



# Blue Ridge Thunder



## Newsletter of the NWS Blacksburg, VA

Welcome to the Fall 2016 edition of 'Blue Ridge Thunder' the biannual newsletter of the National Weather Service (NWS) office in Blacksburg, VA. In this issue you will find articles of interest on the weather and climate of our region and the people and technologies needed to bring accurate forecasts to the public.

### Weather Highlight: June 23-24, 2016 Floods Peter Corrigan, Sr. Service Hydrologist

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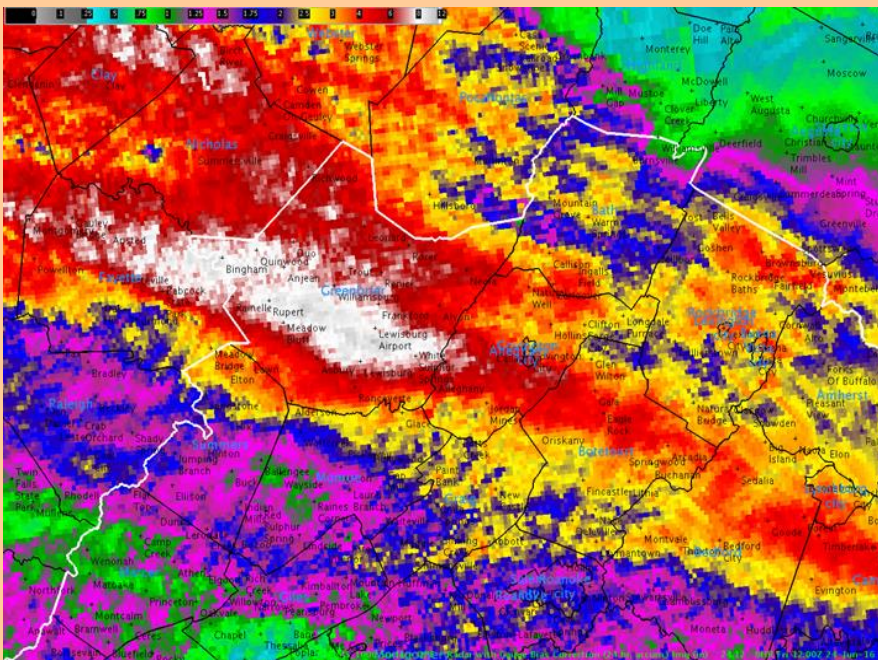
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The most deadly weather event in the 20+ year history of the Blacksburg County Warning Area (CWA) occurred June 23-24, 2016 in Greenbrier County, WV and to a lesser extent in Alleghany County, VA. Rainfall of 5 to 10+ inches was estimated by radar in less than 12-hours across a swath of central Greenbrier into western Alleghany County, VA. The result was unprecedented flash flooding that resulted in 16 deaths in Greenbrier County and another 8 in counties within the Charleston, WV CWA. Damage was widespread across the region with an estimated \$40 million in Greenbrier county and \$6 million in Alleghany County. A detailed summary of this event is available on the [NWS Blacksburg webpage](#).

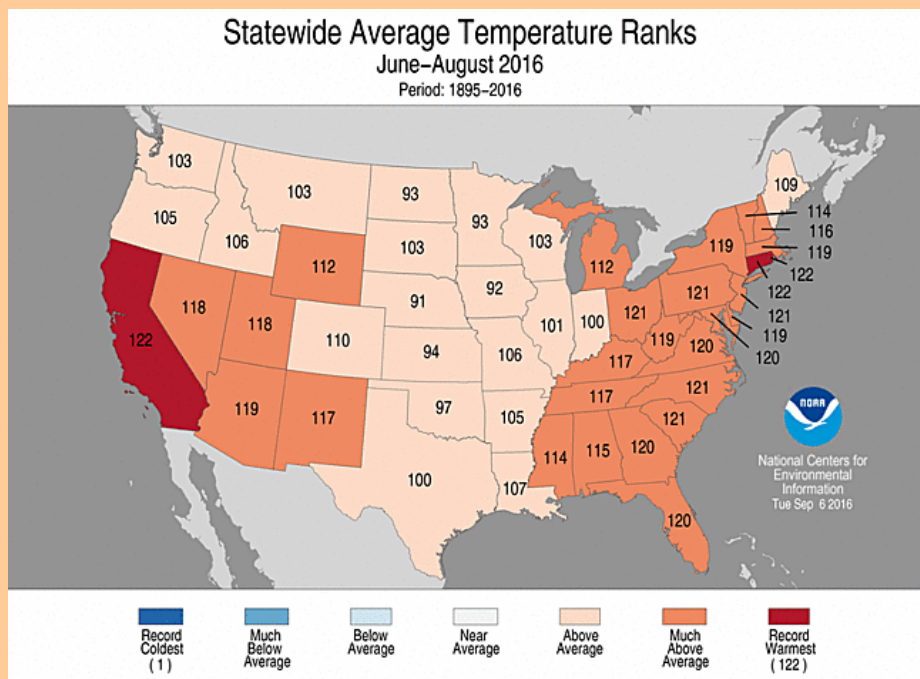


Multi-Radar, Multi-Sensor (MRMS) rainfall June 23-24, 2016

## Summer 2016 Climate Summary

Peter Corrigan, Sr. Service Hydrologist

Summer 2016 (June through August) was very warm across the Blacksburg County Warning Area (CWA) and across the entire eastern U.S. as well. Numerous eastern states had very close to the warmest summer since 1895 (see Figure below).

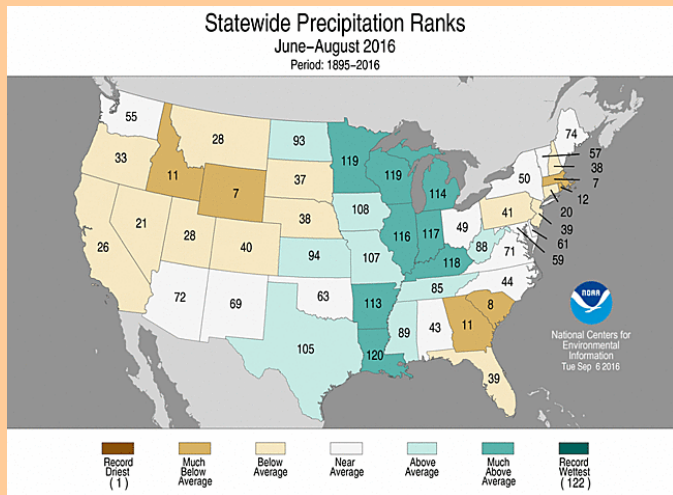


Four local climate sites (Bluefield, WV omitted due to sensor issues) were roughly 1 to 3 degrees warmer than the long-term averages as shown in the table below. At Blacksburg NWS the summer season was tied (with 2011) for the 2<sup>nd</sup> warmest on record after the summer of 2010, but just 0.3°F cooler. Six of the top 10 warmest summers on record have now occurred since 2005 at Blacksburg. The biggest factor contributing to the overall warm summer was high overnight temperatures with numerous daily record high minimum temperature records set. No climate site reached 100°F during the summer of 2016 and the number of 90°F days was fairly close to normal.

### Local Climatological Statistics for Summer 2016 (Jun-Aug)

Climate Site	Average Temperature (Anomaly)	Rank (warmest =1)	Summer Maximum Temp. (°F)	No. of days $T_{\geq} 90^{\circ}\text{F}$	Total Precipitation (Anomaly)	Station Period of Record
Blacksburg, VA	72.6 (+2.9)	t-2 <sup>nd</sup>	93	4	12.65 (+0.80)	1952-2016
Roanoke, VA	77.0 (+2.0)	5 <sup>th</sup>	98	33	16.04 (+4.61)	1912-2016
Lynchburg, VA	75.7 (+2.0)	t-34 <sup>th</sup>	95	26	13.46 (+2.22)	1893-2016
Danville, VA	77.4 (+0.7)	20 <sup>th</sup>	97	36	16.71 (+4.30)	1948-2016

Rainfall was fairly close to the long-term normal across most of the area (see map of statewide precipitation ranks below), although considerably above normal at Danville and Roanoke due mainly to local thunderstorms.



One of the more notable precipitation events of the summer occurred the afternoon and evening of August 3<sup>rd</sup>, 2016 in Surry County, NC. A combination of upslope effects, extremely high ambient moisture and instability led to persistent heavy rainfall over eastern parts of the county. An automated rain gage on the Ararat River south of Mount Airy recorded 12.51" in 24 hours ending at 7AM on the 4<sup>th</sup>, most of which fell in less than 10 hours. Although 'unofficial' this is one of the highest single day rainfall totals ever recorded in the Blacksburg CWA. Radar rainfall estimates were close, lending credibility to the gage report. In addition, flooding along the Ararat River at Ararat was the 4<sup>th</sup> highest on record.

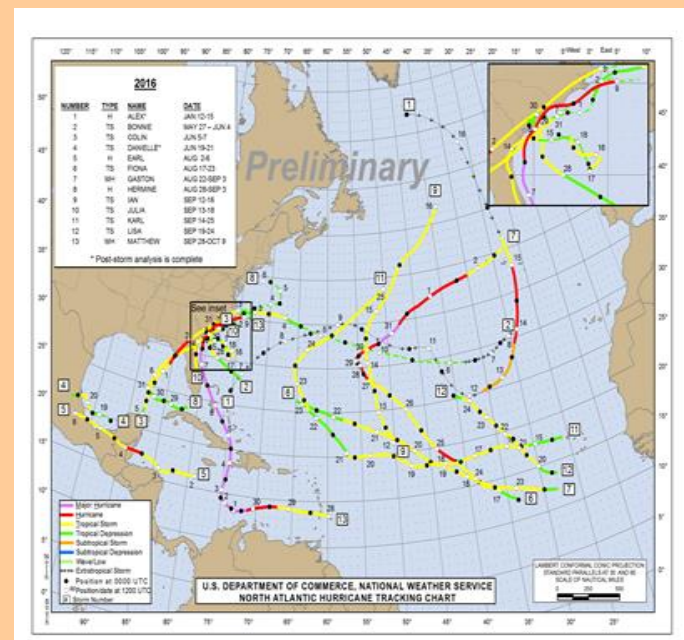
### Landfalling Hurricanes Add to a Busy 2016 Atlantic Tropical Campaign

Jim Hudgins, Senior Forecaster

After several tranquil Atlantic hurricane seasons, 2016 proved to be both active and costly with 14 named storms, 6 of which attained hurricane strength and 3 that reached major level. Although this was just slightly above the normal of 12 named

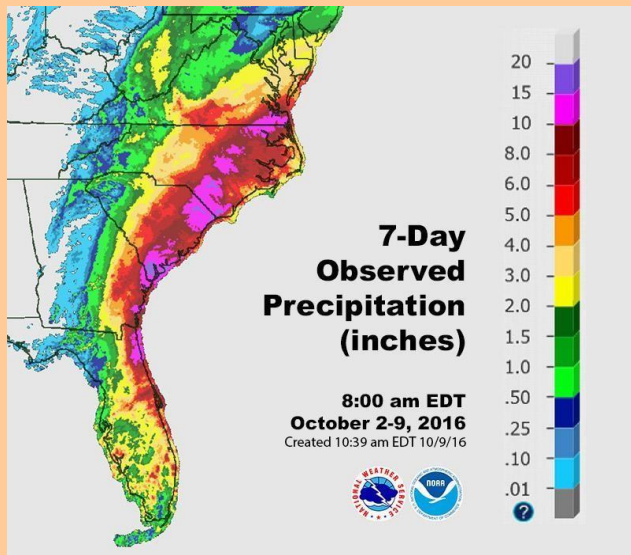
storms, it was the busiest season since 2012 and deadliest since 2005, with even some local impacts from associated heavy rainfall.

Activity was quite spread out with Hurricane Alex forming in the eastern Atlantic in mid-January followed by several weaker storms from late May into mid-August, including a lull in July when no named systems occurred. The heart of the season followed from late August through mid-October with around 10 named systems during this period including 3 hurricanes. The strongest of these was Matthew which was the southernmost hurricane to attain Category 5 status only to be followed by Nicole, a Category 4 storm. This was the first time that more than two major hurricanes with the other being Gaston (2016) had formed in the Atlantic since 2011, and the first time that two Category 4 or stronger hurricanes had developed in October. Of the 14 named systems, 12 impacted land somewhere across the Atlantic basin, and 7 caused loss of life even if by indirect means.



Tracks of 2016 Tropical Cyclones

Hurricane Matthew that affected parts of the southeast U.S. was the most destructive in both life and property with over 1300 deaths (mostly in Haiti) and billions of dollars in damage along its path as of this writing. It also brought heavy rainfall to the local area with between 2 and 6 inches of rain (Figure below) in spots along and especially east of the Blue Ridge in early October. This resulted in mainly small stream flooding with minor to moderate flooding along the lower Roanoke and Dan Rivers.



### Storm total rainfall from Hurricane Matthew

Other notable 2016 storms included Category 1 Hurricane Hermine that made landfall in the Big Bend region of Florida in early September, major Hurricane Nicole which passed directly over Bermuda on October 13<sup>th</sup>, and minimal Hurricane Earl that affected many Caribbean islands before making subsequent landfalls in both Belize and Mexico in early August.

With billions of dollars of damage and over 1400 deaths, the 2016 season ranks as one of the worst since 2005. The season officially ends on November 30<sup>th</sup>.

## Hundreds Attend 2016 Open House

**Phil Hysell, Warning Coordination Meteorologist**

Every two years the National Weather Service in Blacksburg opens its doors to show the public the tools we use to produce forecasts and life-saving warnings. On October 29<sup>th</sup>, 2016 over 330 people took advantage of splendid weather conditions to tour our facility. Mother Nature was very supportive of the event, as Blacksburg set a new record high temperature (78 degrees) during the event. Visitors were able to learn how to be better prepared for weather hazards that impact our area; view radar data from the February 24<sup>th</sup>, 2016 tornado outbreak; see and touch instruments we use to collect weather data; and witness balloon launches. Their experience was enhanced by outdoor exhibits from amateur radio operators, VDOT, the Virginia Tech Meteorology Department and Virginia Tech Meteorology Club.



**Science and Operations Officer Steve Keighton discusses lightning safety**

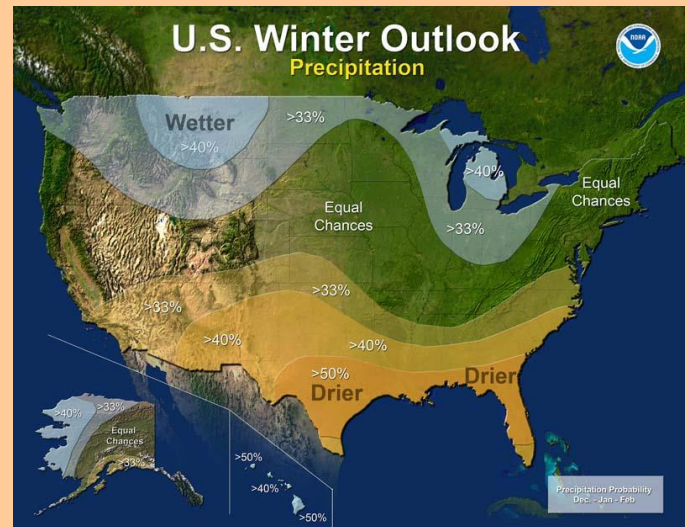
The NWS in Blacksburg would like to extend our gratitude to the attendees and to the agencies and departments that participated. These events demonstrate partnerships that can help build a Weather-Ready Nation. If you were not able to attend this year, our next Open House will be in the fall of 2018.

## Winter 2016-2017 Outlook: Return of La Niña?

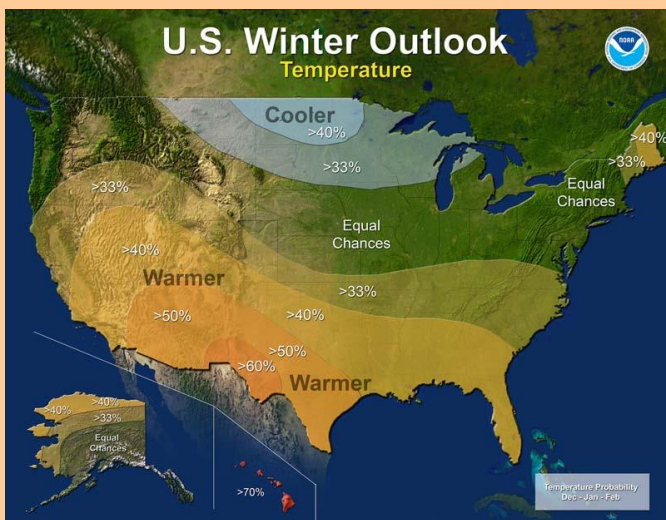
**Robert Beasley, Senior Forecaster**

In a year during which just about every month at every climate station has seen above to well above normal temperatures, one may be asking if we can expect the same to continue this winter? Several climate factors will determine what actually occurs this winter, but perhaps the most important is ENSO or El Niño/Southern Oscillation, a well-documented equatorial oceanic phenomenon. As the record strong El Niño of last winter began to subside during the late spring and early summer, climate projections indicated that a moderate to potentially strong La Niña would follow this upcoming winter. As the fall approached the forecasts for a moderate to strong La Niña to occur began to fade somewhat. However, the Climatic Prediction Center (CPC) still issued a La Niña Watch earlier this fall with a 70% chance of its development this winter. The eventual strength of this La Niña remains to be seen but it appears that its effects may be to aid in producing higher chances for a warmer and drier than normal winter in the southern Appalachians. Below is a graphic with the official CPC winter (Dec-Jan-Feb) temperature forecast for the U.S. The map shows

a slightly higher chance for above normal temperatures this winter across our region. The winter precipitation forecast (see graphic below) shows a slightly increased probability for drier than normal conditions, especially in the southern sections of our area. The rest of the CWA falls into an area of 'equal chances' for any one category (above, normal or below) to predominate.



Keep in mind that there are many factors that determine the actual climate theme for the winter. Significant deviations from normal in these other large-scale patterns such as the Arctic, North Atlantic or Madden-Julian oscillations can have a substantial impact on prevailing weather patterns. More information on all of these phenomena, including expert diagnostic discussions and updates on ENSO, along with various weekly, monthly, and seasonal temperature and precipitation outlooks, can be obtained via the National Weather Service Climate Prediction Center's [web page](#). So, in essence, it appears that we can expect a warmer and drier than normal winter. Therefore, don't get your hopes up for a white Christmas this year!



**Focus on COOP:  
John Campanius Holm Award  
presented at Glasgow, VA  
Jamie Morrow, Meteorologist Intern**

The John Campanius Holm Award is one of the most prestigious awards to be offered in the national Cooperative Observers Program of the National Weather Service. To be eligible for this award, a minimum of 20 years of dedicated service to the COOP program is required. From the list of eligible observers in the program, each office has the opportunity to select a nominee who has proven their dedication to: Their observations, the program as a whole, and the science of Meteorology in order to be eligible for the award. At that point, another competitive selection process takes place at the national level, to further the identification process to only the most deserving observers.

This year, the National Weather Service Office in Blacksburg, Virginia was honored to have a nominee chosen for this award. Julian A. Kesterson, the cooperative observer for Glasgow 1 SE, Virginia has dedicated 49+ years to the weather observation process here in southwest Virginia. Over that time, he has an un-varnished record of reports, surviving even the harshest of floods to report the observed weather conditions the following morning. He also continues to go above and beyond by maintaining a complex and complete climatological record of his observations, which he graciously shares with the weather service, especially in times of record events.

Julian first got into weather at a very young age due to his fascination with snow. To this date, Julian continues to be fascinated by weather events, especially those revolving around precipitation (or the lack of it). He remembers well

the mid-Atlantic flooding of 1995, where over a 3 day period, over 14 inches of rain fell due to training thunderstorms, considerably damaging his truck as a nearby stream (dry 6 months out of the year) rose out of its banks washing out a good portion of his driveway. In a different extreme, he also remembers well the only month in recorded history where his station didn't receive a drop of precipitation, October 2000.



**Julian Kesterson (with his wife Lucile), VA accepts the John Campanius Holm Award in Glasgow, VA on September 20th, 2016.**

Mr. Kesterson's observation site includes over seven separate outdoor meteorological measuring instruments, with other installation plans likely on the horizon. When asked what keeps him motivated as a weather observer for the NWS, he claims that the *"longer you keep records, the more interesting things get. Going out every day keeps you wondering about what's next."* One of the most noticeable and inspirational parts of his story is the passion and love for the science of Meteorology that Julian not only possesses, but also spreads to his family, friends, and neighbors. We here at the National Weather Service in Blacksburg are truly inspired by the passion and dedication that Julian has provided us since the 1960s, and look forward to continuing our relationship with him and his family for years to come.

## North Carolina Floods of July 1916: 100 Years Ago

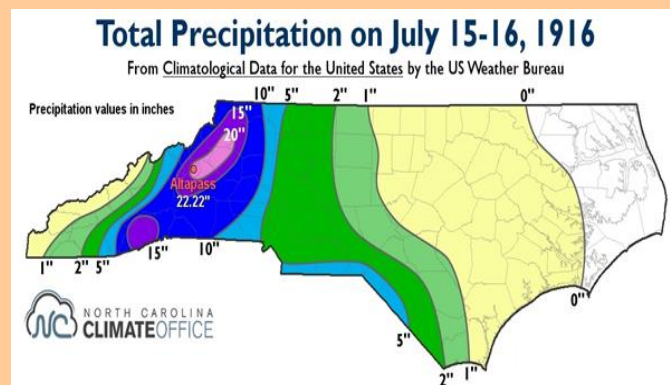
Peter Corrigan, Sr. Service Hydrologist

100 years ago this past July, the Battle of the Somme was raging in France while parts of our forecast area in North Carolina experienced some of the worst flooding ever seen in the region. The floods affected most of western North Carolina mainly impacting the Yadkin and upper New River basins in our area and many more to our southwest. At several long-term river gaging stations the July 1916 flood peaks hold 2<sup>nd</sup> place in the record books after the incredible August 1940 floods (see table below). Interestingly, these two floods provided the impetus for the construction of W. Kerr Scott Dam, completed in 1962 but authorized in the landmark Flood Control Act of 1946. This U.S. Army Corps of Engineers dam provides flood control for the Yadkin River Valley.

Location	Highest Stage (year)	July 1916 Stage (rank)
Yadkin River at Elkin	37.5 (1940)	36.0 (2 <sup>nd</sup> )
Watauga River at Sugar Grove	29.60 (1940)	22.10 (2 <sup>nd</sup> )
SF New River at Jefferson	22.50 (1940)	18.00 (2 <sup>nd</sup> )

The stage for the flood was set in early July as the remnants of a hurricane that made landfall at Mobile, AL on July 5th lifted northeast into the southern Appalachian mountains bringing heavy rain July 8-10 across that area. A second tropical system made landfall near Charleston, SC on July 14th and the remains of this system were pushed northwest again into the saturated southern Appalachians. The storms track was extremely favorable for producing upslope heavy rainfall in western North Carolina. A rain gage at Altapass, NC in Mitchell County, NC (just two counties southwest of Watauga) recorded 22.22 inches in the 24 hours from midday on the 15<sup>th</sup> to the 16<sup>th</sup>.

This still stands as the state record 24-hour rainfall for North Carolina.



## New System for Monitoring NOAA Weather Radio

Robert Stonefield, General Forecaster

On September 1, 2016, NWS Blacksburg “flipped the switch” on an upgrade to the NOAA All Hazard Weather Radio (NWR) software and hardware systems in our office. The new system is known as Broadcast Message Handler (BMH). BMH replaces the Console Replacement System (CRS) which has been used since the late 1980’s.

CRS was a personal computer-based broadcasting console that automatically translated and scheduled written NWS forecasts and warnings into synthesized-voice broadcasts over NWR. BMH has been integrated into AWIPS2 (Advance Weather Interactive Processing System), which is a computer each NWS forecaster uses to create forecast products and issues watches, warning, and advisories. BMH also uses NeoSpeech, which utilizes large databases of recorded sound segments to create synthesized speech. The new voice name being used by BMH is “Paul.” At this time, there is no female voice.

The most important piece of information for you is that NWR listeners do not need to change a thing on their receiver to continue to receive our broadcasts. The way the transmitters and receivers work has NOT changed.

## ***Recent WFO Staff Changes***

### **Rich Carter (Electronic Systems Administrator)**

Mr. Richard Carter, ESA at WFO Blacksburg, VA retired on September 30, 2016 after nearly 23 years of Federal service. Rich began his career in 1971, when he enlisted in the U.S. Air Force (USAF). He spent seven years serving as a Ground Radar Technician and Operator with the Strategic Air Command's 1st Combat Evaluation Group, and another three years as a Technician with the Air Force Space Command tracking DMSP satellites. While serving in the USAF, Mr. Carter earned a degree in Computer Science from Panama Canal College in the Republic of Panama. While stationed in Statesboro, GA in 1974, Rich attended Georgia Southern College and was studying to acquire a major in Music, but changed his area of focus to Electrical Engineering in 1976. During that time, he occasionally graced patrons at various clubs and coffee houses by playing guitar and singing.

Upon leaving the Air Force in 1981, Rich worked for 17 years in a variety of positions in the private sector, including teacher, project engineer, and electronics supervisor. In 1983 he completed a course to acquire certification as a Novell Systems Administrator, and began a part-time business as a consultant. In 1998, Mr. Carter converted his part-time business to full time, achieved a Microsoft Administrators Certification, and designed and maintained several Internet based networks until he disbanded his business in 2004. He then returned to Government service – by being selected as a National Weather Service Electronic Technician at the WFO in Barrigada, Guam. Rich transferred to WFO Blacksburg, VA in 2006, and was promoted to his current ESA position, which he has held since 2012.

Rich is a gifted musician and plays several instruments, including guitar, keyboard, and drums – in addition to vocals. His daughters share his love of music and provided background vocals to many songs that Rich recorded on the home computer-based recording studio. Following retirement, Rich and Patricia - his wife of 32 years whom he has known since his early teens in Howell, NJ – will continue to invest their time with their three daughters (Catherine, Victoria and Marian), and perhaps even get back into focusing on one of his many lifelong passions - music.

### **Andrew Loconto (General Forecaster)**

Andrew Loconto is our new General Forecaster at the office in Blacksburg having arrived in late October. He comes to us from NWS Burlington VT, where he had worked as a Meteorologist Intern since February 2011. Andrew was the Climate and NOAA Weather Radio focal point at the NWS Burlington office. He was a co-author of an operational research paper in the NWA Journal of Operational Meteorology on forecasting “snow squalls”, which are bands of heavy snow that produce snowfall rates of 1” or more per hour and low visibility, but last for an hour or less. He has interests in severe and winter weather, operational research, communication and long-range forecasting. Prior to working in Burlington VT, Andrew was a forecaster in the Operations Branch in the Climate Prediction Center, located in Camp Springs, MD.

Andrew is originally from Worcester, MA and went to college at Plymouth State University in Plymouth, NH. He received his Bachelor's degree in Meteorology in 2005 and stayed at Plymouth State to earn his Master's degree in Applied Meteorology in 2006.





# *Blue Ridge Thunder*

**National Weather Service**

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