Aware

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December 2014

Another Change to SPC Convective Outlooks

By John Ferree, NWS Severe Storms Service Leader; Greg Carbin, SPC Warning Coordination Meteorologist

The Storm Prediction Center (SPC) introduced two new categories in the Day 1-3 Outlooks in October (see Weather-Ready Nation news story). Beginning December 16, the SPC began including a new category in the SPC Day 4-8 Convective Outlook Graphics.

In October, SPC added a new category, "Marginal," to the Day 1-3 Outlooks to replace the "See Text" label on SPC maps. A new "Enhanced" category was also added between the "Slight" and "Moderate" categories (See Figure 1). The underlying probability of severe weather depicted from these outlooks did not change.

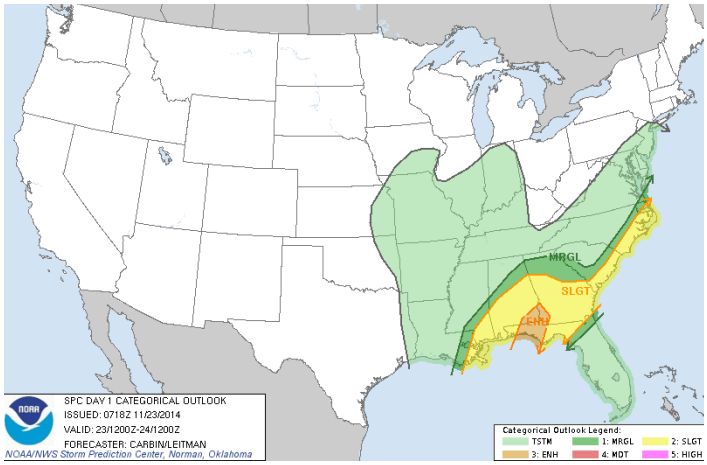


Figure 1: Day 1-3 Outlooks

SPC's Day 4-8 outlooks had previously only outlined areas where the probability of severe weather was 30 percent or more on a given day, and labeled these areas with the day (e.g. Day 6). On December 16, the SPC added a separate graphic for each day in the Day 4 through 8 period. This facilitates the addition of a lower probability, 15 percent, to outline areas where organized severe weather appears possible, but SPC is uncertain about details such as storm formation, coverage or intensity. These areas will be labeled 15% and 30% (see Figure 2).

SPC is adding this additional information to the outlooks to better depict risk in the Day 4-8 period, and to provide better consistency between the map graphic and corresponding text discussion. The change should also better spotlight severe weather threat potential earlier in the forecast process. An instructional video can be found at Find details online.

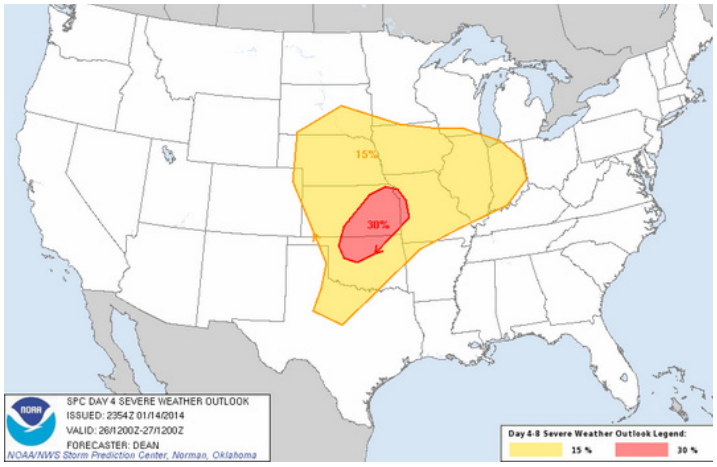


Figure 2: Day 4-8 Outlooks

NWS Launches Seasonal Awareness Campaigns

By Katie Collins Garrett, NWS Hydrologic Outreach, Training and Interagency Coordinator

NWS recently launched a Winter Safety Campaign. This outreach effort is designed to help the public better prepare for winter weather hazards. The campaign will stress that while winter is dangerous, a few simple steps can help prevent injuries and death from snowstorms, extreme cold, wind chill and other hazards. In addition, the campaign will highlight the danger of tsunamis for coastal residents and visitors as we approach the 10-year commemoration of the Indian Ocean tsunami.

The Winter Safety Campaign will be promoted on weather.gov, the Weather-Ready Nation website, NWS Facebook/Twitter pages and by our field offices around the country. In addition, NWS recently launched dramatically updated websites on winter safety and tsunami safety. NWS is in the process of updating all its safety campaigns in this new, easier-to-use format.

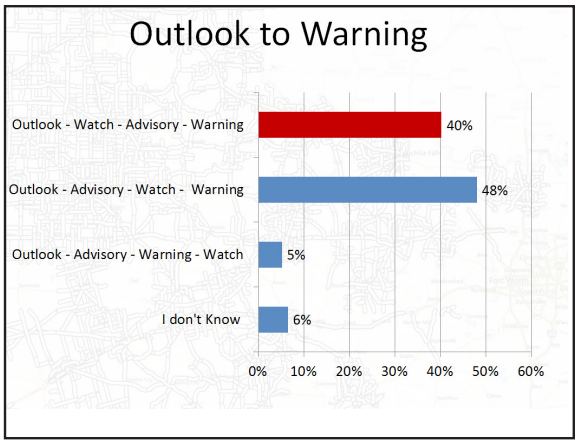
Winter Weather Workshops Prep Key NWS Partners

*By **Rick Shanklin**, WCM, NWS Paducah, KY*

This fall, NWS Paducah, KY, took to the road for its annual round of winter weather workshops, which included sessions in Cape Girardeau, MO; Grand Rivers, KY, and Evansville, IN. The workshops provided training to 165 emergency managers and other NWS partners to enhance decision support and interpretive services. The workshops also provided an open forum session to address areas of potential improvement in decision support services for high impact weather events. Comments and questions from the many attendees at these events confirmed the travel was well worth the time.

Winter Workshops Reveal Communication Gaps

*By **Mark Fox**, WCM, NWS Fort Worth, TX*



Summary of responses to "What is the correct order of an Outlook to Warning?"

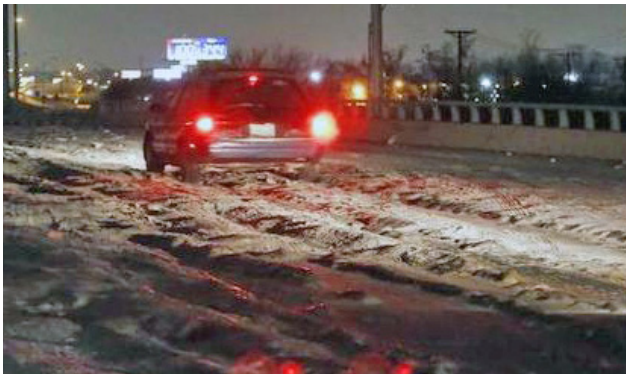
NWS Dallas/Fort Worth, TX, hosted a half-day winter weather Integrated Warning Team (IWT) workshop this fall focusing on the extreme winter weather event of early December 2013, which severely impacted North Texas. Senior Forecaster Dennis Cavanaugh and KXAS-TV meteorologist Samantha Davies gave a brief overview of the event, focusing on the physical processes that led to the rapid intensification of the sleet over North Texas.

It quickly became apparent the language commonly used by the NWS to describe winter weather events is not entirely understood and shared by its core partners. Before the workshop, each attendee was asked to list, in order of severity, the NWS terms outlook, watch, advisory and warning. Less than half of the attendees ordered these terms correctly. Most respondents thought moving from a winter watch to an advisory represented a decrease in an event's severity.

To reduce this disconnect, NWS Dallas/Fort Worth staff passed out materials to participants highlighting the potential impacts from the different types of winter precipitation. Electronic copies were also provided to each local and county emergency manager across the county warning area.

The group next focused on a plausible North Texas winter weather scenario, facilitated by Acting Southern Region Deputy Regional Director Mike Coyne. Most IWT members listed at least several decisions they make before NWS issues a watch, advisory or warning. The winter IWT workshop reinforced the following key points for NWS Dallas/Fort Worth:

- Communicate a deeper, richer stream of information during the outlook and watch periods
- Convey certainty in the forecast and better communicate the range of realistic possibilities within the "forecast envelope"
- Emphasize the *impacts* of an event, not just the phenomena or NWS product being issued. For example,



"Cobblestone Ice" on Dec. 6, 2013. Photo by Fort Worth Star-Telegram

communicating that a quarter inch of sleet will make many roadways slick and hazardous is more important than simply highlighting the boundaries and timing of a winter weather advisory.

- Emphasize forecast temperatures and winds ***after*** the precipitation ends since impacts often persist for many hours or even days after the NWS products expire. Temperatures obviously impact road conditions, while wind speeds over 15 mph can adversely impact utility lines after a freezing rain event.

National Severe Weather Workshop, National Tornado Summit

*By **Greg Carbin**, Warning Coordination Meteorologist, NWS Storm Prediction Center*

Start making plans now to attend the National Severe Weather Workshop, February 24-25, 2015. SPC will again hold its annual workshop breakout sessions during the annual National Tornado Summit. The workshop is a long-time SPC event dedicated to improving the communication of severe weather risk.

The Oklahoma Insurance Department, University of Central Oklahoma, Oklahoma Emergency Management Department, and the National Association of Insurance Commissioners are co-sponsoring the Tornado Summit.

The general sessions of the National Tornado Summit will be interspersed with breakout sessions on Tuesday and Wednesday, February 24-25, at the Cox Convention Center in Oklahoma City. General session speakers will be prominent leaders in government and industry, including NWS Deputy Director Laura Furgione.

Breakout sessions and panel discussions will include NOAA/NWS speakers and others involved in ongoing research into weather forecasts and warnings as well as incident response and recovery. Attendees also will have the opportunity to tour the National Weather Center in Norman, OK.

Emergency managers, weather enthusiasts, teachers, students, meteorologists and broadcasters have gathered to present and discuss weather hazards topics at the workshop for the past 12 years. The collaborative effort is particularly effective because the venue allows involvement with the national insurance industry and other emergency responders. Organizers are expecting up to 800 people for the 2015 event. Complete registration details are online.

The U.S. Tsunami Warning System: 10 Years of Advancements

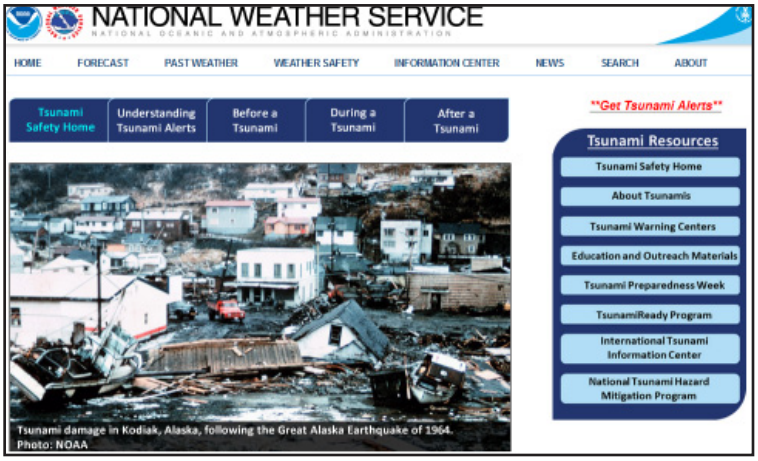
*By **Christa Rabenold**, NWS Tsunami Program, Silver Spring, MD*

Since the devastating Indian Ocean tsunami in 2004, NOAA has made great improvements in tsunami detection, forecasting, warning and preparedness capabilities. As a result, U.S. and international coastal communities are far better prepared to respond to a tsunami.

In 2004, NWS staffed two tsunami warning centers (TWC), 8 hours a day, 5 days a week, with on-call coverage for other hours and provided services for a limited area. The TWCs relied on three key sources for vital information:

- Seismic data from the Global Seismographic Network (GSN), only 80 percent of which was transmitted in real-time
- Water-level data from six experimental Deep-Ocean Assessment and Reporting of Tsunamis (DART) buoy stations in the Pacific Ocean
- Water-level data from coastal water-level stations that provided data in 1-hour cycles

Today, the TWCs are staffed 24/7 and their areas of responsibility have been expanded to include all U.S. and Canadian coastlines. The Pacific TWC is the primary international forecast center for the Pacific and Caribbean Basins. USGS and its partners have fully upgraded the GSN to transmit 100 percent of its data in real-time. NOAA also has upgraded its seismic networks in Alaska and Hawaii. A global network of 60 DART buoy stations, 39 U.S. owned and operated, now monitors tsunami activity in the Pacific, Indian and Atlantic Oceans. NOAA also has installed or upgraded 188 coastal water-level stations, enabling them to support tsunami warning operations by



The new tsunami Safety website offers information for before, during and after a tsunami, links to alerts and more.

providing data in 1-minute cycles.

The centers use data from these networks as inputs to tsunami forecast models. These models enable TWC staff to provide accurate, reliable, real-time inundation forecasts, significantly better products than existed in 2004. Coastal states and communities use NOAA inundation models to create maps defining tsunami hazard and evacuation zones to support community planning.

The last decade also marked the completion of the *U.S. States and Territories National Tsunami Hazard Assessment* and improvements to the quality of the long-term archive of tsunami events.

As worldwide knowledge about tsunami threats has increased, so has interest in tsunami awareness and preparedness. In the last 10 years, the National Tsunami Hazard Mitigation Program has expanded from 5 to 28 partner states and territories and the NWS TsunamiReady program has grown from 14 designated sites to 181 with new sites added frequently.

Despite the advances in technology and hazard assessment, people who live, work or play at the coast must understand and be prepared for tsunamis. No one can prevent tsunamis, but there are actions individuals can take to protect themselves and their loved ones. To help educate the public about what to do before, during and after a tsunami, NWS has launched a new online tsunami safety resource.

NOAA has developed a national plan for tsunami research and the transfer of the resulting technology to operations. Through this plan, NOAA continues to make advances in tsunami detection, forecasting and warning to further improve the accuracy and timeliness of alerts and the accessibility of vital information. All these activities contribute to a Weather-Ready Nation (WRN). Find more safety tips at the WRN website.

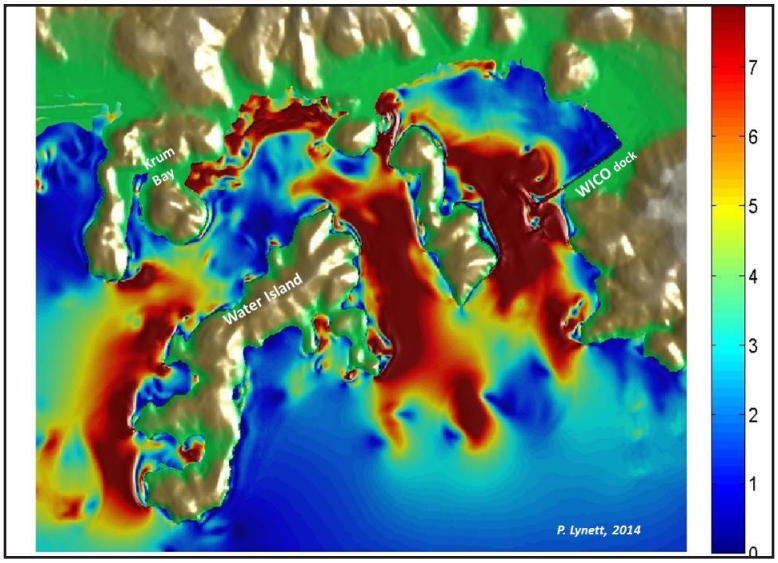
NOAA also has taken on a vital role in the global tsunami warning system, providing warning, training, data exchange, and outreach and education assistance and uses international data, communications, and research.

Maritime Tsunami Workshops Reveal New Challenges—What Boaters Should Know

*By **Christa von Hillebrandt**, Manager, NWS Caribbean Tsunami Warning Program*

The Virgin Island Territorial Emergency Management Agency (VITEMA) and the Caribbean Tsunami Warning Center (CTWC) sponsored workshops on St. Thomas and St. Croix to educate the maritime community and the public about tsunami science and safety. Workshop highlights included:

- Updates on expected changes in tsunami alert messages and procedures
- Explanation of procedures followed by the national Tsunami Warning Center for U.S. Virgin Islands (USVI) alerts as well as guidelines and best practices for the maritime community, including detailed



*Computer modeling of tsunami currents in Charlotte Amalie Harbor 72 minutes after the causative earthquake, yellow to dark red indicates currents from 5 to 8 knots (After P. Lynett, 2014). Animation of the **tsunami currents** are online. An animation of **sea surface elevation** for the same tsunami also is online.*

recommendations for boaters threatened by tsunamis from sources that are local (less than 62 miles away) compared to sources that are regional (more than 62 miles) or distant (more than 620 miles)

- Results of recent storm surge and tsunami flood mapping and storm surge inundation modeling studies
- Review of tsunami warning protocols describing how VITEMA sends alerts to a USVI resident or visitor.
- Update on Coast Guard preparedness and protocols for response to threats of coastal hazards such as tsunamis
- Overview of the most likely tsunami threats in the Virgin Islands, including the usual behavior of tsunamis
- Description of the causes and known sources of tsunamis that might impact the Virgin Islands from local, regional and distant sources
- A discussion of computer-generated images and animations on tsunami hazard modeling for ports and harbors, including a demonstration showing how two U.S. Navy nuclear submarines that had been moved to safe harbor in Guam in anticipation of tsunami waves were torn from their dock and drifted about in the harbor. The models showed that even when large tsunami waves might not overtop bulkheads substantially, the currents just below the sea surface could push and pull on big vessels with enough force to sever the strongest of lines. Computer models of tsunamis generated by a large local earthquake produced currents as strong as 8 knots fluctuating past the West Indian Company dock, Rupert Rocks and the Gregerie Channels on St. Thomas and into Gallows Bay on St. Croix. The model also produced strong whirlpools within protected harbors. Whirlpools and eddies had been actually observed encircling vessels during recent tsunamis such as the 2004 Indian Ocean disaster.

For more information, see the USVI Storm Surge Atlas on the CariCOOS webpage. Prof. Lynett's wave research also is available online.

Weather-Ready Nation Homework Ups School Preparedness Grades

By ***Phil Hysell***, WCM, NWS Roanoke, VA

Between November 20–22, more than 500 science pre-school to college teachers visited the NWS exhibit at the 2014 Virginia Association of Science Teachers Professional Development Institute.

Numerous teachers praised NOAA for providing free materials related to climate, weather and marine sciences. Teachers told how these materials help them develop lesson plans, promote student's interest in science, and generate classroom discussions about science. Sea turtle posters, the Chesapeake Activity Books, Cloud Charts and the Ocean Acidification DVD's were the most popular items.

Some of the attendees were so intrigued by the information presented, they invited NWS Blacksburg, VA, staff to expand on it safety message via a school visit, tour or SKYPE video conversations between classrooms and meteorologists. A Ferrum College professor invited an NWS meteorologist to be a guest lecturer for her Physical Science class.

On the last day of the meeting, NWS Blacksburg WCM Phil Hysell led a breakout session presentation entitled "Preparing Your School for A Significant Weather Event." Improving the responsiveness, readiness and resilience to significant weather events for schools is an important part of building a Weather-Ready Nation. After the session, many of the participants committed to review their school's emergency preparedness plans and shelter locations.

From left, NWS Blacksburg WCM Phil Hysell and Forecaster Robert Stonefield hosted a display provided by the NOAA Office of Education at the 2014 Virginia Association of Science Teachers in Roanoke, VA.

Aware

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