# Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC

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**Spring 2015 Edition**

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## Another Severe Weather Season Arrives

As temperatures start to warm after a very cold February, eastern North Carolina residents need to turn their attention to the threat of severe weather. March through June are our most active severe weather months, with April and May being particularly active in terms of tornadoes. Just last year, on April 25, 2014, an outbreak of tornadoes produced extensive damage, over 30 injuries, and the nation's first EF-3 tornado of 2014 in Beaufort County . Who can forget the April 16, 2011 tornado event, which produced widespread damage and a few deaths over a large portion of Central and Eastern North Carolina? These events highlight the need to have a plan of action should tornadoes and severe weather affect your area. Most tornado deaths and injuries occur outdoors, in automobiles, and in mobile homes. Many fatalities also occur at night. If a tornado warning is issued for your area, remember to "get in, get down and cover up". Seek shelter in a substantial building, in an interior bathroom or closet on the lowest floor.

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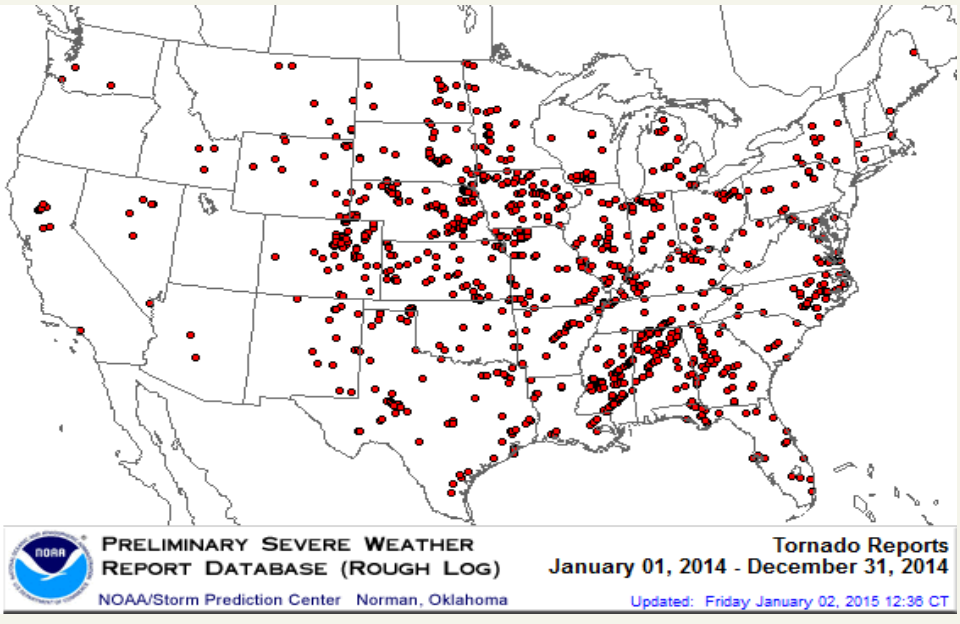
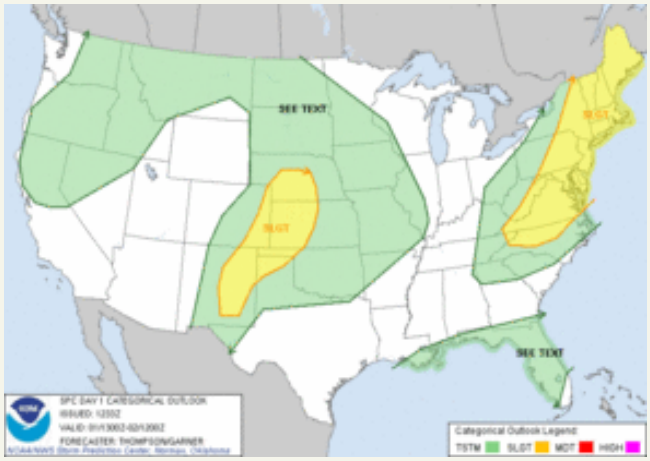


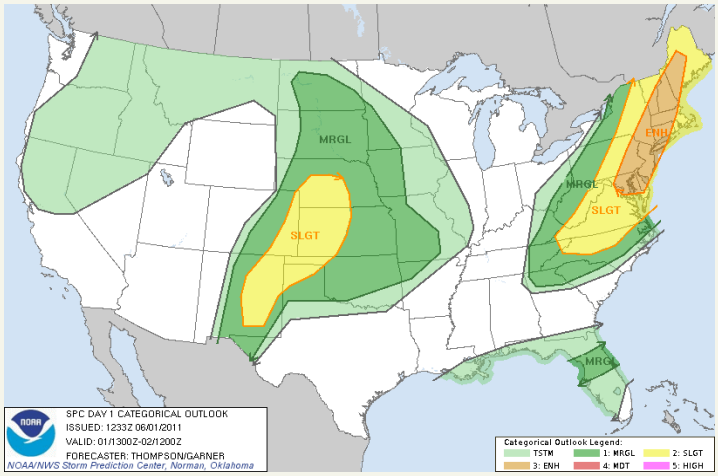

2014 Tornado Touchdowns (Courtesy Storm Prediction Center)

# Changes to Storm Prediction Center Convective Outlooks

*By Bob Frederick, Meteorologist*

Late last year, the Storm Prediction Center (SPC) made changes to its Day 1 to 3 Convective Outlooks. As the graphic below shows, "SEE TEXT" has been replaced with Marginal risk. A new Enhanced risk category was also created, for high end slight chance threats. These changes were made based on feedback from customers and input from Social Scientists. The hope is to better communicate the threat risk and highlight the likelihood of severe weather.




## OLD

- See Text
- Slight
- Moderate
- High

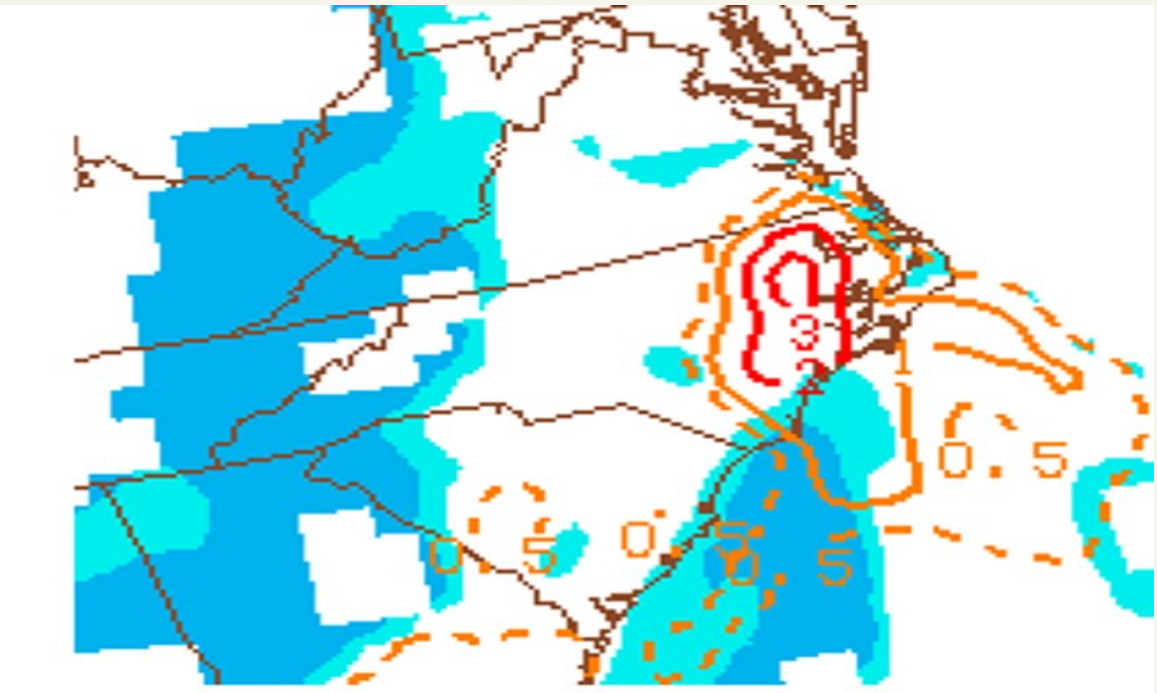
## NEW

- Marginal - Replaces See Text
- Slight
- Enhanced - High End Slight
- Moderate
- High

# A Look Back at the April 25, 2014 Beaufort County Tornado

*By Bob Frederick, Meteorologist*

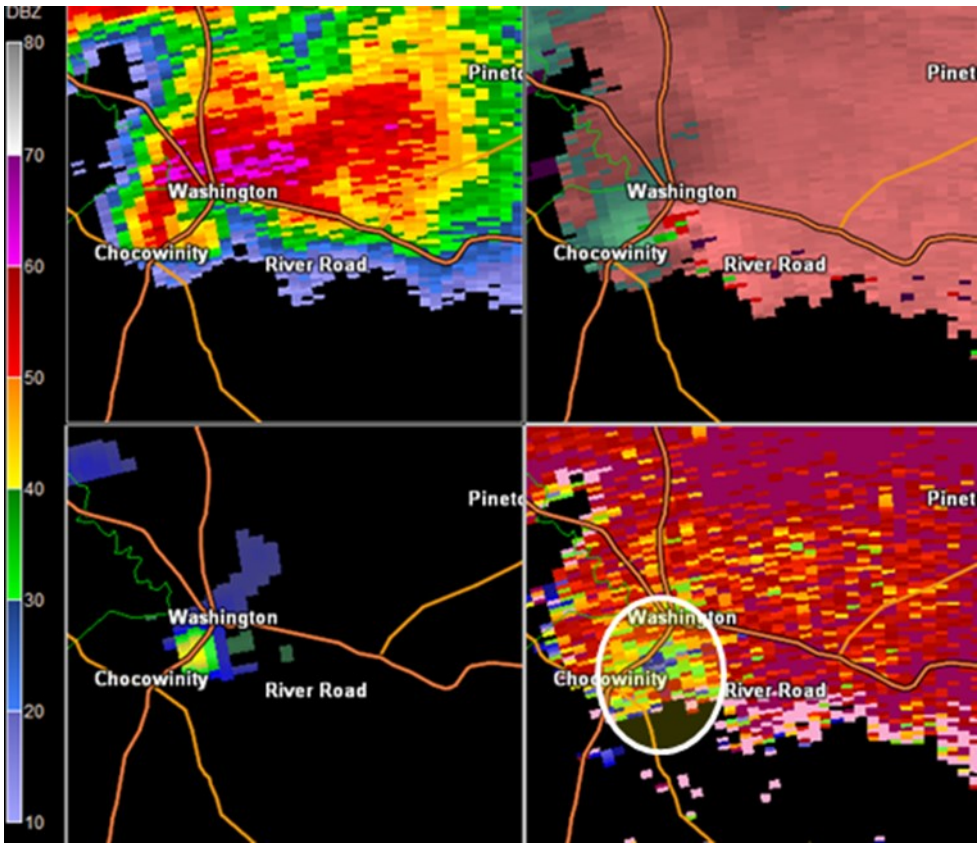
On April 25 2014, a supercell thunderstorm tracked across southern Pitt County and most of Beaufort County producing two tornadoes. This storm produced a brief EF-2 tornado near Chicod in Pitt County, and then produced a powerful EF3 tornado that was on the ground for 21 miles across Beaufort County. Below is a severe weather graphic called Significant Tornado Parameter produced hourly by the Storm Prediction Center. The National Weather Service uses this parameter to gauge the potential for tornadoes as it uses a combination of instability and wind shear. Values over 1 are considered significant and on this day the value reached 3 when the tornado developed.




*Significant Tornado Parameter (Values greater than one are considered significant)*

## April 25, 2014 Beaufort County Tornado (Continued)

The image below shows what the storm looked like on our radar as the strong EF3 tornado was moving between Chocowinity and Washington. The top left shows the reflectivity with a well-defined hook echo that is often seen with tornadic super cell storms. The top right shows the velocity in the storm with strong rotation indicated where red and green colors are close to each other. The bottom left shows this rotation better with values approaching 2 which are considered very strong. The bottom right is a dual-pol radar image called correlation coefficient (CC). CC measures the uniformity of objects being detected. In this image note the minimum in CC where the strong rotation is observed. This is the radar detecting large debris objects like tree limbs, shingles and insulation being lifted several thousand feet in the air by the tornado.




*4-Panel Radar Image of EF-3 tornado between Chocowinity and Washington*.

## April 25, 2014 Beaufort County Tornado (Continued)

The EF3 tornado that tracked across Beaufort County did an estimated 15 million dollars of damage with many homes destroyed. There were 16 injuries due to this tornado with no direct fatalities. The photo below taken by the NWS shows a home in Whichards Beach that was completely destroyed.

***Damage from EF-3 tornado in Beaufort County, April 25, 2014***

# 2014 Year In Review

*By Chris Collins, Meteorologist*

In 2014, the contiguous United States average temperature was 52.6°F, 0.5°F above the 20th century average, and tied with 1977 as the 34th warmest year in the 120-year period of record. 2014 was slightly warmer than 2013 for the CONUS when the annual average temperature was 52.4°F. This marks the 18th consecutive year with an annual average temperature above the 20th century average for the CONUS. The last year with a below-average CONUS temperature was 1996. Precipitation-wise, this was the 40th wettest year on record for the CONUS. Nationwide during 2014, approximately 39,527 daily warm temperature records were tied or broken (14,122 warm daily maximum records and 25,405 warm daily minimum records); while approximately 49,459 daily cool temperature records were tied or broken (28,522 cool daily maximum records and 20,937 cool daily minimum records).

**Seasonal highlights in 2014 included:**

The CONUS had its 33rd coolest winter on record, with much of the country east of the Rockies being cooler than average, mainly due to several Arctic cold-air outbreaks. Many states had their coldest winter since the 1970s. In eastern North Carolina, January was one of the coldest in 25 years. The CONUS spring temperature was near-average, with slightly below normal precipitation across much of the eastern United States.

The contiguous U.S. had a near-average summer temperature that was the coolest since 2009. A majority of the summer precipitation occurred in June and August. Six states across the northern tier had a top 10 wet summer. In eastern North Carolina, both July and August were exceptionally wet, with well over 10 inches of rain area-wide both months.

While much of the country had a warm autumn, it was rather variable in eastern North Carolina. September and October were warmer than normal, while November was 3 to 5 degrees below normal. December ended the year on a milder note, with temperatures about a degree above normal. Rainfall was near normal during the fall.

## 2014 Year in Review (Continued)

# Preliminary Significant U.S. Weather and Climate Events for 2014

### WET
Record precipitation during March contributed to a massive landslide near Oso, WA, which resulted in 43 fatalities.

### WATER LEVELS
The Great Lakes experienced record-high ice coverage in spring; Lake Superior had ice until June. The ice cover, combined with cool and wet conditions, helped water levels to rebound from near-record low levels in 2013.

### FLOODING
In mid-August, a storm system dropped heavy rain across the Midwest and Northeast. Detroit, MI received 4.57" of rain, the city's 2nd wettest day. Islip, NY received 13.57" of rain, a new 24-hour NY state record.

### WARM
Much of the West was warmer than average; eight states had a top 10 warm year. AZ, CA, and NV experienced their warmest year on record.

### DROUGHT
Drought conditions improved across the Midwest and Central Plains, with mixed improvement and deterioration across the Southern Plains, Southwest, and Southeast. Drought worsened for much of the Far West. Parts of the East had drought develop and disappear during the year. The CONUS drought footprint was 31% on Jan 1, peaked at 40% in May, and ended the year at 29%.

### HURRICANE
Hurricane Arthur made landfall in NC on July 3 as a Cat. 2 hurricane. Arthur was the first hurricane to make landfall in the US since Isaac in 2012, the first landfalling Cat. 2 since Ike in 2008, and the earliest landfalling hurricane on record for NC.

### COOL
Numerous Arctic air outbreaks in early 2014 set the stage for a cool year across the Midwest and Mississippi River Valley. Seven states had a top 10 cool year.

### WET
During the summer and autumn, monsoonal flow and the remnants of tropical cyclones brought above-average rain to the Southwest. Phoenix, AZ, received 3.29" of rain on Sep 8, the city's wettest day.

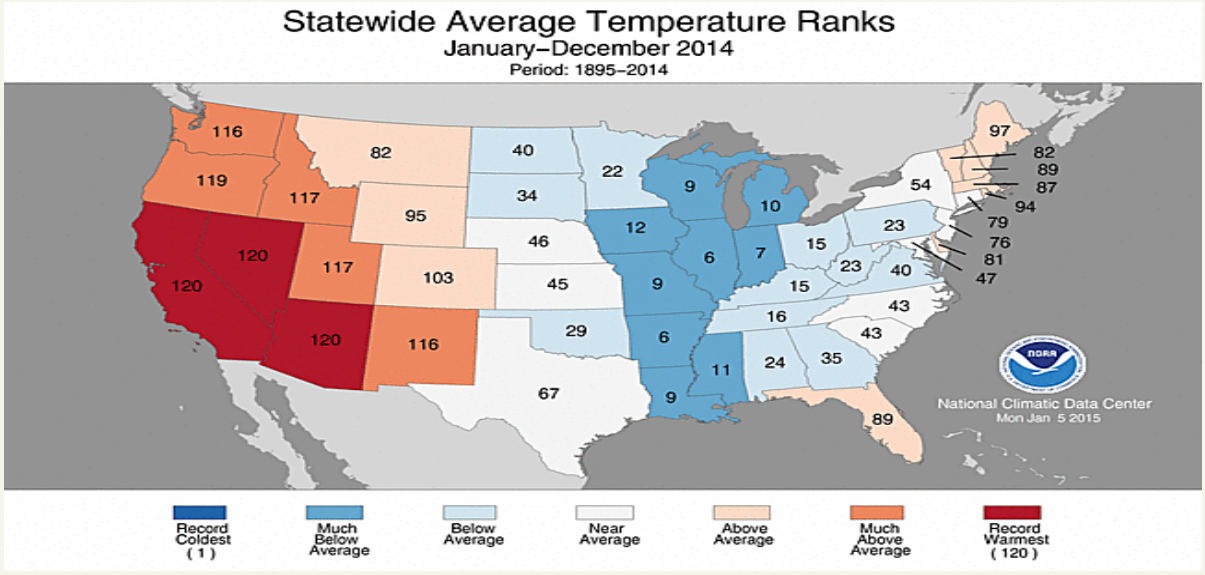
### TORNADOES/FLOODING
In late April, a severe weather outbreak led to 83 tornadoes in the Midwest and Southeast, causing 33 fatalities and over $1 billion in damages. A record 20.47" of rain fell in Pensacola, FL in 48 hours.

### WARM
AK had its warmest year on record. Most towns in western AK were record warm, while most other locations had a top 5 warm year.

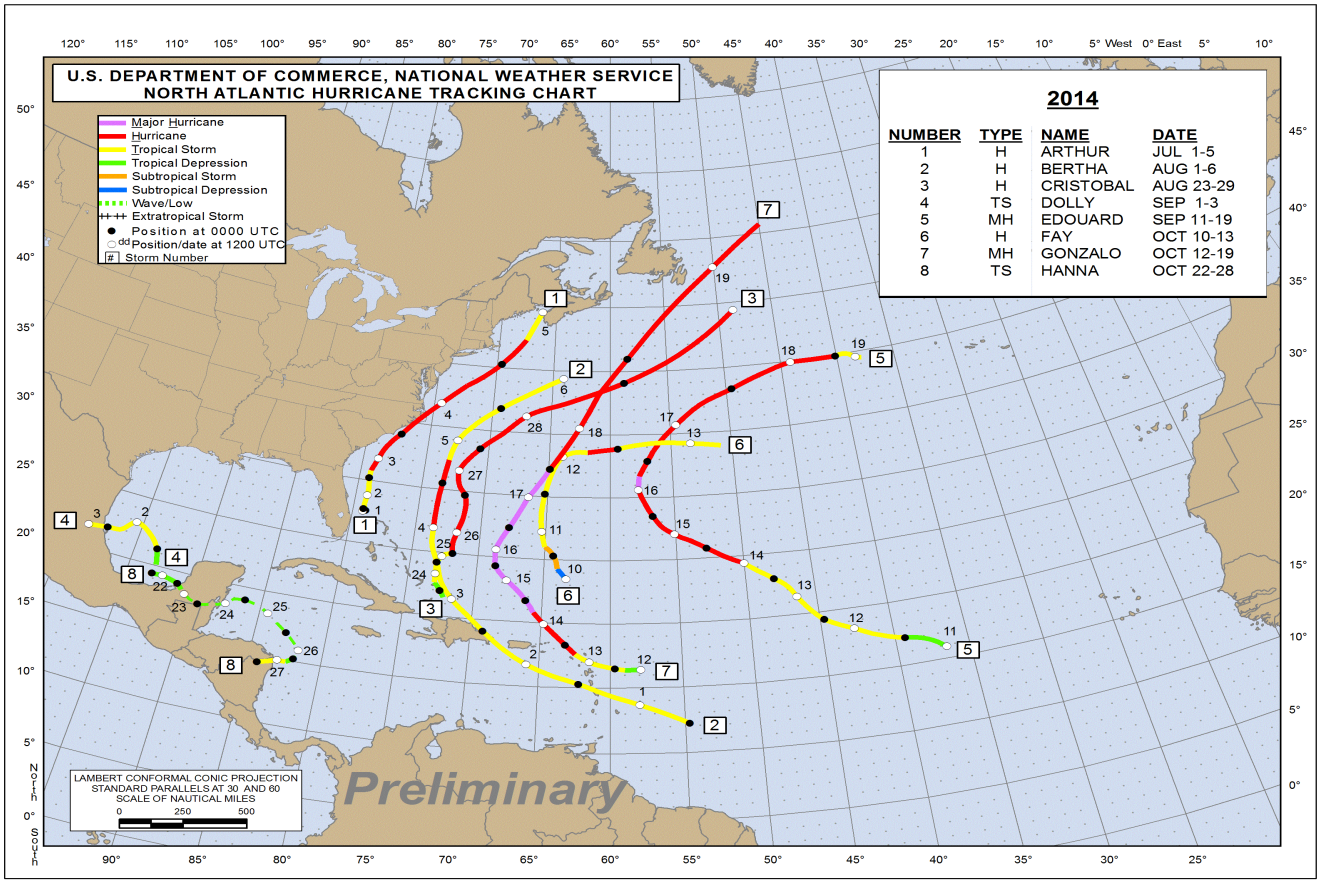
### TROPICAL STORM
Hurricane Iselle traversed the Eastern Pacific, making landfall as a tropical storm on HI's Big Island. This was the first tropical cyclone to hit HI in over 20 years.

### HURRICANE SEASON
The North Atlantic basin had eight named storms, six hurricanes, and two major hurricanes. The number of named storms was the lowest since 1994.

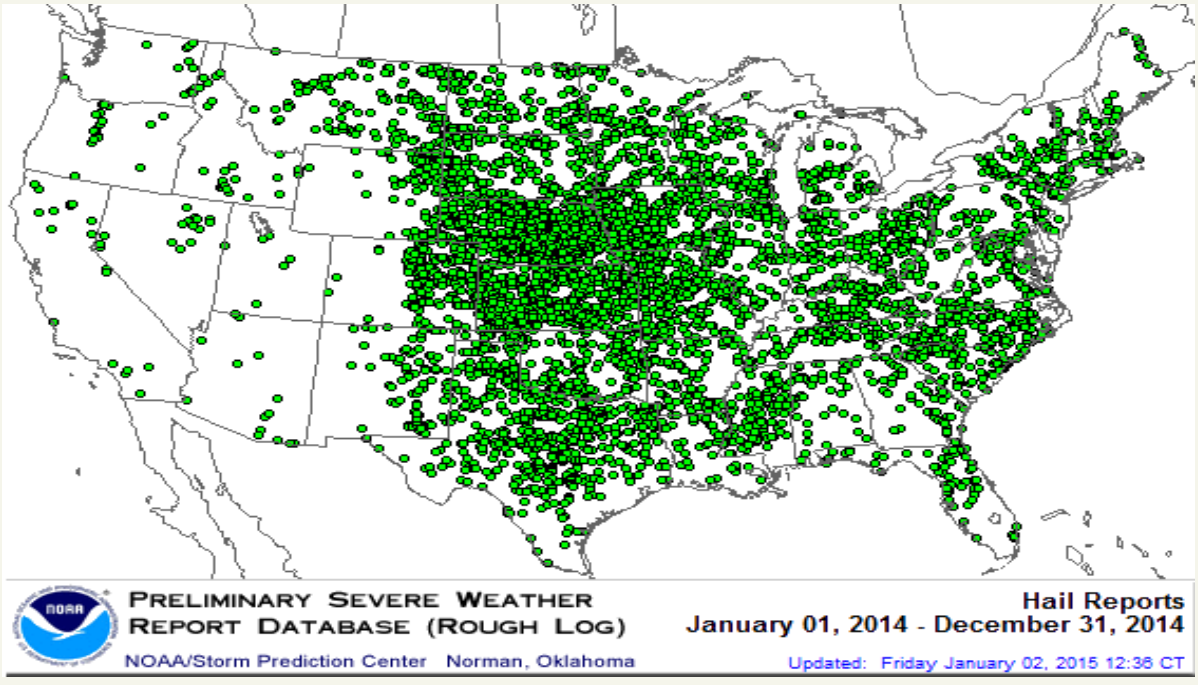
NOAA's National Climatic Data Center



# 2014 Year In Review (Continued)




2014 Hurricane Tracks, Courtesy National Hurricane Center




2014 Large Hail Reports, Courtesy Storm Prediction Center

# Weather Ready Nation– Be a Force of Nature

***By John Cole, Warning Coordination Meteorologist***

Each year, people in this country are killed or seriously injured by all types of extreme weather, despite advance warning. NOAA's Weather-Ready Nation initiative is about building community resilience in the face of increasing vulnerability to extreme weather and water events. As part of the Weather-Ready Nation initiative, NOAA, along with partners such as the Federal Emergency Management Agency (FEMA), wants to motivate individuals and communities to take actions that will prepare them in the event of a weather disaster and to share their preparedness steps with others. These actions can save lives anywhere - at home, in schools, and in the workplace before tornadoes, hurricanes, and other extreme types of weather strike. However, we can't do it alone. A key member of the team is you. That is why we are encouraging everyone to do their part. We ask everyone to "Be a Force of Nature". Be a Force of Nature by knowing your risk, taking action and being an example in your community. Know your risk. Hurricanes, droughts, tornadoes, snowstorms, flooding – severe weather impacts every part of the country.

The first step to becoming weather-ready is to understand the type of hazardous weather that can affect where you live and work, and how the weather could impact you and your family. Be sure to:

1. *Bookmark weather.gov to get the latest forecast information.*
2. *Follow the National Weather Service on Facebook and Twitter.*
3. *Read the State of the Climate reports to discover historical trends.*

Be prepared for severe weather. This includes creating a disaster supplies kit and making sure that you can receive emergency messages.

1. Obtain a NOAA Weather Radio
2. Learn about receiving severe weather alerts on your mobile device.

## Weather Ready Nation– Be a Force of Nature (Continued)

Be a positive influence on your community by sharing your weather preparedness story. Be a Force of Nature by letting your friends and family know what you did to become weather-ready.

1. Tweet that you're prepared with the hashtag #BeAForce
2. Share your preparedness story on Facebook.
3. Make sure you have a Family Emergency Plan.

# Cooperative Observer Celebrates 59 Years of Weather Observations

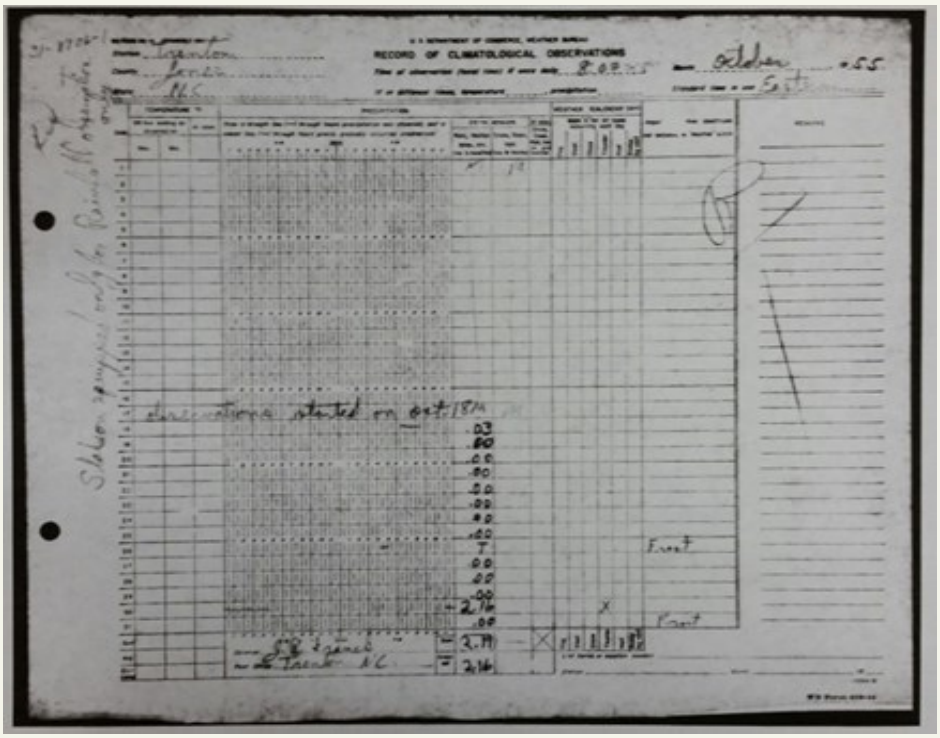
***By Tony Saavedra, Observations Program Leader***

On December 13, 2014, Mr. James R. Franck (92) was recognized with a Lifetime Achievement award for dedicated and selfless service to the National Weather Service in Newport/Morehead City, NC. Mr. Franck, a native of North Carolina, distinguished himself through voluntary and dedicated service to the NWS by observing and recording daily precipitation for over 59 years. Until his retirement on Oct 31, 2014, Mr. Franck faithfully maintained uninterrupted precipitation records that date as far back as Oct 18, 1955. In 2010, Mr. Franck received NOAA's prestigious Benjamin Franklin Award for 55 years of volunteer service to the National Weather Service. The data provided by Mr. Franck provided valuable historical records for the town of Trenton, NC. Mr. Franck's climate records are a benefit to his neighbors, media, surrounding communities, agriculture, the county extension agency, as well as an endless list of other users and is a critical part of the NWS weather and climate data that is used for decision making. On behalf of the NWS we want to thank you Mr. Franck for all these years of dedicated service. May God continue to bless you and we wish you the very best in your future endeavors.

L to R: Tony Saavedra (Observation Program Leader), Mr and Mrs. James R. Franck and Richard Bandy, Meteorologist-in-Charge.

# Cooperative Observer Celebrates 59 Years (Continued)


***Lifetime Achievement Award***




***First Observation form dating back to October 18, 1955***

# Cocorahs Network

*By David Glenn, Meteorologist*


Residents of North Carolina are encouraged to participate as volunteer weather observers by measuring rain,snow, hail, and drought through the CoCoRaHS Program. We are in need of new observers across the region, and especially in the less populated counties of Greene, Jones, Hyde, Martin, Washington, Tyrrell, and Dare.

**So, what is CoCoRaHS?**

CoCoRaHS stands for Community Collaborative Rain, Hail and Snow Network. CoCoRaHS began at the Colorado Climate Center at Colorado State University in 1998 in response to the damaging Fort Collins flood in 1997. North Carolina became the 21st state to join the CoCoRaHS network in September 2007. Roughly 350-450 volunteer observers consistently report their daily precipitation across North Carolina. The CoCoRaHS network is looking for enthusiastic volunteers to report rainfall, snowfall, hail, and drought information. Your data is shared with the National Weather Service, media, researchers, farmers, emergency managers and a wide range of other users, by joining the program. If you would like to contribute valuable precipitation information unique to your location, then this program is for you! Observers record precipitation information using the recommended 4 inch rain gauge and enter their observations into the CoCoRaHS webpage. This program will help a variety of users view and study the variability of precipitation across North Carolina. The accumulated precipitation data will be available to anyone using the web. Become a piece of the meteorological puzzle and join the other 10,000 plus volunteers from across the nation by becoming a CoCoRaHS observer. Recently, drought reporting has also become an important observation within the CoCoRaHS program across the nation. In fact, drought observations from CoCoRaHS are now being included in the National Integrated Drought Information System.

Please visit the CoCoRaHS website at http://www.cocorahs.org/ to learn more about the program. You can click on the "Join CoCoRaHS" link to become an observer. Then go through the on-line training to be on your way to become a part of the meteorological community. If you have any questions please contact David Glenn, North Carolina State Coordinator, or Bel Melendez, Eastern North Carolina Regional Coordinators by phone at (252) 223-5737, or by e-mail at David.Glenn@noaa.gov or Belkys.Melendez@noaa.gov.

# NWS Incident Meteorologist Program

*By Jim Merrell. Meteorologist/Fire Weather Program Leader*

At WFO Newport, our forecasters wear many hats. While our primary focus is issuing forecasts, watches, warnings and advisory for the protection of life and property, we also serve as leaders for the numerous program areas within the office (i.e, marine, aviation, severe weather, tropical, etc.). One of the more interesting activities we participate in is the NWS Incident Meteorologist (IMET) program.

An off-shoot of the Fire Weather program, the NWS has provided trained IMETs since 1914. IMETs receive special training in both mesoscale (large-scale) and micro-scale (the smallest) weather systems. IMETs also are trained in fire behavior and fire operations, which make these fire weather forecasters highly valued members of a fire management team.

Upon request by a partner agency, IMETs are deployed to remote locations throughout the United States to provide support for command staff and incident responders with wildfire operations. Once onsite, an IMET uses a portable All Hazards Meteorological Response System (AMRS) to access the NWS network of Doppler weather radars, computer forecast models, and satellite images. This technology includes a laptop PC, and wireless and satellite communication links.

The main IMET duty is to provide daily forecasts and maintain a weather-watch to ensure the safety of frontline firefighters when a turn in the weather can cause a fire to become erratic. A shift in the wind or a change in weather conditions can help or harm firefighters by hindering the spread of a fire or enlarging and changing its direction.

When on the scene of a wildfire, the IMET starts each day preparing the daily weather forecast for incident commanders and command staff. Next, the IMET presents a fire weather briefing to the command staff and firefighting crews. These critical briefings provide advanced information about wind patterns, thunderstorms, and humidity levels.  Incident commanders have access to the IMET 24 hours a day, seven days a week during a wildfire event.

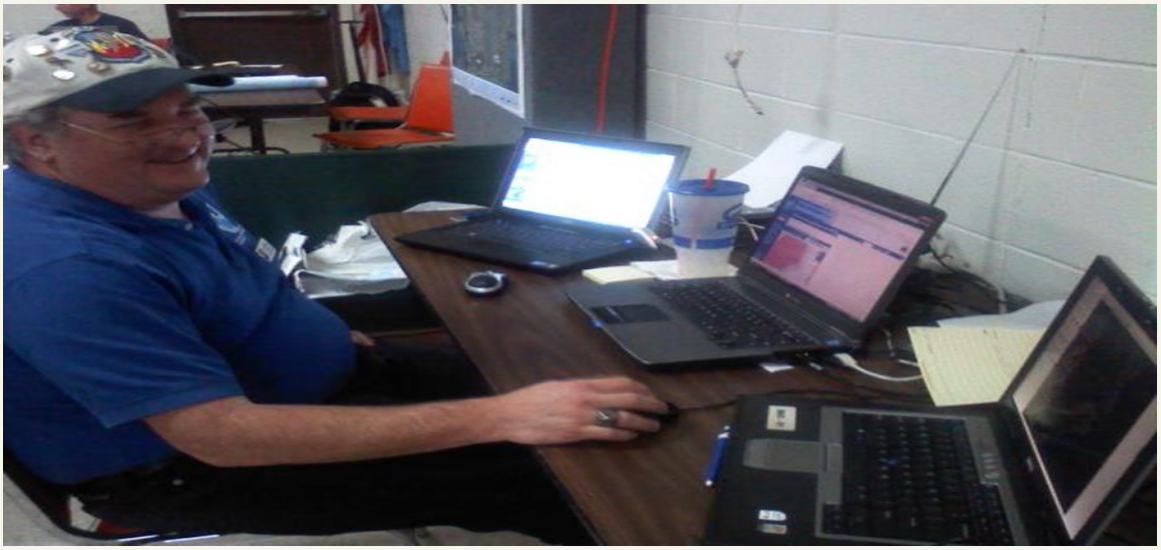
# NWS Incident Meteorologist Program (Continued)

In cooperation with the Department of Homeland Security and other partner agencies, IMETs also provide on-site support for public safety threats ranging from hazardous materials spills to earthquake recovery efforts. There are currently 85 certified National Weather Service IMETs available to deploy at a moment's notice to assist in wildfire suppression efforts.

WFO Newport is fortunate to have two certified IMETs and another in training. Lead Forecaster and Fire Weather Program Leader Jim Merrell has been an IMET since 1995 and was among the first fully-certified IMETs in the NWS Eastern Region. He has been deployed on a number of incidents on the east coast. Jim's most recent assignment was the Pain's Bay Fire (Alligator River National Wildlife Refuge) in 2011. Forecaster Scott Kennedy began his IMET career in 2007 and has been deployed on fires ranging from the Carolinas and Georgia to Oregon and his native California. His latest assignment was to provide incident support for Post-Sandy recovery operations in New Jersey in 2012. Additionally, forecaster Tom Lonka has begun the IMET training process and is working to become a certified IMET in the next three years.

*WFO Newport IMET Scott Kennedy gives a weather briefing to the Dad Fire crew in June 2012.*

# NWS Incident Meteorologist Program (Continued)



*NWS Newport IMET Jim Merrell utilizing the AMRS PC workstation at the Pain's Bay Fire in May 2011. Photo by Fire Management Team.*


*Jim briefing the Pain's Bay Fire Crew at the Stumpy Point VFD in May 2011. Photo by Fire Management Team.*

# NWS Incident Meteorologist Program (Continued)

*A portable RAWS station deployed on the Pain's Bay Fire in May 2011. This equipment provided additional observations of temperature, humidity and wind to the IMET, which resulted in more accurate forecasts. Photo by Jim Merrell*

*A portable RAWS station deployed on the Pain's Bay Fire in May 2011. This equipment provided additional observations of temperature, humidity and wind to the IMET, which resulted in more accurate forecasts.*

# National Weather Service

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