evaluation in December 2005 uncovered unique circumstances in which a Non-Weather Emergency Message (NWEM) message is disseminated twice. Although rare, this problem required a resolution.

The HazCollect Development Test and Evaluation is now scheduled to restart in late April and to run for about 10 days. Rigorous regression testing is required to help ensure a complete end-to-end functionality through operational and test systems.

The Operational Acceptance Test (OAT) is scheduled to run from May 8 to June 23. For the OAT, selected NWS offices nationwide will work with local emergency managers to perform end-to-end tests by sending test, as well as any actual emergency messages, using the Disaster Management Interoperability Service (DMIS) Desktop Toolkit.

HazCollect will be available through DMIS starting this July when the U.S. Department of Homeland Security distributes a scheduled update. Emergency managers and government staff who want to use HazCollect to broadcast messages over NOAA Weather Radio All Hazards or other NWS dissemination systems must establish a Collaborative Operations Group (COG) identity that will be used in HazCollect. NWS plans to start HazCollect registration in May on the HazCollect website noted at the end of this article.

HazCollect will be a one-stop shop for the collection, relay and distribution of non-weather emergency messages (commonly known as Civil Emergency Messages) to the NWS dissemination infrastructure, other national systems such as DMIS and to the Emergency Alert System.

Aware

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HazCollect will use features of DMIS, such as automated user authentication and authorization. When HazCollect becomes operational this summer, emergency managers will be required to use the Non-Weather Emergency Message input tool provided in the DMIS Toolkit. NWS and the Department of Homeland Security are writing specifications for the web services interfaces within the DMIS Open Interoperability Platform. These specifications will allow commercial vendor systems' input into HazCollect. The goal is to distribute the specifications in time to allow commercial vendors to be HazCollect "capable" by late 2006.



For updates on HazCollect, go to: <http://weather.gov/os/hazcollect>. To register with DMIS, go to http://dmi-services.org/register_how.htm, then click on "Register" in the left menu. *

VTEC to be Added to Flood Watches, Warnings, Advisories

*By Art Kraus, NWS Dissemination Services Meteorologist
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As part of a Risk Reduction Activity for the RiverPro software application, selected Weather Forecast Offices (WFOs) are scheduled to begin issuing operational Flood Warnings, Watches and Advisories for Forecast Points with Experimental VTEC (using the X code) on April 4, at 1800 UTC. Specifically, the products involved include:

- Flood Warning for Forecast Points (FLW)
- Flood Statement: Follow-up for Flood Warning for Forecast Points (FLS)
- Flood Advisory for Forecast Points (FLS)
- Flood Watch for Forecast Points (FFA)

WFOs prepare these products using the RiverPro software application on AWIPS. Assuming all goes well during the Risk Reduction test, NWS will conduct a formal Operational Test and Evaluation (OT&E) for these products this summer at a number of WFOs.

For more information on the Risk Reduction and OT&E schedules, including the offices taking part, go to http://www.nws.noaa.gov/os/vtec/hydro_vtec.shtml.

For more information on VTEC, including the phenomenon and significance codes associated with these hydrologic products, go to <http://www.nws.noaa.gov/os/vtec/>.

Later in the year, NWS plans to test other products containing Hydrologic VTEC, such as Flash Flood Warnings.

Operational VTEC in Long Duration Products from WFO Honolulu

On January 17, at 1800 UTC, WFO Honolulu moved from experimental VTEC to operational VTEC in six event-driven product categories and one routine marine forecast. The product categories that began using Operational VTEC were:

- Watch County Notification (WCN)
- Winter Weather Message (WSW)
- Non-Precipitation Weather Message (NPW)
- Flash Flood Watch (FFA)
- Coastal Hazard Message - including High Surf (CFW)
- Red Flag Warning and Fire Weather Watch (RFW)
- Coastal Waters Forecast (CWF)

This follows the November 1, 2005, transition to operational VTEC of these products at WFOs across the contiguous U.S. and at WFO San Juan. There is currently no operational VTEC schedule for these products for Alaska WFOs or for WFO Guam. *

Polygons: A Sub County Level Warning Methodology

By Richard Okulski, WCM, NWS Memphis, TN
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NWS has issued Tornado, Severe Thunderstorm and Flash Flood Warnings on a countywide basis since the 1970s. People are accustomed to seeing: “The National Weather Service in Memphis has issued a Tornado Warning for Shelby County in southwest Tennessee until 945 pm...” Our knowledge of severe weather development and our observational tools, such as the WSR-88D Doppler Radar, have greatly improved over the past 10 years. NWS now have the skill to issue these warnings for parts of a county, rather than the entire county. The challenge is how to define and describe these higher resolution warnings.

NWS offices have included latitude/longitude point pairs at the bottom of Tornado, Severe Thunderstorm and Flash Flood Warnings since the late 1990s. An example of such a warning is shown below. The latitude/longitude pairs appear at the end before the \$\$.

```
WFUS54 KMEG 152245
TORMEG
TNC023-113-152315-
/O.NEW.KMEG.TO.W.0052.051115T2245Z-
051115T2315Z/
```

```
BULLETIN - EAS ACTIVATION REQUESTED
TORNADO WARNING
NATIONAL WEATHER SERVICE MEMPHIS TN
445 PM CST TUE NOV 15 2005
```

THE NATIONAL WEATHER SERVICE IN MEMPHIS HAS ISSUED A

- * TORNADO WARNING FOR...
CHESTER COUNTY IN SOUTHWEST TENNESSEE
MADISON COUNTY IN SOUTHWEST TENNESSEE
- * UNTIL 515 PM CST
- * AT 442 PM CST...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A
TORNADO 7 MILES SOUTHEAST OF BEMIS...OR ABOUT 8 MILES NORTHWEST OF
HENDERSON...MOVING NORTHEAST AT 45 MPH.
- * THE TORNADO IS WILL BE NEAR...
MIFFLIN BY 455 PM CST

```
LAT...LON 3561 8861 3559 8857 3552 8851 3550 8859
3547 8863 3541 8876 3554 8886 3557 8886
3570 8861
```

\$\$

If you plot the point pairs, they depict the “area of maximum impact” or polygon. The rest of the county outside the polygon is often unaffected by a severe weather hazard, but people



A TV meteorologist in Kansas City displays a polygon based tornado warning (in red) within a severe thunderstorm warning (in purple).

take cover because they are in the warning area. NWS conducted a 23 office demonstration in 2005 and found that using polygons reduces the false alarm area or area which did not need to be in a warning by up to 72 percent. Dr. Daniel S. Sutter, an economics professor at the University of Oklahoma, estimated that issuing polygon warnings would save the U.S. economy \$50 million per year. Reducing the area covered by tornado warnings by 75 percent would have the same value as reducing the false alarm rate to 0 percent!

NWS senior leadership approved the transition plan from a county based warning system to a polygon based system in December 2005. A full transition to polygons will take several years. Dissemination technology, such as NOAA Weather Radio All Hazards and the Emergency Alert System, will need to adapt to polygon warnings. Some television meteorologists are already adapting.

The value of this new approach was made particularly clear at the end of a presentation I gave at the National Severe Weather Workshop last spring. A Wal-Mart executive pulled me aside to discuss polygons. As part of their safety plan, all stores in a warned county shut down operations during Tornado Warnings. A finer resolution warning saves his company money and increases employee and customer confidence that they are taking shelter for a good reason. I can think of no better reason for the NWS to transition to polygon warnings. ✱

EAS Summit Focuses on Working with Broadcast Media

*By Herb White, NWS Dissemination Services Manager
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On February 25, about 270 Emergency Alert System (EAS) experts, state broadcaster association officials, state emergency management and homeland security advisors, state EAS and Emergency Communications Committee members attended the 2006 Summit on EAS and Emergency Communications. Most states were represented at the event. The Summit was hosted by the National Alliance of State Broadcaster Associations (NASBA) and underwritten by the National Association of Broadcasters.

The theme of this year's Summit was the role of broadcasters as first responders during major emergencies.

As this year's keynote speaker, Nevada Governor Kenny Guinn opened the Summit with an enthusiastic discussion of state support for EAS. "Lessons Learned" by broadcasters was a common theme throughout sessions looking at weather, biohazards and natural disasters. One broadcast company panelist stressed the importance of a pre-established relationship among emergency managers, broadcast station staff and NWS staff members.

Attendees were updated on FEMA's Integrated Public Alert and Warning System (IPAWS) and the DHS Disaster Management e-Gov Initiative. The DHS session included information about the Disaster Management (DM) Open Platform for Emergency Networks (OPEN) message exchange.

The group was also updated on activities relating to alert and warning in the "Legislative Landscape" session.

One panelist was not optimistic for significant action. Some funding sources for alert and warning improvements have dried up, according to some "Follow the Money: Funding Sources..." panelists, but dollars are still available through programs such as the FEMA Disaster Mitigation Grants.



The “Pandemic Preparedness and Communications” panel put a different perspective on alerts and warnings. The group focused on preparations for public information activities should the bird flu migrate to humans.

A regional breakout session offered the opportunity for broadcasters, emergency managers and NWS participants to discuss issues important to their respective FEMA region areas. At least one NWS staff meteorologist took part in each of the 10 breakout groups. In addition to headquarters NWS staff from around the country, Steve Brueske, MIC WFO Great Falls, MT, and Paul Flatt, WCM, WFO Boise, ID, were there as members of their respective State Emergency Communications Committee delegations.

Many attendees, especially first-timers, were surprised at how much they learned at a 1-day meeting. Special thanks to Jim Keeney, Central Region WCM Program Manager, for his panel presentation showing the link between the StormReady program and emergency communications and public response. ✱

EMWIN-N Staff Use Delay to Make Advancements

*By Rob Wagner, NWS Office of the Chief Information Officer
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The EMWIN-N team is anxiously waiting to complete the final EMWIN-N tests after the launch of the GOES-N satellite. The launch was delayed due to a series of setbacks. Staff members are using the extra time to make further advancements to EMWIN-N.

Our most important gain has been to demonstrate the reliability of the EMWIN-N receiver prototype. The EMWIN-N prototype is sufficiently flexible to demodulate and decode both existing and future broadcasts. Since November 2005, NWS has been using a prototype receiver and software to demodulate and decode the existing EMWIN-I broadcast. This system has performed flawlessly since its initial setup. With a simple crystal change, staff will be able to use this same system to receive the EMWIN-N test broadcasts after the GOES-N launch. In an effort to keep overall system costs down, NWS has also tried various configurations with older or lower cost equipment and has had quite a bit of success. Staff also successfully tested a laptop configuration for possible mobile use.

NWS staff are also actively trying to reach prospective manufacturers of receiving systems by means of a Request for Information (RFI) on FedBizOps. Information about the RFI can be found at <http://iwin.nws.noaa.gov/emwin/emwin-n-rfi.htm>.

Future plans include the hosting of another user-vendor conference following a successful GOES-N field test of the EMWIN-N prototype. The timing and details will be announced on the EMWIN website once they become firm.

To keep abreast of new developments in the EMWIN transition, please visit the website at: <http://iwin.nws.noaa.gov/emwin/index.htm>. ✱



GOES Satellite

Fire Weather

One Stop Fire Weather Site Improves Access

By Jeffrey Cupo, Science Operations Officer, NWS Midland/Odessa, TX
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John Morlock, Big Bend National Park Fire Official, commented: "These twice-daily point forecasts are essential for planning prescribed burns. It ends up being one of the most critical pieces of information that we rely on for determining a cost basis when trying to meet our objectives."

After a devastating hurricane season, it seemed only fitting to kick off 2006 with a record-breaking fire season. NWS Midland/Odessa, TX, is leveraging NDFD advances as record wildfire burns devastate western Texas.

During the most recent prescribed burns in Big Bend National Park, local fire officials erected portable Remote Automated Weather Stations (RAWS) to determine current weather conditions at particular burn sites. NWS Midland staff responded to its customers' needs by obtaining latitude/longitude data for the individual, portable RAWS sites and developing temporary site-point forecast matrices that allow fire officials to anticipate trends in the weather over 6-hour periods. Using one of 14 RAWS, staff provide these data and point forecast matrices for sites already receiving twice-daily data feeds.

NWS Midland also developed a new public fire weather website, based on the NWS Las Vegas prototype. The website is a one-stop shop for fire officials that includes targeted links, local observations, forecasts and local operating plans. The most notable feature is an interactive map allowing users to quickly see the Fire Weather Planning Forecast or Point Forecast Matrix for a local site,

while eliminating unrelated information. This project was developed in response to a comment made by staff of the Geographic Area Coordination Center in Albuquerque, NM, regarding the availability of specific fire weather forecasts on the Internet. The NWS Midland Fire Weather site is online at: <http://www.srh.weather.gov/maf/Fire/index.php>. ❄

New Guam Fire Weather Program Spreading Quickly

By Timothy Hendricks, Fire Weather Focal Point, NWS Guam
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Guam is known for having the highest risk of getting hit by a tropical cyclone of any U.S. site. But few know that Guam also has the greatest number of wild land fires per U.S. unit area. Virtually all of the fires on Guam are caused by carelessly tossed cigarettes, unattended backyard trash burns or by poachers and betel nut gatherers who want easy access to harvesting sites. These are often the most serious fires because they often are inaccessible.

Lightning does not cause wild land fires on Guam because lightning only occurs in Guam during wet periods. The most severe dry periods are in winter and after a spring El Niño event. Strong subsidence and strengthened trade winds lead to dry conditions and a very high risk of wild land fires.

In 2005, WFO Guam issued its first Fire Weather Planning Forecast. Other products include Fire Weather Watches and Red Flag Warnings, Spot Forecasts for agencies involved in fighting wildfires or prescribed burns, NDFD graphical images, Weather Information Management System observations and point forecasts for sites in southern and central Guam in support of the National Fire Danger Rating System. And, at the request of its customers, WFO Guam added Keech-Byram Drought Index forecasts to the Planning Forecast. The program will likely be expanded to include the neighboring islands of the Commonwealth of the Northern Mariana Islands in the next year or two. ❄



A typical dry-season wildfire on Guam. Courtesy, Dave Limtiaco, Guam Forestry Division, and Russ Gripp, Fire & Aviation Management, USDA Forest Service.

Flood Safety Awareness Week: March 20-24

By Larry Wenzel, NWS Hydrologic Services Branch
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NWS is expanding this year's Flood Safety Awareness Week to include other flooding and related phenomena. From ice jams and rapidly melting snow to torrential thunderstorms and slow-moving tropical cyclones, floods can be a threat throughout the year. Extensive and persistent public education on the hazards of flooding is key to reducing loss of life and property and is the goal of Flood Safety Awareness Week.

The second annual Flood Safety Awareness Week will run from March 20-24, 2006, to raise public awareness of the dangers of flooding and ways to protect life and property. On average, each year more than 100 people die and \$4.6 billion dollars in damage occurs from floods in the United States. Topics to be covered during Flood Safety Awareness Week this year include:

- Monday, March 20: Advanced Hydrologic Prediction Service
- Tuesday, March 21: Turn Around Don't Drown™.
- Wednesday, March 22: Flooding and Related Phenomena
- Thursday, March 23: Determining Flood Risk and Flood Insurance
- Friday, March 24: Flood Safety

Information on Flood Safety Awareness Week, including education materials, videos, brochures and news articles are available year round on the following website:
<http://www.weather.gov/floodsafety/>. ❄

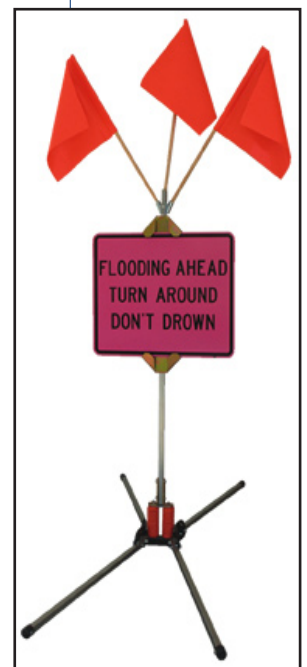
Turn Around Don't Drown™ Incident Road Sign

By Larry Wenzel, NWS Hydrologic Services Branch
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In most years, more deaths occur as a result of flooding than from any other severe weather related hazard. Many people underestimate the force and power of moving water. About half of all flood related deaths are caused by motorists making poor decisions and driving past barriers into flowing water that sweeps their vehicle downstream.

To heighten safety awareness and better inform motorists of this potential road hazard, NWS and the National Safety Council worked with the Department of Transportation National Highway Administration (FHWA) to develop an officially approved incident road sign. The fluorescent pink sign includes the legend, "Flooding Ahead Turn Around Don't Drown." The TADD incident sign is deployed by local emergency managers when roads become inundated with flowing water.

Detailed information about the TADD sign's dimensions, as well as a host of other TADD resources, can be found in the TADD toolbox at <http://tadd.weather.gov>. ❄



Official Turn Around Don't Drown™ incident sign.

Turn Around Don't Drown™ Project in Tennessee

By Tim Troutman, WCM, NWS Huntsville, AL
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NWS Huntsville Forecaster Jason Elliott, NWS Nashville Service Hydrologist Mike Murphy and I have been partnering with the Lincoln County, TN, Emergency Management Agency (EMA) to promote “Turn Around Don't Drown™” (TADD). Tim facilitated a partnership between State Farm Insurance Company and the Lincoln County EMA to kick off the program. As a result the Lincoln County EMA was approved for a Regional State Farm “Safe Neighbor” grant. The EMA plans to use the funding to buy 40 TADD signs for flood prone areas in the county and to educate local residents about the dangers of flash flooding. EMA staff members are working on a full color brochure they plan to distribute throughout Lincoln County to kickoff the campaign.

There are near term plans for a ceremony on March 24 in Fayetteville, TN, that will coincide with the 2006 National Flood Safety Awareness week. Scheduled to take part are dignitaries from federal, state and local county government, along with broadcast media from Nashville and Huntsville, AL.

The partnership next plans to work with the Tennessee Emergency Management Agency to establish a statewide grant program to purchase TADD signs from available state disaster mitigation money. ❄

Spring: Snowmelt Preparations and Flood Warning Coordination

By Greg Gust, WCM, NWS Grand Forks ND
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Grand Forks Forecaster, Dave Kellenbenz, taking a snow water core sample.

Spring snowmelt flooding is a recurrent problem over much of the intermountain west, the northern plains, the Great Lakes and the northeast United States. Preceding the snowmelt, NWS offices serving these areas are typically involved in raw snowfall, snowpack and streamflow data collection; frost depth, ice thickness, soil moisture and snow water analyses; and pre-flood coordination with their many agency, media and public partners.

For the Red River of the North and its tributaries, spring and summer flooding often can be catastrophic. Since the disastrous, record-breaking basinwide flooding in the [spring of 1997](#) there have been record to near-record floods at nearly a dozen of the 32 river forecast points in the Red River Basin—mostly due to snowmelt flooding. Again in 2006, the risk of moderate to major spring snowmelt flooding is apparent. In January, the Grand Forks NWS office began interagency coordination with their many partners including the North Central River Forecast Center (NCRFC) and the National Operational Hydrologic Remote Sensing Center, both in Chanhassan, MN.

By late February, WFO Grand Forks teamed up with the St. Paul District of the U.S. Army Corps of Engineers (COE), the North Dakota Department of Emergency Services and the Minnesota Division of Homeland Security and Emergency Management to host interagency flood coordination meetings with field agencies, local emergency managers, community engineers and civic leaders spanning northwest Minnesota and eastern North Dakota. Back-to-back flood coordination meetings were held in Fargo and Grand Forks, ND, to allow easy access for entities from the southern and northern reaches of the 40,000 square mile basin. We used the Turn Around Don't Drown™ message as a lead-in to each meeting, along with

a 3-minute video montage of recent area flood impacts. NWS presented an analysis of flood potential and Advanced Hydrologic Prediction Services probabilistic outlooks. COE engineers reviewed recent flood mitigation efforts. Each group also reviewed their Flood warning and response procedures.

One item critical to accurate snowmelt flood forecasting is the analysis of moisture in the snowpack, or snow water equivalent (SWE). In mid-February, the NCRFC recognized the need for more detailed SWE data across the headwaters of the Red River Basin, especially in southeastern North Dakota. Through coordination meetings, the interagency team identified several potential sources for additional SWE data, aiding our 2006 and subsequent spring snowmelt flood predictions.

As an aid to the local training effort, Data Acquisition Program Manager Mark Ewens and Met Intern Bill Barrett demonstrated the proper SWE measurement techniques for a student film crew from the University of North Dakota. The segment is scheduled to be aired throughout March during broadcasts of *Studio One*, the university broadcast channel. ❄

Marine Services/Rip Currents

Rip Current Awareness Week Features New Video Product

By Deborah Jones, Outreach Coordinator, NWS Marine and Coastal Weather Services Branch
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This year's NWS Rip Current Awareness Week features a new "B Roll" video to show the dangers of rip currents. NWS has designated the first full week of June as Rip Current Awareness Week. This campaign, which will take place this year from June 4-10, is focused on heightening people's awareness of rip currents at surf beaches.

Working with local businesses, state and National Seashores and National Recreation Areas, lifeguards, emergency responders and the National Sea Grant network, NOAA's brochure, "Rip Currents! Break the Grip of the Rip!"® will continue to be widely distributed throughout the nation's English and Spanish speaking coastal communities.

The new B Roll, officially to be released this year, will have four components:

- **Footage of actual rip currents from the viewpoint of the person on the beach:** Footage will include a live demonstration of how a person trapped in a rip current can escape the current and return to shore. This actual demonstration will be performed by Dr. Jamie MacMahon, a University of Delaware (UD) Sea Grant Coastal Researcher. An aerial view of these same currents will conclude this first segment.
- **Interviews with rip current specialists:** Dr. Wendy Carey, UD Sea Grant Coastal Processes Specialist, Marine Advisory Service; Dr. Jamie MacMahon, UD Coastal Researcher; James Eberwine, Lead Meteorologist, WFO Mount Holly; and Todd Fritchman, Captain of the Dewey Beach Delaware Patrol.



Arrows show four rip currents on a crowded beach.

- **Video of the science of rip currents:** The wave basin, at the Center for Applied Coastal Research, UD, will be used to demonstrate the development of rip currents. Coastal engineers use the wave basin for experiments and to demonstrate the genesis of rip currents from waves intersecting with the nearshore environment. The engineers use dye or particle tracers to track the formation of the nearshore currents.
- **New animation:** The video will feature animation created to demonstrate how to escape a rip current if caught in one.

Highlights of the new B Roll will be posted online at www.ripcurrents.noaa.gov. NWS will provide copies of the B Roll to media, schools and marine and coastal partners. A DVD of the new B Roll will be mailed to NWS WCMs at coastal forecast offices.

This year's campaign will also offer a *USA Today* Web chat featuring Randy Lascody, meteorologist from WFO Melbourne. The chat is scheduled for June 8 at 2 p.m. EDT.

Once again, Olympic swimmer Ian Crocker is supporting NOAA's public education efforts. His radio Public Service Announcement is posted at www.ripcurrents.noaa.gov/media.shtml.

Help us spread this lifesaving information to others. Access www.ripcurrents.noaa.gov to stay current with this year's campaign and break the grip of these dangerous currents. ❄

New Marine Weather Module Released

Wave Life Cycle II: Propagation and Dispersion

*By Richard May, Meteorologist, NWS Marine and Coastal Weather Services Branch
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NOAA's NWS and COMET Program has published a new marine weather training module: "Wave Life Cycle II: Propagation and Dispersion." The module explains how to manually predict wave height and period change as the waves leave their generation area and become swells. This skill is important as a means to cross-check wave model performance, which is dependent on accurate wind forecasts.

NWS has made the quiz for this module available on the NOAA's Learning Management System (LMS) at <http://e-learning.doc.gov/noaa/>.

COMET has also posted the quizzes from the first two Wind and Wave series modules (Wave Types and Characteristics, Wave Generation) and the first two rip current modules (NWS Mission and Partnerships, Nearshore Fundamentals). You can access all of the marine weather modules listed below at the http://meted.ucar.edu/topics_marine.php.

- Wave Types and Characteristics
- Wave Life Cycle I: Generation*
- Wave Life Cycle II: Propagation and Dispersion*
- Rip Currents: Nearshore Fundamentals*
- Rip Currents: NWS Mission and Partnerships*

* Makes use of Macromedia Flash Player

Future modules will focus on winds in the marine boundary layer and forecasting rip currents. ❄

Training Program Reaches Native American Communities

*By Andy Bailey, WCM, NWS Las Vegas, NV
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For the last several years, NWS Las Vegas has partnered with the Environmental Prediction Agency's Tribal Air Monitoring Support (TAMS) Center in Las Vegas to train tribal representatives from around the country. The TAMS center is the first technical training center designed specifically to meet the needs of Native American tribes involved in air quality management.

The TAMS center has provided 17 different courses. NWS Las Vegas has helped teach the Meteorological Monitoring course since the inception of the program. This course provides training on basic meteorology and the fundamentals of siting, installing, maintaining and collecting data from a meteorological station.

Specifically, the NWS office has helped by refining the basic meteorology curriculum, instructing at the center and by providing tours of a local ASOS and the Las Vegas WFO. In addition, a significant portion of the instruction deals with educating the students on the NWS and its products. Since 2003, collaboration with the EPA's TAMS Center has allowed NWS Las Vegas to train representatives from 70 different tribes from across the country. ✱

Assessing Services and Building Partnerships in Western Montana

*By Bryan Henry, Senior Forecaster, and Peter Felsch, WCM, NWS Missoula, MT
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This spring, NWS Missoula, MT, is conducting Phase 2 of a multi-year outreach effort to assess the quality of its products and services. Phase 1 focused on services in Kalispell, MT. Phase 2 shifts to the Butte, MT, area. The program's goal is to determine strengths and growth areas as well as the community's perception of NWS. Described below are the strategic actions taken to complete this task.

Team members have developed a list that contains contact information for federal, state and local government agencies, emergency management, media outlets, law enforcement offices, fire departments, school districts/schools, storm spotters and other emergency responders.

Next, teams of two meet with customers. Existing partners are asked a set of questions aimed at determining forecast biases, perception of product and service quality, website use and overall perception of the NWS.

A different, more educational approach, is taken with new partners. New customers are asked questions geared toward determining their needs. They are then shown the NWS Internet capabilities specific to meeting their needs as well as the entire array of products available to them.

Given the numerous microclimates found in western Montana, partners are asked questions about local, terrain-induced effects that occasionally alter the overall weather patterns, such as canyon winds, a major cause of fog development.

The results of the project show overall perception of the NWS is outstanding. Customers are impressed with recent technological advancements that have further advanced our shared mission of protecting lives and property. NWS has mitigated biases by increasing local knowledge of NWS offices. ✱

Publications

Service Assessments Released for Hurricane Charley, Tsunami Test; Assessments Coming on Hurricanes Katrina and Rita

By Wayne Presnell, Meteorologist, NWS Performance Branch
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This winter the NWS service assessment program released final assessment reports on the West Coast Tsunami Warning Event, which occurred in June 2005 and on Hurricane Charley. These reports are available online at: <http://www.nws.noaa.gov/om/assessments/index.shtml>. A service assessment team formed for Hurricane Katrina briefed its findings and recommendations to the NWS Corporate Board in January 2006. The NWS hopes to release this report before the beginning of the upcoming hurricane season. NWS also evaluated its services during Hurricane Rita by surveying affected customers and partners. That final report also is planned for release before the upcoming hurricane season.

Hurricane Katrina was one of the deadliest and costliest natural disasters in U.S.

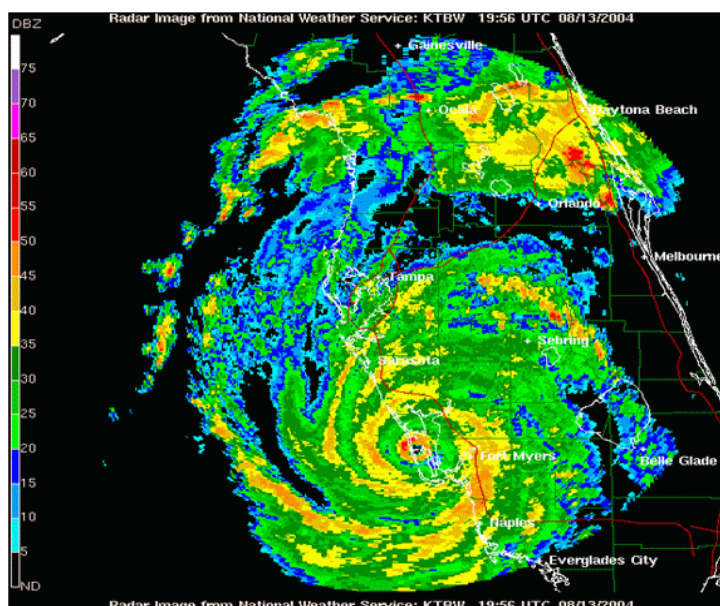
history. Levee breaks around the city of New Orleans contributed to much of the devastation. The National Hurricane Center (NHC) and NWS field offices performed well during Katrina by providing accurate information well in advance of the storm. NHC errors in the hurricane track out to 5 days were less than the 10-year average. NHC's intensity errors were greater than the 10-year average due to the rapid strengthening of Katrina; however, NHC still predicted a major hurricane making landfall near New Orleans nearly 3 days in advance.

Local NWS offices in the Gulf Coast region disseminated critical information to users well in advance, warning of the potential for unprecedented devastation. The reported evacuation rate of 80-85 percent along the areas affected by Katrina is a testimony to NWS effectiveness.

The unprecedented amount of service backup required during Katrina was one of the NWS's many challenges. Service backup went to primary, secondary and even tertiary levels and continued for several days. Coordination, communication and dissemination among offices and to the users were difficult but for the most part, backup services were delivered seamlessly. Typical backup services go to the primary level and last less than 1 day, so these services during

Katrina were much greater than ever before experienced. NWS will address and improve any problems noted in the final Katrina service assessment report.

The Performance Branch worked with Claes Fonet International (CFI) to develop a survey for Hurricane Rita. CFI randomly surveyed 190 people by telephone and received 67 responses to an Internet survey, for a total sample size of 257. The Internet survey targeted local media and emergency management partners and was not available to the public. The Internet survey was limited to enable comparison among different types of NWS users. The survey was conducted in the area directly affected by Hurricane Rita's landfall in southwestern Louisiana and southeast Texas, within NWS Houston's and Lake Charles' areas of responsibility.



Hurricane Charley: Reflectivity image from the WSR-88D located at the Weather Forecast Office in Tampa, FL taken at 1956 UTC, August 13, 2004, as the hurricane made landfall.

The overall Customer Satisfaction Index (CSI) for the NWS is **86** on a scale of 0-100. The CSI is a weighted average of three survey questions, which encompass overall satisfaction, a comparison to expectations and a comparison to an ideal situation. According to CFI Group, this is a very strong score. In the words of CFI, “This is very positive news! When weather information is most critical, the NWS delivers and delivers well.”

Most people were satisfied with how the NWS communicated its messages before, during and after Rita. The survey showed the NWS (nationally and locally) provided an excellent level of service, with 89 percent of respondents saying there was just the right amount of information provided by the NWS during Rita, versus too much or not enough. Some 88 percent said they were satisfied with the way the NWS communicated its messages during Rita and had no suggestions for improvement. Only 12 percent offered suggestions for improvement in communicating NWS messages. The suggestions included more frequent updates (hourly and within two hours of landfall) from NHC and on the NHC Internet site; better power sources for NOAA Weather Radio All Hazards; live broadcasts over the Internet; and more education on “running from the water” (storm surge) and “hiding from the wind.”

The Saffir-Simpson category of Rita appears to have influenced evacuation decisions more than any other criteria. About 90 percent of the evacuees decided to leave when Rita became a major hurricane. This may represent an oversimplification of the threat assessment made for land-falling hurricanes. NWS staff may be able to interpret this result and possibly connect it to opportunities to enhance outreach/education activities with decision makers. In addition, public outreach should continue to highlight the importance of obeying evacuation orders rather than making decisions based primarily on the hurricane category.

In this instance, the majority of the respondents focused on wind as a greater threat than hurricane storm surge flooding. The survey showed 75 percent of respondents in inland counties feel wind is the greatest threat in a hurricane, while only 18 percent thought storm surge flooding is the greatest threat. Of those in coastal counties, 56 percent believe wind was the greatest threat and 32 percent rated storm surge flooding as the greatest threat. From 1970 until Katrina in 2005, only 13 people have died in the U.S. because of storm surge, so the NWS message on the dangers of storm surge may be reaching the public. Since there was approximately an 80-85 percent evacuation rate during Katrina, residents and government decision makers along the central Gulf coast likely have a good understanding of the dangers of storm surge. ❁

Hurricane Publication To Be Updated this Spring

By John Simensky, NWS Outreach Program
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NWS will give its popular publication, “Hurricanes, Unleashing Nature’s Fury” an overhaul this spring. Revisions will be made to update statistics and photographs to reflect the catastrophic 2004 and 2005 hurricane seasons. NWS also plans to add illustrations and explanations of the graphical products now available to the public and produced by the Tropical Prediction Center.

A PDF file will be available on the NWS publications Web page by the start of the hurricane season. NWS plans to print the revised booklet as soon as funding becomes available. ❁





Before, During and After a Hurricane: A New Factsheet

By Melody Magnus, Aware Editor
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The first in a new series of NWS factsheets offers the public an easy-to-print, 2-page guide to hurricane safety. The factsheet tells the public what to do before, during and after a hurricane; offers tips on what to bring to a shelter; and includes an explanation of the difference between advisories, watches and warnings. This product does not replace our more comprehensive hurricane booklet, which offers the science and history of hurricanes. The new product will only be available online. Look for the final factsheet on the NWS Hurricane Safety page in April at <http://www.weather.gov/os/hurricane/index.shtml> or on our brochures and booklets site: <http://www.weather.gov/os/brochures.shtml> ✨

Severe Weather/Tornadoes

NWS to Introduce Enhanced Fujita Scale for Tornado Wind Speed

By Wayne Presnell, Meteorologist, NWS Performance Branch
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NOAA issued a press release on February 2, 2006, however, it was not about a groundhog, a shadow or anything to do with winter. Instead, it announced that NWS has begun implementing the Enhanced Fujita (EF) Scale to rate tornadoes, replacing the original Fujita (F) Scale. The EF Scale will continue to rate tornadoes on a scale from 0-5, but ranges in wind speed will be more accurate. The NWS will continue to use the F Scale to rate tornadoes until implementation of the EF Scale is complete. The NWS expects implementation of the EF Scale to be done by February 2007. Training of NWS field personnel is expected to begin this fall.

The EF Scale was developed by the Texas Tech University Wind Science and Engineering (WISE) Research Center, along with a group of wind engineers, universities, private companies, government organizations, private sector meteorologists and NOAA meteorologists from across the country.

The EF Scale refines and improves the original F Scale. Limitations of the original F scale may have led to inconsistent ratings, including possible overestimates of associated wind speeds. The EF Scale incorporates more damage indicators and degrees of damage than the original F Scale, allowing more detailed analysis and better correlation between damage and wind speed. The original F Scale historical database will not change. Since ratings in both scales are based on damage and estimates of wind speeds, a tornado rated by the original F scale would have the same EF scale number, but the estimated wind speeds would be more accurate.

A correlation between the original F Scale and the EF Scale has been developed and can be found at: <http://www.spc.noaa.gov/efscale>. The methodology behind the development of the scale can be found at: <http://www.wind.ttu.edu/EFscale.pdf>. More information will become available as the NWS implements the EF Scale over the next year. ✨

Hazardous Weather Awareness Week a Success with the Kids

By Daniel Noah, WCM, NWS Tampa Bay Area
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This year Hazardous Weather Awareness Week in Florida was geared toward kids. As always, this campaign relies upon a strong partnership between the Florida Division of Emergency Management (FDEM) and the NWS. FDEM printed 400,000 Hurricane Heralds that were distributed to students in 3rd and 5th grades throughout the state. Many of the articles in this publication were written by the seven WCMs that serve Florida. In addition, FDEM organized poster coloring and essay contests and major hands-on events at several elementary schools throughout the state. Representatives from many emergency response groups attended these school events.

In support of FDEM's efforts, NWS Tampa Bay Area Science Operation Officer Charlie Paxton and I presented eight 30-minute weather safety presentations to 567 elementary students. Karen Brown, Administrative Assistant of the NWS Tampa Bay Area, read *Professor Tinkermeister and the Wacky, Whiz-Bang Weather Watching Wonder* book to 20, 1st Grade students at Southwest Elementary in Lakeland, FL.

Other books developed by FDEM included *The Adventures of Rabbit, Possum and Squirrel in the 30/30 Rule*, geared toward 2nd grade students, and *The Acorn Club*, geared toward 3rd graders. Students are provided a book to take home and read with their family. More information regarding the books can be found at <http://floridadisaster.org/kids/index2.htm> under Emergency Management. ❁



Karen Brown, Administrative Assistant at NWS Tampa Bay, FL, reads a weather safety book to students in the 1st Grade.

Attendees at National Severe Weather Workshop Switch Shoes

By John Ferree, NWS Fire and Public Weather Services Branch
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The annual National Severe Weather Workshop, held March 2-4, in Midwest City, OK, offered a unique opportunity to “walk a mile in the other person’s shoes.” The workshop was designed to enhance partnerships between severe weather forecasters and researchers, emergency managers, broadcast meteorologists, businesses, storm spotters and other weather enthusiasts.

During a 2-day scenario, teams simulated real-life situations in an actual weather event. Teams explored information needs for decision making by NWS forecasters, broadcast meteorologists and emergency managers. The twist was that attendees did not play their usual role. For instance, emergency managers either served as meteorologist making watch and warning decisions or as media representatives in front of a TV camera.

The scenario was played in real-time. An NWS operations center, an Emergency Operations Centers (EOC) room and the TV station were wired together via radio, TV and Internet. As EOCs received spotter reports, they were relayed to the NWS and included in warnings received over the Internet at the TV station. The loop was completed as broadcasts of the warnings were received on TVs in the EOC and NWS rooms.

Each room included subject matter experts to help guide the audience. Chief Meteorologists from several major TV stations had audience members try out their camera skills. Comments included: “Wow, that is a lot harder than it looks!” and “Man, I was terrible!”

As the event generated more warnings and statements, the noise level in the NWS room increased. Voting devices saved the day because warning decisions were never unanimous. The NWS room was guided by employees of the Storm Prediction Center, Norman, OK, Forecast Office and the NWS Warning Decision Training Branch.

Attendees in the EOCs, guided by the experienced hands of local EMs and the Oklahoma Climate Survey staff, had to deal with a myriad of responsibilities having more to do with resource management than meteorology.

With about 480 people registered, this was one of the best attended National Severe Weather Workshops. More than half of the attendees were either from the emergency management or the spotter communities. To see the complete agenda, go to: <http://www.norman.noaa.gov/nsww2006/agenda.html>.

WFO Huntsville Takes Part in Operation Dark Skies Exercise

*By Tim Troutman, WCM, NWS Huntsville, AL
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In February, NWS Huntsville, AL, took part in an extensive multi-agency severe weather and civil emergency drill at Redstone Arsenal in Alabama. Other participants were representatives of NASA, the U.S. Army and other federal and state organizations. The drill consisted of the pre-production of several text tornado warning and follow-up severe weather statements and Civil Emergency Messages (CEM) interjected into the drill by the event planners. The objective of this exercise was to test the preparedness capabilities of Marshall Space Flight Center and Redstone Arsenal. ✱

StormReady/TsunamiReady

StormReady Program Gains 50th State with Recognized Site, TsunamiReady Adds Major East Coast City: Norfolk

*By Melody Magnus, Aware Editor
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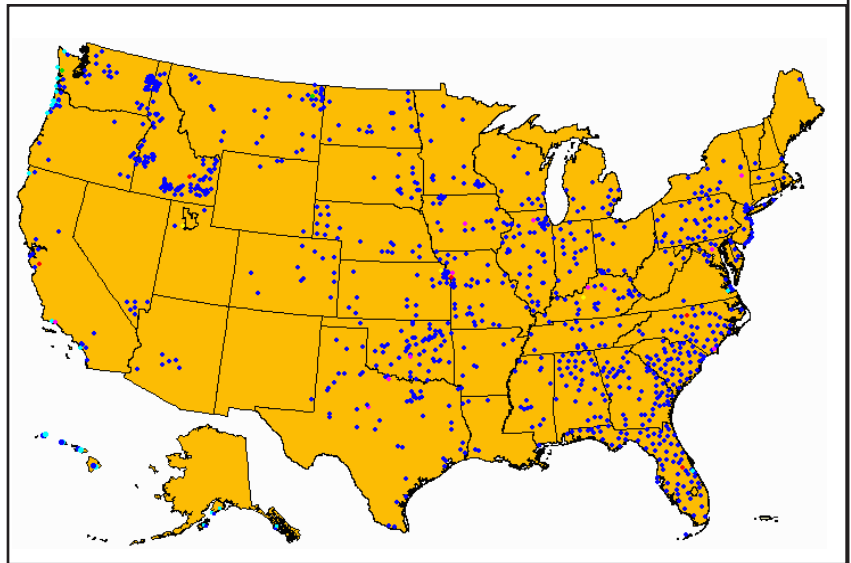
The NWS StormReady program, which helps emergency managers prepare for all kinds of extreme weather, welcomed Norwich, CT, to the program in January. With this new site, all 50 states now have at least one StormReady community or county. Many states have 50 or more sites, including Idaho, Florida, Texas, Georgia and Oklahoma. Florida and South Carolina are both close to having all counties StormReady.

In January, StormReady welcomed Benton, AR, as its 1000th site. Benton is overseen by the Tulsa, OK, NWS Forecast office. The StormReady program was started by NWS Tulsa WCM Steve Piltz, who believed emergency managers were an under-recognized and often underfunded group that needed support. He wanted to develop a program that would encourage communities and counties of all sizes and budgets to become accountable for their severe weather preparedness and also receive recognition for a job well done.

In January, the NWS TsunamiReady program, based on the StormReady model, welcomed Norfolk, VA, as its second East Coast site and second largest TsunamiReady city, behind Honolulu. Norfolk has a major naval installation and is a sister city to Virginia Beach, a huge East Coast summer vacation spot.

The goal of both programs is to provide assurance to local and prospective business owners, tourists and residents that a community is prepared for a variety of extreme weather events. StormReady sites post signs visible in their localities to alert residents to their commitment to safety and preparedness.

Emergency Managers who want to learn more about the StormReady and TsunamiReady programs should contact their local NWS WCM for details. Find contact information by clicking on "Local Contacts" at <http://www.stormready.noaa.gov>. *



The 50th state turned from yellow to gold in January when Norwich, CT, joined the StormReady program. StormReady is steadily building a reputation for reducing injuries and deaths, better protecting property and, in some areas, lowering insurance rates. [Dots represent StormReady communities, military sites, industrial sites, Indian Nations and universities.](#)

Online Spring Awareness Resources

By Melody Magnus, Aware Editor
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For information on severe weather awareness brochures, booklets and state awareness event links, go to <http://www.weather.gov/os/severeweather/>. See below for more awareness and safety information event links. *

Climate, Water and Weather Links

Aviation Weather:	aviationweather.noaa.gov/
Education/Outreach:	weather.gov/os/edures.htm
Flooding/Water:	www.floodsafety.noaa.gov/
Hurricane Awareness	www.weather.gov/om/hurricane/index.shtml
Lightning Safety:	lightningsafety.noaa.gov/
Marine Weather:	weather.gov/os/marine/home.htm
MIC/WCM/SOO/DOH List:	weather.gov/os/wcm-soo.pdf
Natural Hazards Statistics:	weather.gov/os/hazstats.shtml
National Digital Forecast Database	weather.gov/ndfd/
NOAA Weather Radio Information:	weather.gov/nwr/
Past Weather/Climate:	lwf.ncdc.noaa.gov/oa/ncdc.html
Publications List:	weather.gov/os/pubslst.htm
Rip Current Awareness	www.ripcurrents.noaa.gov/
StormReady Home Page:	stormready.noaa.gov/
Severe Weather Safety:	weather.gov/os/severeweather/index.shtml