NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Columbia, SC
Weather Forecast Office

FAMOUSLY HOT FORECASTS

Spring/Summer 2019

Inside this issue:

NWS Columbia Confirms Six Tornadoes

by Whitney Smith - Meteorologist

On Sunday, March 3rd, 2019, a strong cold front moved through central South Carolina and the Central Savannah River Area (CSRA) of Georgia during the late afternoon and evening. Strong thunderstorms developed along and ahead of the front which ultimately produced six confirmed tornadoes across the area: four EF1s and two EF2s. The storm system was the same one that brought deadly tornadoes to Alabama earlier that day.

Surface low pressure deepened as it moved across the Gulf coast states Sunday morning and across the CSRA and central SC during the late afternoon and evening. Strong wind shear, weak to moderate instability and sufficient low level moisture resulted in conditions favorable for severe thunderstorms capable of producing tornadoes. As a result, most of central South Carolina and east -central Georgia were in the slight risk category for severe weather by the Storm Prediction Center which included a 5% risk of tornadoes.

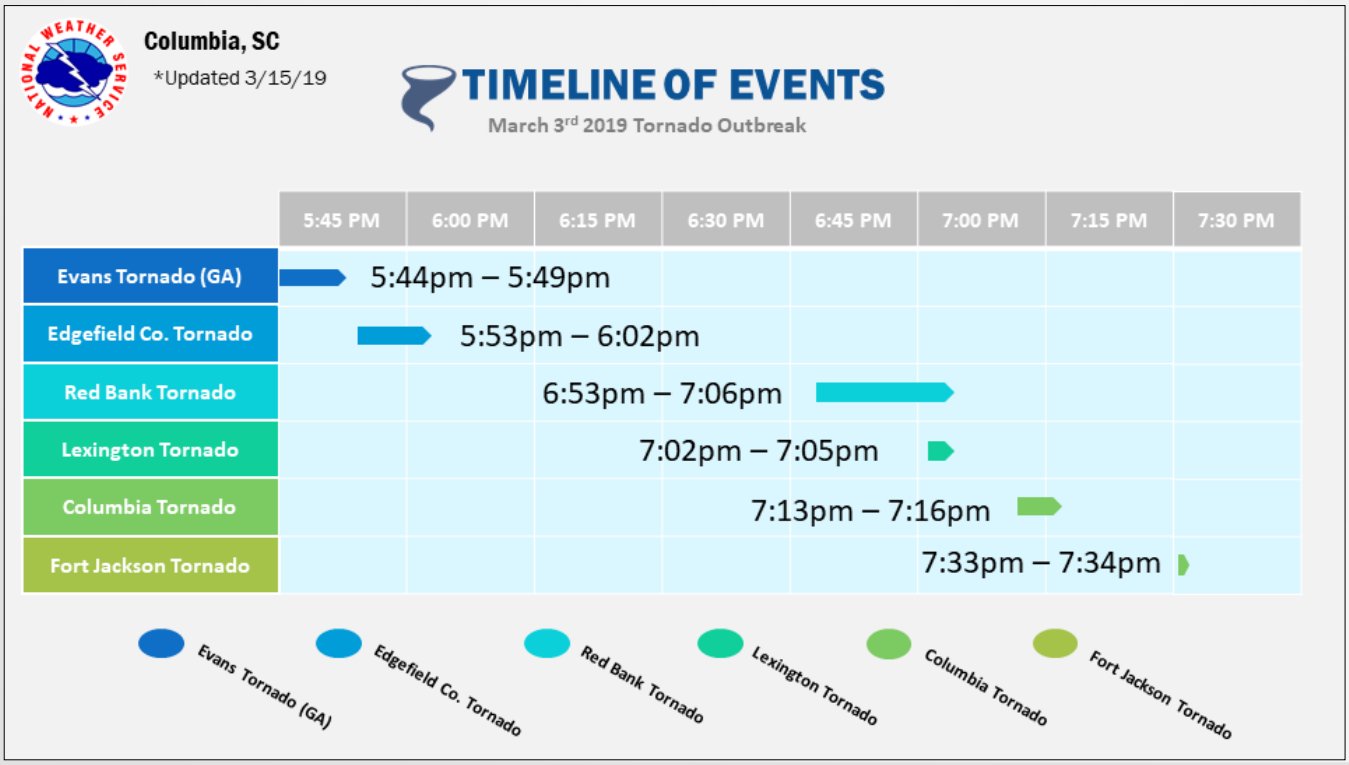
US Forest Service assists with clean up from Edgefield County EF2 tornado on March 3rd, 2019

Tornado Outbreak - Continued

Roof damage to home from EF2 tornado in Evans, GA

Numerous reports of damage were relayed to forecasters throughout the event including extensive tree damage and damage to a number of homes and businesses. On Monday morning, NWS Columbia deployed three storm survey teams to further investigate the reports and to determine the strength and path of the tornadoes.

A survey team determined that the first tornado of the day occurred at 5:44 p.m. in Evans, Georgia and was an EF2 in strength with maximum wind speeds of 120 mph. The tornado was responsible for knocking down numerous trees and damaging several homes. An EF2 tornado then touched down in Edgefield County at 5:53 p.m. with maximum wind speeds of 120 mph. It damaged a gas station and also produced extensive tree damage. An hour later at 6:53 p.m., an EF1 tornado touched down in Red Bank, SC causing damage at the Red Bank Baptist Church. It also snapped and uprooted numerous trees and resulted in roof and property damage to several homes. While the Red Bank tornado was still on the ground, a fourth tornado touched down in Lexington, SC at 7:02 p.m. which was determined to be an EF1 in strength. In addition to tree damage, the tornado damaged several homes and businesses including an RV storage facility. The fifth tornado of the day touched down shortly after the Lexington tornado at 7:13 p.m. in Columbia, SC producing significant damage to trees which fell onto vehicles and homes. The final tornado was an EF1 which occurred at 7:33 p.m. at Ft. Jackson, SC. Multiple trees were snapped and uprooted by the tornado.



National Hurricane Center Familiarization Visit

by Hunter Coleman - Meteorologist

The National Hurricane Center (NHC) is one of the most well known offices in the National Weather Service. WFO Columbia is just one of the many local forecast offices that interact with NHC during times when tropical storms approach the US coast. It is important that the local office and NHC coordinate with one another to make sure there is clear and concise messaging for tropical systems that will impact the United States.

2018 Hurricane Season Map Displayed at the National Hurricane Center in Miami, Florida

I had the opportunity to go to NHC for 2 days on a visit to see firsthand how their operations work and directly interact with many of the forecasters that we coordinate with during tropical events. Part of my time was spent shadowing forecasters to see them in their environment and learn more about the data and information they use to produce their forecasts as well as understand all of the various coordination that they must conduct with local offices as well as foreign country governments. One of the most important things learned from this visit was that satellite data is crucial to NHC analysis and forecasting efforts, since most of storms originate well out at sea where there are little if any near surface data available. NHC also receives wind and wave product guidance from the Tropical Analysis and Forecast Branch (TAFB) which is incorporated into their forecasts. The hurricane season runs from June 1 to November 30 and during the offseason when there is minimal tropical cyclone activity, the hurricane specialists spend their time on training, outreach, and software development.

The visit to NHC was beneficial to both our office as well as to NHC as it allowed the exchange of information to both offices and strengthened the relationship as well as improve communication which will be critical during a future event.

Summer Safety Tips

by Rachel Cobb - Meteorologist

Heat waves, barbeques, and beach weather will be here before you know it! Here are some tips to stay safe in the summer months:

⇒ **Heat-related illness is a serious threat both on the job and at home. Protect yourself by:**

- Wearing appropriate clothing
- Staying hydrated
- Getting out of the sun periodically

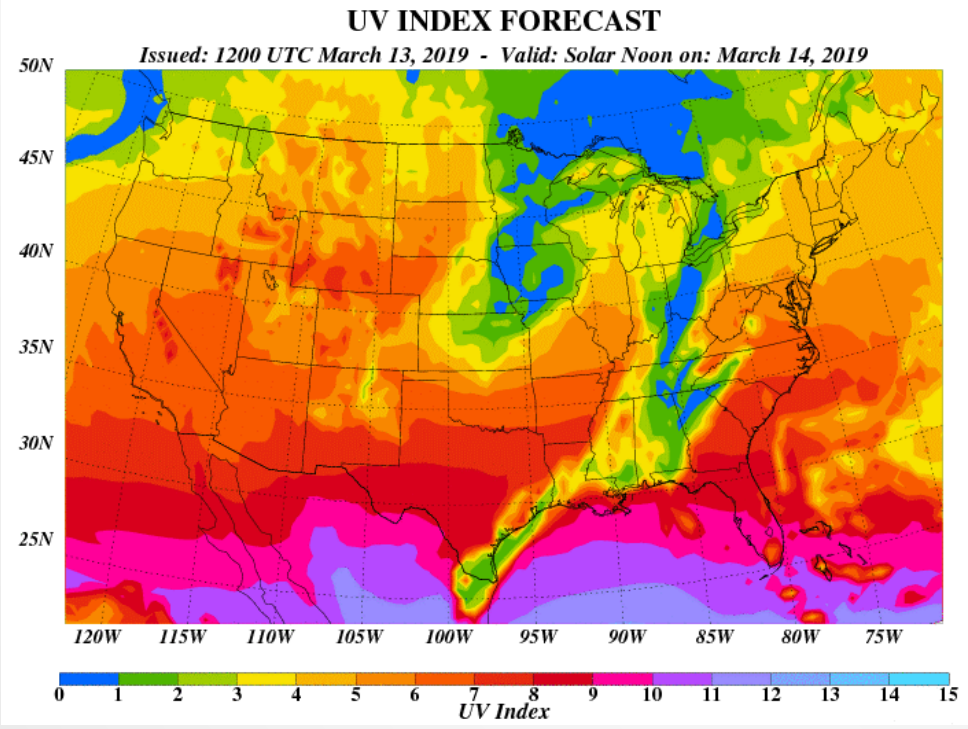
⇒ **Sunscreen, wide-brimmed hats and appropriate clothing can help keep the sun off and prevents sunburns and possible skin cancer.**

⇒ **Use extra caution near water and sand. These surfaces reflect the damaging rays of the sun, which can increase your chance of sunburn.**

⇒ **Check the UV Index daily to help you plan your outdoor activities and prevent over exposure to the sun.**

⇒ **If you're headed to the woods for hiking or camping:**

- Bring plenty of bug spray to help prevent mosquito and tick-borne illness
- Tell someone where you are going and when to expect you back
- Learn to recognize the poisonous plants common to your area



⇒ **Watch for potential rip currents at the beach and know to swim perpendicular to the flow if you're ever caught in one.**

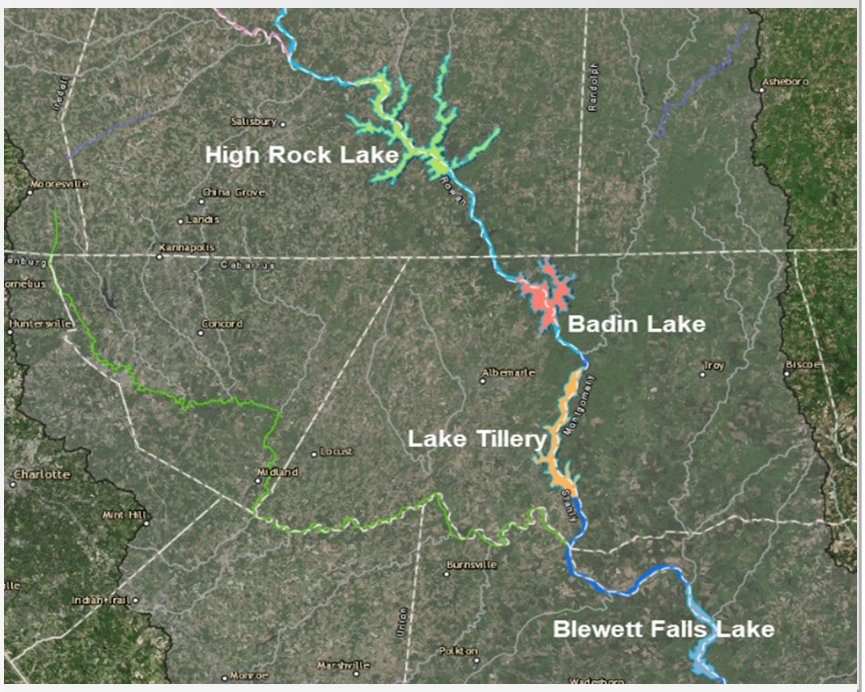
⇒ **If you're heading out on the water, make sure you're following proper boating safety, including wearing life jackets.**

More information about the UV Index and forecasts can be found at: https://www.epa.gov/sunsafety/uv-index-1

Effects of Hurricane Florence on Blewett Falls Lake Dam

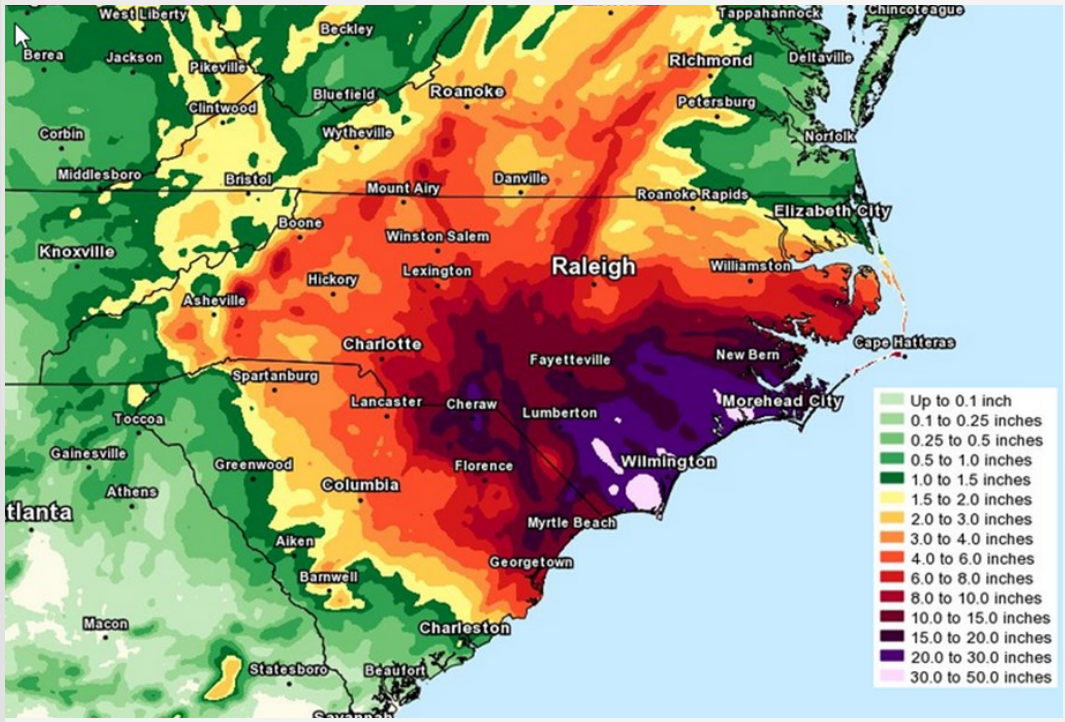
by Leonard Vaughan - Hydrologist

The two main reasons for constructing a dam on a river are for flood control and power generation. But what happens if so much rain falls in a river basin that the powerhouse of the dam becomes flooded? Well, this past September when Hurricane Florence came ashore in southeastern North Carolina, the storm produced rainfall amounts of 1 to 2 feet in portions of the Yadkin/Pee Dee River Basin. The Yadkin-Pee Dee Basin is the 2nd largest basin in North Carolina and covers 7,221 square miles.



Map showing location of Blewett Falls Lake within the Pee Dee River Basin

Florence produced record flooding across portions of North Carolina and South Carolina. Between 10 and 20 inches of rain fell from near Salisbury, North Carolina downstream to Blewett Falls Lake. The rainfall that fell locally around Blewett Falls Lake combined with releases from the upstream lakes of High Rock, Badin and Tillery produced the 4th highest flood on record for the river gage located just downstream from Blewett Falls at Rockingham. Only the floods of August 27th 1908, September 18th, 1945, and September 19th, 1928 were higher. The series of dams along the Yadkin River/Pee Dee River were completed between 1911 and 1929, with Blewett Falls Dams being the oldest.



Hurricane Florence storm total rainfall from September 14-17th based on MRMS radar estimates

Blewett Falls - Continued

Here is a little history of Blewett Falls Dam:

- **The construction of the dam was completed in 1911 and began producing power in 1912.**
- **In June 2018, the Hydro Plant was inducted into the "Hydro Hall of Fame"**
- **The lake encompasses 2,866 acres with 34 miles of shoreline.**
- **The concrete gravity dam has a maximum height of 50 feet and is 1470 feet long.**
- **There are 6 horizontal generating units that were installed in 1911. They produce a total generating capacity of 25.6 megawatts of power. That is enough to power 20,000 homes.**

View from inside the Blewett Falls powerhouse

Aerial view of the Blewett Falls dam and powerhouse

Blewett Falls - Continued

During the flooding produced by Hurricane Florence, the Great Pee Dee River crested at 24.38 feet or 198,000 cfs at the Rockingham gage below the lake. This resulted in a pool height of 107.3 feet. Full pool for the lake is 100.0 feet. That meant that over 7 feet of water was pouring over the Blewett Falls Dam. This dam has no spillway gates, and was designed for water to flow overtop the dam in times of flooding. This high volume of water produced water on the downstream side of the dam to be at least 20 feet higher than normal. This water flooded the powerhouse making all of the units inoperable. The water flooded and destroyed electronics, motors, generators, control panels, transformers and much of what was stored in the powerhouse.

View from inside the Blewett Falls Dam powerhouse while it was flooded from Hurricane Florence

Water flowing over the Blewett Falls Dam during the flooding produced by Hurricane Florence

It will take Duke Energy 18 months to repair all of the damage to the powerhouse due to Hurricane Florence. Remember, much of the infrastructure of the dam was goes back to the early 1900s. Although much of the technology has changed in over 100 years, the generators are original from 1911. Duke Energy has set a completion date of May 31st, 2020 for a total restoration of the powerhouse.

Photos of dam, powerhouse, and flooding courtesy of Duke Energy

COOP Corner

by Doug Anderson - Hydro-meteorological technician

The Cooperative Weather Observing Program's roots can be traced back to 1797 when Thomas Jefferson envisioned a nationwide network of weather observers. The program itself was created in 1890 under the Organic Act passed by Congress. Its mission is two-fold:

⇒ **To provide climatological records, usually consisting of daily high and low temperatures, snowfall and precipitation totals.**

⇒ **To supply observational meteorological data in near real-time to support forecast, warning and other public service programs**

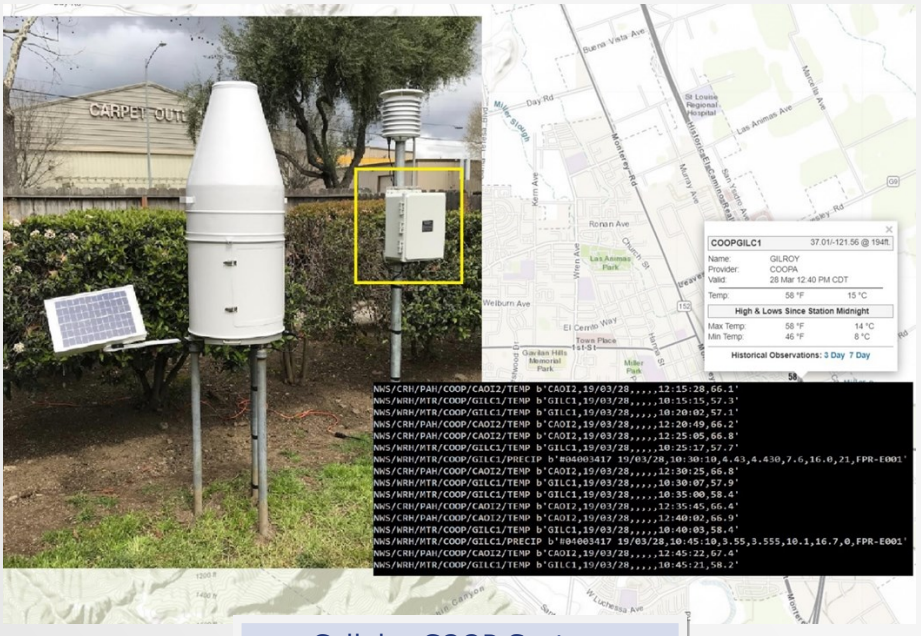
Cooperative stations (COOP) are locations that take daily weather observations using NWS-supplied equipment, filling in gaps between other types of observing stations such as airports, mesonets, etc. We are always looking for new observers with a sense of service and willing to take observations over many years to come. Observers are especially needed right now in Calhoun County, SC. Contact Doug Anderson at douglas.anderson@noaa.gov for more information.

Welcome to our new COOP Weather Observers in Lincoln County, Georgia!

We are very excited to welcome two new observers in the Lincolnton, GA area. After a 15-year period without daily COOP weather observations, The Keneson Family (WC, Gretchen, Lydia, and Archer) and Mrs. Barbara Gould have started up new stations. They are doing an OUTSTANDING job, and we are happy to welcome them to our team! Weather records for Lincolnton began in 1892 and were relatively unbroken until 2004.

NWS Columbia Selected to Test Another New COOP Weather System

In addition to a wireless system being tested at USC in Columbia, NWS recently has developed another type of COOP weather system for the future. One of the main limitations of the current Max-Min Temperature System (MMTS) systems is that a coaxial cable must be installed between the sensor and the digital display and must be manually read daily by the observer. A new system called CCOOP (Cellular-COOP) has just been developed, and we are excited to receive one of only 10 initial test systems nationwide. The CCOOP system allows data from the temperature sensor and a weighing-type rain gauge to be transmitted via a cellular data connection directly into data collection databases. This can allow everyone to see the rainfall and temperature data virtually in near real-time.



Cellular COOP System

COOP Corner– Continued

Many of NWS Columbia's COOP observers have recently earned recognition for their service. We cannot say thank you enough for their dedication!

125-Year Family Heritage Award - Margaret Jayroe, *Little Mountain, SC*

Mrs. Margaret Jayroe was honored as the winner of NOAA's most prestigious award, the Thomas Jefferson Award. Additionally, the family has operated our station in Little Mountain for over 125 years, earning them recognition with a Family Heritage Award.

Margaret Jayroe accepts the 125-Year Family Heritage Award

35-Year Service Award - Otis Williams & Tommy Young, *Winnsboro, SC*

Mr. Otis Williams and Mr. Tommy Young have been the driving force behind keeping the Winnsboro COOP station up and running for the last 35 years. The station has been active since 1896 and has been at the water plant since 1983.

Tommy Young (left) accepts the 35-Year Service Award

10-Year Service Award - R. Anthony Black, *Midville, GA*

Congratulations to Mr. R. Anthony Black from the University of Georgia Southeastern Branch Research Station for his 10-year service award.

10-Year Service Award - John Hofman, *McCormick, SC*

Mr. John Hofman pays particularly close attention to the weather for us and has earned his 10-year service award.

John Hofman (left) accepts the 10-Year Service Award

R. Anthony Black (left) accepts the 10-Year Service Award

Research and Students

by Frank Alsheimer - Science & Operations Officer

There is certainly a lot going on these days on a regular basis as weather effects all of us in some manner on a daily basis. While we are certainly doing a lot of work today, we are not resting on our laurels. We are continuously working on advancing our understanding of weather for future generations.

To accomplish some of our goals, we engage in numerous research projects to improve our service. Some of the topics we have covered in the past couple of years include:

⇒ **Tools for providing more advanced warning of severe weather**

⇒ **Understanding more about vulnerabilities during extreme heat and cold**

⇒ **Evaluating the new leading-edge satellites launched by NOAA in the last few years**

⇒ **Learning more effective ways to communicate hazardous weather to the public**

Many of these efforts have engaged students from universities who are majoring in meteorology or a related field. These students have come from a number of institutions, including the University of South Carolina, The College of Charleston, The University of North Carolina at Charlotte, North Carolina State University, and Florida State University. During their time at our office, students learn valuable skills in conducting accurate research on problems that affect our daily operations. It also allows the students to get an understanding of what life is like for meteorologists, hydrologists, and all the other technical experts at a National Weather Service forecast office. Some of the students that have passed through the office have gone on to graduate school, while others have entered the workforce.

UNIVERSITY OF SOUTH CAROLINA

Weather Ready Nation Ambassadors

by John Quagliariello - Warning Coordination Meteorologist

The Weather-Ready Nation (WRN) Ambassador initiative is the National Weather Service's effort to formally recognize NWS partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water and climate events. The WRN Ambassador initiative helps unify the efforts across government, non-profits, academia, and private industry toward making the nation more ready, responsive, and resilient against extreme environmental hazards.

We must involve everyone in an effort to move people, and society, toward heeding warnings, taking action, and influencing their circles of family, friends, and social network to act appropriately. The WRN Ambassador initiative is the connecting hub of a vast network of federal, state, and local government agencies; emergency managers and city planners; researchers; the media; the insurance industry; nonprofit organizations; the private sector; and many others who are working together to address the impacts of extreme weather on daily life.

2018 WRN Ambassador of Excellence Award:

South Carolina Emergency Management Division

We would like to congratulate South Carolina Emergency Management Division (SCEMD) on being our 2018 Ambassador of Excellence! SCEMD is a leading example of a partner helping to build a Weather-Ready Nation through efforts aimed at ensuring citizens of the state are prepared for weather disasters. SCEMD recently unveiled the SC Emergency Manager App for mobile devices which allows users to build their own emergency plans, keep track of supplies and stay connected. They also publish and distribute an annual hurricane guide, engage with residents during numerous weather preparedness weeks and participate in many outreach activities with the NWS including Weatherfest and at NOAA Weather Radio programming events.

How to Become a WRN Ambassador:

Any organization across all levels of government, businesses large and small, non-profit and non-governmental organizations, and academia can become a WRN Ambassador by submitting a short online application.

You can check out our local webpage to see all of the WRN Ambassadors in the area.

Thank you to our NWS Columbia Weather Ready Nation Ambassadors!

28th Operational Weather Squadron Shaw AFB

Aiken County Emergency Management Division

Augusta-Richmond County EMA

Bamberg County Emergency Services

Barnwell County Emergency Management

Buford Fire & Rescue

Burke County EMA

Carolinas Integrated Sciences & Assessments (CISA)

Challenger Learning Center of Richland District One

Chris Wolfe SC Weather

City of Columbia Police Department

City of Sumter

Columbia County Emergency Management Agency

Columbia Metropolitan Airport

CSRA Weather

District Five of Lexington and Richland Counties

Edgefield County EMA

GA Dept. of Public Health - East Central Health District

Gold Cross EMS

Kershaw County Amateur Radio Club, Inc.

Kershaw County Emergency Management

Lady Starr Radio

Lancaster County Emergency Management

Lee County Emergency Management

Livingston Insurance

McCormick County Emergency Services

McDuffie County Fire Rescue Service

Michelin Tire North America - Lexington, SC

@Midlands_Wx

Orangeburg County Emergency Services

Palmetto Chapter - American Meteorological Society

Pantagraph.online

Pee Dee Ice & Fuel, Inc.

Richland County Emergency Services

Richland Library

Robert Bryant & Son, Inc. SCANA

Simply Flood LLC

South Carolina Emergency Management Division

South Carolina Farm Bureau Insurance

South Carolina State Climatology Office

South Carolina Weather

The Times and Democrat

University of SC Emergency Management

USGS South Atlantic Water Science Center

WAGT (Augusta, GA)

Wilbur's Last Ride

WJBF-TV (Augusta, GA)

WLTX-TV (Columbia, SC)

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