

Aware

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

Spring 2005

Climate, Water, Weather

Summer Fun: Heat, Floods, Rip Currents, Hurricanes

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

This issue of *Aware* was sent just after the Memorial Day Weekend, the start of the summer season for most folks. With summer comes a full set of potential hazards, some of which are very subtle and slow to affect us. To help elevate awareness levels, a number of national, regional and state awareness weeks will take place through June. These events provide opportunities for all of us to focus attention on hazards such as rip currents, excessive heat, lightning, air quality and ultraviolet radiation. There should be many great chances for us to work closely as partners in our communities to educate, inform and raise awareness about summer hazards.

One of the major killers in the summer and early fall, of course, is the flash flood. New signs posting the "Turn Around, Don't Drown" motto will certainly receive attention and help promote this great campaign. An event I will never forget is the father who drove his vehicle around barriers at a low-water crossing on a stormy night in southern Oklahoma. He was caught in rising water that overturned his vehicle, pushed it off a low-water bridge, into a stream and over the falls downstream. His two-year old son drowned in the process. What a tragedy! Most of us know similar stories. The challenge is getting everyone to understand the danger.

Maybe an even bigger challenge is getting people to understand the hazards associated with heat and direct sun. Activities that make our summer days at the pool, the stream or the beach so enjoyable can turn deadly if we don't understand the hazards and take basic precautions.

Take advantage of the wealth of information and resources available through the NWS Awareness Week websites to enhance your programs. Together, we can keep Americans safe and healthy. *

Inside Aware

- 2 Digital Services
- 4 Dissemination
- 7 Excessive Heat
- 7 Hurricanes
- 8 Lightning Safety
- 9 Marine/
Rip Currents
- 11 Outreach/
Education
- 12 Severe Weather/
Tornadoes
- 14 Statistics
- 15 Tsunamis
- 15 Climate, Water,
Weather Links

Summer Safety Awareness Information

- Flood Safety Information: <http://www.floodsafety.noaa.gov>
- Rip Current Awareness Week: <http://www.ripcurrents.noaa.gov>
- Lightning Safety Awareness Week: <http://www.lightningsafety.noaa.gov>
- Hurricane Awareness: <http://www.nhc.noaa.gov/HAW2/english/intro.shtml>
- Heat Safety: <http://www.nws.noaa.gov/om/heat>
- UltraViolet Awareness: <http://weather.gov/os/uv>
- State Spring/Summer Weather Events:
<http://weather.gov/os/severeweather/severewxcal.shtml>



Digital Services

NDFD Expansion Planned for June 15

By Wayne Presnell and Glenn Austin, NWS Digital Services
Wayne.Presnell@noaa.gov, Glenn.Austin@noaa.gov

On June 15, NOAA's NWS will add two new experimental elements to the National Digital Forecast Database (NDFD) for the lower 48 states, Puerto Rico, Hawaii and Guam. NWS will also upgrade six experimental elements to operational status for Puerto Rico and Hawaii.

The initial operating capability of NDFD, released last year, included 12 forecast elements. On June 15, NWS will add two new experimental elements: relative humidity and apparent temperature. These elements are derived from the operational temperature and dew point and experimental wind forecasts. Relative humidity and apparent temperature gridded forecasts will be available out to 7 days.

This is the first expansion of NDFD. The elements are being added in response to land management, emergency response and public health officials who requested relative humidity, wind chill and heat indices be added to the digital database.

Also on June 15, the following elements will be upgraded from experimental to operational status for Puerto Rico and Hawaii:

Maximum temperature	Temperature
Minimum temperature	Dew point
12-hour probability of precipitation	Weather

These six forecast elements are already operational for the lower 48 states and will be operational for Guam later this year. The remaining experimental grid elements are:

Quantitative precipitation forecast	Snow amount
Significant wave height	Sky cover
Wind direction	Wind speed

An ongoing NDFD assessment shows progress made toward improving these forecasts. An official decision is expected early this summer on which of these elements will become operational next, and when. Meanwhile, NWS plans to add additional experimental weather parameters to NDFD in the near future. Check future editions of *Aware* and the NDFD website for details on this evolving program: <http://www.nws.noaa.gov/ndfd>. ❄

NWS Recognizes Need to Evolve Digital Services

By Glenn S. Austin, National Digital Services Program Manager
Glenn.Austin@noaa.gov

Commerce is becoming increasingly dependent on computer transactions. Meanwhile, NOAA's environmental information is becoming a greater vital national asset in support of the nation's economic growth. Recognizing this need, starting in 2004, NWS began providing operational forecasts stored in NDFD in digital formats (see related article above).

Aware

NOAA's
National Weather Service
Office of Climate, Water,
and Weather Services

Dennis H. McCarthy
Director

Kim Campbell, Chief
Performance and
Awareness Division

Bob McLeod, Chief
Awareness Branch

Editors:

Melody Magnus
Donna Ayres
Deborah Lavine

Articles:

Melody.Magnus@noaa.gov

Questions:

Melody Magnus:
301-713-1970 x163

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Faster and more efficient methods of data exchange are still needed. To improve the production and distribution of critical weather information, NWS must continue to evolve. A successful transformation will depend on upgrading the agency's information technology infrastructure, including systems such as AWIPS.

Digital Services includes plans for improving how data is produced and flows to the customer. The implementation of Digital Services will help NOAA fulfill the President's Management Agenda to "expand electronic government." Digital Services also adopts the National Research Council's recommendation to "provide data and products in digital form." (Fair Weather Report; June 2003, <http://books.nap.edu/catalog/10610.html>)

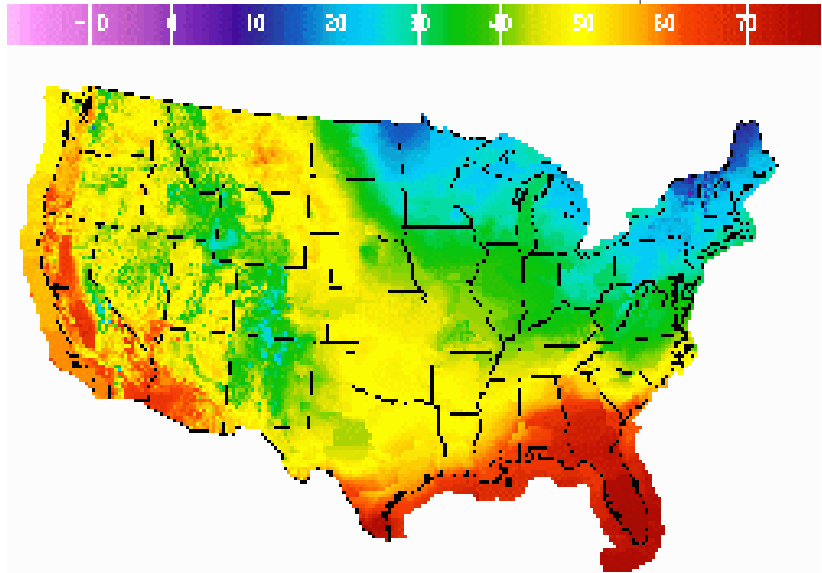
Customers and partners have expressed their need for additional weather information in new formats and asked that this information be more reliable and accurate. Finally, customers requested forecast information with higher spatial and temporal resolution. Users, such as the U.S. Departments of Energy and Homeland Security, U.S. Forest Service, state and local emergency managers, broadcast media and commercial weather companies, have requested the following additions to NDFD:

- Hazardous weather watches and warnings
- Aviation, marine, tropical weather and hydrologic weather forecasts
- Weather information presented in probabilistic fashion
- Other data including snow and ice information and weather observations

To satisfy this critical need, NWS must commit to taking the following actions:

- Implement improved forecast tools including quality assurance applications
- Enhance the support of these software applications
- Develop, test and deploy new digital forecasts and formats
- Create new national guidance products
- Integrate other NOAA data into compatible digital databases
- Ensure forecasters are trained to use new tools and applications
- Educate consumers and monitor customer satisfaction
- Update, backup and maintain operational Internet servers and web-based applications

The NWS goal is to provide all these enhancements by 2012. By that date, NWS envisions the digital database(s) will have much finer geospatial and temporal dimensions and be much more interoperable exchanging data in standard, convenient-to-use formats. An ongoing dialogue with all stakeholders will ensure these capabilities will be developed in a coordinated fashion and guarantee relevant weather information continues to flow efficiently in this fast-changing world. ✨



HazCollect Enters Testing Phase

*By Herb White, NWS Dissemination Services Manager
Herbert.White@noaa.gov*

NWS and Battelle, the HazCollect primary contractor, will conduct HazCollect Development Test and Evaluation in two phases this summer. In the fall, NWS will conduct an Operational Acceptance Test. During this test, select NWS offices nationwide will work with local emergency managers to send emergency messages using installed test versions of the Disaster Management Interoperability Service (DMIS) Desktop Toolkit.

In December 2005, the HazCollect capability will be available nationally through FEMA's DMIS. At that time FEMA will distribute a scheduled DMIS update. Emergency managers and government agencies who wish to use HazCollect to broadcast messages over NOAA Weather Radio All Hazards or other NWS dissemination systems must first register as a DMIS user. NWS will start HazCollect registration this fall.

HazCollect will be a one-stop location 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. HazCollect will use features of DMIS, such as automated user authentication and authorization.

For more information, visit the NWS HazCollect website at: <http://weather.gov/os/hazcollect>. To become a registered DMIS user, click on Register in the left menu after entering the DMIS web site at <http://dmi-services.org/>. *



FEMA Conference Focuses on Integrated Public Alert and Warning System

*By Herb White, NWS Dissemination Services Manager
Herbert.White@noaa.gov*

FEMA sponsored a one-day Integrated Public Alert and Warning System (IPAWS) Conference on April 25. This meeting was the first in a series of dialogues with emergency managers and public warning experts to help them understand changing state and local emergency alert and warning notification requirements and to craft an IPAWS for the future. The Federal government is conducting IPAWS demonstrations and technology pilots focusing on infrastructure and distribution. Kevin Briggs, Readiness Division Director in FEMA's Office of National Security Coordination, provided the IPAWS overview. Other topics included:

- Digital Emergency Alert System Pilot
- Geo-Targeted Alerting Pilot
- Emergency Alert System Notice of Proposed Rulemaking Update
- HazCollect Project
- Warning Accessibility Issues

There also were presenters from FEMA, NOAA, FCC, DOJ, Association of Public Television Stations, and George Washington University, as well as panel discussions to facilitate future IPAWS planning.

Policymakers and technical managers came away from the conference with a better understanding of IPAWS projects, issues and concerns. Specifically, attendees left with a better understanding of the Federal government's plan to enhance IPAWS systems, such as the Emergency Alert System, and deploy new warning systems to bring public alerting into the 21st century. The next conference in this series will be held later this year. ✱

Mark Trail Awards Recognize Weather Radio Heroes

*Herb White, NOAA's NWS Dissemination Services Manager
Herbert.White@noaa.gov*

On May 26, NWS recognized 17 individuals, government and non-government organizations and corporations at the Mark Trail Awards in Washington, D.C. These Awards are presented for noteworthy gifts, community action, and individual or group response to a NOAA Weather Radio All Hazards (NWR) warning. These actions exemplify the lifesaving benefits of NWR.

Among this year's corporate winners are the General Motors Corporation and Parsons Manufacturing Company. These companies implemented severe weather preparedness plans when warnings were broadcast on NWR, permitting quick, decisive, life-saving action before tornadoes struck their plants. The awards were presented by Undersecretary of Commerce for Oceans and NOAA Administrator Vice Admiral Conrad C. Lautenbacher, Jr. (Ret.) and by NOAA's National Weather Service Director Brigadier General David L. Johnson (Ret.).

Mark Trail, the syndicated comic strip published in approximately 175 newspapers, has been the official spokesman for NWR since 1997. Jack Elrod, the creator, writer and illustrator of Mark Trail, began taking an active interest in NWR in 1995 and developed Sunday feature cartoons to illustrate its use to mitigate severe and hazardous weather threats. ✱



Pictured from left are NWS Director D.L. Johnson; Mark Trail Award Winner Rodney Andreasen, Jackson County, FL, Emergency Management Director; NOAA Administrator Conrad C. Lautenbacher, Jr.; and Mark Trail Author Jack Elrod.

EMWIN: Latest Test of Prototype Gets Good Marks

*By Robert Wagner, NWS EMWIN Team
Robert.Wagner@noaa.gov*

NOAA's NWS continues to make progress with the Emergency Managers Weather Information Network-N (EMWIN-N) prototype. The tests performed earlier this year were rated a success. A final test of the prototype is scheduled for this summer. In this round of tests, NWS will verify the EMWIN-N broadcast from the satellite uplink station successfully passes through the GOES-N satellite transponder and is received by the EMWIN-N prototype receive station. These tests will occur about 30 days after a successful launch and checkout of the GOES-N satellite.

Changes in the next series of satellites, the GOES-N to P constellation, have spurred development of EMWIN-N. By 2011, the current GOES satellites will be replaced by the new series. EMWIN users will need to migrate to newer technologies to respond to frequency, power and modulation changes.

EMWIN users and vendors have stressed the importance of increasing the EMWIN data rate and keeping the cost of the GOES-N transition as low as possible. The EMWIN team, together with NESDIS, has been developing a design to meet these needs.

The EMWIN-N prototype can receive both current and future broadcasts, allowing for a smoother transition. Moving to the EMWIN-N broadcast also will allow NWS to use improved technologies and will double the current data rate. The EMWIN-N prototype operates at 19.2 kbps, using offset quadrature phase shift keying (OQPSK) modulation and employs error correction coding to provide additional gain. In the near future, NWS will make the prototype specification and the demodulating and decoding software available to manufacturers and the general public on the EMWIN website.

In a related effort, development is underway to encapsulate the EMWIN broadcast in the Low Rate Information Transmission (LRIT). This NESDIS system is the replacement for the current WEFAX transmission. To keep abreast of new developments in the EMWIN transition, please visit the EMWIN website at: <http://iwin.nws.noaa.gov/emwin/index.htm>. ❄

VTEC Update: GHG Testing to End June 24

*By Art Kraus, Awareness Branch
Arthur.Kraus@noaa.gov*

The Valid Time Event Code (VTEC) Operational Test and Evaluation (OT&E) for the Graphical Hazard Generation (GHG) software began May 9 at 35 Weather Forecast Offices (WFOs) and runs until June 24. NWS is using GHG to issue the following operational products with Experimental VTEC code strings:

- Winter Weather Messages (WSW)
- Non-Precipitation Messages (NPW)
- Fire Weather Watches and Warnings (RFW)
- Flood and Flash Flood Watches (FFA)
- Coastal and Lakeshore Hazard Messages (CFW)
- Marine Weather Statements (MWS): non-followups to Special Marine Warnings
- Coastal Waters Forecasts (CFW)
- Watch Coordination Message (WCN)
- Great Lakes Nearshore Waters Forecasts (NSH)

To ensure sufficient sample sizes and to exercise all the possible VTEC action codes and phenomena/significance pairs, the offices are also running canned test scenarios using the above products. During daily Test Review Group conference calls, National and Regional Program Leaders and the GHG software developers discuss issues and assess the status of the test. Multiple conference calls are also conducted every week with the participating Field Offices to answer questions and pass along lessons learned.

The OT&E Assessment will be completed by the end of June. NWS plans to issue a Public Information Statement by July 1 announcing which product classes will move forward with Operational VTEC on November 1.

Experimental Tropical Cyclone for VTEC TCV Product

NWS will issue an experimental Tropical Cyclone Watch/Warning Product (TCV) product during the 2005 Atlantic tropical season. TCV will contain Tropical Storm and Hurricane Watch and Warning information for the U.S. Atlantic and Gulf Coasts, Puerto Rico and the U.S. Virgin Islands. The VTEC coding in the TCV will be added to GHG and used to format headlines in WFO Zone Forecasts and headlines and experimental VTEC strings in WFO Coastal Waters Forecasts. If the testing is successful, the TCV could become an operational product in 2006. You can find further information on the experimental TCV at the Product Description Document posted on the website <http://products.weather.gov/viewliste.php>.

Warngen and Riverpro Testing for Hydrologic Products

VTEC was tested in several non-routine Hydrologic products in the 2004 VTEC OT&E, but the success criteria was not met. The Flood and Flash Flood products are currently being retested in the GHG OT&E. A second round of VTEC testing for other non-routine Hydrologic products is planned for late 2005, using the Warngen and Riverpro software applications. If successful, operational VTEC is expected in these products by Spring 2006.

More information on VTEC, including an overview and primer, draft and operational product Directives, upcoming testing schedules and VTEC-related Public Information Statements, is posted on the VTEC website. Go to <http://weather.gov/os/vtec/>. ❄

Excessive Heat

Heat Health Warning System Expands Reach

*By Ted Buehner, WCM, Seattle, WA
Ted.Buehner@noaa.gov*

In April, WFO Seattle adopted the Heat Health Watch/Warning System as part of its forecast program. Dr. Larry Kalkstein, University of Delaware's Center for Climatic Research and developer of the system, introduced the new heat watch/warning system, tailored for the Seattle area, at a press conference.

Dr. Kalkstein explained that the Heat Health Watch/Warning System is the first and only meteorological tool to identify oppressive air masses dangerous to health. The custom-made system is adapted to each urban area, based on specific meteorology for the local area as well as urban structure and demographics. This system is tailored to individual communities, a significant enhancement over the heat index.

NWS Seattle Meteorologist in Charge Chris Hill, Tracy Connelly of the Seattle/King County Chapter of the American Red Cross and Thomas Hearne of Seattle/King County Health and I also took part in the press conference.

Seattle is the 15th city use this system since it debuted in Philadelphia in 1995. Other cities include Dallas/Fort Worth; Phoenix; Los Angeles; Washington, D.C.; Chicago; St. Louis; Cincinnati; New Orleans; Little Rock, AR; Memphis; Shreveport and Lake Charles, LA; and Jackson, MS. Kansas City and Portland, OR: are slated to begin their tailored systems in FY 2006. For more information, see <http://www.udel.edu/SynClim/>. ❄



Dr. Kalkstein, University of Delaware's Center for Climatic Research, explains his Heat Health technology.

Hurricanes

Coastal Residents Flunk Hurricane Test

*By Stacy Stewart, Hurricane Specialist & WCM, NOAA TPC/National Hurricane Center
Stacy.R.Stewart@noaa.gov*

From May 2-6, NOAA's National Hurricane Center (NHC) launched its annual tour to promote hurricane safety and awareness. The tour features Ms. Piggy, NOAA's WP-3D 'Hurricane Hunter' aircraft. The annual NHC trip alternates between the Gulf and East Coast States. This year the traveling show landed on the East Coast. Highlighting the importance of the trip were results of a recent poll conducted by the Mason-Dixon Polling and Research group showing coastal residents lack sufficient knowledge of tropical storm dangers.



For National Hurricane Week materials and tips, go to <http://www.nhc.noaa.gov/HAW2/english/intro.shtml>

According to the poll, "When asked a 20 question test about hurricane-related facts and issues, the average coastal state adult was only able to answer 8 correctly, with an overall average of 42 on a 100-point scale. Only 22 percent were able to answer more than 10 of the 20 questions correctly, and only 2 percent got a "C" grade or better by answering 14 or more correct (70 on a 100-point scale). An additional 9 percent passed with a "D" (60-69 on a 100-point scale). Overall, 89 percent failed the test."

The poll continued, "Of more concern is that adults who lived within 10 miles of the coast did not score higher than those who lived inland. Both groups of adults averaged

8 correct answers out of 20. Those who had experienced a hurricane before only scored marginally higher than those who have not. For more of the results, go to http://hurricanesafety.org/mediakit/masonDixon_poll.pdf.

The poll, commissioned by the National Hurricane Survival Initiative, a public-private partnership, highlights the importance of redoubling efforts by NWS and its emergency management partners to educate residents about Tropical Storm safety. For more information about the NWS program, go to <http://www.nws.noaa.gov/om/hurricane/index.shtml> or to <http://www.nhc.noaa.gov/HAW2/english/intro.shtml>. *

Lightning Safety

Lightning Safety Week: June 19-25, Focuses on Outdoor Sports

By Melody Magnus, Aware Editor
Melody.Magnus@noaa.gov

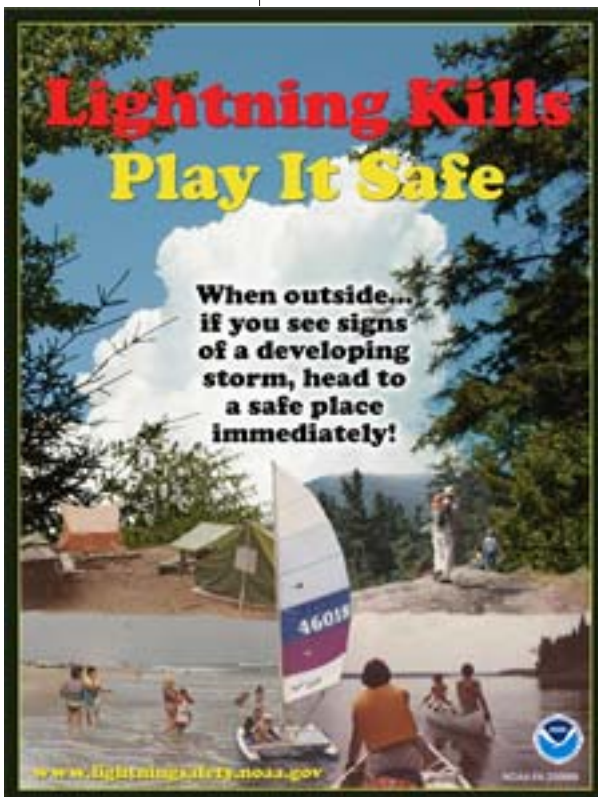
In 2004, lightning claimed 31 lives and causes 280 injuries, many of which will last a lifetime. Most of these injuries happen because people wait too long to go indoors. A broad-based Lightning Safety Team, which includes members from private and government groups, emphasizes that no place outdoors is safe.

The only safe place during a lightning storm is inside a completely enclosed building, not a picnic shelter. A vehicle with a hard top is an acceptable second choice.

The 2005 NWS Lightning Safety Campaign features four free posters designed by NWS staff for use by coaches, schools, pools, camps, golf courses and any other group that features outdoor events. The posters were designed as part of a contest won by NWS Portland, ME, WCM John Jensenius. Runners up in the contest were NWS staff members Sam Lashley, Sherrie Hebert and Randy Hartley. Users can download and reprint copies of these high quality posters at no charge. A limited number of printed free copies also are available as well as posters from past years of well-known soccer and golf players promoting lightning safety.

In addition, the NWS website offers downloadable Public Service Announcements, brochures, multimedia downloads and a broad spectrum of other safety information on its many web pages.

Victims of lightning strikes can find links to medical information. To take advantage of the wealth of materials available online, go to <http://www.lightningsafety.noaa.gov>. *



NWS to Make Major Upgrades to Coastal and Lakeshore Advisory/Watch/Warning Product Suite

By *Tim Schott, NWS Marine Services Branch*
Timothy.Schott@noaa.gov

NWS Coastal Flood Products or the Lakeshore Flood Products are now more simply known as CFW. The Mass News Disseminator states Coastal Flood Statement, Coastal Flood Watch, Coastal Flood Warning or Lakeshore Flood Statement, Lakeshore Flood Watch, Lakeshore Flood Warning. In response to user and WFO feedback and enhanced product capabilities provided through VTEC, major changes are underway for our "CFW" products.

Beginning this spring and phasing in through the summer, all WFOs serving the Atlantic, Pacific, Gulf and Great Lakes coasts will change the product type line in the Mass News Disseminator to either "Coastal Hazards Message" or "Lakeshore Hazards Message." Because of software testing and operational requirements, it is not possible for these 47 offices to implement the software change on the same date. Users will not need to make any changes in their AWIPS or WMO communications system directories to continue receiving the CFW products through this transition.

Atlantic, Pacific and Gulf coast users will receive the following headlines in their CFW products:

Coastal Flood Advisory	High Surf Warning
Coastal Flood Watch	High Surf Advisory
Coastal Flood Warning	

Along the U.S. Great Lakes, users will receive the following headlines in their CFW products:

Lakeshore Flood Watch
Lakeshore Flood Warning

A VTEC-coded /S/ for statement will be used to address situations not meeting advisory criteria, such as rip currents and oil spills. ✱

Three Experimental Tropical Cyclone Products Released; NWS Seeks Your Feedback

By *Tim Schott, NWS Marine Services Branch*
Timothy.Schott@noaa.gov

NOAA kicked off Hurricane Preparedness Week on May 15 and issued the 2005 Atlantic Hurricane Season Outlook, with another above normal season expected. This year, in addition to official tropical cyclone products, the Tropical Prediction Centers will provide the following experimental tropical cyclone products.

- **Tropical Cyclone Valid Time Event Code Product** will be issued by the National Hurricane Center (NHC). The tropical cyclone watch/warning product (AWIPS identifier TCV) is based

on VTEC and summarizes all new, continued and cancelled tropical cyclone watches and warnings issued by NHC for the U.S. Atlantic and Gulf Coasts, Puerto Rico and U.S. Virgin Islands.

- **Tropical Cyclone Surface Wind Speed Probabilities, text version** will be issued by the NHC and the Central Pacific Hurricane Center (CPHC). The product provides the probabilities, in percent, of sustained winds equaling or exceeding 34-, 50- and 64-knots. Probabilities will be computed for coastal and inland cities as well as offshore buoys.
- **Tropical Cyclone Surface Wind Speed Probabilities, graphical version** will be provided on the websites of the NHC, CPHC and WFO Guam. The products will be provided in static and animated formats.

Examples of these products and a means for providing user comments are available at these websites after June 1:

<http://www.nhc.noaa.gov>
<http://www.prh.noaa.gov/hnl/cphc/>
<http://www.prh.noaa.gov/guam>

Users are strongly encouraged to provide feedback on these products. NWS will subsequently assess whether the experimental products should transition to official products. ❄

Rip Current Awareness Week: June 5-11

*By Tim Schott, NWS Marine Services Branch
Timothy.Schott@noaa.gov*

NOAA has designated the week of June 5, 2005, as our inaugural national Rip Current Awareness Week. In future years, the campaign will be scheduled for the first full week of June. Rip currents are extremely hazardous. They claim an estimated 100 lives each year along the nation's coasts.



Here's the lineup for our safety week:

- June 5, Mark Trail Comic Strip on rip current safety released
- NOAA-Weather Channel rip current vignette to detail the week of June 5th
- NOAA Rip Current Public Service Announcement featuring Olympic swimmer Ian Crocker

In addition, NWS is offering rip current brochures in English and Spanish. Electronic files for a beachfront rip current sign are also available for use by NOAA partners. Information on rip currents is available at: <http://www.ripcurrents.noaa.gov>

For additional information please contact: Deborah Jones: 301-713-1677 x124, Deborah.Jones@noaa.gov; Tim Schott at 301-713-1677 x122, Timothy.Schott@noaa.gov ❄

CERT Training Prepares Americans for Disasters

*By Rick Dittmann, WCM, NWS Great Falls, MT
Rick.Dittmann@noaa.gov*

Community Emergency Response Teams (CERT) is part of the federally funded Citizen Corps program. People who go through CERT training have a better understanding of the potential threats to their homes, workplace and community and can take appropriate measures to mitigate the effects of such hazards. This spring, NWS conducted initial CERT training in Cascade County, MT.

If a disaster occurs that overwhelms local response capability, CERT members apply the training learned in the classroom and during exercises to give critical support to their community until help arrives. When help does arrive, CERT staff update emergency personnel and support their efforts at the disaster site.

Vince Kolar, Disaster and Emergency Services Coordinator for Cascade County said, "Ninety percent of all Presidential declarations for disaster are weather or flood related, so we place a high priority on ensuring our responders are aware of, and trained, to recognize the hazards posed by weather and water." ❄

Girls Explore Science Careers at Science Forum

*By William T. Parker, Meteorologist in Charge, NWS Cheyenne, WY
William.Parker@noaa.gov*

Rockets built by junior and senior high school girls soared to 400 feet over the University of Wyoming as part of the 2005 Women in Science Forum this spring. Nearly 300 girls attended the day-long event that featured interacting with professional women representing various science and technology disciplines.

The Women in Science forums provide mentors and role models to students to encourage girls to consider science careers. This year Dr. Joy Crisp, a NASA Jet Propulsion Laboratory senior scientist on the Mars Rover Expedition, led the girls on a firsthand exploration of Mars.

Wyoming's first female FBI agent, Melinda Casey, took part along with Dr. Pat Diebert, a biologist from the U.S. Fish and Wildlife Service, and Sherra Cook, a free-lance medical illustrator and animator. Forum topics included botany, robotics, geology, geophysics, molecular biology, engineering, botany, mathematics, zoology, renewable resources, sports medicine, physics and astronomy.

Major sponsors for the event included: NOAA, NWS Cheyenne, WY; NASA Space Grant Consortium; and the Western State's Learning Corp. (WSLC). Others sponsors included Wells Fargo Bank, Laramie County School District #1, Cheyenne Kiwanis, the Cheyenne Zonta Club, the University of Wyoming President's Office, and the College of Agriculture Renewable Resources and Molecular Biology Departments at the University of Wyoming.

Acting University of Wyoming President, Tom Buchanan, kicked off the day's activities. Wyoming Governor Dave Freudenthal issued a Proclamation recognizing May 10 as Women in Science Day. An added feature to this year's event was a special presentation by WSLC on planning for college and developing strategies that work for getting a college degree. ❄



Launching Rockets from Prexy's Pasture on the University of Wyoming campus as part of the 2005 Women in Science Forum in May.

Severe Weather/Tornadoes

High Risk Outlook Product Expands Parameters

*By Joe Schaefer, Storm Prediction Center
Joseph.Schaefer@noaa.gov*

For the past several decades, the Storm Prediction Center (SPC) has only issued its Public Weather Outlook (PWO) when the Convective Outlook was a high risk. On average, SPC sent out only three or four PWOs annually. Due to the extremely rare nature of the PWO, SPC partners did not routinely look for this product or know how to use it. To improve knowledge of this key product, starting in March 2005, SPC added moderate risk events to PWOs to increase issuance frequency to about 35 per year.

To compensate for the higher frequency, the wording used in moderate risk PWOs was toned down considerably from text in high risk messages. The moderate risk PWO, however, provides a mechanism to tell the public when a significantly enhanced risk of severe thunderstorms exists. The high risk version also provides a summary of the states that will be affected. ✱

Park Service Partnership Helps Confirm Tornado

*By Chris Darden, NWS Huntsville, AL
Chris.Darden@noaa.gov*

On late afternoon of Friday, April 22, a series of severe thunderstorms rolled through northeast Alabama. These storms produced hail up to the size of baseballs. One particularly intense storm prompted a tornado warning for DeKalb County. This storm moved through eastern portions of the county, but no significant reports of damage or tornado sightings were received by NWS that evening.

The following Monday, after reviewing the radar data, NWS decided to follow-up with the National Park Service at Little River Canyon National Preserve. One of the Fire/EMS Coordinators at the park reported that a contract crew working in the park saw funnel clouds and a large area of damaged trees after the storm moved through. The representative of the park even offered her time and resources to assist NWS on a storm survey of the Little River Canyon National Preserve that same day. Due to the coordination between the National Park Service and NWS, it was determined that an F0 tornado did indeed touch down across portions of eastern DeKalb County. Further information about the survey can be found at: <http://www.srh.noaa.gov/hun/stormsurveys/2005-04-22/> ✱

Tri-State Tornado 80th Anniversary an Outreach Gold Mine

*By Rick Shanklin, WCM, WFO Paducah, KY
ricky.shanklin@noaa.gov*

March 18 marked the 80th anniversary of the nation's deadliest tornado, the Great Tri-State Tornado of March 18, 1925. This tornado killed 695 people during its record breaking 219 mile path across southeast Missouri, southern Illinois, and southwest Indiana. In preparation for the anniversary, WFO Paducah planned a public education strategy, including the message

that if a tornado of this magnitude and this level of destruction occurred once, it could do so again.

A major objective of the anniversary campaign was to use this event as a focus for our annual severe weather preparedness and awareness campaign. This objective was met with the following activities:

- Media interviews and participation in various shows
- Public information statements
- WFO Paducah Tri-State Tornado website
- Outreach presentations, including town hall meetings and spotter training sessions



Originally a three-story building, Werner's Drug Store on the corner of 10th and Walnut Streets was reduced to only two stories. Photograph courtesy of the Jackson County Historical Society in Murphysboro, Illinois.

While the 80th anniversary events increased attention on the Great Tri-State Tornado, WFO Paducah fields ongoing interest in this intriguing and record breaking tornado. The WFO Paducah Tri-State Tornado Team compiled a wealth of information about this historic event, and WFO Paducah forecaster Ryan Presley created an outstanding website: <http://www.weather.gov/pah/1925>. The website, which draws many visitors, offers details on the tornado track, first hand accounts from survivors, "Startling Stats" and much more. ❄

Backyard Tornadoes Draw Crowds to Severe Weather Workshop

*By Steve Drillette, WCM, WFO Amarillo, TX
Steve.Drillette@noaa.gov*

NWS Amarillo, TX, along with Amarillo Department of Emergency Management hosted a Severe Weather Workshop on March 12. More than 400 people attended the event. This year's theme "Tornadoes in Your Backyard; A 50 Year History" included presentations by local TV meteorologists, local NWS forecasters and Dr. Kevin Kloesel of the University of Oklahoma. Speakers discussed the history of tornadoes across the panhandle, how tornado safety and tornado detection has evolved over the past 50 years and what the future holds.

The all-day workshop included sessions on Basic Radar Interpretation and Severe Storm Spotter Training, along with over 20 booth exhibitors. Numerous local businesses and organizations donated merchandise or services to make the workshop a top notch event. This was the 6th biennial workshop hosted by WFO Amarillo and local emergency management. The first Severe Weather Workshop debuted in Amarillo in 1995. ❄

Statistics for Severe Weather

Severe Weather Deaths and Injuries Down in 2004 But Major Hurricanes Push Property Damages Up

In 2004, there were 367 weather-related fatalities, a significant decrease from 438 in 2003 and even more notable drop from the 2002 total of 542 deaths. The deadliest weather threat to life in 2004 was flooding, which claimed 82 lives, down from 86 in 2003. The next biggest killers in 2004 were tornadoes and tropical storms/ hurricanes with 34 fatalities each, followed

by rip currents with 32 deaths and lightning with 31. For the second year in a row, extreme heat, typically the biggest killer, ranked as one of least dangerous hazards, claiming only 6 lives. The 2004 fatality number is well below the 10-year average (1995-2004) of 514 for major weather events.

Weather-related injuries dropped in 2004 to 2,395 down from 2,924 in 2003. Hurricanes, with 840 injuries, replaced tornadoes as the major cause of injuries in 2004. Tornadoes were responsible for 371 injuries (down from 1,087 in 2003); lightning, 280; and thunderstorm winds, 252.

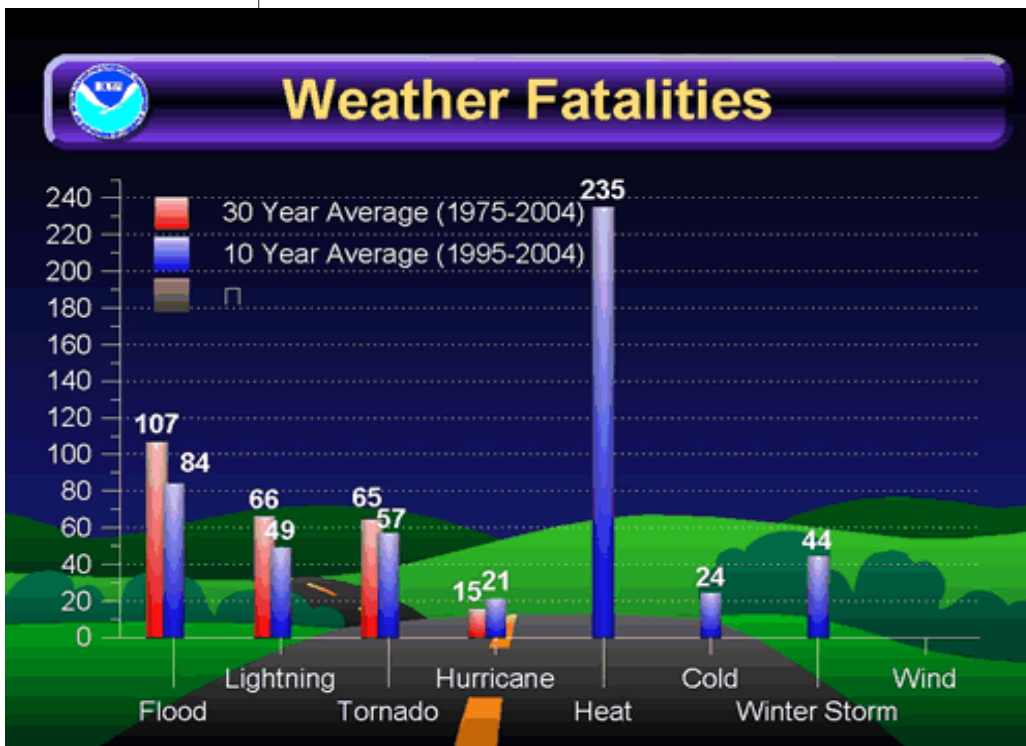
Weather damage to property and crops was significantly higher in 2004. Severe weather caused

\$25.3 billion in damages in 2004, up from \$11.4 billion in 2003 and \$5.7 billion in 2002. Hurricanes replaced wildfires as the most damaging weather in 2004 with an estimated \$18.8 billion in claims. Coming in a distant second was high wind which caused \$3.3 billion in losses. Flooding registered about \$1.7 billion. Florida took the dubious honor of suffering the highest weather related property and crop damages with losses totaling \$19.3 billion, mostly due to pounding from three major hurricanes.

Of the 367 weather-related fatalities, men again accounted for about twice as many deaths as women. As in the past, men were impacted more by weather in all categories.

September was the deadliest month with 72 fatalities, most of which were from a series of strong hurricanes that pounded the southeastern coastal states. As to be expected, Florida was hardest hit by weather, losing 61 citizens to hurricanes, rip currents and other hazards. Also hard hit were Illinois, which lost 28 lives to weather and Texas, which numbered 25 deaths.

The 2004 numbers will be posted by the end of June. For more details, go to <http://www.nws.noaa.gov/om/hazstats.shtml>.



NOAA Implements Tsunami Warning Program for Gulf of Mexico and East Coast of United States

By Stephan Kuhl, National Warning Coordination Meteorologist Program Leader
Stephan.Kuhl@noaa.gov

On April 20, NOAA's NWS West Coast/Alaska Tsunami Warning Center in Palmer, AK, implemented a new suite of tsunami products for the coastal areas of the Gulf of Mexico and the eastern United States. These products will be similar in format and content to the existing suite of tsunami products issued for Alaska and the U.S. West Coast.

NOAA tsunami watch/warnings will provide information about potential tsunamis, including the source and the estimated time of arrival for waves and will alert residents to the risk of flooding. The tsunami information bulletin will contain information about significant earthquakes even if they are not likely to trigger a tsunami. This earthquake information message will contain information about smaller earthquakes that may be felt in a coastal area but are unlikely to generate a tsunami.

Local NWS offices will relay tsunami watch/warning and tsunami informational products via NOAA Weather Radio All Hazards using appropriate Specific Area Message Encoding/Emergency Alert System codes.

TsunamiReady is a voluntary program designed to educate local emergency management officials and their constituents about the threat of tsunamis and to promote a well-designed tsunami emergency response plan for coastal communities. For more information about tsunami preparedness, tsunami education, and the NOAA/NWS TsunamiReady program, please contact your local NWS office or go to the website at: <http://www.tsunamiready.noaa.gov>. ✨



Climate, Water and Weather Links

Aviation Weather:	aviationweather.noaa.gov/
Education/Outreach:	weather.gov/os/edures.htm
Flooding/Water:	weather.gov/os/water/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
StormReady Home Page:	stormready.noaa.gov/
Severe Weather Safety:	weather.gov/os/severeweather/index.shtml
Tsunami Information: NOAA/NWS	www.tsunami.gov