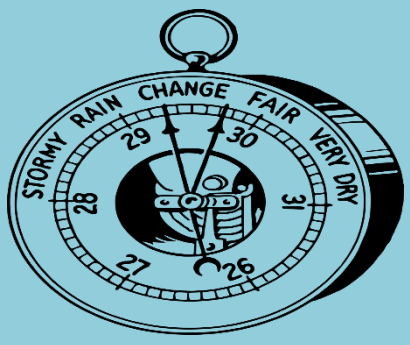



# Blue Ridge Barometer

*Welcome to the Winter 2023 edition of Blue Ridge Barometer, the biannual newsletter of the National Weather Service (NWS) office in Blacksburg, VA! In this issue, you will find articles of interest about the weather and climate of our County Warning Area (CWA), including the 2023-2024 winter outlook and highlights from this past spring and summer. You'll also learn about the National Weather Service director's visit to our office, our time at the West Virginia State Fair, and our participation in a local fundraising event. All this plus reflections on the colors of fall and some fun wintertime activities for kids and kids at heart. We wish all of you a safe and joy-filled Winter!*

## Inside this Issue:



## Hello from the Electronics Section!

*Justin York, Electronics Systems Analyst*

When we think of weather forecasting, we often picture meteorologists analyzing radar images, studying weather maps, and delivering forecasts on television. While these activities are undoubtedly essential, there's a crucial behind-the-scenes team that ensures the accuracy and reliability of our weather information—the Electronics Section at the National Weather Service (NWS) Weather Forecast Office.

In this newsletter article, we'll delve into the fascinating world of the Electronics Section and explore their indispensable role in providing us with timely and accurate weather forecasts.

### A Hub of Technology

The Electronics Section within the NWS Weather Forecast Office is responsible for managing and maintaining an array of high-tech instruments and systems that collect and disseminate vital weather data. These instruments include radar systems, weather balloons, satellites, weather stations, and more. This advanced technology forms the backbone of modern meteorology, allowing meteorologists to monitor and predict weather patterns with precision.

## Radar Systems

One of the most iconic tools in the NWS's arsenal is its radar systems. These powerful machines use radio waves to detect precipitation and severe weather phenomena like thunderstorms and tornadoes. The Electronics Section plays a pivotal role in ensuring that radar systems are operating at peak performance. They perform regular maintenance, conduct quality control checks, and troubleshoot any technical issues that may arise. Without their expertise, radar systems would not be able to provide the crucial information that helps us prepare for severe weather events.

## Weather Balloons

Another vital component of weather forecasting is the use of weather balloons equipped with instruments that measure temperature, humidity, and atmospheric pressure at various altitudes. These measurements assist meteorologists in understanding the vertical structure of the atmosphere.

## Instrument Calibration

Accuracy is paramount in weather forecasting, and the Electronics Section plays a crucial role in instrument calibration. They ensure that all weather monitoring equipment is precisely calibrated, which is essential for producing reliable forecasts and warnings.

This attention to detail is what makes the NWS a trusted source for weather information.

## Continuous Innovation

The field of meteorology is ever-evolving, and the Electronics Section is at the forefront of technological advancements. They continually strive to improve existing systems, integrate new technologies, and enhance the overall reliability and accuracy of weather data.

In conclusion, while meteorologists may be the face of weather forecasting, it's the unsung heroes in the Electronics Section who keep the gears turning behind the scenes. Their expertise and dedication are instrumental in providing us with the weather information we rely on every day, whether it's planning our daily activities or preparing for severe weather events.

Next time you check your local weather forecast, remember the hardworking individuals in the Electronics Section of the NWS Weather Forecast Office, ensuring that you receive the most accurate and up-to-date information to keep you safe and informed.

Stay weather-aware, and thank you for your continued support of the National Weather Service!

# Spring and Summer 2023: A Review

Meteorologists and climatologists define seasons in a way that differs from what you may see printed on your calendar. For us, seasons are represented by the clustering of three consecutive months of data. We consider Spring to be the period of March, April, and May, and Summer to be June, July, and August. The following review analyzes how far above or below the 30-year (1990 – 2020) climatological normal these seasons were in 2023 for both temperatures and rainfall.

March and April were warmer than normal across the region, followed by a May that was cooler than normal. For the entire Spring season, temperatures were either very close to normal or a degree or two higher on average.

| | MARCH | | APRIL | | MAY | | SPRING | |
|---|---|---|---|---|---|---|---|---|
| LOCATION | Average | Normal | Average | Normal | Average | Normal | Average | Normal |
| Blacksburg, VA | 45.4 | 41.7 | 54.3 | 51.4 | 60.0 | 60.2 | 53.2 | 51.1 |
| Bluefield, WV | 43.2 | 42.2 | 53.8 | 52.7 | 57.6 | 60.3 | 51.6 | 51.7 |
| Danville, VA | 50.3 | 49.0 | 59.1 | 58.1 | 63.5 | 66.0 | 57.6 | 57.7 |
| Lynchburg, VA | 49.8 | 46.4 | 59.9 | 56.1 | 63.2 | 64.2 | 57.6 | 55.6 |
| Roanoke, VA | 50.2 | 48.3 | 59.7 | 58.0 | 64.3 | 66.1 | 58.0 | 57.5 |

*Table 1. Average Spring temperatures compared to normal. (Red = warmer and Blue = cooler)*

March was drier than normal across the region, followed by an April than was wetter than normal or near normal. May was a mix of well below normal and well above normal. Only Blacksburg was somewhat close to normal, but still a bit on the dry side. This Spring season, we had a mix of notably above and below normal values. Roanoke was the driest compared to normal with a deficit of almost three inches. Bluefield was the wettest compared to normal with a surplus of a little over two inches.

| | MARCH | | APRIL | | MAY | | SPRING | |
|---|---|---|---|---|---|---|---|---|
| LOCATION | Total | Normal | Total | Normal | Total | Normal | Total | Normal |
| Blacksburg, VA | 2.66 | 3.78 | 4.42 | 3.77 | 4.13 | 4.47 | 11.21 | 12.02 |
| Bluefield, WV | 3.00 | 3.84 | 3.62 | 3.64 | 7.64 | 4.61 | 14.26 | 12.09 |
| Danville, VA | 1.90 | 3.53 | 5.40 | 3.53 | 5.00 | 4.13 | 12.30 | 11.19 |
| Lynchburg, VA | 1.67 | 3.76 | 4.79 | 3.45 | 1.91 | 3.98 | 8.37 | 11.19 |
| Roanoke, VA | 1.59 | 3.51 | 3.95 | 3.49 | 2.82 | 4.31 | 8.36 | 11.31 |

*Table 2. Total Spring rainfall compared to normal. (Green = wetter and Brown = drier)*

June was cooler than normal, followed by a July that was warmer than normal. In August, there was a mix of above normal and below normal temperatures, with each location typically not having more than one-half degree to one degree deviation. For the Summer season, temperatures averaged around normal to a little below normal.

| | JUNE | | JULY | | AUGUST | | SUMMER | |
|---|---|---|---|---|---|---|---|---|
| LOCATION | Average | Normal | Average | Normal | Average | Normal | Average | Normal |
| Blacksburg, VA | 65.3 | 67.9 | 73.5 | 71.7 | 71.4 | 70.4 | 70.1 | 70.0 |
| Bluefield, WV | 63.0 | 67.1 | 70.6 | 70.3 | 68.8 | 69.3 | 67.5 | 68.9 |
| Danville, VA | 69.8 | 73.9 | 78.4 | 77.9 | 76.0 | 76.5 | 74.8 | 76.1 |
| Lynchburg, VA | 68.8 | 72.0 | 77.7 | 76.0 | 74.8 | 74.5 | 73.8 | 74.1 |
| Roanoke, VA | 70.7 | 73.8 | 79.3 | 77.8 | 77.3 | 76.2 | 75.7 | 75.9 |

*Table 3. Average Summer temperatures compared to normal. (Red = warmer and Blue = cooler)*

There was a wide range of plus or minus values compared to normal in June, with Bluefield being the driest with a deficit of a little more than two inches. Danville was the wettest compared to climatology, with a surplus a little over two inches. For July, most areas were on the wet side except for Danville which had a deficit of a little over two inches. Lynchburg had the greatest surplus at a little over six inches! The 10.39 inches recorded at Lynchburg was unique. It was the wettest July on record, surpassing the previous record of 10.30 inches from 1984. A total of 8.15 inches of the 10.39 inches fell in the four-day period between July 13 and July 16. Finally, on July 15, 4.29 inches fell on that day alone. This one-day value is special in many ways: It is greater than the normal monthly rainfall value in July for Lynchburg of 4.19 inches. It set a record rainfall amount at Lynchburg for July 15, surpassing the previous record of 1.92 inches from 1945. Finally, it is the second highest one-day rainfall total at Lynchburg for the month of July. The current record is 4.44 inches set on July 31, 2022. For August, all but Bluefield recorded amounts below normal, with the greatest deficit at Roanoke, which was almost two inches below normal. Bluefield's surplus was a little shy of an inch above normal. For the Summer season, all locations except Lynchburg (thanks to its record-setting July) reported rainfall amounts below normal. Blacksburg had the greatest deficit with an amount close to two inches.

| | JUNE | | JULY | | AUGUST | | SUMMER | |
|---|---|---|---|---|---|---|---|---|
| LOCATION | Total | Normal | Total | Normal | Total | Normal | Total | Normal |
| Blacksburg, VA | 2.94 | 4.27 | 4.38 | 4.21 | 1.95 | 3.57 | 9.27 | 12.05 |
| Bluefield, WV | 2.05 | 4.14 | 5.31 | 4.36 | 3.91 | 3.14 | 11.27 | 11.64 |
| Danville, VA | 5.89 | 3.98 | 2.61 | 4.88 | 2.78 | 3.47 | 11.28 | 12.33 |
| Lynchburg, VA | 4.33 | 3.82 | 10.39 | 4.19 | 2.31 | 3.22 | 17.03 | 11.23 |
| Roanoke, VA | 4.03 | 4.66 | 5.60 | 4.28 | 1.54 | 3.37 | 11.17 | 12.31 |

*Table 4. Total Summer rainfall compared to normal. (Green = wetter and Brown = drier)*

# Winter Outlook 2023-2024

On October 19, 2023, the Climate Prediction Center (CPC) issued its temperature and precipitation outlook across the United States for the meteorological winter time period of December 2023, and January and February 2024 (DJF 2023-24). The full article can be read here. This newsletter article provides a summary of the conditions expected for Southeast West Virginia, and the mountains, foothills and Piedmont regions of North Carolina and Virginia. Through the use of various color shades, the outlooks represent the probability of conditions (temperatures or precipitation amounts) being below, near, or higher than average for the three-month period. If the probability is the same among the three possibilities, a forecast of "Equal Chances" is provided along with no coloration of the area (i.e. the map remains white).

In Image 1, the temperature forecast across the geographical area of interest is within the lowest range of what CPC classifies as "Leaning Above" average. This is depicted by the light tan, 33 to 40 percent color shading. In Image 2, the precipitation forecast across the same region is not uniform. The region from Southeast West Virginia eastward to approximately the Interstate-81 corridor of Southwest Virginia has "Equal Chances" of above, near, or below normal precipitation. The remainder of the geographical area of interest is within the "Leaning Above" normal probability categories. Most of this area falls within the light blue-green, 33 to 40 percent probability. The far southeast portion of Southside Virginia is clipped by the slightly higher 40 to 50 percent (light green color) probability.

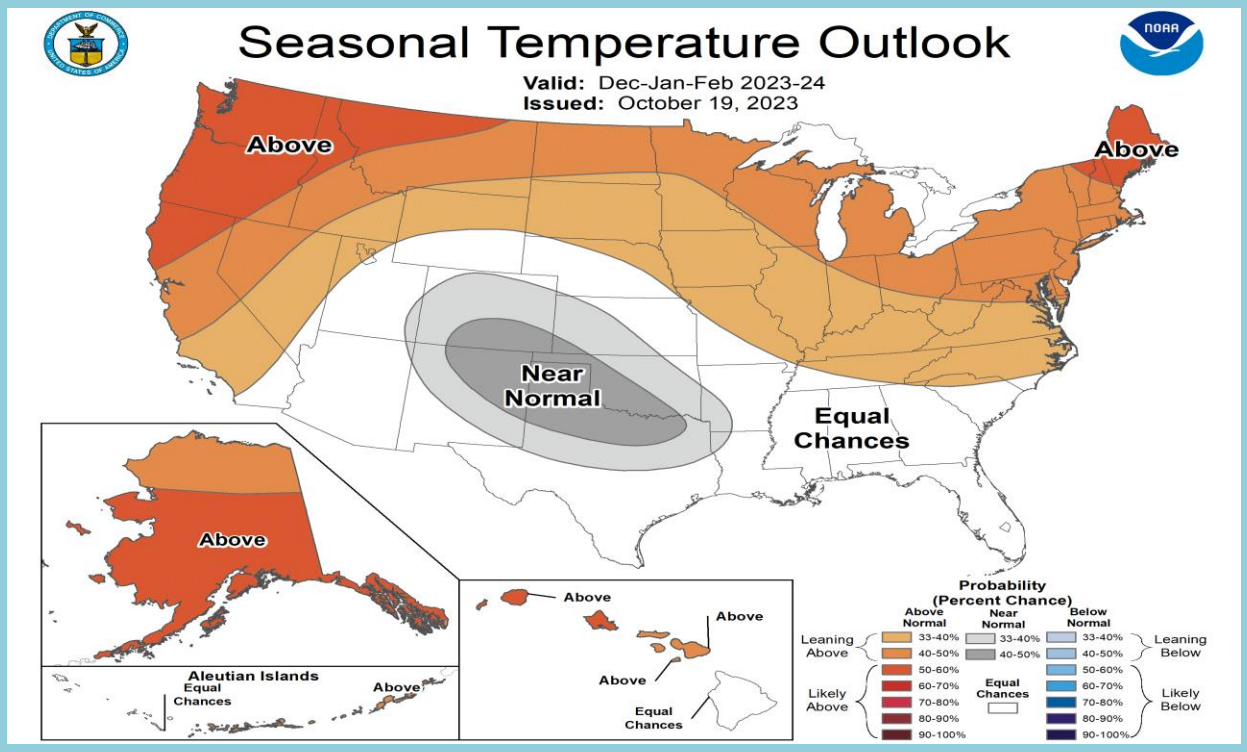



*Image 1. DJF 2023-24 Temperature Outlook Across the United States. Source: CPC*

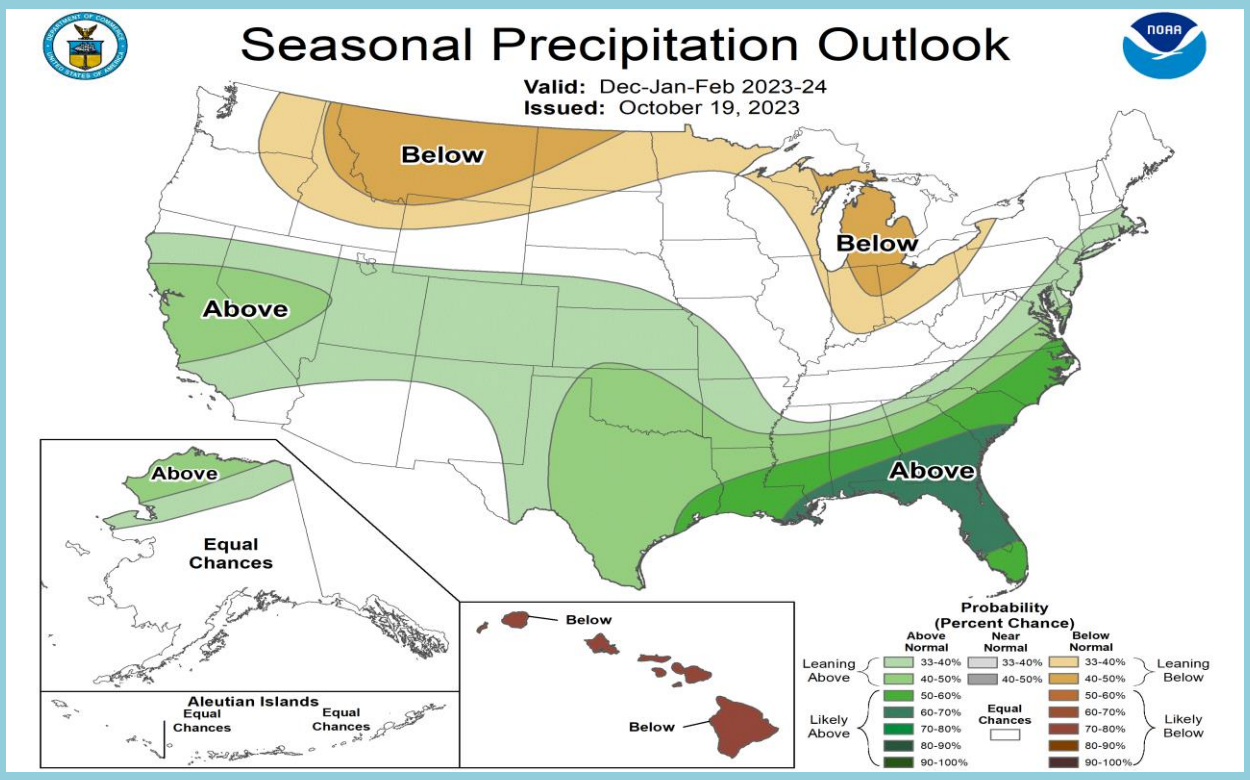



*Image 2. DJF 2023-24 Precipitation Outlook Across the United States. Source: CPC*

While these probabilities don't seem very high (and they are not), the forecast for the area of interest must be viewed within the greater picture of the entire United States. This winter, as compared to recent winters, the southern branch of the jet stream is expected to be more active. This in turn will help direct more weather systems across the Southeast US. Conversely, this also means fewer weather systems are expected across northern parts of the country. The closer one lives to the Southeast US, the better one's chance of being impacted by these systems, and thus a higher probability of above normal precipitation for the three-month period.

## Winter Weather Witticisms

What do you call a penguin in the Sahara Desert? Lost.

What do mountains wear to stay warm? Snowcaps.

What's the weatherman's favorite food in winter? Brrr-itos!

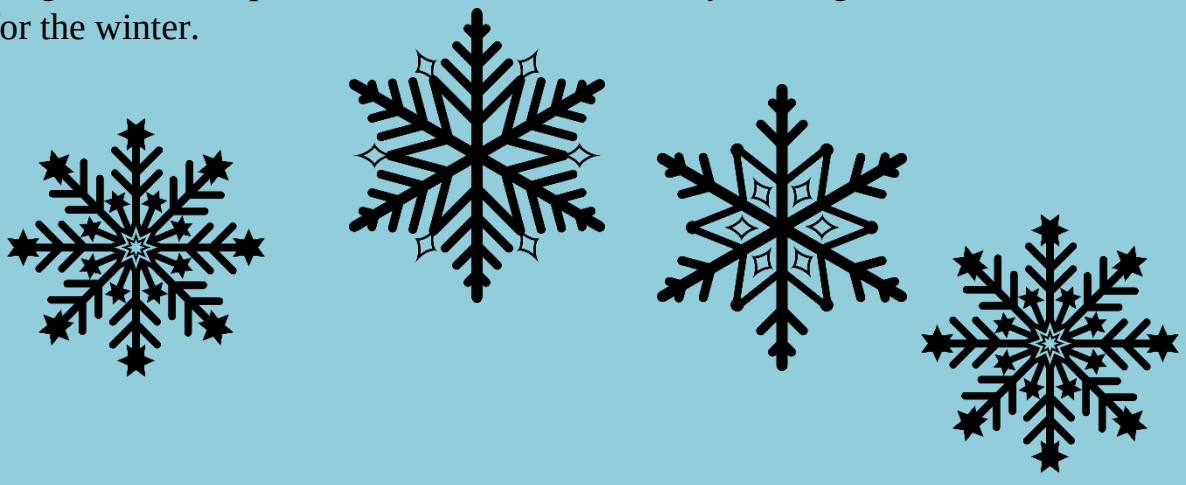
Who is Frosty's favorite Aunt? Aunt Arctica!

What vegetable was forbidden on the ships of Arctic explorers? Leeks.

What do you call ten Arctic hares hopping backward through the snow together? A receding hare line.

Why shouldn't you use your loyalty card to scrape ice from your windshield? You will only get 10% off.

What's a good winter tip? Never catch snowflakes on your tongue until all the birds have flown south for the winter.



# National Weather Service Director Visits NWS Blacksburg

*Phil Hysell, Warning Coordination Meteorologist*

On July 13th, 2023, NWS Director Ken Graham visited Roanoke, VA, to speak at the Annual FEMA Hurricane Season Kickoff event. This event is usually held at a coastal location to help bring attention to the hazards tropical systems can bring. To highlight the importance of preparing for inland flooding, the event was held, for the first time, in Roanoke. During this event, Director Graham announced that the NWS will hire and permanently place a meteorologist with the Virginia Department of Emergency Management. After this event, the NWS Blacksburg office was treated to a visit from Mr. Graham, where he spoke to the staff about his vision for the future of the agency (found in the NWS 2023-2033 Strategic Plan) and answered questions from the staff.

After numerous interviews with local media outlets, Director Graham streamed a Facebook live session on the NWS Facebook account during our evening upper air launch where he highlighted the importance of the data collected from these launches and interviewed one of our meteorologists.

Director Graham is the first NWS Director to start in the NWS in an entry level position and work his way up to Director. It was an honor and a privilege to welcome him to our office! You can learn more about Director Graham by visiting the following website: www.weather.gov/organization/graham-kenneth

*Figure 1. NWS Director Ken Graham Addresses the NWS Blacksburg Staff*

# NWS Provides Support at the West Virginia State Fair

*Amanda Sava, Ben Gruver, and Megan Kiebler (NWS Charleston), Meteorologists*


*Figure 1. Night view of the State Fair of West Virginia. Photo by Greenbrier County Convention and Visitors Bureau.*

Meteorologists from the Blacksburg, Virginia and Charleston, West Virginia forecast offices teamed up to provide on-site Impact-Based Decision Support Services at the State Fair of West Virginia in August. On Friday, August 11, meteorologists Ben Gruver and Amanda Sava, and hydrologist Nick Fillo from NWS Blacksburg, VA traveled to Lewisburg, West Virginia to provide weather briefings and alerts directly to the Greenbrier County Emergency Management and West Virginia State Police. On Sunday and Monday, August 13 and 14, meteorologists James Zvolensky, Kimberly Hoeppner and Megan Kiebler from NWS Charleston, WV made the trip to the fair to continue on-site support. The state fair kicked off on Thursday August 10, with a nearly sold out concert on Friday, and totally sold out concerts on Sunday and Monday. About 185,000 people attended the state fair through the duration of the 10 day event, which was a record number of attendees. The fairgrounds cover 200 acres in the towns of Lewisburg and Fairlea.

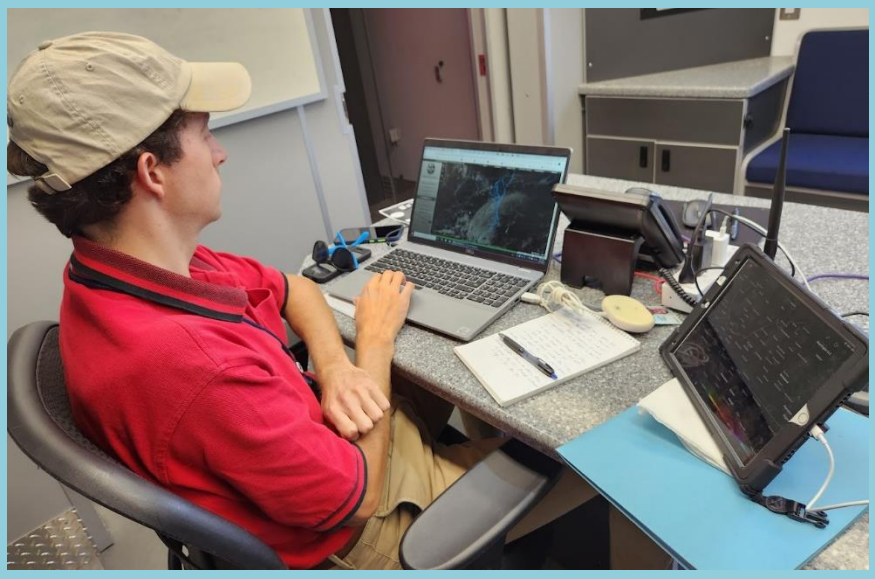


*Figure 2. NWS Blacksburg meteorologist, Ben Gruver, in the Greenbrier County Emergency Operations Center preparing a weather briefing to Greenbrier County emergency management officials.*

The weather for the West Virginia State Fair was rather pleasant for the first week, which fortunately made the decisions easier for emergency management. However, even without thunderstorms for several days, NWS Blacksburg meteorologists were still carefully watching the fair grounds for temperatures reaching critical heat index thresholds. On Monday, the second night of a sold out concert, the weather initially was hot and sunny, but storms developed west in the Ohio Valley and progressed eastward towards the State Fair through the afternoon. NWS Charleston meteorologists remained vigilant of radar trends that afternoon and evening, and provided weather briefings, updates, and alerts to the emergency manager of Greenbrier County. Luckily, the storms tracked in a northeasterly direction, which allowed the state fair and the concert to go on as planned.

It wasn't all just work and no play. The meteorologists were able to grab some of the local fair foods and stop by the animal barns.

*Figure 3. NWS Charleston meteorologist Megan Kiebler visiting with her favorite animals, cows!*

*Figure 4. Meteorologists Megan Kiebler and Kimberly Hoeppner from NWS Charleston posing with one of the vendors at the State Fair.*


*Figure 5. NWS Blacksburg meteorologist Amanda Sava in front of the State Fair of West Virginia.*

In addition to the on-site support, NWS Blacksburg provided daily email weather briefings and forecast updates for the 10 days of the fair, as well as weather watch and notifications of any weather that would pose a threat to the safety of the fair attendees. Greenbrier County Emergency Manager, Paula Brown, said:

*"The National Weather Service is an integral team member with all Emergency Management offices and we couldn't do our daily job without the partnership with NWS providing timely all-hazard forecasts, vulnerability/risk/damage assessments, hazardous weather planning, and excellent/easy to understand social media posts to share and educate our residents. We have additionally been fortunate to work in partnership with both the NWS Blacksburg office as well as the NWS Charleston office for Decision Support Services at large major events like the State Fair of West Virginia. Severe weather has been associated with several major catastrophic events at large outdoor stages and settings nationwide, so we seriously value the multi-faceted coverage of:*

*a) Remote Monitoring: agreed threat thresholds and key contacts for all hazard alerts setup for the spot forecasts, but also,*

*b) having both the NWS meteorologists as well as training staff on-site in the Command Center setting giving timely weather hazard*

*updates/briefings during periods of site-specific unstable weather that could be a hazard to the thousands of people exposed to those threats with limited shelter protection available.*

*We cannot thank the NWS enough for everything they do round the clock as our most valued partner to keep our residents informed, prepared and safe."*

NWS Blacksburg sincerely thanks their colleagues at their neighboring office, NWS Charleston, for their help in providing on-site support to one of the biggest events in their CWA!

## Golfing for a Good Cause

*Dan Nealy, Electronic Technician*

On October 1, 2023, a beautiful day on the greens turned into a powerful fundraising event as four WFO Blacksburg golf enthusiasts – Dan Nealy, John Strickland, Nick Fillo, and Vance Joyner – teed off at the Draper Valley Golf Course to support the Radford High School Athletic Booster Club. The event brought together community members for a day of friendly competition, all for a good cause. The tournament is the Booster's largest fundraiser of the year. Money raised from the event supports purchasing uniforms and athletic equipment, funding scholarships and travel expenses, and field maintenance.

Although the WFO foursome didn't clinch victory in the tournament, they found solace in the glorious weather, their genuine camaraderie, and the shared love of the game. As the sun dipped below the horizon, they reflected on the true prize of the day: the bonds of friendship and the joy of the outdoors.

*WFO Blacksburg golfers, L to R: Dan Nealy (Electronic Technician); Vance Joyner (Meteorologist); Nick Fillo (Service Hydrologist); and John Strickler (Electronic Technician).*

*John Strickler takes a swing, as Nick Fillo looks on.*

*FORE-caster Vance Joyner hopes for the best.*

## Changing Colors

*Stacie Hanes, Lead Meteorologist*

When fall arrives in the southern Appalachians, many people think of cooler weather, apple cider, and the beautiful reds, yellows, purples, and browns of deciduous tree leaves. Because the Blue Ridge has very vibrant fall colors, thousands of sightseers visit every year. In general, the days of late September to late October are the peak time to see fall colors in West Virginia and Virginia. For northwestern North Carolina, October to early November is the main time frame.

But what causes the leaves to change color? Leaves get their green color from an abundance of chlorophyll. Chlorophyll captures sunlight and converts it to energy most of the time, but during the fall it stops being replenished as the number of hours the sun is above the horizon decreases. Since the chlorophyll's green pigment is weakened by this action, the other pigments in the leaves that have been present all along, like orange and red, become visible.

Someone trying to predict the days or weeks of the best fall foliage would need to take the following into account: the amount of rain that has fallen recently, high and low temperatures, the number of daylight hours, and the amount of sugar in the leaves. In addition, peak foliage season begins in the higher elevations and latitudes and works southward with time. Even so, there are microclimates in valleys, near lakes, and in varied terrain that produce pockets of fall color according to a more localized time table. Also keep in mind that a strong wind storm has the potential to rip leaves off trees before they have a chance to turn colors.

The leaves have disappeared from the trees, now that winter has arrived. However, in the future, you can use these websites to stay apprised of changing colors:

West Virginia:

https://wvtourism.com/seasons/fall/

Virginia:

https://dof.virginia.gov/education-and-recreation/fall-foliage-in-virginia/

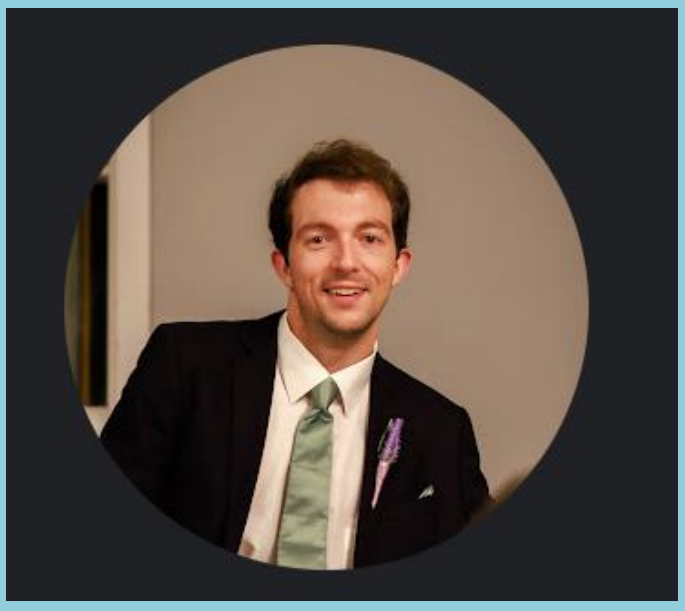
North Carolina:

https://biology.appstate.edu/fall-colors/fall-color-map-north-carolina

# What's New In Our Office: Personnel Changes

### Ben Gruver

Recently, one of our Meteorologists was promoted to Lead Meteorologist, effective in February 2024. Ben Gruver arrived at WFO Blacksburg in early September 2018. He is a 2017 graduate of Virginia Tech. While at Tech, he participated in the National Weather Service Capstone program, and was a volunteer in our office. Ben is active in several committees and serves as the Tropical committee chair. Congratulations, Ben!



# Kidz Korner

Sledding, snowball fights, ice skating, and creating snow people! When you think of fun outdoor wintertime activities, these may come to mind. However, did you know there are many more snow-related activities for kids than these popular ones? The folks at Penn State Extension offer the following additional wintertime activities:

**Snow Olympics.** Just like athletes who performed a wide array of sporting events in ancient Greece, you, too, can participate in a wintry version in your own backyard or neighborhood park.

**Long Jump.** Mark a starting line in the snow. Jump from that line as far as you can. Your boots will mark your distance. From these marks, you can determine who jumped the farthest.

**Snowball Throw.** At the same or different starting line, you and your friends can each throw a snowball or snowballs. Either by visual marks in the snow, or by others marking the landing spot of the snowball(s), you can determine which one of you threw the farthest.

**Snow Pile Hurdles.** Construct piles of snow in a straight or even crooked line. After you make the piles/hurdles, run through the area, jumping over the piles as you come to them.

**Snow Obstacle Course.** Using the same piles from the hurdle course, pick and follow a pattern where you jump over some, hop around others, run around others, etc.

**Ice blocks.** Building ice blocks is easy to do, and you don't even need snow on the ground to do it. First, plan ahead. Ask your parents to save and clean several plastic containers. These can be milk containers or tub-like containers that originally contained margarine, yogurt, cottage cheese, or other similar items. When the forecast calls for a very cold day, where temperatures are expected to fall well below freezing, fill the containers with water and let the water freeze overnight. The next day, free the ice blocks by cutting away the outer container or briefly dipping the containers in warm water to free the ice. Be sure to wear gloves or mittens. Once freed, you can build with the ice blocks.

**Snow maze.** After a newly fallen snow, ask your parent to create a maze pattern in the snow. It can contain turns and twists and straight lines. You can then walk or run through the maze trying to find the quickest way from the starting point to the ending point. Pretend you are driving your car through snowy city streets. (Be certain to stop at the stop signs!)

**Snow creatures.** Why stick with building snow people when you can try your hand at creating snow creatures? These could be animals, dinosaurs, birds, fish, or visitors from another planet. Build your creature and see if your friends and family can guess what you've made.

Remember that we would love to see pictures of the fun things you do outside in the snow. Have a wonderful winter and stay warm!

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**Goodbye Fall, Hello Winter**

*Author Unknown*

Leaves of forest and emerald green
Have long turned to orange, yellow, and red
And fallen on the path before me.
A lone auburn leaf floats through the sky,
And grazes my cheek, as if to say goodbye.

Holding my coat tight as I brave the wind,
My mind wanders like the trail ahead.
Thoughts of corn mazes and hay rides
And apples turned into pies.
Memories of hot mugs of caramel chocolate
Shared with friends, in front of the fire.

Orange, yellow, and red are now brown,
Covered with a dusting of bright white.
One lone snowflake floats through the air.
It lands on my nose, as if to say hello.

Would you like to see your art or writings included in the next edition of Blue Ridge Barometer? If you are between the ages of 3 and 17, we would love to see your hand-drawn artwork, short poems, or short stories about the weather. For the next edition, we are looking for art and writings that involve the spring or summer.

To submit your original drawing, poem, or story, scan your artwork or writing into a .jpg computer image file (with the help of an adult, if needed). You can also write your poem or story using Word and save it as a .doc or .docx file. Please keep any written material to 500 words or less. Artwork may also be completed using drawing or painting software, submitted as a .jpg file.

When submitting your drawing, poem, or story, please include your first name and first initial of your last name, age, and the city/town where you live. All entries should be submitted no later than April 1, 2024. Please email your entries here.

## More Winter Weather Witticisms

How does a snowman lose weight? He drinks only hot chocolate.

What type of beer is served in Iceland? Only drafts.

When will you see snowpeople dance? At a snowball.

How do you know when you have angered a snowman? You'll get the cold shoulder.

What dilemma does a snowperson with achy muscles have? Wondering whether or not IcyHot rub is a good idea.

What happens when you cross a wizard with a blizzard? You get a cold spell.

How do you stay warm in any room during the winter? Go into a corner. It's always 90 degrees.

# From Piedmont to Mountaintop

In this edition, we have two pictures submitted by our meteorologists. The first is a picture of sunrise on August 17, 2023, at the Virginia Tech airport. Smoke from the Canadian wildfires made the sunrise a deeper shade of orange than normal. The size of smoke particles (less than one micrometer) is responsible for scattering sunlight within the orange/red wavelength of the color spectrum. Given sunrises and sunsets are naturally prone to be more orange/red because of scattering of sunlight by atmospheric gases, the smoke particles amplify this effect. The process in both cases is called Rayleigh scattering. Visit noaa.gov/jetstream/clouds/color-of-clouds to learn more about this process.

The second picture taken by one of our meteorologists captured the beautiful colors of sunset on August 30, 2023, in downtown Salem.

As you can see, our meteorologists enjoy taking pictures of the weather in our neighborhood. However, we would really enjoy seeing pictures from yours! From now through April 1, 2024, we invite you to take some weather-related photos and share them with us. Please include with your photos your first name, the first initial of your last name, and where and when you took the picture. We will include your photos in upcoming newsletters and credit them appropriately. Also, by submitting a picture, you agree that we can use it on one of our social media platforms (Facebook and Twitter) or in our local community outreach presentations (for example, a SKYWARN class). Photos used in these forums will also be credited appropriately.

# Stay Safe & Stay Involved!

The winter season not only brings cold temperatures, but a wide range of potential weather hazards, including flooding, lightning, snow, and ice. Check out the NWS Weather Safety page for information on all types of weather hazards. We would love to hear how much snow and ice you are receiving in YOUR area! Please review our Guide to Measuring Snow and Sleet and scroll down the page to report your totals. If you are interested in helping the NWS with storm spotting and verification, please consider participating in the SKYWARN program. Additionally, the NWS can always use new rain/snow observers for the CoCoRaHS network, especially in West Virginia!

To keep up to date on what's happening in our office in between newsletters, please visit our website: https://www.weather.gov/rnk or follow us on Twitter and Facebook.

For questions or comments about this newsletter, please contact the editor or via snail mail at:

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