

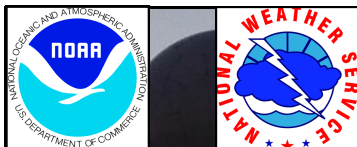
# SPECIAL OPEN HOUSE 2016 EDITION

## Sterling Reporter

Volume 16, Issue 1

National Weather Service Baltimore MD/Washington DC Forecast Office

Winter 2015/Spring 2016



### MIC's Corner

By, James E. Lee  
Meteorologist in Charge

If someone would have told me ten years ago that the mid-Atlantic region would be able to have an accurate 6-day notification of a major winter storm, I would have been amused. However, the forecast success of the January 2016 Blizzard was not only a testament to the increase in skill of our numerical weather prediction models, but also to our excellent staff. Early in winter 2015-2016, staff members here in Sterling developed an experimental product that provides an outlook for winter storms 4-to-7 days in advance, combining forecaster confidence and potential impact to the region. Starting in early January 2016, this experimental product was issued daily by our staff, and saw a lot of exposure due to the blizzard as it was used in social media posts by the Washington Post and CNN. This product is one example of how the community can become aware of hazardous weather, and then make good decisions to reduce the impacts from hazardous weather.

***Building Community Awareness to Reduce Hazardous Weather Impacts*** is the theme of our 2016 Open House. We are once again opening our doors for a Public Open House on the weekend of April 30 – May 1. You can get more detailed information at this website, including a schedule of presentations:

<http://www.weather.gov/washington/openhouse>

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## Open House

*“Building Community Awareness to Reduce Hazardous Weather Impacts.”*

*April 30th-May 1st, 2016*

You will have the opportunity to tour our facilities and see how we produce our forecasters, observe weather-balloon launches, listen to one of our weather seminars, and visit exhibits from our partners in ensuring a safe and weather prepared community. In addition, if you have ever had the interest in becoming a storm spotter, we will be hosting two SKYWARN classes during the weekend.

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*MIC's Corner (continued)*

I hope you can block out an hour or two on Saturday, April 30 or Sunday, May 1 to visit our office, and get a glimpse of what we do here and meet our staff. Additionally, on Saturday, April 30, there will be a Weather-Ready Nation Ceremony, with words of wisdom from Congresswoman Barbara Comstock (Virginia-10<sup>th</sup> District); National Weather Service Director Dr. Louis Uccellini; Doug Hill, Chief Meteorologist at WJLA-TV; Kevin Johnson, Director of Emergency Management for Loudoun County Virginia; and yours truly.

Since our last issue of the Sterling Reporter, the Baltimore/Washington Weather Forecast Office (WFO) has had several staff changes:

Departures: Ken Widelski, Emergency Response Specialist Meteorologist, transferred to the NWS National Operations Center in Silver Spring, MD. Calvin Meadows, Observation Program Leader, retired after more than 38 years of federal service.

Arrivals: Our office has hired two new staff members over the past year: Tina Harris, Administrative Support Assistant, joined our ranks via NASA, and General Forecaster Mike Muccilli joined our staff from the Burlington, Vermont, National Weather Service Office.

If you have any questions, please call me at 703-996-2200, extension 222, or email me at [James.E.Lee@noaa.gov](mailto:James.E.Lee@noaa.gov).

**Winter 2015-16**

*By Dan Hofmann,*

*Meteorologist/Climate Program Leader*

Winter started out with a record-shattering warm December, and then managed to end with well above normal snowfall **and** temperatures, thanks in large part to one big blizzard in late January.

Site	December 2015 Monthly Average Temperature	Previous Record
DCA	<b>51.2° F (11.5° F above normal)</b>	45.6° F (set in 1889 and 1984)
BWI	<b>49.0° F (12.3° F above normal)</b>	46.0° F (set in 1889)
IAD	<b>48.7° F (12.1° F above normal)</b>	43.3° F (set in 1984)

Site	January 23 <sup>rd</sup> -24 <sup>th</sup> 2016 Snowfall	Rank (PRELIMINARY) For 2-day snowfall
DCA	<b>17.8 inches</b>	4 <sup>th</sup> (tied with Feb 5-6, 2010)
BWI	<b>29.2 inches</b>	<b>1<sup>st</sup></b> (previous largest was 26.8 inches Feb 16-18, 2003)
IAD	<b>29.3 inches</b>	2 <sup>nd</sup> (largest was 32.4 inches Feb 5-6, 2010)

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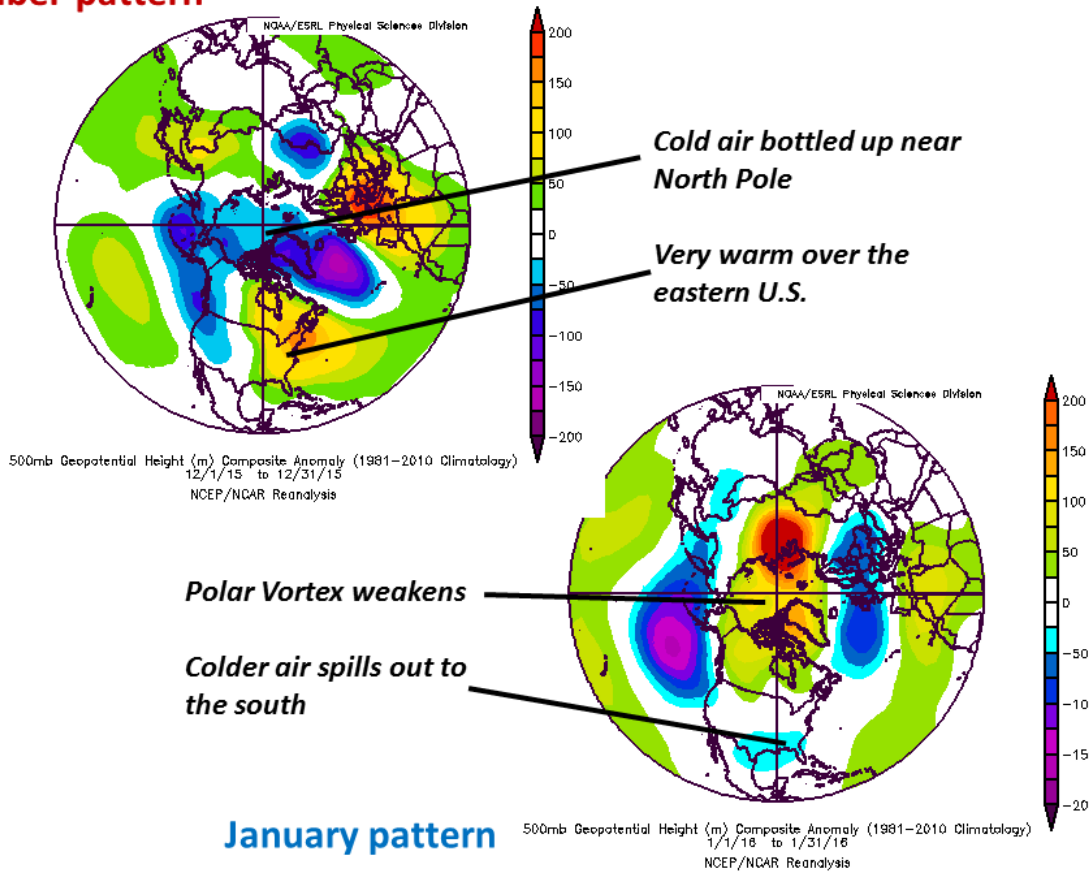
***Winter 2015-16 (continued)***

Meteorological winter begins December 1<sup>st</sup> and runs through the end of February, which climatologically is the coldest 3-month period of the year. This differs from the astronomical winter which begins in late December and ends in late March. So when you hear of winter statistics, unless otherwise noted, it's talking about a 3-month average for December, January and February.

The overwhelming climate signal this past winter was a strong El Niño, or much warmer than normal water in the central and eastern equatorial Pacific Ocean that alters the state of the atmosphere. El Niño patterns often bring milder air since they strengthen the subtropical jet stream that originates over these warmer-than-normal waters. Additionally, a very strong polar vortex was observed to start the winter season. The polar vortex is a permanent wintertime counter-clockwise circulation usually directly over or very near the North Pole driven by differences in temperature between higher and lower latitudes. The stronger the polar vortex is, the more it keeps cold air bottled up near the Polar Regions.

These two forces fed off of each other and flooded not only the Mid-Atlantic but much of the United States with record warmth in December. The pattern then reversed in January when the Polar Vortex weakened, allowing colder air to spill south.

**December pattern**



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***Winter 2015-16 (continued)***

February wound up being a highly variable month with periods of both well above and well below normal temperatures. Overall, it averaged above normal for the month.

Contrary to typical El Niño years, January was the snowiest this time around, not February. In fact, January 2016 ranked as the 8<sup>th</sup> snowiest January on record for Washington, DC, the 3<sup>rd</sup> snowiest in Baltimore, MD, and the 2<sup>nd</sup> snowiest at Dulles Airport, again thanks almost entirely to that one big storm.

March of 2016 broke the consecutive stretch of colder and snowier than normal Marches that began back in 2013. The previous 3 starts to meteorological spring (which begins March 1st) had all been cold and snowy. But March 2016 ended with well above normal temperatures and below normal snowfall.

April looks to start out much cooler than normal, but the cool pattern should be brief with milder air returning by mid-month.

Our next issue will highlight the long range outlook for the upcoming summer and hurricane season.

For the latest climate outlooks, please visit NOAA's Climate Prediction Center website at [www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov).

**January 22-23, 2016 Blizzard Recap**

*By Andrew Woodcock, Lead Forecaster*

One of the amazing things about this storm was that just a few weeks prior, due to the effects of El Niño, Washington DC and Baltimore both experienced their warmest end of the year in history – with average temperatures for the last ten days of almost four degrees warmer than had previously ever been recorded. On both Christmas Eve and Christmas Day Baltimore topped 70 degrees. DCA's four day average temperature for December 24-27 was 61.5 degrees. Perhaps most impressively Dulles broke its lowest maximum temperature recorded on a December 25 by 21 degrees! The 63 degree reading was also the warmest low temperature ever recorded in the month of December at Dulles.

The weather began to turn January 17th, when low pressure brought a mix of snow and rain to the Mid Atlantic. On the 20<sup>th</sup> a cold front brought an inch of snow to Washington DC metro area and caused temperatures to fall back below freezing leading up to January 23.

Low pressure developed along the Texas-Louisiana border on the afternoon of January 21. At the same time arctic high pressure descended on the eastern US. This provided a feed of cold air into the Mid Atlantic. On the afternoon of the 22<sup>nd</sup> the low moved off the Georgia coast. Snow began to fall that morning in the central Shenandoah Valley. By mid-afternoon it moved into the DC metro area, becoming extremely heavy across the entire region by early evening, and continuing throughout the night. On the morning of the 23<sup>rd</sup> the low was located just east of Cape Hatteras. Snow continued to pile up at 1-2 inch per hour rates. It came to an end during mid-afternoon in the central Shenandoah Valley, but continued until around midnight north of the Potomac River to the Pennsylvania border as the low tracked northeast of the Delmarva.

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***Blizzard (continued)***

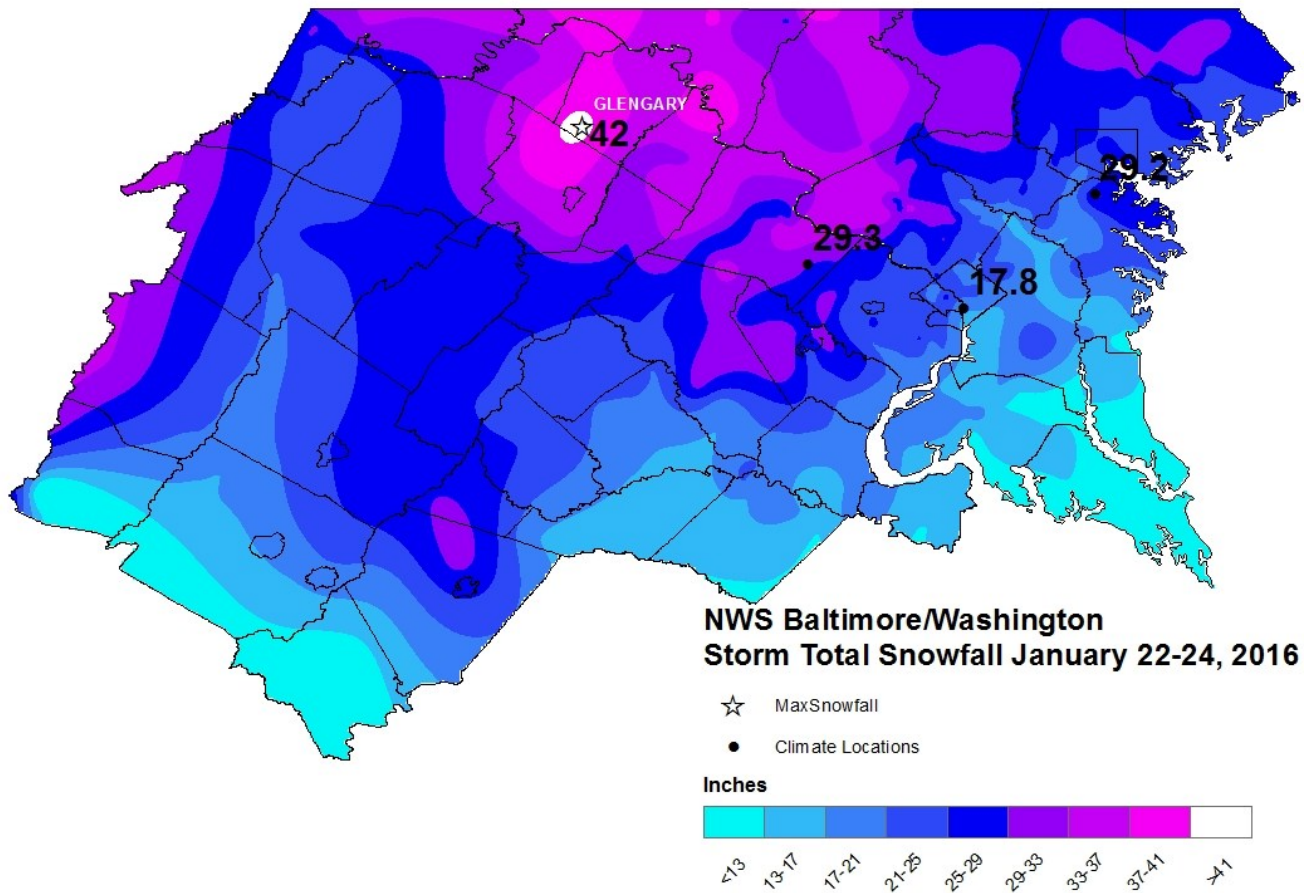
Snowfall totals in the NWS Sterling forecast area included:

**Washington DC:** 26” at Delcarlia Reservoir 22.4” at the National Zoo, and 21” in Adams Morgan.

**Maryland:** North Potomac 38.5”, Cascade and Maugansville 37.5”, Frostburg 34”, Point of Rocks 35.2”, Scarboro 33.5”, Westminster 32.2”, and Reisterstown 32.1”.

**Eastern West Virginia:** Glengary 42”, Sheperdstown 40.5”, Jones Springs 39”, Bayard 34.5”, and Smith Crossroads 33.2”.

**Virginia:** Gainesboro 38”, Bluemont 36.6”, Ashburn 36”, Berryville 35”, Karo and Bull Run both 32.1”, and Carrsbrook, Hightown, Earleysville, Chantilly and Opal all 30”.



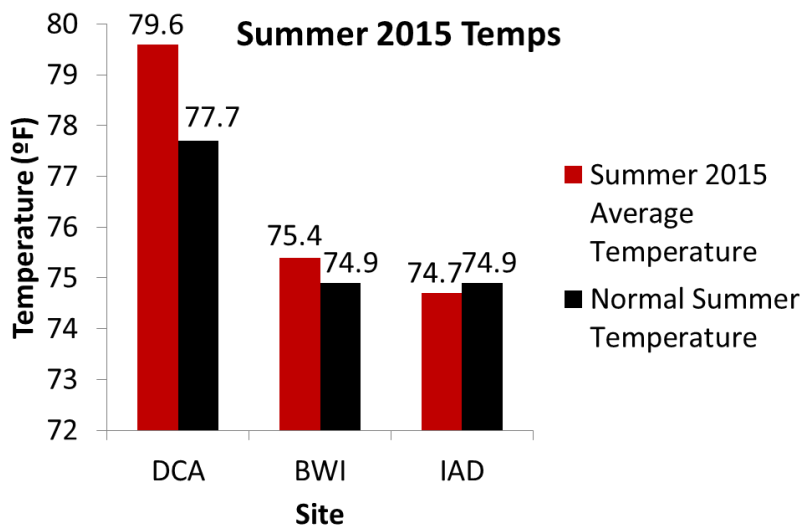
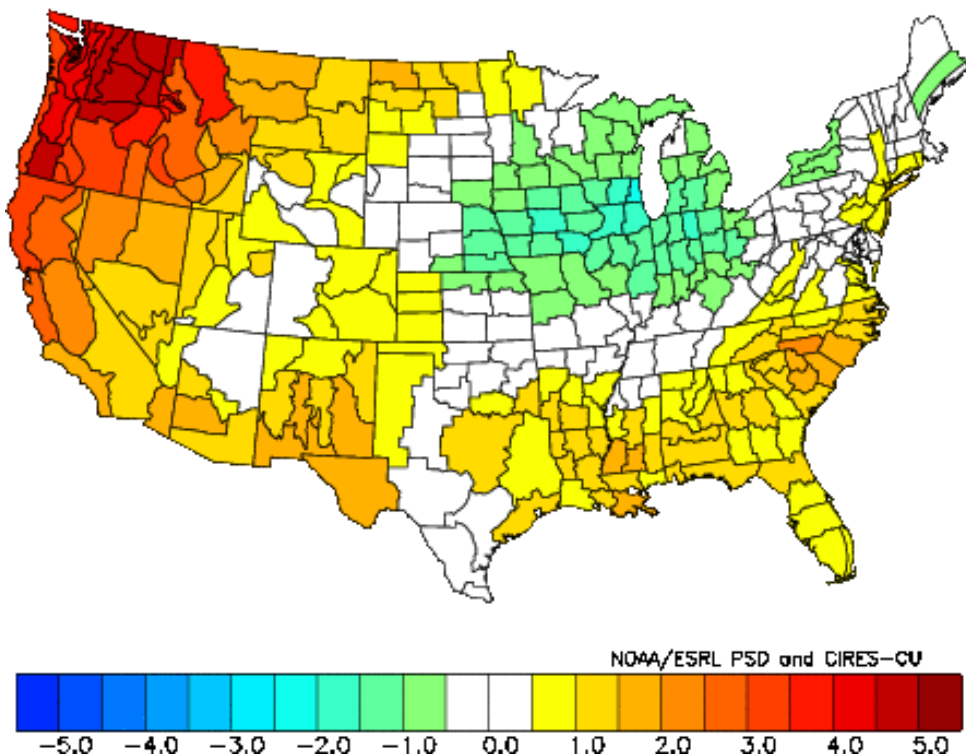
**Summer 2015 Summary**

*Dan Hofmann, Meteorologist/  
Climate Program Leader*

NOAA/NCDC Climate Division Temperature Anomalies (F)  
Jun to Aug 2015  
Versus 1981-2010 Longterm Average

This past summer was warmer than the previous two, but right around normal from a climate perspective. The first half of the summer, especially June, began on a wet note with particularly warm overnight temperatures. The second half of the summer was notably drier. This dry trend continued into the first part of meteorological fall.

The average 2015 summer temperature was within half a degree Fahrenheit of the 1981-2010 climatological normal on a regional scale.



Locally, summertime temperatures at our three main climate sites were near to slightly above normal.

Urban areas such as Washington, D.C. and downtown Baltimore experienced slightly above normal temperatures, in large part due to warm overnight temperatures. The rest of the area, including near BWI Marshall and Dulles International Airports, had temperatures closer to normal.

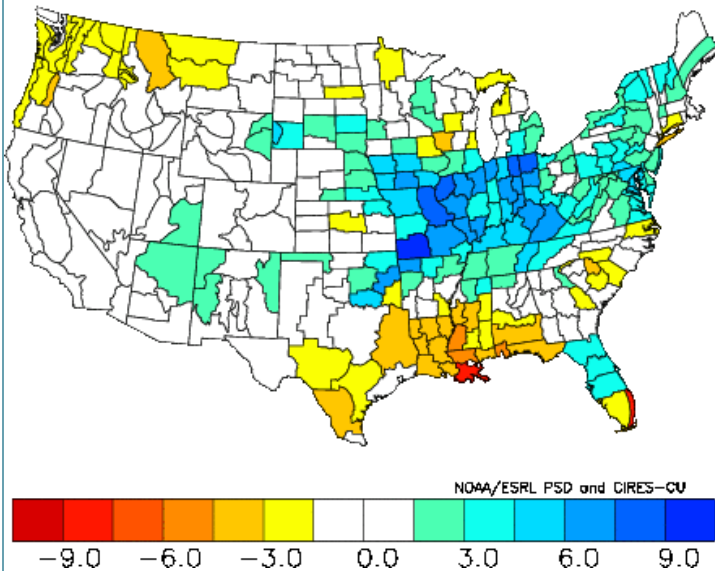
Despite being the warmest summer since 2012, there were no days where the temperature reached or exceeded 100° F.

Site	Highest summer 2015 temp	Lowest summer 2015 temp
DCA	98° F (07/19)	59° F (06/04, 06/03)
BWI	97° F (07/19)	55° F (06/05, 06/03)
IAD	94° F (08/17, 07/19)	53° F (08/14)

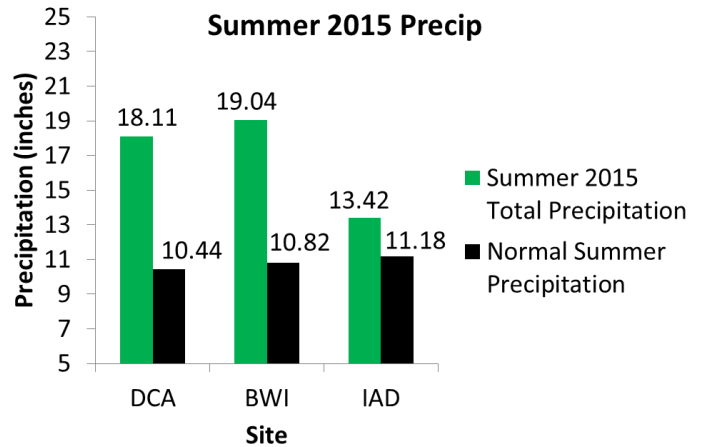
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**Summer 2015 Summary (continued)**

NOAA/NCDC Climate Division Precipitation Anomalies (in)  
 Jun to Aug 2015  
 Versus 1981-2010 Longterm Average



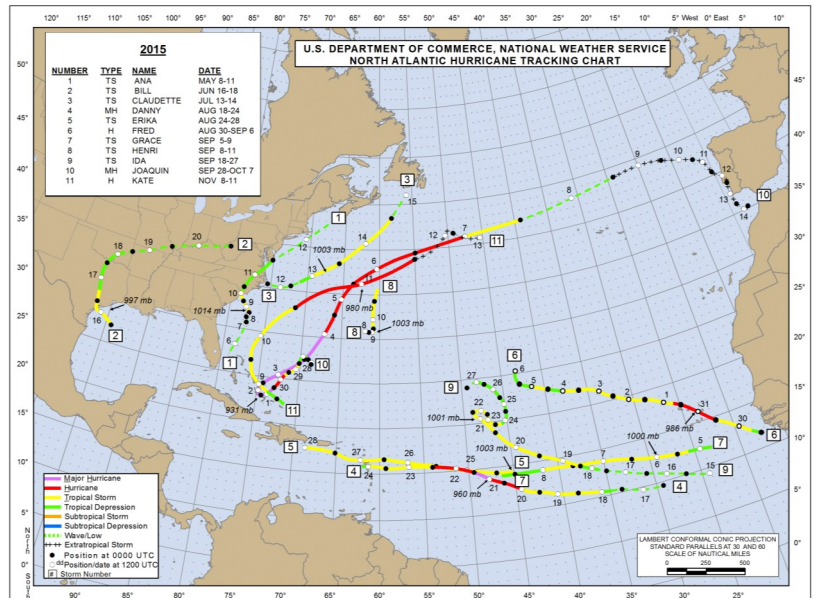
Precipitation was above normal on a regional scale. Locally, Reagan National Airport (DCA) and BWI Airport had nearly twice their normal precipitation this summer, despite a drier August. Dulles International Airport (IAD) was closer to normal, but still a couple inches above.



**2015 Atlantic Hurricane Season**

*Luis Rosa, Lead Forecaster/Tropical Program Leader*

The 2015 North Atlantic Hurricane Season saw much below normal activity as predicted by NOAA’s Climate Prediction Center (CPC). In its final August outlook, CPC forecasted 6-10 named storms, 1-4 hurricanes, 0-1 major hurricanes, and an Accumulated Cyclone Energy of 25% - 70% of the 1981-2010 median as the most likely outcome.



As of the end of the hurricane season, the Atlantic had 10 named storms, 3 hurricanes (Danny, Fred and Joaquin), and 2 major hurricanes (Danny and Joaquin). Accumulated Cyclone Energy (ACE), a much better measure of the overall tropical cyclone activity since it takes into account the number, strength and duration of all named storms, reached around 52% of normal.

The 2015 Atlantic hurricane season was only half as active as normal, and would have been much less had it not been for powerful and long-lived Hurricane Joaquin in early October.

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**2015 Atlantic Hurricane Season (continued)**

This year’s lack of tropical cyclone activity in the Atlantic basin was largely due to the strong El Niño event still in progress over the equatorial Pacific. During strong El Niño events, atmospheric winds tend to be stronger over the Atlantic (especially the Caribbean region), significantly disrupting thunderstorm clusters and preventing potential areas of development from getting organized.

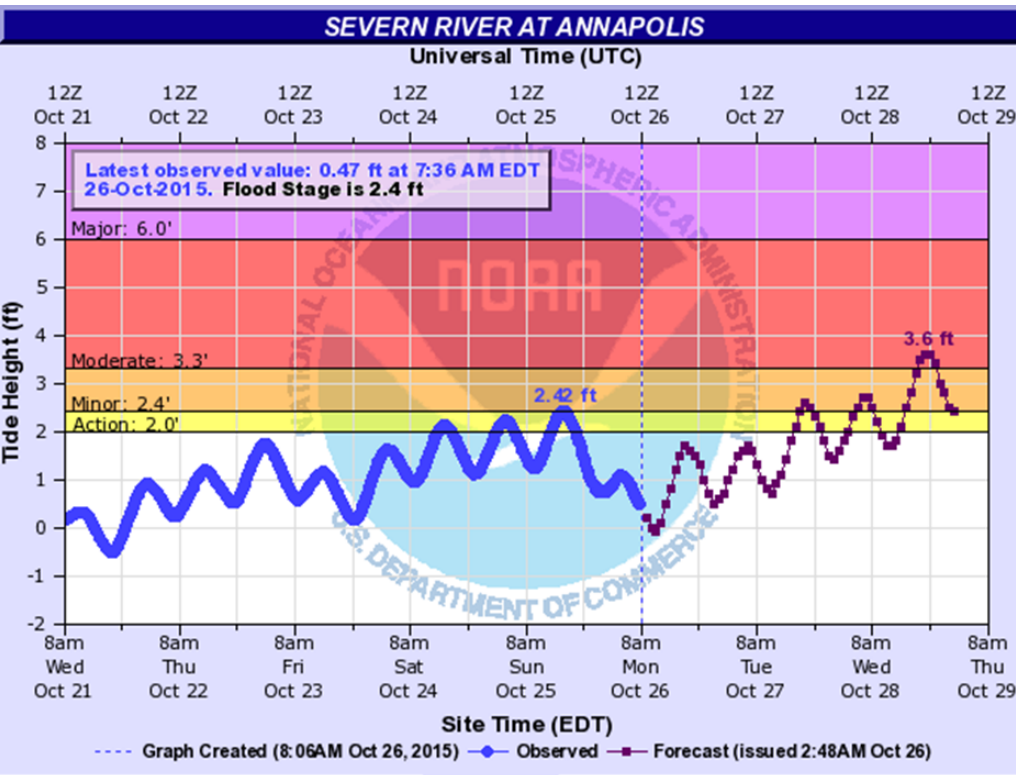
**New Forecasts Available in Tidal Areas**

*Jason Elliott, Senior Service Hydrologist*

In 2013, through partnership with the NWS Middle Atlantic River Forecast Center, we began providing forecast guidance for two key locations in Washington, D.C. – the Potomac River near Georgetown (Wisconsin Avenue) and Washington Channel at Southwest Waterfront. Recently, two new initiatives allowed us to expand our tidal forecast services even further.

First, the forecasts near Washington, DC have expanded in area and are now available for the Potomac River at Alexandria as well. This means forecast service is now available for the tidal Potomac down to Broad Creek in Prince George’s County, Maryland. Additional exciting initiatives are currently being worked for this section of the Potomac, on which we will report in future editions of the Sterling Reporter.

Secondly, our office is now routinely producing what are called Total Water Level forecasts.



At this time, these forecasts are mainly for locations on or close to the Chesapeake Bay. The forecasts utilize data from National Weather Service and National Ocean Service extratropical surge models to help forecasters determine expected water levels. The forecaster adjusts the model output both to reflect current conditions and to account for residual tidal anomalies which often exist from prior events.

These forecasts are available for five key locations: Annapolis, Baltimore, Havre de Grace, Solomon’s Island, and Straits Point (in Saint Mary’s County).

Above: An example of new Total Water Level forecast display, which takes surge and tidal anomalies into account rather than just astronomical tides.

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### *Tidal Areas (continued)*

During times of flooding, you can find these forecasts at the end of the text of our Coastal Flood Advisory and Coastal Flood Warning products.

For these sites, as well as the three locations in and near Washington, DC, the forecasts are available out to three days at <http://go.usa.gov/htQV>. We additionally produce high tide-only forecasts when flooding is expected at North Beach and Bowley's Quarters, which will be in the text of the advisory or warning only.

Enhancements in 2016 will allow us to provide better, more accurate forecasts for the existing locations, and potentially expand the service to more locations. Additionally, student volunteer Katie Thomas conducted research this summer focusing on model preferences and residual anomaly change which we are already making efforts to verify, and will use to further improve the forecast process.

### **Interagency Partnerships Strengthen Flood Services in the Mid-Atlantic**

*Jason Elliott, Senior Service Hydrologist*

Longtime readers of the Sterling Reporter have seen articles about some of our user groups, who meet with us periodically to provide feedback on National Weather Service products and services.

In the flood/hydrology program, we have a similar group – but we don't call it a users' group for one important reason: we rely on so many other partners to be able to provide you with flood data and forecasts; we can't do it alone! So we call the group our Hydrology Partners Group.

It is made up of our federal partners at the United States Geological Survey (USGS), the National Park Service (NPS), and the U.S. Army Corps of Engineers (USACE); our state/district partners at the Maryland Department of the Environment (MDE), the District Department of Energy and the Environment (DOEE), and Virginia Department of Emergency Management (VDEM); and local partners, including local officials from Jefferson County, WV, the City of Alexandria and Fairfax County.



*The NWS Baltimore/Washington Hydrology Partners Group met on September 29<sup>th</sup>, 2015. Pictured from left to right: Russ Lotspeich, USGS; Steve Zubrick, NWS; Doug Curtis, NPS; Jon Dillow, USGS; Sandee Niles, Jefferson County (WV) Emergency Management; Shaun Wicklein, USGS; Aaron Hope, City of Alexandria Emergency Management; Kevin Wagner, MDE; Jason Elliott, NWS; Peter Ahnert, NWS; Phetmano Phannavong, DOEE; Abigail Hunt, NPS; Dale Nisbet, NPS; Julie Fritz, USACE; Jim Lee, NWS; Chris Strong, NWS.*

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### ***Interagency Partnerships (continued)***

The Hydrology Partners Group meets once each year to discuss National Weather Service products and services, both past and future, and to share information amongst the group about ongoing and upcoming projects.

Many of these projects come to be as a result of further interagency partnerships, fostered by the U.S. Army Corps of Engineers' Silver Jackets program. The NWS Baltimore/Washington office is an active member of the District of Columbia, Maryland, and Virginia Silver Jackets teams. Many of the same people who participate in our office Partners Group are Silver Jackets Team members, but the Silver Jackets teams are larger and focused on bringing together many federal, state, and local agencies to learn from one another in reducing flood risk and applying shared knowledge. Interagency projects completed in this area include:

- Development and distribution of a levee information brochure to residents in the Cumberland, MD and Ridgeley, WV areas.
- A two-day workshop for emergency managers and floodplain managers in the state of Maryland on storm surge and coastal flood risk.
- Development of an informational brochure for the Virginia Silver Jackets team.

Additional major projects are ongoing within the Washington DC metro area for development of inundation mapping, and preparing area agencies for future flooding. Additional details on these projects will be provided in future editions of the Sterling Reporter.



### **2015 Outreach Activities**

*Bryan Jackson, General Forecaster/Marine Program Lead*



Bryan Jackson participated in the Howard University NOAA Center for Atmospheric Sciences Weather Camp Day at Noblis in Falls Church, VA earlier this summer. He led small group sessions on the topic of severe weather and also participated in a career advice panel. This weather camp occurs each summer and it is always a thrill to work with and hear from these scholars who are interested in meteorology.

*Bryan Jackson is picture front-left in the above photo, which was taken at Howard University's NOAA Center for Atmospheric Sciences Weather Camp Day.*

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### Outreach (continued)

On March 17, 2015, the 18th Marine Users Committee (MUC) meeting was held here at the office. Six MUC members made the voyage out to Sterling for a lively discussion on wave forecasts, marine wind headlines, and low water.

Wave forecasts have recently been upgraded and images are available for viewing at this website: <http://www.weather.gov/lwx/nwps>. This is the output from the Nearshore Wave Prediction System (NWPS), a truly state-of-the-art wave forecast. NWPS is run for 100 hours which takes the forecast into Day 5. You can advance the data either by looping or a single image at a time. Each image depicts the wave height in feet for that particular time. As always, you can get marine forecasts from our website: <http://www.weather.gov/lwx/>.



Above: Marine Users Committee

Marine weather safety is a key topic with this committee. We partner closely with the US Coast Guard, Coast Guard Auxiliary, members of sail and power squadrons, and the National Safe Boating Council. Speaking of, there is a new National Weather Service safe boating website. Check out <http://www.nws.noaa.gov/os/marine/safeboating/> for forecasts and services, including information from the most recent safe boating week.

The Marine Users Committee has been very successful in establishing communication between our forecast office and the marine community. We look forward to further discussion at future meetings as we continue to improve our marine weather service.

In May our office held its first ever “Weather Camp” for college meteorology majors. The all-day event featured multiple speakers. It was designed to give students an idea of possible careers in weather, as well explain the widely varying paths the speakers took to get to where they are today. Several former NWS Sterling employees returned to give talks on topics such as aviation and customer support. Current Sterling employees gave talks on hydrology, the future of the NWS, women in meteorology, and pay and benefits of government employees. An unexpected “field trip” arose when the Storm Prediction Center arranged a conference call with NWS Eastern Region offices for a severe thunderstorm watch.



Captain Claire Jarry of the Air Force Pentagon weather unit.

## Remembering the Madison County Flash Flood of 27 June 1995

*Heather Sheffield, General Forecaster/Flash Flood Program Leader*



Record rainfall across the Central Virginia foothills of the Blue Ridge Mountains led to catastrophic flooding that caused millions of dollars of damage in late June of 1995. Madison County received the worst of the flash flooding. The following is a recap of the historic flood.

*US-29; Photo by Stephanie Gross, Charlottesville Daily Progress (June 1996).*

### The Precursor of Madison County, Virginia (Topography)

Madison County is located in North-Central Virginia on the front range of the Appalachian Mountains. Its topography ranges from the Blue Ridge Mountains in the west to the foothills in the east. The highest elevation in Madison County is Hawksbill Mountain at 4,050 feet which is located in Shenandoah National Park. Its dramatic drop off from the Blue Ridge to the foothills makes for a beautiful landscape. However, this landscape can act as a barrier or wall when easterly winds are present.



*Photo courtesy of USGS.*

The Blue Ridge Mountains are oriented SSW-NNE from Georgia to Pennsylvania, bisecting the state of Virginia. They are the eastern edge of the Appalachian Mountains acting as the last ridge line before the Piedmont that extends to the tidal zone of the Atlantic Ocean. Madison County lies 70 miles from Washington DC and 65 miles from Richmond, Virginia.

The week leading up to the catastrophic flash flooding of June 27, 1995 in Madison County, Virginia was a wet one. Multiple rounds of thunderstorms produced heavy rain which amplified what was to come next by saturating the ground and causing rivers to rise across much of the Mid-Atlantic.

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**Madison County Flash Flood (continued)**

**The Meteorology (Surface Analysis)**

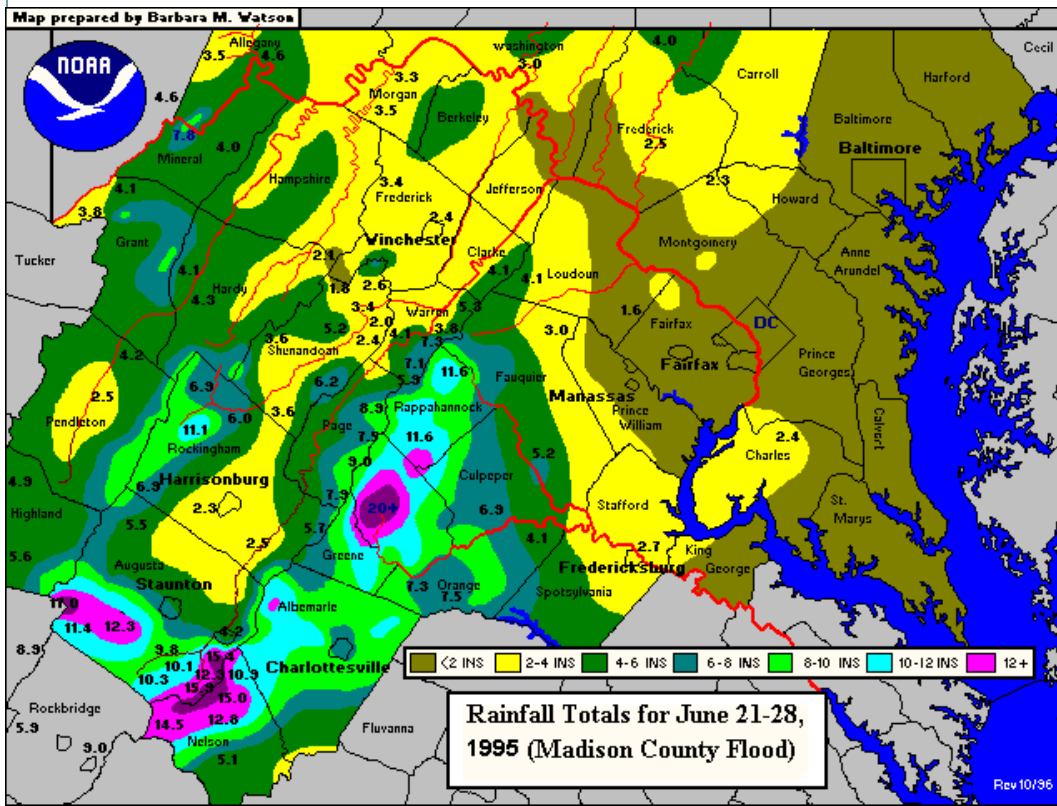
Three factors go into flash flood potential: rain rate, rain duration, and hydrologic factors. There is no doubt that the flash flooding that occurred on June 27, 1995 in Madison County, Virginia had these three characteristics, creating an optimal setup for torrential and historic rainfall.

*Storm Environment*

The large scale or synoptic pattern across the eastern half of the United States on 00Z (2000 EDT) 27 June 1995 was dominated by a large, negatively tilted long wave trough located across the Upper Mississippi River Valley. Multiple disturbances were located along the base of the trough that evening. An upper level ridge was located across New England.

At the surface, a high pressure system was located over New England while a low pressure system was located near the upper level trough, across the Upper Mississippi River Valley. The clockwise motion around the high pressure system led to cool air moving into the Mid-Atlantic from the east. This cool air mass outlined by a cold front, will move into Madison County, Virginia and its accompanying moisture flow from the Atlantic will reach against the Blue Ridge Mountains.

The multiple disturbances or shortwave troughs mentioned above rotated across the Mid-Atlantic during the day on June 27, 1995. An area of upper level divergence also moved into Western Virginia and led to enhanced lift for thunderstorms. The high pressure system over New England continued to move southward during the day and the cold front pushed through Madison County.



The Madison system slowly moved along the Blue Ridge Mountains into the early afternoon of June 27, 1995. The Sterling, VA WSR-88D radar depicted low cloud tops in the Madison system reaching only 10-12 km AGL. This system was still capable of producing intense rainfall rates due to the high freezing level in the storm. It is reported that rainfall rates exceeded 3 in/hr with a peak rainfall rate of almost 12 in/hr.

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***Madison County Flash Flood (continued)***

Madison County was not the only place that received copious amounts of rain that week but it was the hardest hit. One report from Madison indicated that 10 inches of rain fell in two hours. Further north and west, Allegany County, Maryland and Mineral County, West Virginia experienced road closures from rock slides, mudslides, and bridge washouts from flash flooding. Augusta County, Virginia to the southwest of Madison County received 17 inches of rain.

**Impacts from the Flood of 1995 over the Shenandoah Valley and Virginia Piedmont**

- ◆ Three persons are known to have perished from the flood, one in Madison County, one in Warren County and one in Rappahannock County.
- ◆ Over 400 roads were closed, with more than half damaged or washed out by mud slides and floods
- ◆ Some 800 bridges were washed out or damaged
- ◆ More than 2,000 homes were damaged or destroyed
- ◆ At least 800 people were evacuated from their homes
- ◆ Half the farms in Madison County sustained damage.
- ◆ Six cities and 18 counties were declared federal disaster areas. They were the cities of Bedford, Buena Vista, Lexington, Lynchburg, Roanoke, and Staunton; and the counties of Albemarle, Amherst, Augusta, Bath, Bedford, Campbell, Culpeper, Franklin, Greene, Giles, Halifax, Madison, Orange, Pittsylvania, Roanoke, Rappahannock, Rockbridge and Warren
- ◆ About 250 million dollars of damage was reported

**Decision Support Services - 4th of July and the Pope Visit**

*Ashley Sears, General Forecaster/Decision Support Services Program Leader*

Every year, Washington D.C. hosts the National Mall Fourth of July Celebration, which involves all day activities in and around the National Mall. The culminating activity is the fireworks show at dusk. 200,000 - 300,000 people were estimated to have attended the event this year.

Due to the sensitivity to any hazardous weather, the District of Columbia's Homeland Security and Emergency Management (HSEMA) requested on-site weather support from the National Weather Service, a service the Sterling office has provided for the past couple of years. Having an on-site meteorologist allows for more frequent weather updates and quicker decision making ability. This year, having an on-site meteorologist proved especially useful with the threat of thunderstorms in the forecast.

An on-site meteorologist arrived at HSEMA early the morning of Fourth and was able to brief immediately the potential for thunderstorm activity in the afternoon. The early heads up allowed HSEMA and their partners to begin preparations for the possible evacuation of the Mall. Additional briefings occurred at two hour intervals, each providing more specifics on the time frame that would have the most impact. Luckily, it was determined early on that the weather would not have an impact on the fireworks show later in the evening.

Early in the afternoon, showers and thunderstorms began to form over West Virginia and central Maryland near a warm front extending between low pressure over northwestern Pennsylvania and another low over the Delmarva region. The storms were moving to the south and east along the boundary, with the trend showing that the activity would near the DC area between 3-5 pm. Behind the warm front,

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*Decision Support Services (continued)*

breaks in the clouds led to a significant increase in instability.

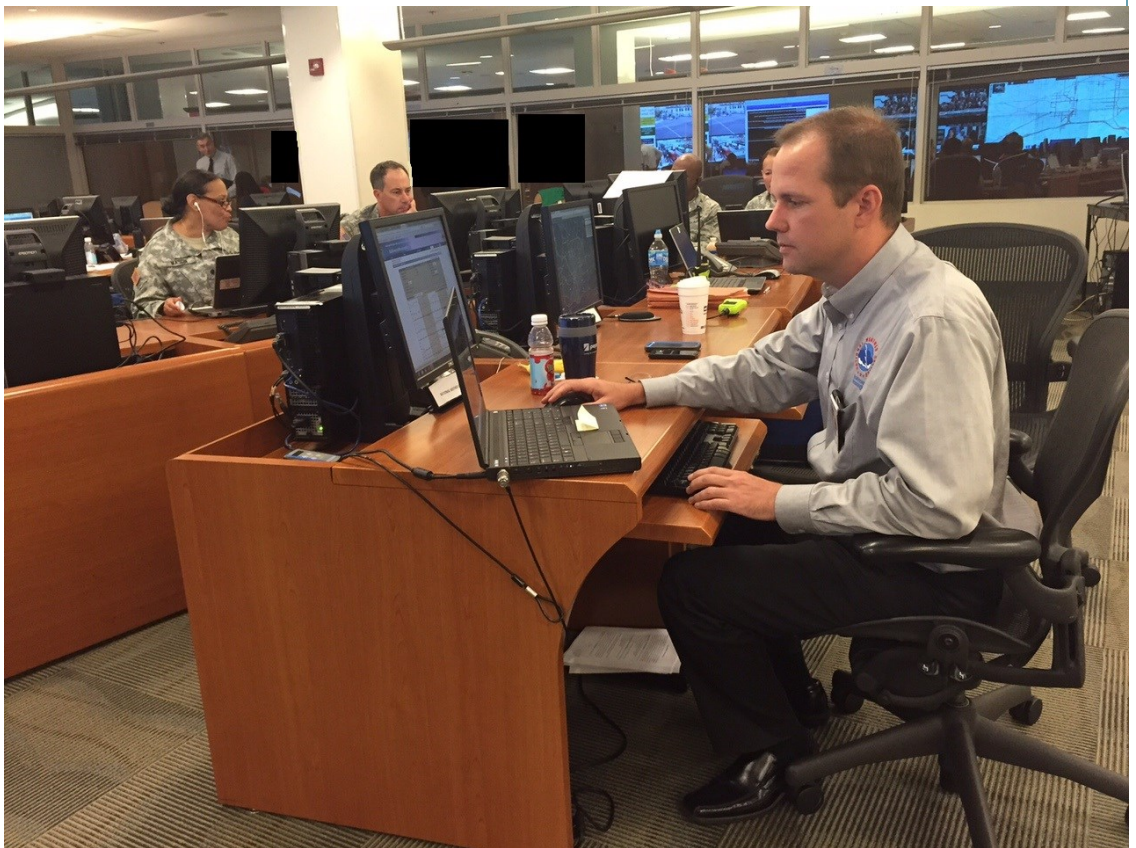
By 3 pm, the meteorologist on the second shift was able to determine that the storms would indeed reach the immediate DC area, posing a threat to the over 200,000 people who had gathered on the Mall for the daytime activities. He briefed the group and within 45 minutes, Operation Safe Haven was implemented, providing shelter and safety for all the attendees in and around the Mall. Operation Safe Haven was a plan developed by the city emergency management to aid in sheltering masses gathered on the Mall. It involved all the buildings along the Mall to suspend bag checks and other forms of checks and allow everyone inside to shelter until the weather threat had passed.

Operation Safe Haven was implemented at 3:45 pm, with the thunderstorms reaching the DC area between 4:15 and 4:30 pm and clearing the area by 6:00 pm, thus allowing for the evening activities to continue as planned. HSEMA considered the implementation successful with everyone sheltered by the arrival of the storms, resulting in no injuries.

The Fourth of July celebration was yet another example of the growing partnership with the National Weather Service and our core customers. Being able to provide as much lead time as possible to our customers will ensure in minimizing risks and promote safety.

Washington D.C. was chosen to be one of the three hosting cities for the Papal Visit on September 23rd and 24th. As many of the Pope's activities involved outdoor

events sensitive to adverse weather, the National Weather Service was asked to staff the EOC of HSEMA in addition to the briefings provided by the office leading up to the visit. Two meteorologists from the office deployed for the two days, providing on-site meteorological support covering about 16 hours per day. During their shifts, they were responsible for providing weather updates every two hours. Fortunately the weather proved to be favorable, with minimal weather impacts actually becoming a concern. Temperatures were the main focus as highs each day reached into the 80s.



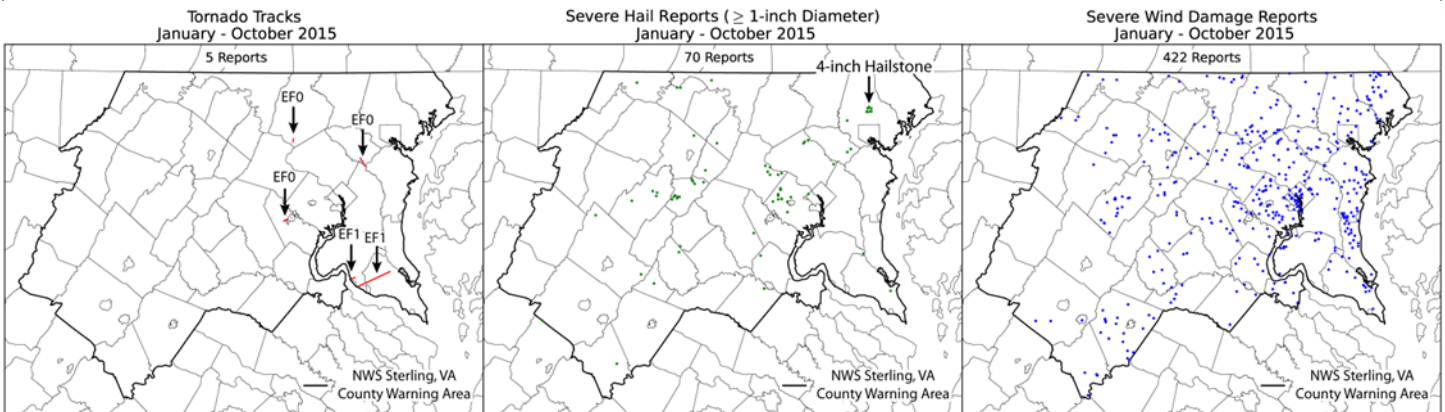
*Chris Strong providing DSS for Papal visit.*

## 2015 Severe Weather Season

*Matt Elliott, Meteorologist/Severe Program Lead*

As we look ahead to this year’s severe weather season, let’s take a moment to look back to last year to see how active our area was in 2015.

During January through October, there were **39 days** with at least one report of severe weather (i.e., 1-inch diameter hail, 58-mph wind, and/or a tornado) in the NWS Baltimore/Washington warning area. This is about average.



<u>NWS Sterling, VA</u>	<u>2015</u>	<u>Average (1996-2014)</u>	<u>Remarks</u>
Days with Tornado Report	3	5	Below Average
Days with Severe Hail Report	12	15	Below Average
Days With Severe Wind Report	39	34	Above Average

Appreciation is extended to law enforcement, emergency managers, media, SKYWARN® spotters, and citizens for the **497 reports** of severe weather that were received.

Nearly all of the NWS Baltimore/Washington counties had at least one report of severe weather. Though, there were no reports from Page and Highland counties in Virginia or Pendleton and Grant counties in West Virginia. The greatest number of reports (45) was received from Fairfax County, Virginia.

Severe weather season in the Mid-Atlantic can be volatile and this year was no exception, with a near-record 4-inch diameter hailstone reported in Baltimore County, Maryland and a long-track EF1 tornado that traversed nearly the full width of southern Maryland.

### Tornado (5 reports)

Through October, the number of days with tornadic activity was below average. Thankfully, the tornadoes were also on the weaker end of the spectrum, with two EF0 (winds up to 85 mph) tornadoes on 20 June, two EF1 (winds up to 110 mph) tornadoes on 27 June, and one EF0 on 29 September.

The strongest tornado occurred on 27 June, from a supercell thunderstorm over southern Maryland. It had a peak wind speed of 90 mph, a maximum width of 800 yards, and was on the ground for 35 minutes as it traversed nearly the entire width of St. Mary’s County.

*(continued next page)*



**2015 Severe Weather Season (continued)**

Substantial tree damage was observed along its path. A few outbuildings and barns were completely destroyed, and some homes suffered siding and shingle damage. Chopticon High School in St. Mary’s County also had damage to bleachers and sports fields.

**Severe Hail (70 reports)**

During the 2015 severe season, the number of days with severe hail was below average.

The largest hail reported was a near-record grapefruit-sized 4-inch diameter hailstone that fell from a supercell thunderstorm on 23 June and was found near Timonium, Maryland in central Baltimore County. It was only the fourth hailstone larger than 4 inches in Maryland since records began in 1950. It was also only the fifteenth hailstone larger than 3 inches in the NWS Baltimore/Washington warning Area since 1950. So, this was quite a rare event, indeed!

**Hail ≥ 3 inches  
NWS Baltimore/Washington Warning Area  
(1950-2014)**

<u>Hail Size (inches)</u>	<u>MD</u>	<u>V</u> <u>A</u>	<u>D</u> <u>C</u>	<u>WV</u>	<u>ALL</u>
3	1	3	0	0	4
3.5	2	2	0	0	4
4	1	0	0	0	1
4.5	2	2	0	0	4
5	0	1	0	0	1
<b>Total</b>	<b>6</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>14</b>



**NWS Baltimore/Washington  
Warning Area**

<u>Month</u>	<u>Severe Wind Reports</u>
January	0
February	0
March	0
April	9
May	27
June	280
July	42
August	43
September	19
October	2
November	0
December	0
<b>Total</b>	<b>422</b>

**Severe Wind (422 reports)**

For 2015, the number of days on which severe wind was reported was above normal.

The greatest number of severe wind reports (88) was received on 23 June, when widespread wind damage occurred east of the Blue Ridge Mountains from a line of severe thunderstorms with embedded supercell structures.

Other days with large numbers of wind reports were 20 June (59), 18 June (42), and 4 August (38).

As is often the case, June was the most active month for storm damage reports from wind, with almost 67% of the January through October 2015 total occurring then.

**SKYWARN®**

Thank you to all the new (and old) spotters for attending the classes we have held so far this spring. We still have a few classes left this year, including Tropical, Flood and our brand new Convection class. For more information about the class including registration details, please visit our SKYWARN® page:

[www.weather.gov/washington/skywarn](http://www.weather.gov/washington/skywarn)

We will be scheduling SKYWARN® classes for the fall this summer. Fall classes will include our Basic/Introduction to Storm Spotting, Tropical, Winter Weather and Flood. If your county or city is interested in hosting a class, please email our SKYWARN® class coordinator, Ashley Sears at [ashley.sears@noaa.gov](mailto:ashley.sears@noaa.gov). While we do not do classes for specific groups, if your group is interested, please email Ashley and she can work with your county to potentially set up a class.

If you have misplaced your spotter ID or have never received your ID, please email [lwX-report@noaa.gov](mailto:lwX-report@noaa.gov).

**Upcoming Classes with Available Seats**

**Wednesday, April 6th @ 6:00 pm**  
**Flood - Morgan County, WV**

**Thursday, April 7th @ 6:30 pm**  
**Basic - Rappahannock County, VA**

**Wednesday, April 13th @ 6:30 pm**  
**Convection - Allegany County, MD**

**Thursday, April 21st @ 7:00 pm**  
**Flood - Anne Arundel County, MD**

**Saturday and Sunday, April 30th and**  
**May 1st (AT OUR OPEN HOUSE)**  
**Basic - Loudoun County, VA**

**Thursday, May 5th @ 6:00 pm**  
**Tropical - St Mary's County, MD**



**We need your Storm Reports!!**

**How to report:**

**Telephone: 1.800.253.7091**

**Amateur Radio: WX4LWX**

**Email: [LWX-report@noaa.gov](mailto:LWX-report@noaa.gov)**

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