Prevailing Winds

Volume 4, Issue 2 October 21, 2014

A Rare EF-2 Tornado Strikes Revere, MA

by Hayden Frank, Senior Meteorologist

At approximately 9:32 AM on the morning of July 28th 2014, an EF2 Tornado touched down in Revere, Massachusetts. It was the first tornado ever confirmed in Suffolk County, since records began back in 1950. Fortunately there were no fatalities or serious injuries resulting from the tornado. The tornado had a path length of 2 miles and a path width of 3/8 of a mile. Maximum wind gusts were estimated between 100 and 120 mph.

The tornado resulted in widespread damage throughout Revere. Numerous houses on Revere Beach Parkway were severely impacted, with one roof completely blown off. Numerous trees were downed across the region, with a few of them falling onto and crushing cars. At the town hall, windows were blown out and there was significant roof damage. More than a hundred homes had damage that ranged from siding torn off to portions of roofs lifted or blown off. There were several store signs that were destroyed. The police reported that a car had been overturned, to the west of Broadway at the intersection of Malden Street and Carlson Avenue. The tornado moved north northeast and was on the ground for only 4 minutes. This led to a sharp cutoff of damage east of American Legion Highway/Route 60 as it dissipated.

While on average a few tornadoes occur each year in Southern New England, they are usually brief and weak with a rating of EF0 or EF1. They also occur with a greater frequency across interior Southern New England, as the proximity to the ocean often acts as a limiting factor along the coast. It is also quite unusual for a tornado to occur during the morning hours, although not completely unprecedented.

There were several ingredients that came together to result in this unusually strong, but brief tornado that occurred in Revere, Massachusetts. There was a warm front lifting north across the region, that combined with strong winds aloft veering with height. In meteorology terms, this is referred to as wind and speed shear. The greater the amount of wind and speed shear increases the greater the chance for a tornado. Severe weather also requires a certain amount of ...

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...instability, which acts as fuel for thunderstorms. Instability increases during the afternoon as temperatures warm, but in the Revere case there was just enough of it around in the morning for the tornado.

While our office had issued a severe thunderstorm warning for that storm prior to the touchdown, there was little if any damage reported until the tornado struck Revere. No tornado warning was in effect for Revere or Suffolk County during the event. Doppler radar did not indicate a classic tornado signature until 934 AM, when the tornado was already on the ground. The image to the left is the radar scan from that time, showing strong inbound vs. outbound velocities over the region. This is just an important reminder that despite improving technology, severe weather and tornadoes can and will occur without warning. It is important to be weather savvy and remember, "When thunder roars, go indoors."

Winter Safety Tips

by Alan Dunham, Observation Program Leader

The heat and humidity of summer is rapidly fading into memory, the leaves are showing their vibrant fall colors, there is a nip in the air and soon the white flakes of winter will be falling. Now is the time to begin planning and making preparations to stay safe this winter.

Living in New England, we can be reasonably assured that there is a possibility that we will see at least one, if not several, good size snowstorms that could leave you without power for a few hours to a few days. Now is the time to make your home winter-ready as well as prepare an emergency kit.

To make your home winter-ready you should make sure you have fresh batteries for your smoke and carbon monoxide detectors. If you use a wood or pellet stove make sure you have your chimney cleaned before you start firing it up regularly. Also, you may want to have your stove inspected to make sure it is in good working order and that there are no leaks which will allow carbon monoxide to seep into your home. You should also make sure all your gutters are cleaned to lessen the chances of having any ice dams form as the snow on your roof melts.

As for an emergency kit, your kit should include the following: flashlights with extra batteries, a battery operated portable radio as well as a battery operated NOAA Weather Radio, a first aid kit, a 3 day supply of water (one gallon per person per day), as well as fully charged fire extinguishers.

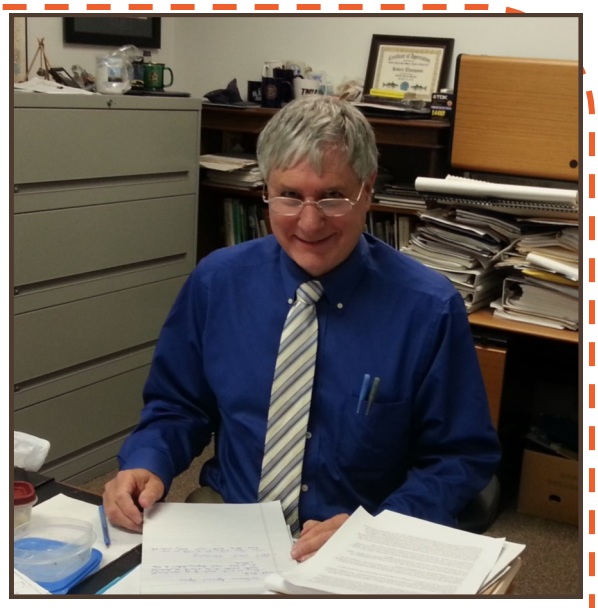
Should you lose power during a storm, there are certain "dos and don'ts" to follow. Do use battery powered lanterns. Avoid using candles or oil based lanterns as these pose an increased risk of fire. If you have a gas stove DO NOT use the stove to try to heat your house. Using your gas stove/oven as a source of heat greatly increases the chance of fire AND carbon monoxide poisoning. If you have a portable generator make sure that you run the generator outside well away from the windows. DO NOT run your generator in your garage as it is a potential fire hazard. Also, if you have a garage that is attached to your house, deadly carbon monoxide WILL seep into your home.

For other ideas to make your home winter storm ready you can contact your local American Red Cross chapter or your local emergency management office for ways to get your home ready for winter.

It is also possible that you may be stuck in a vehicle during a particularly severe winter storm, so it does not hurt to have an emergency kit for your car as well. Your kit should contain: a container of kitty litter, blanket or sleeping bag, small folding shovel, road flares, a small candle, windshield scraper, small first aid kit, jumper cables, as well as candy or energy bars and water in case you get stuck in your vehicle.

MIC Musings

by Robert Thompson, Meteorologist-in-Charge



I'm struck by how far we've come and how far we have to go with our science and services. We've acquired capabilities that we could only have dreamed about a decade ago. The summer of 2014 provided an opportunity to showcase some of those capabilities. It also reminded us of our limitations and how far we have yet to go.

Let's first take a look at a few of those new science/service capabilities. Working in line toward a WeatherReady Nation, the Decision Support Services (DSS) for the July 3rd-4th timeframe were spectacular. Besides dealing with a close passage of Hurricane Arthur and a severe weather outbreak on July 3rd, the office had a profound impact on the nationally visible July 4th Esplanade activities in Boston. Only thing, those July 4th Esplanade activities did not take place on July 4th! Our office advised organizers of a washout expected July 4 due to Arthur's rain shield, and an unprecedented (and wise) decision was made to reschedule the July 4th concert/fireworks to July 3rd, typically the rehearsal day. The 4th was indeed a washout! Yet, the story doesn't end here. DSS on a more tactical level during the evening of July 3rd prompted organizers to adjust the concert and fireworks schedule to allow people to disperse at the end of the program prior to the arrival of a severe thunderstorm (that downed trees in nearby Natick and Wellesley). The weather advice by on-site DSS meteorologist, Matt Doody, and the folks backing him up at the office was spot on. This past summer also featured another DSS success story that involved the antique whaling ship, *Charles W. Morgan*. In response to a request by a fellow NOAA office, the Stellwagen Bank National Marine Sanctuary Office, our office input led to successful decision-making on the sailing of the *Charles W. Morgan* over a six week period.

There are many other success stories from this summer and over the past few years. The DSS provided during the last few winters has enabled state transportation departments to be far more proactive in preparing for and responding to winter storms. It used to be unheard of that schools would be cancelled the night before for a storm that hadn't arrived yet. No more. It's become nearly the norm in many locales for those high confidence events. And don't forget that it was this office that pioneered the concept of snowfall probabilities to communicate our confidence to decision-makers. Pilots and other users now have aviation forecast information for locations not traditionally serviced by aviation forecasts through this office's groundbreaking digital aviation forecast services. And our forecasting of coastal impacts has progressed greatly with new resources. Thanks in large part to the work of student volunteer, Kevin Deneault (see his article in this issue), our web page hosts inundation maps for the entire Massachusetts and Rhode Island coastline. New high resolution models now project developments on a level of detail never before possible. Our Skywarn spotter program has grown to over 6000 people. Through a correlation coefficient parameter, our radar is now able to reliably confirm the presence of a tornado on the ground when debris is being tossed into the air. Recall the Wireless Emergency Alert of a Tornado Warning that undoubtedly prevented injuries and probably saved lives at a sports dome in East Windsor, CT last year. And the list goes on…

Yet, the summer of 2014 also reminded us of how far we have to go. Two tornadoes struck urban areas unwarned (see Hayden Frank's article on the Revere Tornado in this issue). For us as forecasters, having a tornado strike without warning hits us very hard and very personally. After all, saving lives is at the very core of our mission. Thankfully, there were no fatalities with either the Revere or Worcester Tornado, although there were a few injuries (mainly minor) in Revere. In stark contrast to the June 1, 2011 tornado that traveled on the ground for 38 miles and more than an hour in south central Massachusetts, these were very quick spin-ups and short-lived affairs that challenged conventional tornadic storm detection techniques. As with other aspects of our science, we will take on this challenge.

" Yet, the summer of 2014 also reminded us of how far we have to go. Two tornadoes struck urban areas unwarned…[this] hits us very hard and very personally."

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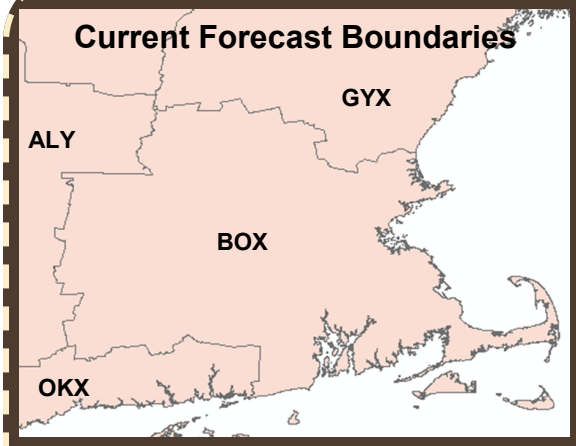
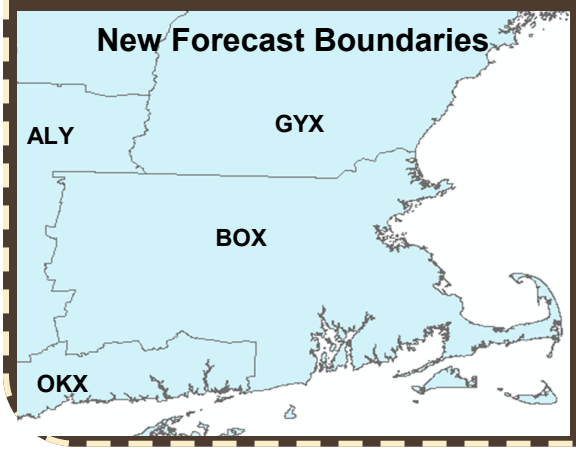
Learn more about the NWS's effort to become a Weather Ready Nation: http://www.nwsnoaa.gov/com/weatherreadynation/

Cont'd from pg 3…MIC Musing

An initiative called "Warning on Forecast" may lead to success in warning for such fast-breaking events, but this will not happen overnight. In the short term, we are studying the environment very closely where these storms erupted to give the forecasters more confidence to issue a warning prior to seeing the telltale tight and deep rotation on the radar. Also, in late August, we updated our Doppler radar with new technology that provides a more frequent look at the lowest levels. The conventional approach has been for the radar to scan the atmosphere at progressively higher elevation angles (and hence observing a storm at progressively higher slices) to the highest elevation angle and then after 4 to 5 minutes start the process over again. Called Supplemental Adaptive Intra-Volume Low-Levels Scans or SAILS (see Joe DelliCarpini's article in this issue), the new technology allows for a more frequent look at the lower levels of a storm, where an incipient tornado may be forming. The hope is that SAILS will help detect those tornadoes that spin-up quickly and only last a few minutes. In the longer term and commensurate with the establishment of high density observation networks, we expect storm scale models of the future to be able to alert forecasters to storms with a high potential to rapidly turn into tornado producers.

In essence I have given a few reasons here why many of us are drawn to this field. We have the excitement of witnessing and being part of advances that do really make a difference in peoples' lives. We are also drawn to the humbling challenge of a science that is still breaking into new frontiers with so much still to learn. The summer of 2014 brought into contrast our satisfaction at applying scientific advances and our awe at knowing how far we have yet to go in the weather discovery journey.





Notification of Change in Forecast Area Responsibilities for Cheshire & Hillsborough Counties in New Hampshire

Effective Wednesday, December 3, 2014 at 800 AM Eastern Standard Time (EST), the National Weather Service (NWS) office in Taunton MA (BOX) will transfer all warning and forecast responsibilities for Cheshire and Hillsborough Counties in NH to the NWS office in Gray, ME (GYX). This transfer will enable more efficient service for the state of New Hampshire. The NWS Taunton office will now only cover north-central Connecticut, Rhode Island and all of Massachusetts except Berkshire County.

This change means that the NWS office in Gray, ME will be in charge of all the warning issuances, TAFs for Manchester Airport as well as issuing the forecast. SKYWARN spotters trained by NWS Boston should be on the lookout for an e-mail by late October or early November discussing the change as well as updated phone numbers and contact information.

For more details check out the following link: **http://www.nws.noaa.gov/os/notification/scn14-48box_gyx_county.htm**

My Volunteer Experience

by Kevin Deneault, GIS Specialist at Salem State University

Ever since I was young I have always aspired to be a Meteorologist. During second grade, I remember completing an assignment in which I dressed up as a weatherman because that was what I wanted to be when I grew up. On that day I got up in front of my classmates and presented the weather forecast. Since then, seventeen years have passed and I am still fascinated with the weather; however due to a Geographic Information Systems (GIS) introductory course that was offered my senior year of high school, I took an alternate route. I received my undergraduate degree in Geography and Regional Planning and currently I am finishing my Masters degree in GIS at Salem State University in Salem, Massachusetts. The GIS class exposed me to many opportunities within the realm of meteorology and because of those opportunities, I was given the privilege to work with the National Weather Service (NWS) in Taunton, Massachusetts.

I have spent a little over a year as a Student Volunteer at the NWS in Taunton. Here, I was given the opportunity to work on an extensive GIS inundation project for the coastal communities of Massachusetts and Rhode Island. The project consisted of utilizing the ArcGIS software, developed by the Environmental Systems Research Institute (ESRI), using LiDAR data to create inundation polygons and depth grids that represent different levels of inundation along the New England coastline. The project provided me with the understanding and knowledge of how vital our coastal region is to us and how coastal hazards can have greater implications beyond our shorelines. This opportunity has allowed me to use technology and visualizations to display a solid product for the NWS. The inundation project will not only improve coastal forecasting, but essentially communicate the severity of flooding and the potential impacts to property and the public's lives.

Besides working on the coastal inundation project, I've had the privilege to shadow meteorologists at the NWS over the past year. This part of my experience has been the most thrilling because I have been able to sit down with forecasters who have trained me on how to use the AWIPS II software to develop short term and long term forecasts. I have also witnessed several weather events during my time at the office. One weather event that grabbed my attention was the Revere Tornado. I remember walking into the building early that morning on July 28th, 2014 and hearing that a tornado may have formed. When I approached one of the senior forecasters, who was closely monitoring the radar at that time, he pointed out a signature on the radar indicating that a tornado may have touched down in Revere. It wasn't your ordinary hook echo like the ones you would see in the middle tier of the country. This EF2 tornado was unique because it touched down during the morning hours and within one scan of the radar it was completely gone. By the end of that afternoon, I was helping out by collecting damage reports and recording them into the storm damage database. The Revere tornado has certainly shown me the importance of teamwork within the forecast office. This is one event that I will always remember as a Student Volunteer for the NWS in Taunton.

I also had the opportunity to assist several meteorologists, hydrologists, and emergency managers, as well as other federal government agencies by helping out with the substantial NART wave run-up project for the New England coastline. The wave-run up project focuses on incorporating parameterizations developed by Hilary Stockdon of the USGS in computing wave-run up models to determine beach erosion, overwash, and inundation, due to wave battery along the New England coastline from tropical or extra-tropical cyclones. Assisting with this project has given me the opportunity to use my knowledge in GIS and inundation mapping, while collaborating with different weather forecast offices and other government agencies across the Northeast.

Inundation Mapping

My experience with the NWS in Taunton has certainly been exhilarating. Completing the coastal inundation project has given me a sense of accomplishment and the ability to visually understand how drastic our coastal region is changing. Helping the NWS develop and improve their coastal inundation mapping is essential for future improvements to coastal hazard mitigation and public awareness. This experience with NWS has been an opportunity that I will never forget and it certainly has opened new doors for my future endeavors.

Visit to a Remote Sensor: Norwood Airport ASOS

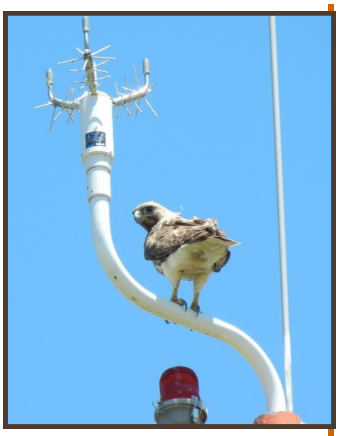
by Mike Esip, Electronic System Analyst

Above: Norwood Airport

This is the second of several articles that will take you to various remote sensors assigned to the Taunton National Weather Service (NWS) County Warning Area. Each article will provide a little information with regards to a site and sensor. In this article you will visit Norwood Airport and the Automated Surface Observation System (ASOS) site there.

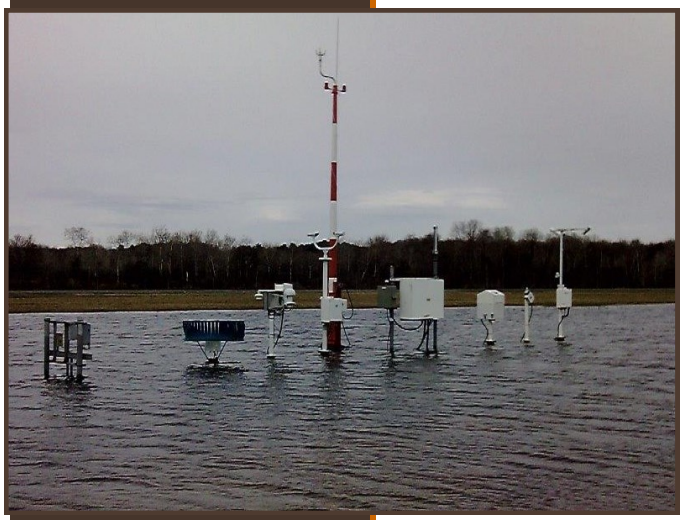
Norwood Airport, also referred to as OWD, is 13 nautical miles southwest of Logan International Airport. It is a publicly owned towered airport of the Town of Norwood. OWD is listed as a Service Level "B" facility and is defined as a Federal Aviation Administration (FAA) ASOS site. What this means is the NWS provides maintenance support to the ASOS equipment that is funded by the FAA. To access the OWD ASOS equipment, NWS technicians must be annually trained for OWD and specifically badged to enter the tower and field areas of the airport.

The Acquisition Control Unit (ACU) is located in a small room at the base of the tower. The ACU is the heart of the ASOS system, with data being acquired from the Data collection Package (DCP), and then distributed to users via FAA AWOS Data Acquisition System (ADAS) comms, dial in phone lines, or Ground to Air (GTA) radio. It also houses the pressure standard used to allow ASOS to report altimeter settings and pressure data.



Above: Hawk perching on the wind system at the Norwood ASOS.

The DCP feeds sensor data to the ACU. At OWD, the DCP is located in the field area adjacent to one of the runways. It consists of Precipitation Gauge, Temperature and Dewpoint, Present Weather, Winds & Obstruction Lights, DCP Cabinet, Ceilometer, Freezing Rain, and Visibility Sensor. Upcoming articles will provide more information on each sensor.



Above: Norwood Airport ASOS underwater .

OWD is one of the ASOS sites frequented by birds that can create issues with the wind system. Sudden significant wind gusts can occur from birds that perch on the wind tower, suddenly fly off.

OWD is also affectionately called Lake Norwood. In 2010, after significant rains, the airport became flooded. OWD sits in somewhat of a bowl. The heavy rains coupled with the merging of the Neponset River and Purgatory Brook caused the entire airfield to become a huge pond. Having nowhere to drain, water engulfed ASOS for close to a month. The power to ASOS was shut down to prevent damage to the system. Approximately three weeks later, when the water receded enough to turn the power back on, the ASOS system came alive again without any issue or problem.

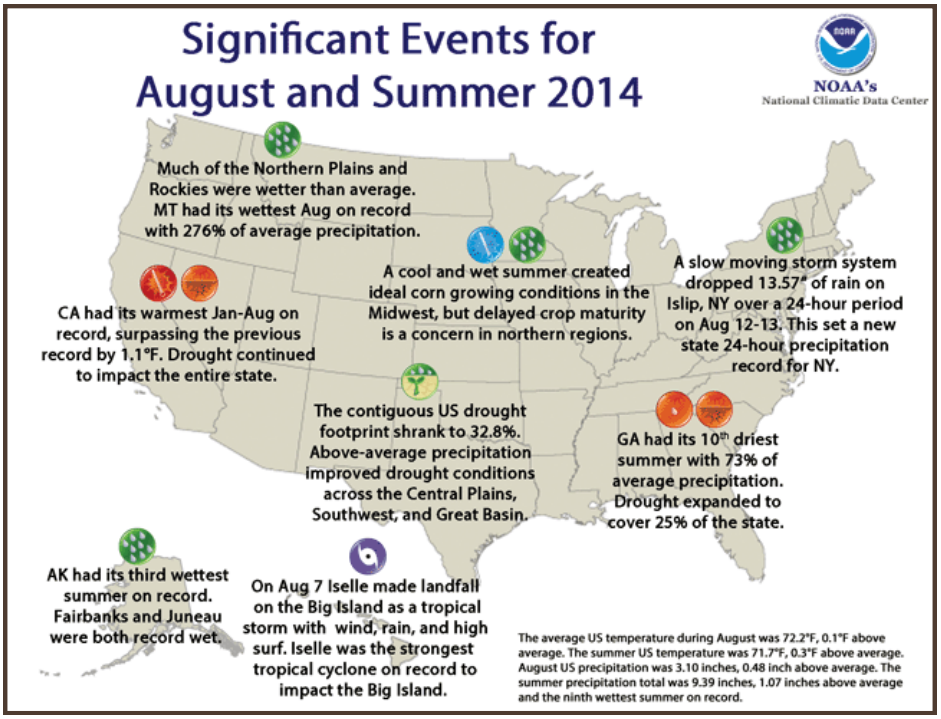
Quarterly Climate Outlook

by Ellen Mecray, NOAA Eastern Region Climate Services Director

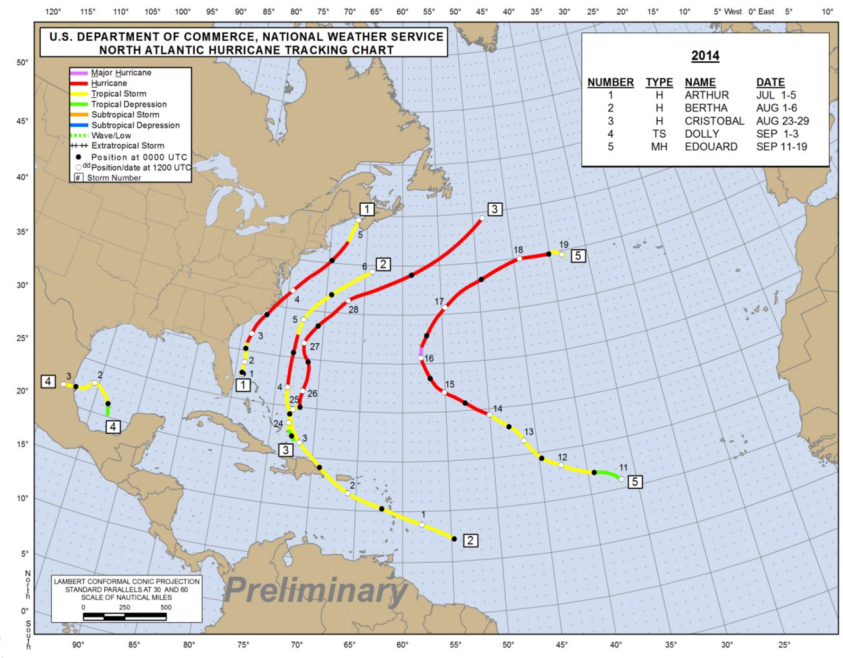
Highlights for the East

Severe storms struck the region throughout the summer. Forty-eight tornadoes touched down, with the majority occurring in July. A tornado in Madison County on July 8 was the second deadliest tornado in New York. A tornado in Suffolk County, MA on July 28 was the first tornado to strike the county since records began. Also, straight line winds of up to 100 mph caused extensive damage. Flash flooding accompanied the storms, as did large hail.

In early July, Hurricane Arthur's storm surge and heavy rain caused flooding in coastal North Carolina and southeastern Massachusetts. Arthur was the earliest hurricane to make landfall in North Carolina since records began in 1851.



On August 12 and 13 extreme rainfall shattered records and caused significant flash flooding across the Northeast. Numerous roads, including major highways, were submerged under feet of water, leaving cars stranded and leading to dozens of water rescues. Also two long-term parking lots of Baltimore-Washington International Airport were partially flooded. At Islip Airport on Long Island, 13.57 inches of rain fell in a 24-hour period. Both Baltimore, MD and Portland, ME received over 6 inches of rainfall.



Above: Current Hurricane Tracks for the 2014 season. (Credit: National Hurricane Center)

Updated 2014 Atlantic Hurricane Season Outlook

The Atlantic hurricane season is still expected to be below-normal, according to NOAA's updated outlook issued on August 7. The updated outlook calls for a 70% chance of a below-normal season. The initial outlook from May called for a 50% chance of a below-normal season. The updated outlook, which includes hurricanes Arthur and Bertha, predicts 7-12 name storms, 3-6 hurricanes, and 0-2 major hurricanes. In comparison, the May outlook predicted 8-13 names storms, 3-6 hurricanes, and 1-2 major hurricanes. The outlook changes are due to the development of atmospheric and oceanic conditions that inhibit storm formation, the expectation that unfavorable conditions will persist through the season, and the likely development of El Nino. So far there have only been seven named storms in the Atlantic: Arthur, Bertha, Cristobal, Dolly, Edouard, Fay and now Gonzalo.

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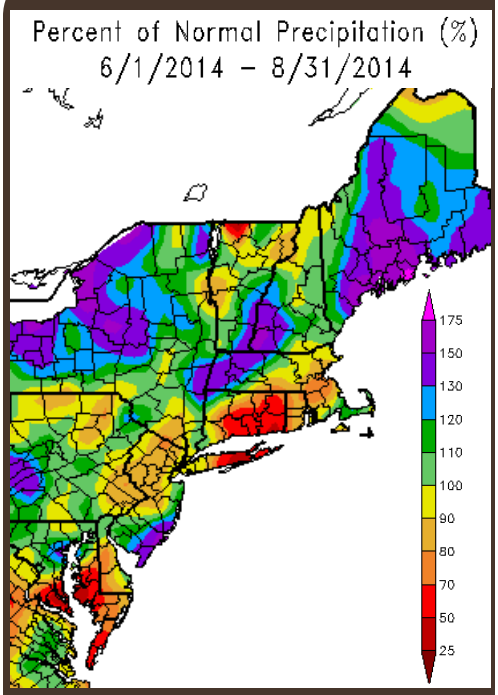


Above: Percent of Normal Precipitation from June 1 - August 31.

"Last winter's cold temperatures damaged up to 90% of buds of some grape varieties ... Due to low grape supply and high demand, New York is allowing wineries to use out-of-state grapes for the first time since 2005."

Temperature and Precipitation Anomalies

The average summer temperature for the Eastern Region was 70.2°F, 0.6°F cooler than normal. Fourteen of the sixteen states saw below-normal temperatures. Maine, however, had its 15th warmest summer on record. June was warmer than normal for all states, with the region 1.0°F above normal. Ten states were cooler than normal during July, with the region 1.2°F below normal. Ohio and West Virginia has their 3rd and 16th coolest July on record, respectively, while Rhode Island has its 19th warmest July. The region ended August at 1.5°F below normal, with Virginia and North Carolina ranking the month among their top 20 coolest.

The Eastern Region picked up 105% of normal rainfall during the summer. Three states ranked the season among their top 20 wettest. South Carolina had its 20th driest summer on record. Ten states were drier than normal in June, but the region ended the month at 100% of normal. Delaware had its 19th driest June on record, while Ohio had its 19th wettest. In July, the region saw 107% of normal rainfall. Ten states were wetter than normal, with five ranking this July among their top 20 wettest. The region received 101% of normal rainfall in August, with nine states drier than normal.

Precipitation Variability

Precipitation was highly variable in the Eastern Region this summer. Coastal Maine received around 145% of its normal summer rainfall, while just to the south, coastal Massachusetts experienced abnormally dry conditions. In Virginia and the Carolinas, rain totals ranged from less than 25% of normal in some areas to more than 200% of normal in other areas in July and August. Locally heavy rainfall affected sites such as Islip, NY; Raleigh, NC; and Portland, ME. Consistent with a changing climate, the frequency and intensity of heavy precipitation events will continue to increase, but so will the annual number of consecutive days. That's because higher temperatures lead to greater evaporation (leading to dry conditions), but a warmer atmosphere can contain more moisture (leading to heavier downpours).

Agriculture

Last winter's cold temperatures damaged up to 90% of buds of some grape varieties in parts of the region. Due to low grape supply and high demand, New York is allowing wineries to use out-of-state grapes for the first time since 2005. The harsh winter also wiped out Ohio's pear crop. The state had to import peaches from South Carolina, which rebounded from a slow start. In some areas, heavy rain caused soggy fields and crop disease, but in other areas, crops were stressed by a lack of rain. While yields varied from farm to farm, corn and soybean harvests in Ohio were expected to surpass last year's record setting numbers by 5-6%.

For the latest weather information, check out:

www.weather.gov/boston

Winter Weather Preparedness Week: November 3rd — 7th

Getting to know your NWS Team:

Glenn Field, Warning Coordination Meteorologist

Above: Glenn Field, Warning Coordination Meteorologist for the National Weather Service Office in Taunton, MA.

Glenn Field has been the Warning Coordination Meteorologist (WCM) for the National Weather Service (NWS) Forecast Office in Taunton, MA since October, 1993. As WCM, he is responsible for ensuring that customers of weather forecasts and warnings are able to receive the products and that they understand what they mean. He gives many presentations to police, fire, emergency managers, and school groups and always listens to suggestions for improvement of services. Glenn is responsible for coordinating and implementing new procedures at the NWS, for the quality assurance of products, and is in charge of the SKYWARN volunteer weather observers program. Also, Glenn works with towns to enable them to become "StormReady," another National Weather Service community preparedness program. For the past 14 years, Glenn has been the main organizer of the agenda for the annual Southern New England Weather Conference.

Glenn has served on many national teams within the NWS, including the Severe Weather Algorithms Team (SWAT) and the Watch By County Team, for which he invented the Watch County Notification (WCN) product – which greatly simplified the way in which customers were notified of which counties were in and out of a severe weather watch. Most recently, he is on the team for improving the icons on the point-and-click web display on weather.gov.

As of this August, Glenn has now worked for NOAA for 30 years! Prior to coming to Taunton, Glenn was a Senior Forecaster at the NWS in Raleigh, NC; a Forecaster at the NWS in Milwaukee, WI; and a Satellite Meteorologist at the National Environmental Satellite, Data, and Information Service's Synoptic Analysis Branch in Washington, D.C. Glenn holds a M.S. Degree in Meteorology from the University of Wisconsin - Madison, where he also received his B.S. in both Meteorology and Economics (the 2 sciences that one can't predict, he jokes.)

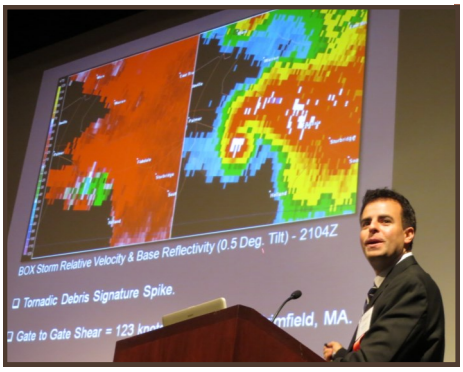
Glenn became interested in meteorology at a very young age. His parents were divorced and he lived with his mother in Cherry Hill, NJ. On the weekends, he would visit his father, a chemical engineer, but who had been a ship's meteorologist in the Navy and held a M.S. in Meteorology from the Naval Postgraduate School in Monterey. On the weekends, his dad would teach him that if you count to 5 after hearing the thunder, the lightning was a mile away. His mother was an elementary school music teacher and helped motivate Glenn to perform in *My Fair Lady* in High School, *Oliver* in a semi-professional theater in NJ, and sing baritone in high school and college choirs and even in a barbershop quartet. Very interestingly, his career ended up being a combination of the two parents, the science side from his dad and the being-in-front-of-audiences side from his mom. Above is a photo of Glenn giving a presentation at the Massachusetts Emergency Management Agency, where he sang an original hurricane preparedness song entitled "Hunker In the Bunker" to the tune of Jethro Tull's *Bungle in the Jungle.*

Glenn married his best friend from high school, Dahlia, and they just celebrated their 29th anniversary this summer. Dahlia is a school teacher in Brockton. They have two wonderful children, Corey and Lauren. Corey recently graduated from the University of Minnesota and works in Boston for a growing virtualization management company. Lauren is attending James Madison University in Virginia, majoring in Marketing and minoring in Music Industry.

Glenn hopes that his legacy will be that he worked well with people and helped them understand warnings and know what to do when severe weather strikes. "If I was able to save a few lives, then my job was worthwhile," he says.

15th Annual Southern New England Weather Conference

By: Matt Doody, General Forecaster



Do you constantly find yourself looking at the weather? You are in luck! Every fall, the Southern New England Weather Conference brings together great national and local speakers on a wide array of topics.

You do not need to be a professional meteorologist to enjoy the topics covered at the conference. Even with a casual interest in weather, the Southern New England Weather Conference is sure to offer topics of interest to you! This year's conference, which is the fifteenth anniversary, will take place on Saturday October 25, 2014. The conference will again be held at Meditech Corporation, at the base of Great Blue Hill in Canton, MA.

The Southern New England Weather Conference started in 2000, and is a non-profit venture that is sponsored by the Blue Hill Observatory, near Boston, the National Weather Service in Taunton, Massachusetts and the University of Massachusetts-Lowell Student Chapter of the American Meteorological Society. It provides a place for weather enthusiasts and professionals to gather and share their knowledge and expertise regarding topics such as winter weather forecasting, severe weather, hurricanes, and advances in the science of meteorology, emergency preparedness, etc. A small fee provides attendees with a full day of educational and entertaining talks from both meteorological and non-meteorological professions along with breakfast and lunch, as well as snacks through the day.

This year, the conference features a myriad of topics including the anniversaries of Carol and Edna, two talks on storm chasing as well as discussions of fire weather and how the weather affects private industry. Ever wonder about the Old Farmer's Almanac? While we may not learn the true secrets, we do have a speaker willing to talk about it.

This year, the conference will also once again feature a panel of local on-air meteorologists who will be answering questions submitted by the guests in advance.

Finally, as a feature keynote, Dr. Phil Klotzbach will be in attendance. Under the guidance of Dr. William Gray, he helps to issue the tropical storm and hurricane forecast each year for Colorado State. In addition to discussing how this forecast is generated he will also discuss how last year's Atlantic season turned out to be relatively meager.

There is still a short time to register, go to: **http://www.sneweatherconf.org** If you are unable to attend this year, we hope to see you in 2015!

Attention teachers: You can receive 10 Professional Development Points (PDPs) for attending the conference, issued by the Blue Hill Observatory.

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Carl Aveni—A Main Voice at WX1BOX Steps Down after 18 Years of Service

By: Robert Macedo, Amateur Radio Coordinator

Above: Carl Aveni's (second from the right in the first row) goodbye party at NWS Taunton. Carl is surrounded by NWS personnel, other amateur radio operators and TV meteorologists.

After 18 years of volunteer community service, N1FY-Carl Aveni, Assistant SKYWARN Coordinator for the National Weather Service (NWS) in Taunton MA, has stepped down from his position earlier this summer. Now that Carl and his wife are retired, they plan on embarking on a journey to travel through Europe over the next year. Afterwards they plan on coming back to the States but continue their travel adventures. We are blessed through the SKYWARN program and the community service it provides to meet people who are as dedicated to this volunteer work, and Carl was one of the highest examples. Carl's accomplishments to the SKYWARN program have been extraordinary.

The NWS Taunton SKYWARN program would not be where it is today without Carl's efforts. He was one of the main operators at NWS Taunton who operated during a large portion of the SKYWARN activations when Amateur Radio Operations were required at NWS Taunton. Carl became experienced with how the weather and storms in New England would impact the region observing and talking with the forecasters at NWS Taunton. Since Carl's retirement from the Brockton VA Hospital in 2008, Carl has probably logged more hours at the NWS Taunton Amateur Radio Station than any of our other operators. Such examples of his dedication were shown during the 2008 Ice Storm, Blizzards in 2009-2011 and 2013, and the March floods of 2010. Many long hours were logged including hours of overnight operations and Carl had the ability to be up through those hours to gather reports. When asked why he wouldn't even take a nap to rest during those major storm events, he would always respond with “sleep is overrated.” He also assisted at countless SKYWARN training sessions both teaching and setting up sessions as well as many SKYWARN presentations at Amateur Radio Club meetings and other group meetings. There are also countless other contributions Carl has made to amateur radio and Amateur Radio Emergency Services (ARES) including support of an Amateur Radio hospital network in Eastern Massachusetts, working with at the EOC in Bridgewater and the FEMA-graded Nuclear Power Plant exercises just to name a few. We will all miss what Carl has done for all of us and his countless contributions in the name of volunteerism, both public and community service. That said, on behalf of NWS Taunton forecasters and the SKYWARN and Amateur Radio community, we wish Carl and his wife farewell, safe and fun travels, and all the best as they begin their retirement journey together. For those who wish to thank and contact Carl directly, you can email him at caave@peoplepc.com and he has setup a blog where he will post highlights of their travels. Carl's blog can be seen at http://aveniadventure.weebly.com/

Above: Rob Macedo (left) & Carl Aveni (right)

Cont'd from pg 3…Carl Aveni Goodbye

We have known that Carl will be leaving us as early as the beginning of this year. To that end, we have been recruiting additional amateur radio operators to serve at NWS Taunton and to help us remotely from their Amateur Radio stations as well. Some of you may have already heard new and different voices at WX1BOX, the Amateur Radio Station at NWS Taunton, over the past 6 weeks or so. Some of these new operators have included KB1MTW-Paul Moss, KB1WFS-Mike Bennett, KB1YMY-Nick Snow and KB1VMZ-Noah Goldstein. We will likely be recruiting additional people within our ranks to provide support for our program. If you are interested, please feel free to contact Rob Macedo-KD1CY: rmacedo@rcn.com.

Summer Season 2014 Review

By: Robert Macedo, Amateur Radio Coordinator

The Summer of 2014 was cooler than normal with many fantastic summer weather days. However it was punctuated at times with several bouts of severe weather including some fairly significant weather events. WX1BOX Amateur Radio Operations' most active periods were in the month of July as well as on the week of August 31st through September 6th. One of the bigger severe weather events was back on July 3rd and 4th when a cold front stalled over the region and combined with Hurricane Arthur's approach to southern New England.

Above: Wind Damage in Wayland, MA on July 3rd. Photo taken by Tom Turner

On July 3rd, a widespread severe weather event with pockets of large hail and wind damage affected portions of Massachusetts and southern NH. Several amateur radio operators had trees down on their cars and homes and one of our amateur operators in Natick, MA lost his antenna system. Hurricane Arthur's influence combined with a stalled out cold front on July 4th allowed for a significant flash flood event and a rare flash flood emergency issuance in New Bedford, MA. Almost 8" of rain fell in the area with widespread 5-7" rainfall amounts in that region. Arthur would come close enough to bring Tropical Storm force conditions to portions of outer Cape Cod and Nantucket Island. In fact, Nantucket Island had a measured wind gust to 62 mph and in Eastham, MA wind gusts to 55 mph were recorded.

On July 7th, scattered to numerous severe thunderstorms impacted north-central and northeast MA. Several microbursts occurred on this day with winds estimated around 90 to 100 MPH in Ashburnham and Bedford, MA. Several tornado warnings were issued that day and while no tornadoes occurred, significant straight-line wind damage did occur and a funnel cloud was spotted near the Fenway Park area of Boston along with numerous reports of large hail.

Above: Tornado Damage in Revere, MA on July 28th. Photo taken by Marek Kozubal

On July 15th, another round of scattered severe thunderstorms affected portions of northern MA with several pockets of trees down along a line extending from Billerica and North Chelmsford through Tewksbury and North Andover, MA. One cell even prompted a tornado warning over southeast NH and Northeast MA. Flash flooding was also reported in parts of Cheshire county NH.

On July 27th, two separate rounds of severe thunderstorms producing wind damage, hail, and flash flooding affected Western and Central MA and Northern CT. During the early afternoon, a funnel cloud was spotted in Springfield, MA followed by several reports of flash flooding in the Worcester Metro area. Later in the day, several rounds of severe thunderstorms occurred causing wind damage and large hail and measured wind gusts at or greater than 58 mph. Some of the areas most affected with wind damage included Agawam, MA and Tolland county CT. Tolland, CT was particularly hard hit with many trees and wires down and roof damage to a restaurant.

Cont'd on page 13

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Above: Tornado damage in Worcester, MA. Picture by Scott Thrasher.

On Monday, July 28th, there was a round of severe weather and flash flooding during the morning hours. This included straight-line wind damage in Needham, Massachusetts from a storm that would later produce the tornado on the border of Chelsea and Revere, MA extending well into Revere, MA. The tornado was EF-2 in intensity causing not only damage to trees and wires but blew out windows and roofs off of structures in town. SKYWARN spotter reports in conjunction with reports from the Revere Police Department zeroed in on the area of most significant damage allowing for faster response to survey the damage. Amateur Radio Coordinators KB1KQW-Jim Palmer and KB1NCG-Marek Kozubal assisted Warning Coordination Meteorologist Glenn Field with the survey damage.

The cell that developed into the tornado in Revere, MA, along with other strong thunderstorms in the area, produced significant flash flooding and major impacts to the morning rush hour. In some cases 3" of rain fell in as little as 30-60 minutes causing numerous road closures and cars stuck in flood waters across the Boston area and the 128/I-95 corridor. Later on the afternoon of July 28th, additional severe thunderstorms formed causing large hail and pockets of wind damage. The Bradley International Airport had a wind gust to 56 MPH with pockets of wind damage in Enfield and Somers, CT. Additional wind damage reports occurred across much of northern MA as a cold front moved through Southern New England.

Over the course of August, the severe weather pattern was more on the quiet side. On August 7th, strong to severe thunderstorms caused a waterspout off the coast of Martha's Vineyard. The weather would turn more active on the week of August 31st as the weather transitioned from summer to a more fall-like pattern.

On August 31st, several strong thunderstorms produced flash flooding in the area before one strong thunderstorm would rapidly intensify over the city of Worcester, MA and would produce an EF-0 tornado. WX1BOX Amateur Radio Operations received reports in real time of trees and large limbs down and the sudden increase in wind speed. SKYWARN Spotter Michael Roescher, who was impacted by the June 1st, 2011 tornado, was near the path of this tornado that occurred in Worcester. In fact, his night camera video was able to grab footage from this Worcester tornado. The footage showed a clearly defined touchdown near the end of the video at the edge of the camera image. His weather station also measured a 46 mph wind gust at his location as the tornado formed. The rapid reporting in real time of damage was critical in the NWS' decision to issue a Tornado Warning. It also helped the NWS to rapidly classify what had occurred in the Worcester, MA area.

The last formal SKYWARN Activation with operations at NWS Taunton occurred on Saturday September 6th. As a cold front approached a hot and humid air mass, severe weather occurred across southern NH and Massachusetts, with reports of wind damage, large hail and isolated flash flooding in this area. Many pockets of wind damage occurred in this corridor with strong microbursts occurring in the Leyden-Bernardston area, the Hollis NH area and in Ipswich, MA. Multiple damage surveys were conducted in these areas determining that winds between 80 to 90 mph occurred in Ipswich, MA and Bernardston, NH with 110 mph occurring in Hollis, NH. In addition, lightning caused 2 injuries that would unfortunately turn into fatalities at Crane Beach in Ipswich, MA. A third person in Lowell, MA was struck by lightning with only minor injuries. SKYWARN Spotters were critical in providing damage reports and information to the National Weather Service.

Below: Wind Damage in Wayland, MA. Picture by Tom Turner.

The 2014 Summer Season was one of the nicest summers as far as weather in recent memory but there were also several bouts of severe weather that affected portions of Southern New England. Amateur Radio and non-Amateur Radio SKYWARN Spotters many times, in cooperation with local public safety and emergency management, provided a very strong situational awareness picture to allow for timely warnings and information on what is actually happening on the ground for the general public. The service provided this year was exemplary and a huge thank you to all who have supported the SKYWARN program during this past summer severe weather season. If interested in joining the SKYWARN Announcement email list sign-up (you don't have to be an amateur radio operator to join): contact Rob Macedo-KD1CY: rmacedo@rcn.com

Setting our "SAILS" to Improve Severe Weather Detection

By: Joseph DelliCarpini, Science and Operations Officer

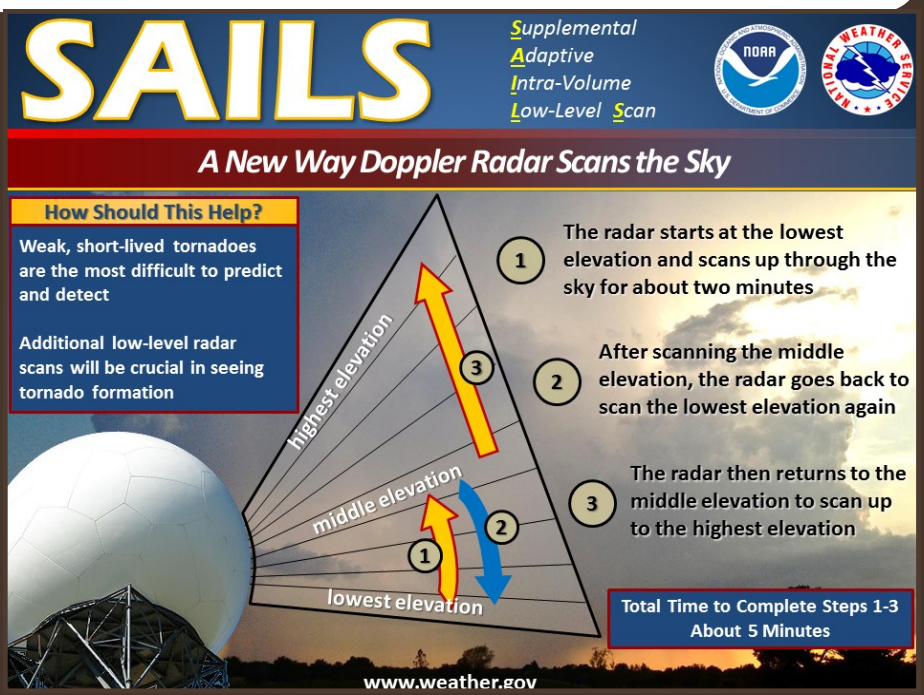
Recently, the Doppler radar in Taunton received new software as part of an upgrade to the national Doppler radar network. Probably the most important of these was the SAILS upgrade (Supplemental Adaptive Intra-volume Low-level Scans) which provides an additional radar scan at the lowest level during severe weather. This additional scan will help forecasters better see a thunderstorm evolve and help in the detection of brief tornadoes.

As you may know, tornadoes in southern New England tend to be short-lived, so this additional scan should go a long way to providing more timely warnings. SAILS was not installed in time to help with the Revere EF2 tornado in July, but was used for the Worcester EF0 tornado in early September. Both touchdowns were very brief, only lasting a few minutes, so the additional data proved to be very useful. Forecasters have also used SAILS in the decision to not issue warnings, since it can provide additional information in more marginal situations.

So how does SAILS work? Depending on its operational mode, the radar scans several different elevations, starting with its lowest scan (0.5 degrees) and working its way upward. When SAILS is active, it will scan the lowest four elevations and then immediately provide a new lowest scan, before returning to scan the mid and higher elevations. In the past, forecasters would have to wait for all elevation scans to be completed before a new lowest scan was done, which typically took about five minutes. Now with SAILS, it only takes about two minutes.

For those who are familiar with the various operational modes of the radars (VCPs, or Volume Coverage Patterns) note that SAILS only applies when VCP 12 or VCP 212 is operational. Those are the standard severe weather modes for the radar. It is not employed for any other VCPs.

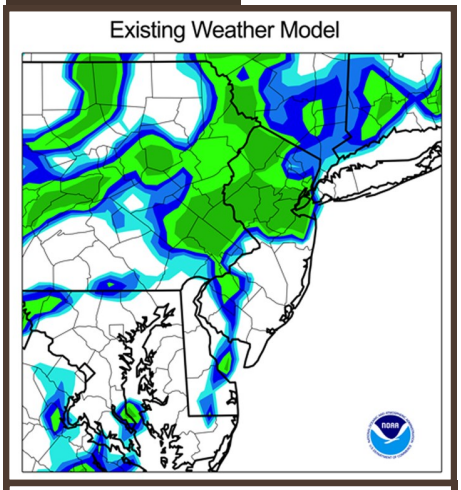
How can you see the additional SAILS scan? If you've looked at images from the Taunton radar during severe weather since late August, then you've probably seen it already! It can be seen on the internet or through smart phone apps, just like you've seen before.

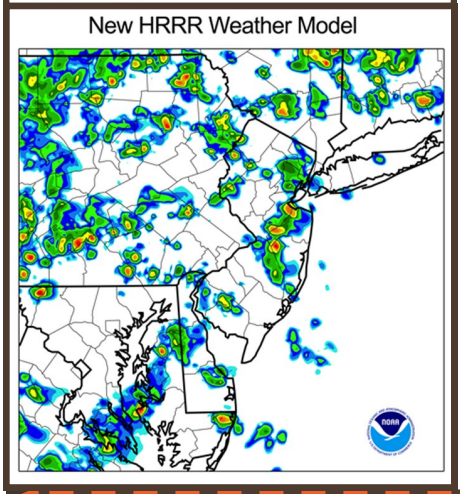


New Weather Model will help Improve the National Weather Service's Short-Term Forecast

By: Stephanie Dunten, General Forecaster & NOAA Public Affairs

On September 30th, meteorologists at NOAA's National Weather Service (NWS) are using a new model that will help improve forecasts and warnings for severe weather events. Thanks to the High-Resolution Rapid Refresh (HRRR) model, forecasters will be able to better identify in locations that are under the threat for hazardous weather. It will also help forecasters provide more information to air traffic managers and pilots about hazards such as air turbulence and thunderstorms.





Developed over the last five years by researchers at NOAA's Earth System Research Laboratory, the HRRR is a NOAA research to operations success story. It provides forecasters more detailed, short-term information about a quickly developing small-scale storm by combining higher detail, more frequent radar input and an advanced representation of clouds and winds. The HRRR model forecasts are run in high resolution every hour using the most recent observations with forecasts extending out 15 hours, allowing forecasters to better monitor rapidly developing and evolving localized storms.

"This is the first in a new generation of weather prediction models designed to better represent the atmosphere and mechanics that drive high-impact weather events," said William Lapenta, Ph.D., director of the National Centers for Environmental Prediction, part of the National Weather Service. "The HRRR is a tool delivering forecasters a more accurate depiction of hazardous weather to help improve our public warnings and save lives."

The HRRR model's hourly output includes more frequent snapshots, in 15 minutes intervals, of the atmosphere. With this information forecasters can better anticipate and predict the onset of a storm and critical details of its evolution, allowing for earlier watches and warnings.

"The HRRR model will provide forecasters a powerful tool to help them inform communities about evolving severe weather," said Stan Benjamin, Ph.D., a research meteorologist at NOAA's Earth System Research Laboratory who led the research team that developed the model. "Being able to warn the public of weather hazards earlier and with greater detail is an outstanding return from NOAA's investment in research and observation systems."

Many NOAA scientists were involved with testing, optimizing, and implementing the model, including experts at NOAA's National Weather Service and its National Centers for Environmental Prediction. NOAA's partners at the Cooperative Institute for Research in Environmental Science at the University of Colorado at Boulder and the Cooperative Institute for Research in the Atmosphere at Colorado State University, Fort Collins helped with development. NOAA researchers partnered with users such as the Federal Aviation Administration, the National Center for Atmospheric Research, and the Department of Energy to significantly improve forecasts for aviation, energy among other industries through the HRRR model.

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The National Weather Service provides weather, hydrologic, and climate forecasts and warnings for the United States, its territories, adjacent waters and ocean areas, for the protection of life and property and the enhancement of the national economy. NWS data and products form a national information database and infrastructure which can be used by other governmental agencies, the private sector, the public, and the global community.

Meteorologist in Charge: Robert Thompson

Warning Coordination Meteorologist: Glenn Field

Science and Operations Officer: Joe DelliCarpini

Editor: Stephanie Dunten

Southern New England Rivers

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