Sterling Reporter

Volume 10, Issue 2 | National Weather Service Baltimore MD/Washington DC Forecast Office | Spring 2011

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MIC's Corner

By, James E. Lee
Meteorologist in Charge

The past month has been a very busy time at our office. Our forecast area has had numerous tornadoes this spring, along with flash flooding and river flooding. From April 26-28 alone, the region experienced 18 tornadoes. Fortunately, there was no loss of life within our area. This is quite a contrast to locations in the southeast United States, where devastating tornadoes struck, killing many people and destroying entire towns. The weather system that struck the southeast with such destruction was the same system that impacted our region. The differing impact between our area and the southeast is related to the timing of when the system moved through the areas. The most destructive of the southeast tornadoes struck in the late afternoon, coincident with peak heating from the afternoon sun. The tornadoes that hit our region were generally in the overnight hours, when peak solar heating is at a minimum. Despite the lack of solar heating to fuel the tornadoes, the wind shear more than made up for the lack of heating to spawn destructive tornadoes, including one EF-2 tornado that occurred in Shenandoah County Virginia.

Damage in Shenandoah County

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Even Better Short Term Forecasts from the NWS!

By, Christopher Strong (WCM) and Steven Zubrick (SOO)

Our office is always looking to improve its weather forecasts. Particular emphasis has targeted improving forecasts of weather parameters occurring in the first day or two. This period in the forecast is what we refer to as the "short term" forecast period (less than 2 days out). Efforts underway here since early 2010 mirror similar efforts underway at several other National Weather Service (NWS) Weather Forecast Offices (WFOs), e.g., Charleston

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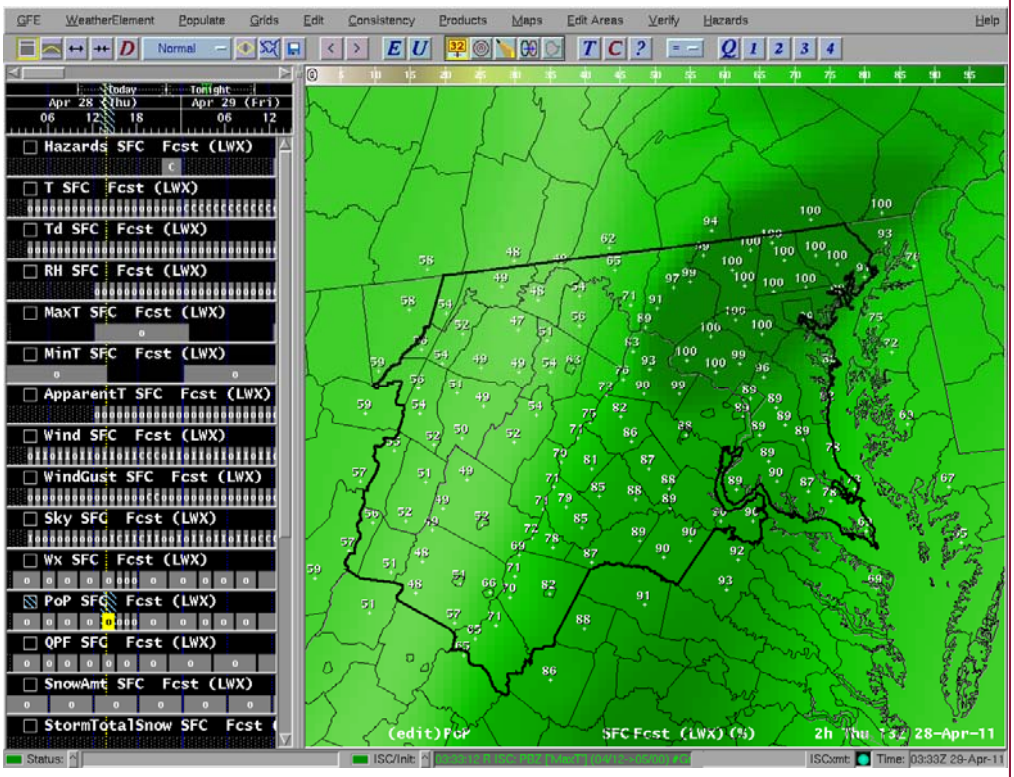
ESTF *(continued)*

WV and Taunton-Boston, MA. The lessons learned during all these early prototype forecast improvement efforts were captured and implemented this spring (2011) among NWS WFOs throughout most of the Eastern U.S. This effort, called "Enhanced Short Term Forecasting" or ESTF for short, is described below. Our goal with ESTF is to provide users with more frequent and accurate forecasts through 30 hours.

In the past, issuance times of NWS forecasts were largely based on the timing of nationally-run meteorological models (computer simulations of the atmosphere). Twenty years ago, these models were run only twice daily. After NWS forecasters had reviewed guidance from these twice-daily models, they issued two major forecast updates – once in the mid afternoon and again during the overnight hours. Typically these forecasts were manually typed into a computer using a word processer. These forecast updates were also timed to meet the (then) typical broadcast news cycles (early morning, and 6 and 11 PM). There were also typically two minor updates in the late evening and late morning. These minor updates made only relatively minor changes to the forecast. Typically, forecasters made minor (tweaking) changes to a few weather parameters (e.g., like sky cover or temperatures), and usually made changes to parameters within the first 12 hours or so of the forecast.

How times have changed! As mentioned in previous newsletters, instead of manually typing up the forecast, forecasters now maintain a gridded database of weather parameters (like sky cover and temperatures) that are used to create forecasts from NWS offices. This NWS gridded database allows users with access to the Internet to create on-demand forecasts for any point in the country.

Another big change – many broadcast news outlets now broadcasts 24/7. Additionally, weather computer models have proliferated and improved and now provide additional model forecasts as frequently as every hour. Add to this mix the veritable explosion of data from remote sensing platforms like satellites, radars, surface weather stations, buoys, etc.; all delivered to the forecaster in minutes and displayed on fast, easy-to-view workstations, and it's easy to see the opportunity to update NWS forecasts more frequently.



A snapshot of the gridded forecast database. Displayed is the Probability of Precipitation Grid.

In all of this, an idea emerged – "Why not have the forecast as accurate and as up-to-date as possible at any given moment?" Enter Enhanced Short Term Forecasting (ESTF)!

Studies have shown meteorologists add considerable value to forecasts when adjusting (and improving upon) the model computer simulations in the short term (out 2 days). While meteorologists do adjust the longer range portions of the forecast (i.e., beyond 2 days), with ESTF, most of their time is now spent with analysis and updates focused in the first 1 to 2 days of the forecast.

During rapidly changing weather in the short term of the forecast, more detail and accuracy is focused there. A major reason to focus on the short term is that is often the time period when most people make their weather-related decisions. For example, *"…will there be softball practice tonight…", "…should I hold off painting my fence since the latest NWS forecast is calling for a 100% chance of rain in two hours…", "…is rain going to change to snow in 6 hours; if so, how much snow will fall..., etc.*).

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ESTF *(continued)*

With our ESTF focus, we now issue forecast updates every three hours. During daylight savings times, these update are available 24/7 at the following times: 430 AM, 730 AM, 1030 AM, 130 PM, 430 PM, 730 PM, 1030 PM, and 130 AM. In addition, the area forecast discussion text product that contains the thinking and rationale behind our NWS forecasts are updated near these forecast issuance times. (*Note: in standard time, forecast updates occur an hour earlier, e.g, 330 AM, 630 AM, etc.*).

In addition to these 3-hourly forecast updates, at anytime should forecasters see a need for a change to the forecast, they can easily update it. They simply make adjustments to affected parameters (e.g., sky cover) in the NWS forecast gridded database, click a button, and all text and image forecast products are recreated and made available to all. This ease in amending the forecast allows for an "*always updated*" forecast to give one the best information to make weather-informed decisions any time of day or night!

With the improvements afforded through ESTF, one should notice forecast wording used in the first couple of days tends to be more definitive. Should Mother Nature stray from what's forecast (i.e., the forecast is going awry), the users should see more frequent updates to the forecast. Finally, forecast information is available hourly on our webpage to let you better plan your day. Just click on our front page map for a forecast, scroll to the bottom, and on the right-hand side, click on the linked labeled "*Hourly Weather Graph*". This link provides a chart of user-configurable forecast weather parameters in graph-like manner in 48-hour increments.

ESTF is just part of the NWS's goal to always give you the best forecasts and weather warnings to help everyone make good weather decisions and to keep everyone safe and protect property.

Towson University is StormReady!

By, Christopher Strong
Warning Coordination Meteorologist

On the first of February, Warning Coordination Meteorologist Chris Strong headed to Towson Maryland to recognize Towson University as Maryland's first StormReady Supporter!

Chris met up with Mark Demski from Baltimore County Emergency Management, Chief of Police Bernard Gerst, and Larry Holbrook and Joe Gregory from Towson University's Office of Public Safety at a press conference in the Minnegan Room on-campus. At the meeting, Chris presented the group with a letter of recognition, a StormReady certificate, and two StormReady Supporter street signs.

From Left to Right: Mark Demski (Baltimore County Emergency Management), Chris Strong (NWS), Chief Bernard Gerst (Towson University), Larry Holbrook (Towson University Office of Public Safety), and Joe Gregory (Towson University Office of Emergency Preparedness)

In order to be recognized as StormReady Supporter, an entity must strengthen their ties with their local National Weather Service office and county emergency management, be able to disseminate weather alerts quickly, and train their people on how to respond to the myriad of weather threats we get in this region. Joe Gregory spearheaded the work, helping spread life saving weather information throughout the university quickly, and training the students and faculty what to do when these emergencies happen.

In Maryland, the National Weather Service directly works with counties to attain StormReady designation. In order to broaden the program however, the StormReady Supporter designation was created to allow StormReady counties to work with entities within their borders to fulfill the goals of the program and continue to make more and more people safe from weather dangers. StormReady Supporters must also have several ways of quickly receiving and transmitting weather warnings to their people, as well a solid training, planning, and strong ties with the NWS and their county.

No community will ever be storm proof, but with their efforts and StormReady Supporter recognition, Towson University will be well prepared for whatever weather threats come their way in 2011 and beyond. Congratulations to the Towson Tigers!

Spring Media Workshop

By, Christopher Strong
Warning Coordination Meteorologist

On April 14th, NWS Baltimore/Washington hosted our annual spring media workshop for our media partners. The workshop included broadcast meteorologists from Washington and Baltimore, to Charlottesville, Winchester, and Hagerstown. We conduct these winter and spring workshops annually to strengthen ties with those who are most directly responsible for getting weather information out to the public. If we all are sharing and communicating similar information, then people will hear a similar message and be more likely to take action when life threatening weather events roll through our area.

Much of the workshop time this time was devoted to a discussion about NWS storm surveys and a discussion about squall line tornados (called QLCS – Quasi Linear Convective System – tornadoes by meteorologists). The presentation on NWS Storm Surveys gave the broadcast meteorologists insight on how and when the NWS conducts ground surveys for storm damage. Typically, the NWS conducts a ground survey when evidence collected at the office is inconclusive as to what caused weather related damage. Ground surveys can help make determinations as to whether thunderstorm damage was caused by extreme microbursts (AKA straight-line winds) or a tornado. Typically in our region, microbursts are more than 10 times more common than tornadoes.

The other discussion that dominated the day was a presentation on squall line (or QLCS) tornadoes. As radar data becomes more and more refined, we as meteorologists are now seeing things that were relatively unknown before. Squall line tornadoes are somewhat different than what most people would call "classic" or "supercell" based tornadoes. How we warn the public for these tornadoes which are much quicker to form and dissipate brought about many good points from the group - a

From Left to Right: Jim Lee (NWS), Brian van de Graaff (WJLA), Lauryn Ricketts (FOX5), Cassie Behofist (TV3 Winchester), Drew Tuma (TV3 Winchester), Topper Shutt (WUSA), Steve Rudin (WJLA), Chris Smith (WHAG), Vytas Reid (FOX45), Bob Ryan (WJLA), Doug Kammerer (WRC),Steve Zubrick (NWS), Eric Pritchett (NBC29), John Collins (WBAL)

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Early March Brings Back-to-Back Heavy Rain Events

By, Jason Elliott
Senior Service Hydrologist

After a rather dry and relatively snow-free winter, it appeared we might escape the spring of 2011 without flood threats like what was experienced in March 2010. That is, until the weather pattern shifted in early March to one more favorable for heavy rainfall.

The Monocacy River overflowed its banks onto Michaels Mill Road near the Buckeystown community in Frederick County, MD on Monday, March 7th. Photo by Jason Elliott.

The first event dampened the opening weekend in March. Some rain fell on Saturday March 5th, especially on the east-facing slopes of the Blue Ridge and Potomac Highlands, but the main event was Sunday March 6th, as a slow-moving cold front traversed the area. The upslope rain continued, and a line of heavy rain developed, nearly stalling just west of the I-95 corridor in Northern Virginia. Rainfall totals were around three inches in those heaviest areas, including parts of Page, Augusta, Fauquier, and Loudoun Counties. Most locations received one to two inches of rain, with the lightest amounts in the eastern West Virginia panhandle.

Floodwaters from Conococheague Creek cover Walnut Point Road north of Williamsport on Friday, March 11th. Photo by Brandon Peloquin.

Flooding during this first rain event was mostly confined to the region where the heavy rainband stalled, but high water did affect the Monocacy River from Bridgeport down nearly to the Monocacy Aqueduct. NWS employees surveyed this flooding on March 7th, finding several roads and parks near the river flooded, including the one pictured above. Surveys like these help us provide you with detailed impact information when a flood warning must be issued for the river.

The greatest impact of the March 6-7 event, however, was an increase in soil moisture, which led to an increased flood threat when another system followed quickly behind on March 9th and 10th. The most prolonged and heaviest rain with the second event occurred in the Baltimore Metro area. Although the rain was mostly moderate in nature, the dura-

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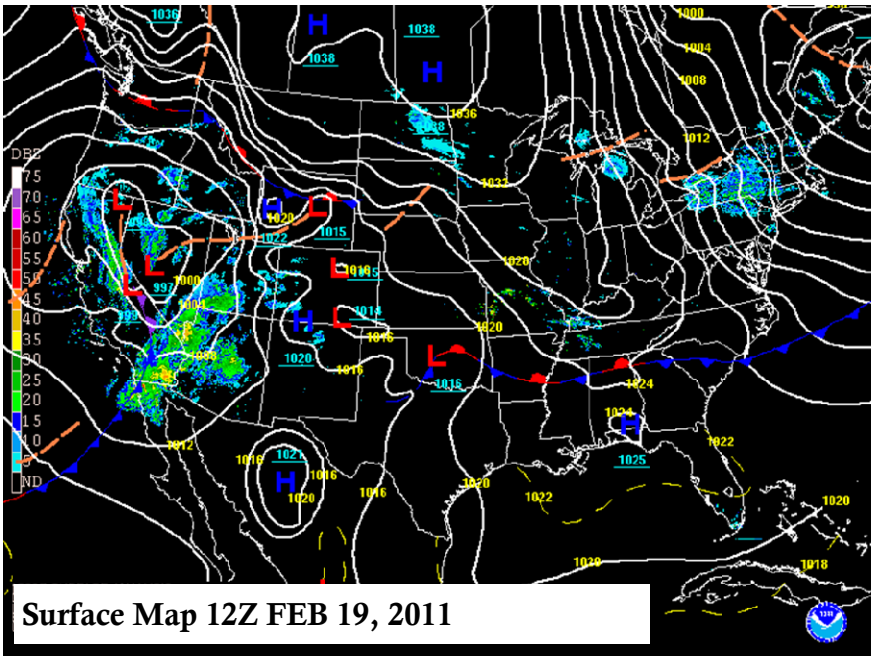
Strong Winds in February

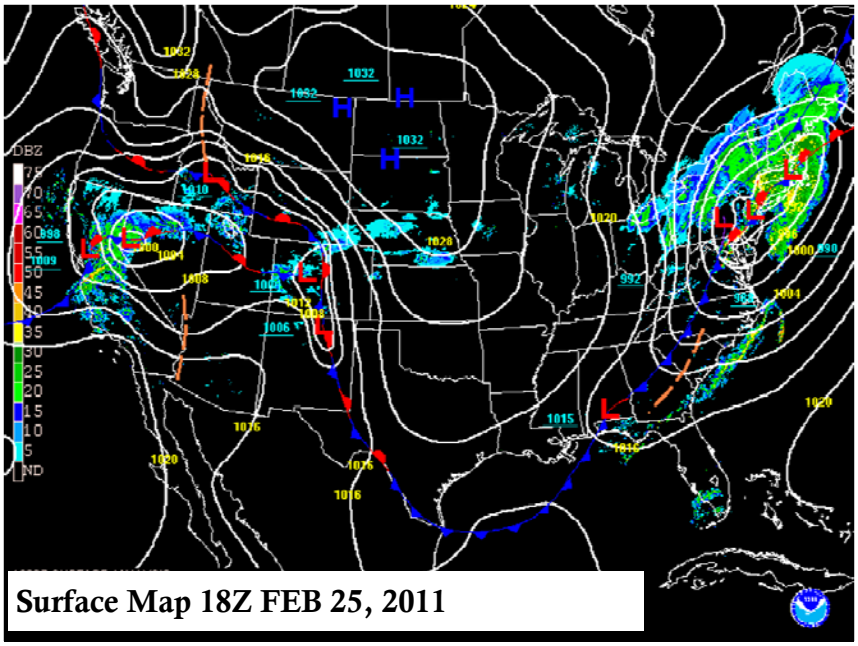
By, Bryan Jackson
General Forecaster

A particularly windy 2010/2011 Mid Atlantic winter culminated with the two most significant wind events of the season in mid to late February: on the 18th/19th and the 25th. Between mid November 2010 and the end of February 2011, the Sterling WFO issued 15 wind advisories and three high wind warnings. All of these wind headlines were issued because of the potential for high wind gusts (as opposed to sustained wind); the gust criterion for a wind advisory is 46 to 57 mph and 58 mph or greater for a high wind warning. Non-thunderstorm wind damage may also be used to verify wind headlines. Wind headlines in the Sterling WFO forecast area are most frequently issued for locations along and west of the Blue Ridge Mountains due to greater winds occurring along exposed ridgelines. However, many of the wind headlines this winter covered the entire Baltimore/Washington forecast area. The District of Columbia alone experienced 10 wind events; 8 that met wind advisory criteria and 2 that met high wind warning criteria.

Let's take a closer look at those two high wind events from February. On February 18, a strong low pressure system occluded as it moved northeast from the northern Great Lakes to northern Quebec. Canadian air spilled southeast behind this system, with a cold front crossing the Mid Atlantic that night. By the 19th, a strong surface pressure gradient had setup across the eastern U.S. between a high pressure ridge extending from the Canadian Prairies to the Tennessee Valley and a new low forming along the occlusion over the Canadian Maritimes (see image below). The result was a strong northwesterly wind across the Mid Atlantic. Reports of 50 to 60 mph winds were common across the region, including two 53 mph gusts at DCA and 55 mph gusts at both BWI and IAD. There were several reports of trees down along with some structural damage due to the strong winds. Strong gusts around 9:10am caused roof damage at a Hazmat center in Bel Air, MD and brought down the National Christmas Tree at the National Mall around 10:55am. The combination of dry continental air and strong, gusty winds also resulted in a particularly dangerous fire weather situation. Multiple brush and forest wild fires occurred.



Surface Map 12Z FEB 19, 2011



Surface Map 18Z FEB 25, 2011

The next high wind event occurred one week after the first event. From February 24 to 25, a rapidly developing low pressure system moved from the southern Great Plains to the Gulf of Maine. The low crossed western Maryland early in the morning of the 25th, sending a trailing cold front through the central Mid- Atlantic

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Spring Media Workshop *(continued)*

discussion that will continue as we continue to learn more and more about these transient, but dangerous events.

Other topics covered included information on the standard watches and warnings that we issue during the warm season – including those for heat and hurricanes, as well as our Special Marine Warnings.

Most importantly, there was plenty of time for good discussion between the NWS and our media colleagues on how we can work together most effectively to minimize the impact of weather events on our region. The National Weather Service strives to work seamlessly with the broadcast media community, giving people the consistent and accurate weather information they need to make decisions that will keep themselves and their families safe.

Spring Severe Weather Workshop

By, Matthew Kramar
Senior Forecaster

WFO Sterling held its annual Spring Severe Weather Workshop on 6 April. This internal workshop is conducted to help refresh staff on severe weather operations and to provide a forum to educate staff on new science, techniques and models related to severe thunderstorms and tornadoes.

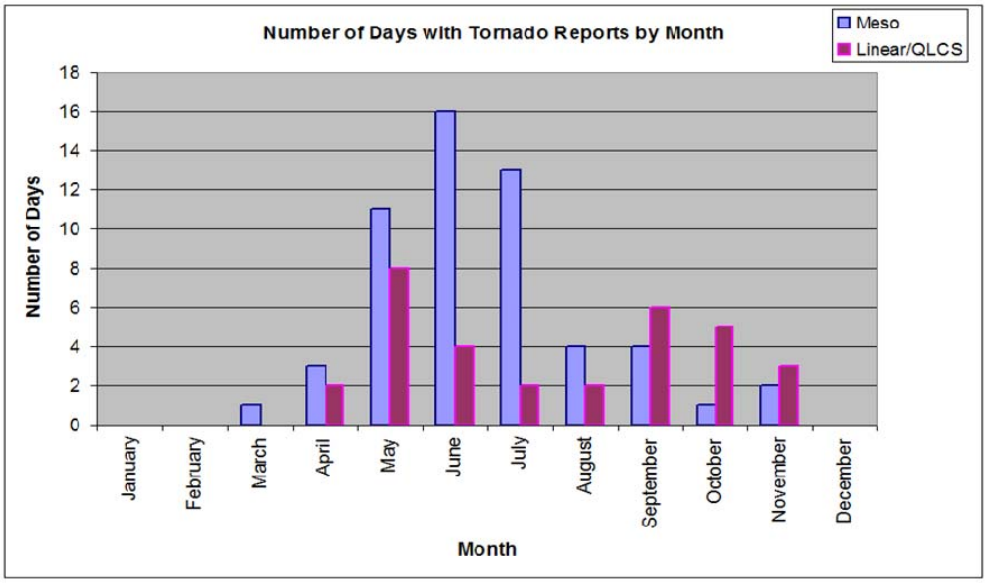
This year's workshop focused on environmental awareness in all aspects of severe weather operations. Presentations on anticipating flash flooding and damaging wind potential were made, and a series of presentations focused on reviewing the latest science in understanding tornado development and on forecasting environments favorable for tornado development.

In particular, a local study by Senior Forecaster Matthew Kramar and Summer 2010 student volunteer Kyle Olmstead presented forecasters with an updated climatology of tornadoes by the type of storm that produced them. This study also used historical upper air observation datasets to create composite maps by storm type that showed weather patterns that are favorable for tornadoes in the WFO Sterling forecast area.

An in-depth analysis of quasi-linear convective systems (QLCSs) also was made to provide forecasters with the latest research and conceptual models of these often-damaging storms. The term QLCS is used to describe thunderstorm complexes with organized, linear structures, like bow echoes or squall lines. In fact, these systems typically are responsible for a large number of early season (spring) and late season (fall) tornadoes in the Mid-Atlantic region (see bar graph). QLCS tornadoes typically are very difficult to detect, so it is vital for forecasters to anticipate environments that support their formation and to understand the mechanisms through which they form.

There is typically a minimum in severe weather occurrence during the winter, but this winter brought several severe weather episodes to the Mid-Atlantic, including ones in mid-November, December and February, and the first December tornado to occur in the WFO Sterling forecast area since 1950.

Perhaps needless to say, it has been a challenging winter on the forecasting front! But this important annual workshop ensures that forecasters are ready to transition from winter weather forecasting to severe thunderstorm forecasting when the time arises.



18-year monthly distribution of tornado days by storm type: mesocyclonic (supercell) tornadoes and tornadoes generated by linear storms (QLCS)

March Heavy Rains *(continued)*

tion led to fairly significant flooding in Baltimore and Harford Counties, including the evacuation of some areas. Widespread rainfall of 3 to 4 inches occurred in Baltimore City and Baltimore and Harford Counties. Elsewhere, totals were mostly between one and a half and three inches. Given the wetter soils, even the lower amounts were enough to cause widespread flooding across the region, both of small streams and larger rivers. Aside from the event in the Baltimore metro, most of the flooding was minor, but did affect a large swath of the lowlands along the Potomac River from just downstream of Harpers Ferry all the way through the District of Columbia.

Again, NWS employees traveled to visually survey several areas following this rainfall, improving impact information along Conococheague Creek and portions of the Potomac and Rappahannock Rivers. On page 5, you can see a picture of Conococheague Creek north of Williamsport, where water from the creek flooded portions of Walnut Point Road and Kemps Mill Road.

MIC's Corner *(continued)*

Earlier this month, our office partnered with the Patuxent River Naval Air Station in Lexington Park, MD, to host the Hurricane Awareness Tour. Craig Fugate, the Administrator of the Federal Emergency Management Agency, spoke at event. One of his primary points was for people and businesses to expect the unexpected, and be prepared. As we enter the 2011 Hurricane Season on June 1st, please make a hurricane plan for yourself, your family, and your business. Be aware of weather forecasts, outlooks, watches, and warnings from our office. Our area will be impacted by a tropical system sooner or later; we are unable to tell you when and where, but history has shown that it does happen periodically. In the past 10 years, we've been hit by the remnants of Hurricane Ernesto in 2006 and Tropical Storm Isabel in 2003. On average, the Chesapeake Bay region is impacted by a tropical system once every 5 years.

Unfortunately, our 3rd Biennial Open House that was scheduled to take place April 30-May 1, 2011, had to be postponed due to budget uncertainties. I hope to be able to reschedule it later this fall.

If you have any questions, feel free to call me at 703-996-2200, extension 222, or email me at James.E.Lee@noaa.gov.

Hurricane Hunter Plane at Patuxent River NAS

Strong Winds *(continued)*

region into that afternoon. Behind this system, a strong surface pressure gradient between a large area of high pressure across the central U.S. and the developing low pressure moving toward New England (see image below) lead to strong northwesterly winds for the Mid-Atlantic states. Reports of 55 to 65 mph winds were common across the region, including a 58 mph gust at Reagan National Airport, a 59 mph gust at Dulles Airport, and a 60 mph gust at Baltimore-Washington International Airport. With higher wind gusts reported than in the event a week before, there were more widespread reports of downed trees, structural damage, and power outages. At least 125,000 people lost power that day in Fairfax County, the District of Columbia, and Baltimore City alone.

Snapped National Christmas Tree Photo By: Evan Vucci, Associated Press

Attention Mobile Phone Users!

By, Bryan Jackson
General Forecaster

Did you know that the National Weather Service offers a simplified version of our website, geared for use on cell phones with browsing capability? Visit http://mobile.weather.gov for a quick loading page to access basic weather and forecast information. Once there, you can enter your zip code for your counties Zone Forecast, scaled down images of radar and satellite, see any headlines in effect for your county, and even read the Area Forecast Discussion from the local forecast office. Also from the mobile page, you can access observations by site or by state, outlooks and discussions from both the Storm Prediction Center and National Hurricane Center, and marine forecasts and observations. While now prevalent 3G and 4G phones can easily handle the main http://weather.gov site, it is nice to have a simple website to access, particularly in areas of low connectivity. Also, the mobile page may work better for you in those rare instances that the main site is bogged down with particularly high traffic during large scale weather events. Check out http://mobile.weather.gov today!

NWS Baltimore/Washington Forecast Office Hires Two New Electronic Technicians

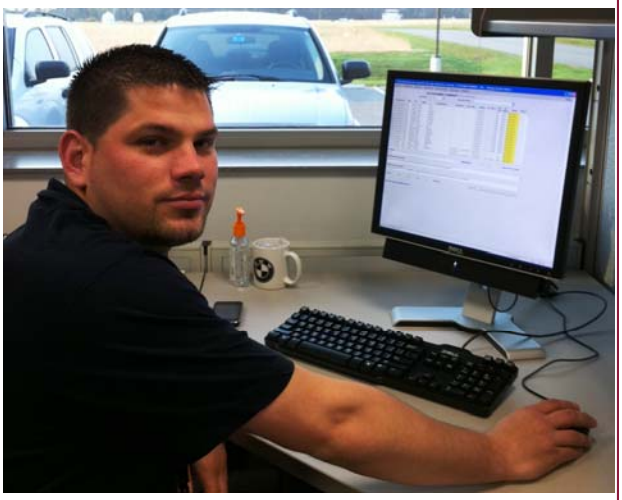
By, Nikole Winstead Listemaa
Senior Forecaster

Dave Eckberg

In January, Dave Eckberg and Mike Baldwin were hired to fill two vacancies within the Electronics Shop at NWS Baltimore/Washington Forecast Office. Dave and Mike were both contractors for the National Weather Service and had extensive experience maintaining Upper Air, Cooperative Observer, hydrology and **A**utomated **S**urface **O**bserving **S**ystem equipment.

While in the United States Air Force, Dave worked on Wideband (microwave) Radio Equipment while stationed in Germany and Mississippi. After the military, Dave worked at the Help Desk at USAF at Andrews Air Force Base supporting computer mainframes and desk top computers. Dave eventually became a contractor for the NWS at the Sterling Field Support Center, researching and maintaining all types of weather sensors.

In addition to his electronics job, Dave is currently working on his Bachelor of Science Degree in Computer Network Security. On his time off, he enjoys many outdoor activities including fishing, camping and hiking.



Mike Baldwin

After graduating High School, Mike Baldwin joined the United States Marine Corps. While on active duty, he attended Basic Electronics and Ground Radio Repair at the Marine Corps Air Ground Combat Center in Twentynine Palms, California. Mike was the Electronic Technician Shop Chief at Quantico, Virginia where he trained USMC officers on how to run an Electronics Shop. After leaving the military, Mike became a contractor for the NWS at the Sterling Field Support and maintained equipment for the **R**adiosonde **R**eplacement **S**ystem and ASOS.

Carrie Larsen Hired as Meteorologist Intern

By, Nikole Winstead Listemaa
Senior Forecaster

Carrie Larsen was hired earlier this year as a Meteorologist Intern at the National Weather Service Baltimore/ Washington Forecast Office. Carrie had previously worked at the NWS Office in Juneau, Alaska as a Meteorologist Intern since September 2009. She moved here with her husband Paul, who is also a Meteorologist at the National Transportation Safety Board.

Carrie loves horses and rode competitively in horse/jumper competitions from 1998-2005. Carrie and her husband just bought a small horse farm south of DC, where they raise their three horses.

Skywarn Reporting Procedures

1. **Tornado or Funnel Cloud**
2. **Storm Rotation**
3. **Hail (any size and depth on ground)**
4. **Wind 50 MPH or greater (measured or estimated)**
5. **Wind Damage (downed trees and/or powerlines, structural)**
6. **Snow Accumulation (every two inches, storm total)**
7. **Ice Accumulation (any ice accumulation)**
8. **Heavy Rain (measured 1 inch, storm total)**
9. **Flooding (water out of banks and/or covering roadways)**
10. **Time of event & location**

How to report:

Telephone: 1.800.253.7091

Amateur Radio: WX4LWX

This is very time critical information that needs to be relayed to the forecaster **immediately**. Give the person on the phone/radio your name and spotter number.

If you absolutely cannot get to a telephone to relay a report or to email ***delayed*** reports and storm totals: **LWX-report@noaa.gov**

weather.gov/washington OR

weather.gov/baltimore

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