NOAA 'Bout Weather

Welcome! To the Fall 2013 Newsletter of the Blacksburg, VA Weather Forecast Office (WFO) of the National Weather Service (NWS). In this issue we present a variety of information on weather, water and climate topics as well as information about our office. Submit comments, questions, or ideas for improvement to the newsletter editor.

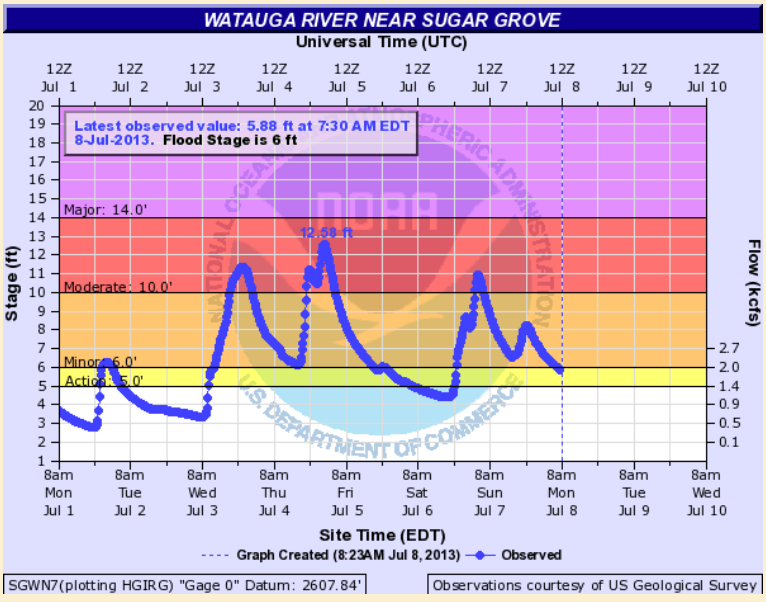
A semi-annual publication of the National Weather Service Blacksburg WFO. Articles written and prepared by staff and guests.

Inside this Issue:

Weather Highlight:

July Flood Disaster in NW North Carolina

Extremely heavy rains caused flooding and debris flows during much of July prompting the Federal Emergency Management Agency (FEMA) to declare parts of western North Carolina a major disaster area. Repeated thunderstorms and embedded heavy rainfall dropped 10 to 20+ inches of rain across much of the foothills and mountains of North Carolina from July 3 through 27 causing substantial damage, with many counties reporting the wettest July on record. The extreme rainfall damaged roads, bridges, culverts, public utilities, parks and even some schools in many western counties. Among the counties in the Blacksburg forecast area included in the declaration were Watauga, Ashe, Alleghany and Wilkes. The graph below shows the repeated rises above flood stage in early July on the Watauga River.



Climate Highlight: The Wet Summer of 2013

Peter Corrigan, Service Hydrologist

The meteorological summer of 2013 (June-August) will be remembered by many in our area for extraordinary wetness, although this was not true across the entire region. Table 1 below shows the 3-month precipitation and departures from normal along with the ranking for the five official climate sites in the County Warning Area (CWA). It was the 2nd wettest summer on record at Danville, 3rd at Roanoke (with a much longer period of climate record) and 4th at Blacksburg. Bluefield and Lynchburg were considerably drier however, and did not even make the top 20 wettest summers. The extreme period of heavy rainfall was in July and centered over northwest North Carolina (see above) where parts of Watauga County received over 25 inches of rain for the month at unofficial sites and up to almost 20" (19.70") at the Boone 1 SE NWS Cooperative station. At Jefferson Coop station in Ashe County, NC it was the 2nd wettest month ever (17.19") with records dating all the way back to 1896.

Table 1. Climatological Statistics for Summer 2013 (Jun-Aug).

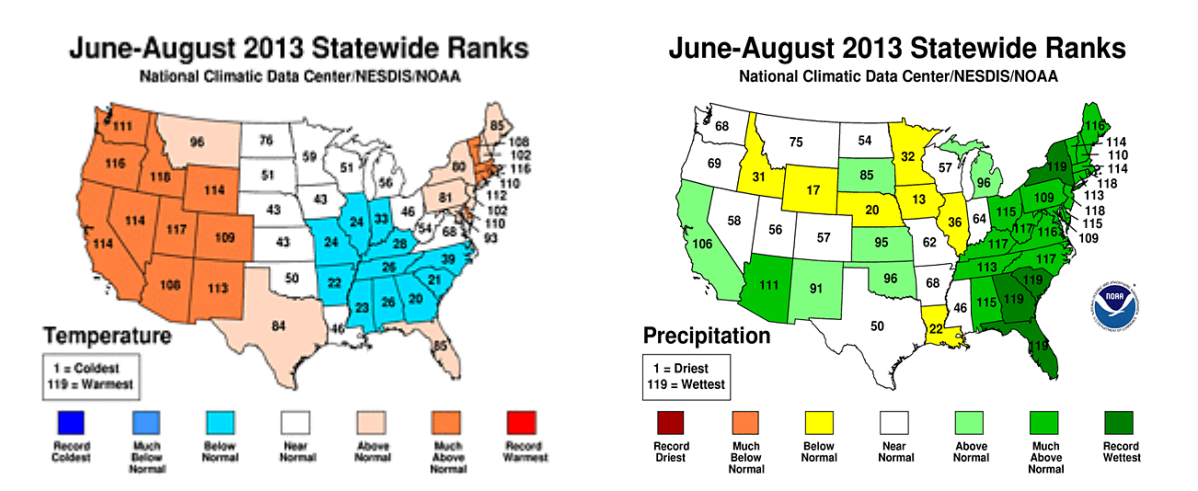
Climate Site	Precipitation (Anomaly)	Wettest Rank (Yrs of Data)	Avg. Temperature (Anomaly)
Danville	21.10 (+8.69)	2nd (66)	76.1 (-0.6)
Roanoke	21.77 (+10.34)	3rd (102)	74.9 (-0.1)
Blacksburg	17.68 (+5.83)	4th (61)	69.6 (-0.1)
Bluefield	11.69 (+0.12)	23rd (54)	72.4 (+0.7)
Lynchburg	13.28 (+2.04)	38th (121)	74.4 (0.0)

The frequent cloudiness and rainfall put a big dent in the summer heat especially compared to the last three summers (2010-2102) which were all notable for periods of intense and record-breaking heat in much of the CWA. Table 2 shows the number of days that reached 90°F or greater at the climate sites this summer and for the past three summers and as compared to the long-term averages for this statistic. The dramatic drop-off in very hot days compared to the recent very hot summers is apparent at all the climate locations.

Table 2. Number of summer days with maximum temperatures equal to or higher than 90°F in 2013 and recent summers

Climate Site	2013	2012	2011	2010	Long-term Average
Danville	16	51	53	65	26
Roanoke	13	29	38	40	22
Blacksburg	0	6	9	14	4
Bluefield	2	7	8	5	3
Lynchburg	16	33	40	42	19

Nationwide rankings for temperature and precipitation broken down by state are shown below, and demonstrate just how wet the entire eastern third of the CONUS was. It was 3rd wettest in 119 years in both West Virginia and North Carolina and the 4th wettest over that period in Virginia.



Temperature Ranking **Precipitation Rankings**

Remarkably Inactive 2013 Atlantic Hurricane Season

Jim Hudgins, Senior Forecaster

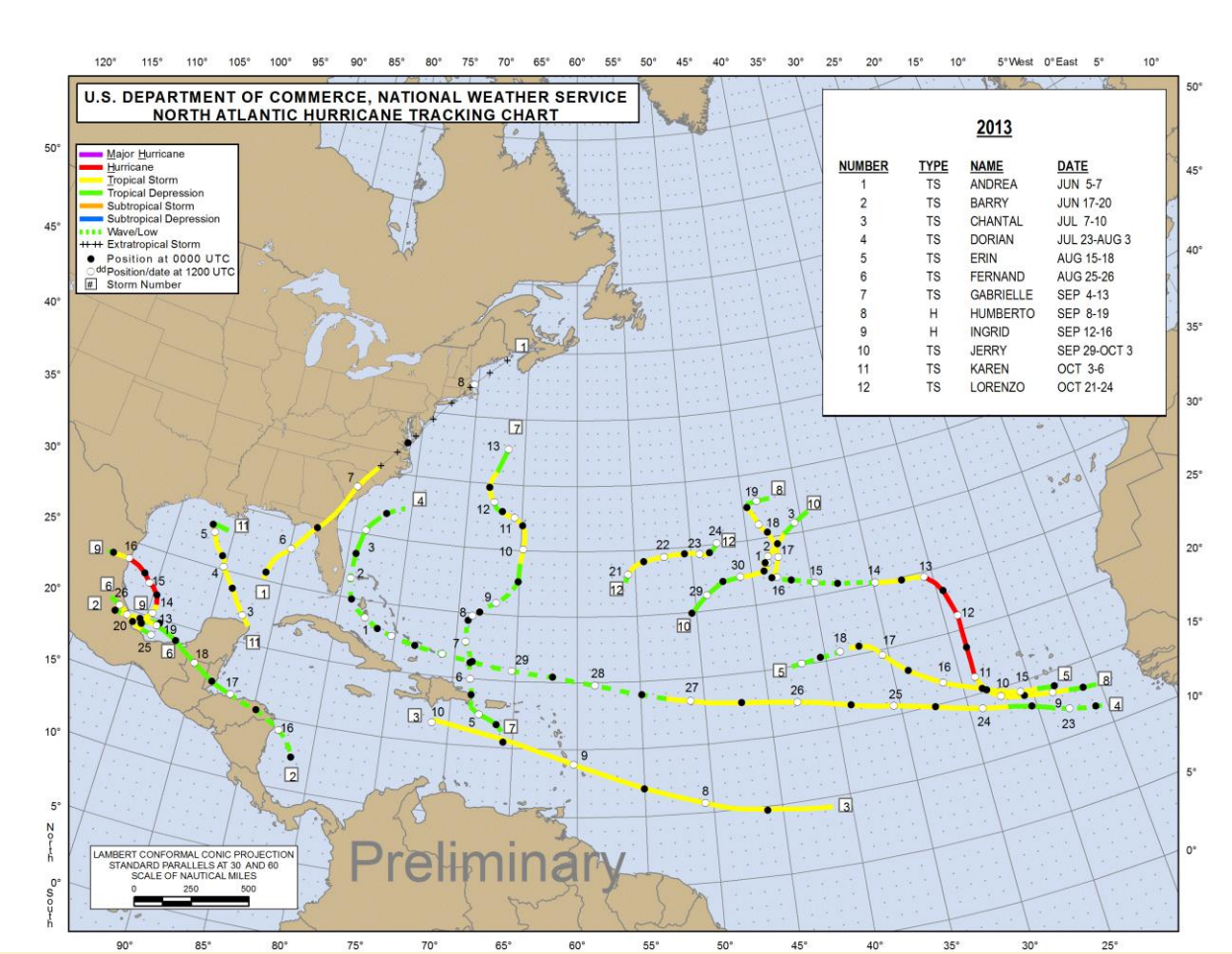
The 2013 Atlantic hurricane season has been one of the quietest on record since the early 1900s with 12 named storms to date (Fig. 1) of which only 2 became hurricanes, while none reached major status (Category 3 or higher). The 30 year average for the number of named storms in the Atlantic is 12, with 6 hurricanes and 3 majors. This has resulted in a season of minimal impacts as many of the systems have remained weak and mostly offshore. This year also marked the 2nd latest date on record in seeing a hurricane form in the Atlantic with Hurricane Humberto (September 8th) beating the date for the latest by just a few hours. By one measure of tropical cyclone activity, 2013 will rank as one of the least active on record. This is the so-called Accumulated Cyclone Energy (ACE) index. The ACE uses an approximation of the wind energy for each tropical system over its lifetime and is calculated every six-hour period. The ACE of a season is the sum of the ACEs for each storm and takes into account the number, strength, and duration of all the tropical storms in the season. The ACE for the Atlantic basin in the 2013 season so far is 30, which ranks it as the 5th lowest since 1950 (after 1983, 1977, 1972 and 1982).

Pre-hurricane season forecasts for the Atlantic tropical season from NOAA and other organizations such as Colorado State University were all predicting an above-average tropical season. Hence, a lot of questions remain regarding the reasons behind such a slow season when environmental conditions coming into early summer looked quite favorable: including above normal water temperatures and a

forecast for low wind shear. Despite this positive outlook, a combination of very dry air moving across the Atlantic Ocean off the Saharan desert, a trough of low pressure along the East Coast of the U.S., periodic rounds of strong shear in the developmental zone off Africa, and a lack of many tropical waves made for a lack of many significant tropical cyclones. There may also be other reasons, as research will continue into trying to determine what caused such a peculiar 2013 season.

The only system to remotely impact the area was Tropical Storm Andrea which tracked across eastern North Carolina and far southeast Virginia in early June and brought an inch or two of rainfall to areas mainly east of the Blue Ridge. Otherwise most systems have either stayed offshore in the Atlantic or have impacted Mexico where a few storms including Hurricane Ingrid caused 23 fatalities mainly due to flooding rainfall.

The outlook for the rest of November focuses on storm formation more in the Caribbean and central Atlantic, with areas from Central America into Mexico being the more climatological favored region to see a stronger system as we head into the cooler months. The 2013 season will officially end on November 30th.



Winter 2013-2014 Outlook

Robert Stonefield, Forecaster

The Climate Prediction Center (CPC) three-month forecast is based on Sea Surface Temperatures (SST) from products such as the: Pacific Decadal Oscillation (PDO), Arctic Oscillation (AO), North Atlantic Oscillation (NAO), Madden Julian Oscillation (MJO), and North Pacific Oscillation (NPO). The one product that is heavily used to predict seasonal forecasts, especially in the winter, is the El Nino South Oscillation (ENSO). El Nino/La Nina is the warming/cooling of equator waters in the Pacific. Warm sea surface temperatures (SST) generate deep convection over the Pacific which then develops an atmospheric low pressure system. Cooler sea surface temperatures promote high pressure. Since the Pacific is a large body of water, the pressure systems that develop are also large. These large pressure systems then alter the polar and subtropical jet stream which then affects the weather across North and South America, particularly during the winter months. El Nino episode typically bring the southern Appalachian and Mid-Atlantic regions a cooler and wetter winter. La Nina episodes generally results in warmer and drier conditions for the forecast area. For more information on products, tools and models CPC uses to create climate outlooks, visit http://www.cpc.ncep.noaa.gov.

The CPC is forecasting neutral conditions, no significant warmer or cooling of Pacific equatorial water, to continue into this winter. Neutral conditions do not give any significant signals to whether this winter (Dec-Jan-Feb) will have above or below normal temperatures or precipitation. Looking at CPC three-month outlook maps for this winter, there is an equal chance (EC) that temperatures and precipitation could be above, near, or below normal.

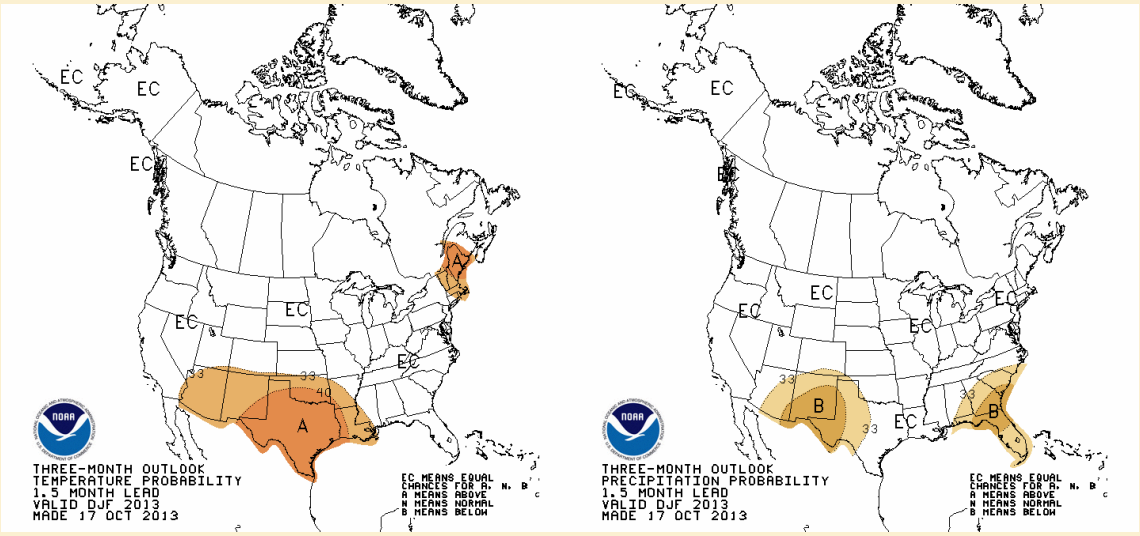


Fig. 1: CPC Three-Month Temperature and Precipitation Outlooks for 2013-2014 winter (Dec-Feb).

Station	Temp (F)	Precip (inch)	Snow (inch)
Roanoke	38.3	8.75	14.0
Lynchburg	36.9	9.31	10.8
Danville	39.5	9.69	4.2
Blacksburg	33.1	8.84	20.5
Bluefield	36.2	8.57	24.3

Table 1. Three-Month Winter (Dec-Jan-Feb) Normals

The most common question asked this autumn, does a wet summer mean we will have a snowy winter? This a difficult question to answer, especially when ENSO is in a neutral phase. Everyone knows we need two things to come together to make snow; cold air and moisture. Some years it is difficult to get both of them together. Then there are some years, such as the winter of 1995-1996, where cold air and moisture collide to produce above normal snowfall for a season. Table 2 has the top 5 wettest summers, the amount of snowfall the following winter, and the ENSO phase of that particular winter for Roanoke and Blacksburg. Table 3 displays the top 5 snowiest winters and ENSO phase for that winter starting 1950. Note: Snowfall records may be inaccurate due to missing and incomplete data.

Roanoke	Summer	Rainfall	Winter Snow	ENSO Phase	Blacksburg	Summer	Rainfall	Winter Snow	ENSO Phase
1	1940	26.85	1.5	N/A	1	1992	19.82	12.0	Neutral
2	1949	23.64	2.0	La Nina	2	2003	18.52	32.9	Neutral
3	2013	21.77	?	Neutral	3	2006	18.23	5.6	El Nino
4	1937	21.28	2.0	N/A	4	2013	17.68	?	Neutral
5	1989	19.50	11.3	El Nino	5	1996	17.42	26.7	El Nino

Table 2: Roanoke's and Blacksburg's Top 5 Summer rainfall, snow amounts the following winter, and ENSO Phase. Roanoke period of record started in 1912. Blacksburg period of record started in 1952.

Roanoke	Winter	Snowfall	ENSO Phase	Blacksburg	Winter	Snowfall	ENSO Phase
1	1995-96	55.5	La Nina	1	1995-96	69.5	La Nina
2	1965-66	49.9	El Nino	2	2009-10	52.6	El Nino
3	1986-87	47.0	El Nino	3	1965-66	52.0	El Nino
4	1963-64	46.0	El Nino	4	1997-98	44.2	El Nino
5	1917-18	44.5	N/A	5	1963-64	34.8	El Nino

Table 3: Roanoke's and Blacksburg's Top 5 snowfall amounts and ENSO Phase. Roanoke period of record started in 1912. Blacksburg period of started in 1952.

From climatic data standpoint, it appears that when Roanoke has a lot of rain over the summer the following winter has very little snow, despite the ESNO phase. However, after a wet summer, Blacksburg may have a snowy winter, then again they may not. Table 3 data suggests that we would need to be in an El Nino Phase to have the possibilities of seeing above normal to record snowfall for a winter.

Lewisburg, WV to Become New NWS Climate Site

Robert Beasley, Senior Forecaster

Starting December 1, 2013, the Blacksburg, VA National Weather Service Forecast Office will start transmitting daily climate reports (CLI) for Lewisburg (LWB), West Virginia located in the southeast part of the state. In addition, monthly (CLM), seasonal (CLS), annual (CLA), and Current Preliminary Monthly Climate Reports (CF6) will also be transmitted for LWB on a regularly scheduled basis beginning after December 1, 2013.

The Lewisburg area, which generally consists of the municipalities of Lewisburg, Fairlea, Ronceverte, White Sulphur Springs, Maxwelton and Caldwell, comprises about 19,000 out of the nearly 36,000 county residents. The Lewisburg/Greenbrier Valley Airport (Airport Code: LWB), located three miles north of Lewisburg provides commercial air transportation to southeast West Virginia and will be the site for climate observations. A Federal Aviation Administration (FAA) sponsored Automated Weather Observing Station (AWOS) is located at LWB airport and provides weather observations for the entire suite of weather elements required for all U.S. NWS Climate Stations. The climate report for Lewisburg will use the data transmitted by the LWB AWOS. The only element not provided by the LWB AWOS is snowfall, which will be provided via the existing co-located cooperative observers.

Lewisburg has a long history of weather observations. Incomplete weather records exist as far back as the late 1800s through the early 1900s. From 1948 through 1963, fairly regular weather observations were begun in the city of Lewisburg, located three miles south of the current airport location. From 1963 through 1987, the observations were taken two miles south-southwest of the city of Lewisburg. In 1987, weather observations were officially established at the current airport location, where they have been taken ever since. The FAA-sponsored AWOS site, maintained by the Vaisala Corporation, was commissioned in April 2002.

Lewisburg/Greenbrier Valley Airport (LWB)

The Lewisburg area hosts several high profile events annually, such as the Greenbrier PGA Golf Classic and the West Virginia State Fair, both of which draw hundreds of thousands of visitors to the region. The diverse geography and climatology of West Virginia allows for substantially different climate regimes across short distances. Given these considerations and the lack of a nearby climate reporting site in a similar climatological area (the nearest existing climate site is in Bluefield, WV approximately 100 miles to the southwest), it was decided that there was definitely a need to have a climate reporting site in the Lewisburg area.

WFO Blacksburg Participates in Roanoke GoFest

Mike Sporer, Meteorological Intern

Roanoke GoFest, October 18-20, 2013

NWS Blacksburg, in cooperation with the Virginia Tech meteorology program, was in attendance at the Go Outside Festival (GoFest) October 18-20 in Roanoke, VA. Outdoor enthusiasts frequently use weather data when planning outdoor activities such as hiking, biking, or paddling adventures. Hence, the GoFest was an excellent opportunity for the NWS to engage attendees and highlight specific products and services provided by the NWS which could be very useful when planning an excursion. It was also great to explain how data gathered by the Hokie Storm Chasers can lead to research breakthroughs which help NWS Blacksburg issue better forecast and warning products. Here's a big "Thank You" To all who stopped by our display to chat for a while!

NWS Blacksburg Welcomes a New Employee

Drew Bouvette, Electronics Technician

I graduated from Sturgis, SD High School and joined the US Air Force in 1982, choosing Weather Maintenance as a career field. I was first assigned to Whiteman Air Force Base in Missouri. Tornado alley and Minuteman Two ICBM's – what a combination! I worked on the older radars and other meteorological equipment. The WSR-88D radar program was starting in the late 80's and I had an opportunity to go into that program or to take an assignment to Eielson AFB, Alaska. I chose a lifelong dream to go to Alaska. I summed Alaska up in one word – demanding! My final Air Force assignment was to March AFB, California. While I was in the Air Force I completed my A.S. degree in Electronic Systems Technology along with several other schools. I received several commendation medals and numerous other awards in the Air Force and served in Operation Desert Shield and Storm.

I joined the NWS in 1995 as an electronic technician (ET) in Great Falls, MT. I then took a position at Johnston (Des Moines), IA WFO as a radar technician, working on a variety of programs and systems. In 2008 I accepted a position as a general ET in Anchorage, Alaska. This assignment was quite different from the lower 48. I was assigned to the Alaska Region not the WFO in the Electronics Maintenance Unit, which was responsible for maintenance on NWS equipment across most of the huge state of Alaska.

Ever since I started with the NWS and even before then, my wife and I have wanted to live

on the east coast. Blacksburg, VA was one the WFOs that appealed to us. Not too close to the big cities, not too hot or humid (we hope) and still in mountains. My wife's name is Lori and we have one daughter, Amanda. Amanda finished her freshman year at the University Alaska Anchorage. She is looking forward to attending Virginia Tech My hobbies include: hunting, fishing, rock hunting/prospecting (the great outdoors in general) and photography.

Town Hall Meeting to be held in Lewisburg, WV

The NWS will host a town hall meeting in Lewisburg, WV on November 19, 2013 at 7 PM. The 2-hour meeting will be held at the New River Community and Technical College Lewisburg Campus at 101 Church St. in Lewisburg. The meeting is free and open to the public (children welcome). The public will have the opportunity to learn about meteorology and forecasting in the local area and to meet NWS forecasters. This will be the fourth Town Hall meeting to be held by the NWS, with previous town halls held in Roanoke and Lexington, VA and Boone, NC

August 2009 Town Hall, Lexington VA

Winter Weather Terminology

Heavy Snow - Snow accumulating 4" more in 12 hours or less, or 5" or more in 12-24 hours for locations east of the Blue Ridge. For those areas in the Blue Ridge and west, heavy snow is defined as 5" or more in 12 hours or less, or 6" or more in 12-24 hours.

Blizzard - Sustained winds or frequent gusts of 35 mph or greater and considerable falling and/or blowing snow frequently reducing the visibility to less than 1/4 of a mile. Conditions must last for a period of at least 3 hours for the storm to be classified as a blizzard.

Winter Storm Watch - Issued for the possibility of a combination of any of the following events: blizzard conditions, heavy snow, or significant and damaging accumulations of freezing rain or sleet. A watch usually gives 12-36 hours advance notice of the onset of winter weather conditions.

Winter Storm Warning - Issued when a mixture of heavy snow, freezing rain, freezing drizzle or sleet is occurring, is imminent, or is very likely. If the precipitation is only expected to fall as snow, a **Heavy Snow Warning** will be issued.