Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC

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Spring 2016 Edition

Lightning Safety

By Bob Frederick, Meteorologist

As we head into spring and warmer weather, there will be an increase in thunderstorms across eastern North Carolina. The National Weather Service issues warnings for large hail, damaging winds, tornadoes and flash floods associated with severe thunderstorms. Another threat that all thunderstorms pose is lightning, Over the past 30 years an average of 49 people per year in the United States have been killed by lightning strikes. A detailed study by John Jensenius, Jr, the Lightning Safety Specialist for the National Weather Service, revealed some interesting statistics concerning lightning deaths in the United States from 2006 to 2014. There were 287 deaths during this period from lightning strikes, and over two thirds of those killed were taking part in outdoor leisure activities, with water related activities topping the list. The image below shows a breakdown of the fatalities associated with water activities, fishing/boating accounting for the majority of the deaths.

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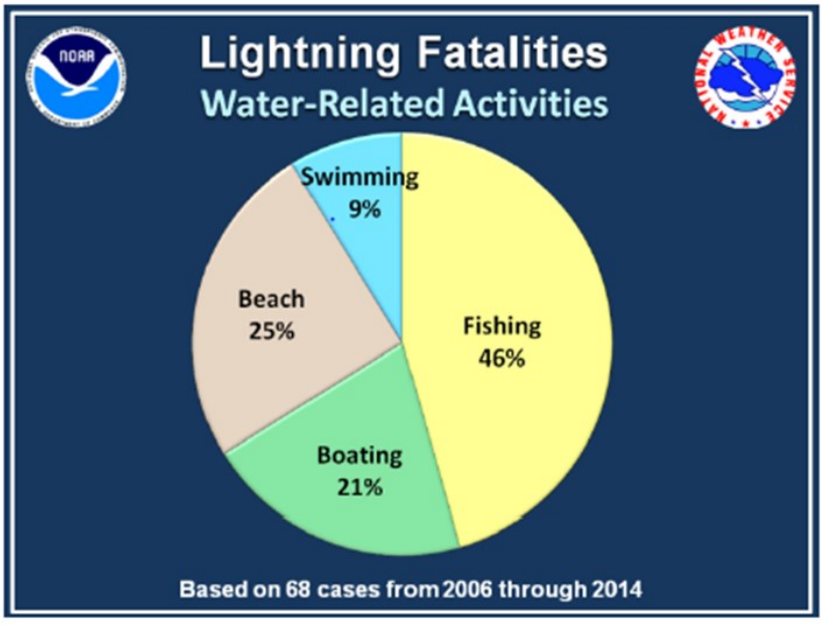

Lightning Safety (Continued)

Water related activities are very popular across eastern North Carolina during the warmer months and people are urged to recognize the danger lightning poses and follow these lightning safety rules.

- Have a lightning safety plan and know where you will go and how long it will take to get there.
- Consider postponing boating/fishing trips if thunderstorms are forecast.
- Monitor the weather closely. If skies begin to darken and thunder is heard, even a distant rumble, head for shelter. Fully enclosed buildings with wiring and plumbing offer the most protection. A hard topped metal vehicle also offers good protection. If caught in open water stay as low as possible and go in the cabin of the boat if one is available.

EF-1 Tornado Hits Davis, NC

By Chris Collins, Meteorologist

A squall line of strong thunderstorms raced across eastern North Carolina during the morning hours of Tuesday February 16, 2016. Several reports of downed trees and wind gusts in excess of 60 mph were received across the Coastal Plains counties.. As the system moved east, a small mesocale area of low pressure developed just off the Crystal Coast, called a "mesolow". This low produced wind damage in the Morehead City/Beaufort area with wind gusts as high as 81 mph at Fort Macon. This was followed by an EF-1 tornado touchdown near Davis. Additional wind damage occurred near the path of this mesolow over portions of the Northern Outer Banks as well as mainland Hyde and Tyrrell Counties through mid-morning.

This system was part of a crazy week of weather that included up to 4 inches of snow over the northern Outer Banks on Friday February 12, and a light freezing rain event on the morning of Monday February 15, just one day prior to the tornado, that caused numerous accidents across the coastal Plains.

Path of EF-1 tornado in Carteret County, February 16, 2016.

Damage from the Davis, NC tornado, February 16,

Five Big Weather Events from 2015

By Chris Collins, Meteorologist

#1 Snow, Ice and Cold in Late February

Three separate winter storms in late February produced a mixture of snow and ice across eastern North Carolina. The first system on February 17 produced a few reports of snow, but the predominant precipitation type during the event was sleet and freezing rain. Widespread power outages were noted with numerous downed limbs and power-lines across portions of the Coastal Plains, with Pitt, Martin, Lenoir, Craven, Duplin, Onslow and Jones Counties the hardest hit. Subsequent storms during the morning of February 24 and the late evening of February 25 produced up to 4 inches of snow in the northern Coastal Plains and areas of freezing and sleet elsewhere.

#2 Severe Thunderstorm/Flooding on July 23

A cluster of severe thunderstorms during the midday hours of July 23, 2015 led to widespread flooding, some minor wind damage and very intense lightning over portions of eastern North Carolina, especially Carteret County.

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Five Big Weather Events from 2015 (Continued)

#3 Prolonged Heavy Rain/Coastal Flooding in October

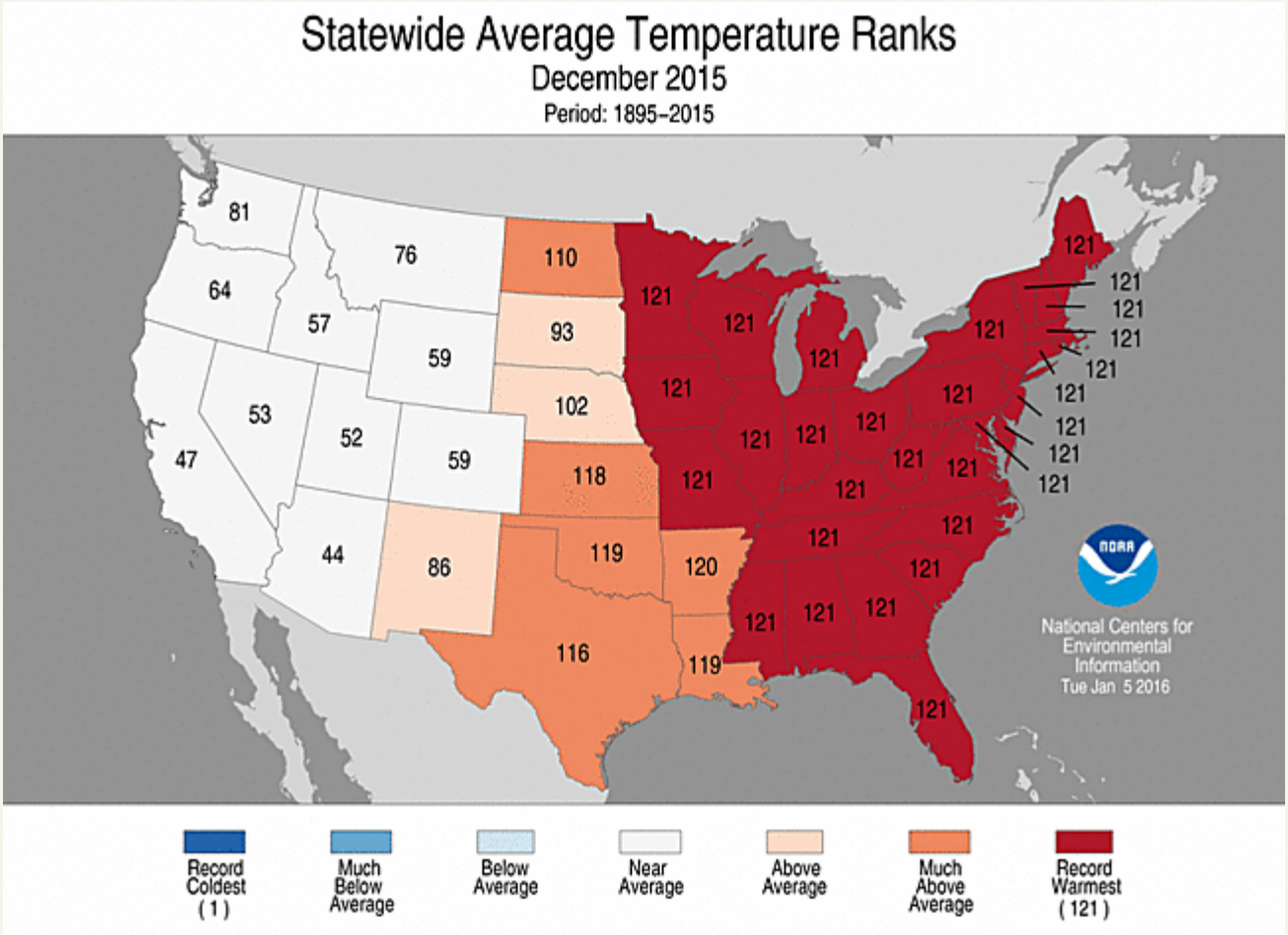
The combination of Hurricane Joaquin passing well to the east, an upper level low pressure system off the Southeast U.S. coast and a stalled cold front led to an event that produced a wide variety of impacts across eastern North Carolina during the first week of October, 2015. Major coastal flooding, very heavy rainfall and strong winds impacted much of eastern North Carolina for several days. This is the same storm system that brought historic rainfall amounts to the Charleston and Columbia areas in South Carolina, as well as parts of southeast North Carolina.

#4 Flood Event in Carteret/Onslow Counties

A nearly stationary area of heavy rain produced locally up to 8 inches of rain, mainly over Carteret and eastern Onslow Counties during the afternoon of November 19.

#5 Record Warm December

December 2015 was characterized by a persistent ridge along the southeast coast providing a warm, moist southwest flow resulting in temperatures that were not only well above normal, but the warmest December on record for many parts of eastern North Carolina and the eastern United States. Cape Hatteras had an average temperature in December of 62.8 degrees, shattering its old record of 56.6 degrees set in 1956. Likewise, New Bern had its warmest December on record with an average temperature of 59.8 degrees, breaking the old record of 56.3 set in 1971. Other locations such as Kinston and Jacksonville also had their warmest December ever. At the National Weather Service office in Newport, the temperatures were at or above 70 degrees on 17 days!



Every state east of the Mississippi River recorded their warmest December ever (Courtesy National Climatic Data Center.

Building a Weather Ready Nation

By Lara Pagano, Meteorologist

As we encounter extreme weather, water and climate events, it is imperative that we work closely with communities to ensure everyone is "Ready" and able to make good and fast decisions. The Weather Ready Nation (WRN) program helps with just that. WRN will shape our communities in ways that saves lives. The overall initiative is to partner with officials, businesses and the media to motivate individuals to prepare and make informative decisions, no matter where they are. It is through this knowledge and understanding that lives are saved. Being ready, responsive and resilient in the face of dangerous weather situations reduces risk. So how exactly can we go about creating a Weather Ready Nation you may wonder? It is through the WRN Ambassador Program. We are looking for individuals who can be advocates for the National Weather Service in promoting our preparedness messages and weather information. By dispersing this information and supporting the weather enterprise as a whole, you are inspiring others to make better decisions and prepare for weather to come; this ultimately will reduce the overall impacts of natural disasters. By being a WRN Ambassador, you are serving as leaders to your community and are near the forefront of communication dissemination. If you are already a leader within your community, business or agency, consider becoming a WRN Ambassador. The collaboration with the NWS is one in which will be advantageous for everyone. For more information, please visit: www.noaa.gov/wrn or email Lara.Pagano@noaa.gov. Below is a list of our current Ambassadors. Join our growing list of advocates and become an Ambassador today!

Greene County Emergency Services

County of Dare 1870 North Carolina

abc 13

Craven County Schools
Today's Learners...Tomorrow's Leaders

Washington County 1799 State of North Carolina

Lenoir County Emergency Services
Division of Emergency Management

Carteret School District
Children · Community · Commitment

Carteret County EMS E 911 Emergency Services

County of Jones North Carolina

Sea Grant North Carolina

ECU

Jones County Public Schools

Weather-Ready Nation
National Oceanic and Atmospheric Administration

New Radar Tool Helps Detect Severe Thunderstorms

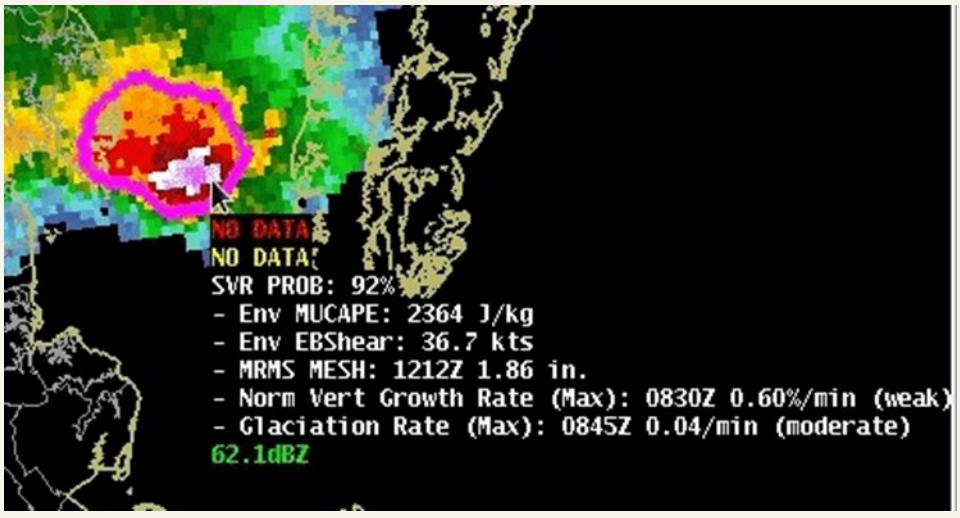
By Hal Austin, Meteorologist

Forecasters here at the Newport National Weather Service office have a new tool to help with the detection of severe thunderstorms. It's called "**ProbSevere**", a statistical model that combines high-resolution numerical weather prediction data, satellite information and radar data. ProbSevere is designed to predict if a storm will first produce severe weather in the near term (next 60 minutes). However, it does not predict if a storm will continue to pose a severe weather threat, or if the storm will decay.

Below is an example of the product from July 24, 2014 of a rapidly intensifying thunderstorm moving east across the Chesapeake Bay toward the Delmarva Peninsula. The cursor readout shows the probability of this storm producing severe weather at 92%. The MESH (Maximum Expected Hail Size) is 1.86 inches. The other indices give information about available energy in the atmosphere, wind shear and two types of satellite-derived cloud growth rates.

As this storm reached the Virginia shore of the Delmarva Peninsula, it produced an EF-1 tornado and damaging straight line winds that were responsible for 2 fatalities and 36 injuries at the Cherrystone Family Camping Resort. The storm also produced golf ball to baseball size hail.

ProbSevere will be a valuable tool in helping NWS Newport forecasters issue timely warnings for the protection of life and property for the citizens of eastern North Carolina.



Example of the ProbSevere program in Chesapeake Bay, July 24, 2014.

Post-Storm Damage Surveys and Summaries

By John Cole, Warning Coordination Meteorologist

Local National Weather Service (NWS) offices have the responsibility of surveying sites within their County Warning Areas (CWA's) which experience significant weather related damage. The NOAA NWS office in Newport/Morehead City has designated a storm damage survey team including management, and staff meteorologists. The team determines the type of damage (straight-line wind, microburst, or tornado) based on the pattern of debris, and the most likely peak wind speed associated with the storm. In the case of a tornado, the touchdown location is identified, as well as the length and width of track, and the strength based on the Enhanced Fujita scale (EF0-weakest to EF5-strongest).
http://www.spc.noaa.gov/efscale/

Members of the team are tasked with cataloging damage by taking photographs tagged with Latitude/Longitude GPS coordinates, and determining the approximate strength of the winds based on the damage type and severity. Interviews with individuals witnessing the event is undertaken to gain valuable information about the type of severe event. A variety of NWS partners collaborate on the damage assessments. Initially, law enforcement, Skywarn volunteer storm spotters, the general public, and local media sources relay valuable storm damage information to the NWS. County Emergency Management officials are queried to find out where the damages have occurred as they are usually first at the scene to assess the damages within their county. Emergency Management officials assist the NWS storm damage team in assessing where to go and will often guide the NWS survey providing access to the damage areas. It is likely to have news media at the scene gathering information as well.

A thorough assessment must be undertaken before information is released to the media through onsite interviews, and through distribution of Public Information Statements (PNS's). Therefore, viable lines of communication must be set up with the various partners, and the NWS Weather Forecast Office (WFO) through use of cell phone and Internet instant messaging, as close coordination is required. The survey team must have the necessary equipment in their vehicle in order to accomplish assigned tasks. This would include computer laptops with backup power, photographic equipment, and GPS devices to accurately catalogue event damages. One of the necessary assessment reference documents came into existence in February of 2007, the Enhanced Fujita Scale or EF Scale. The original Fujita tornado damage scale was updated and improved by a group of scientists and engineers to give a more accurate assessment of winds associated with tornadoes. There are 28 damage indicators associated with

Post-Storm Damage Surveys and Summaries (Continued)

this scale, and each damage indicator has various degrees of damage associated with each of them. Damage indicators include various types of structures, trees, etc. which sustain damage a different degrees given a range of wind speeds. Our job is to assign a wind speed value or small range of values to all catalogued damage, and assign an EF rating if the damage is associated with a tornado. We must be able to ascertain, to some degree, how stable the structure was before the damage was incurred. We determine whether the damage was caused by tornadic or straight line severe thunderstorm winds based on damage characteristics, through eyewitness accounts or archived videos, and analysis of radar data. For example, a tornado will generate a more narrow concentrated damage path in general, and can have a long path length. Also, a tornado will result in a convergent damage distribution due to the circulation, and will often loft debris high into the air and farther downstream. Straight-line wind damage may be broader in width and fan out in a divergent pattern as the thunderstorm downdraft impacts the ground.

Local storm events, including any injuries or fatalities, are archived by national StormData, the Storm Prediction Center, local NWS offices, and others, and is available to the public. Here are additional links for accessing storm information as well as a link to our news headlines on our website with information about a recent tornado event including information from a subsequent storm damage survey conducted by NWS Newport: http://www.ncdc.noaa.gov/stormevents/
http://www.weather.gov/mhx/Feb242016SevereEvent
If you witness storm damage, either as it is occurring or afterwards, we are interested in your report. This link gives information on how to contact us, submit storm report, and send a photo. http://www.weather.gov/mhx/OnlineSpotterReport
You may also contact and send information to us utilizing social media. We look forward to hearing from you! Follow us on Twitter and Facebook. Your information are important to us! https://twitter.com/NWSMoreheadCity
https://www.facebook.com/NWSMoreheadCity?sk=wall

NWS conducts a storm survey in Davis, NC following a tornado.

Enhanced Fujita Scale	
EF–0	65–85 mph winds
EF–1	86–110 mph
EF–2	111–135 mph
EF–3	136–165 mph
EF–4	166–200 mph
EF–5	>200 mph

CoCorahs Network

By David Glenn, Meteorologist

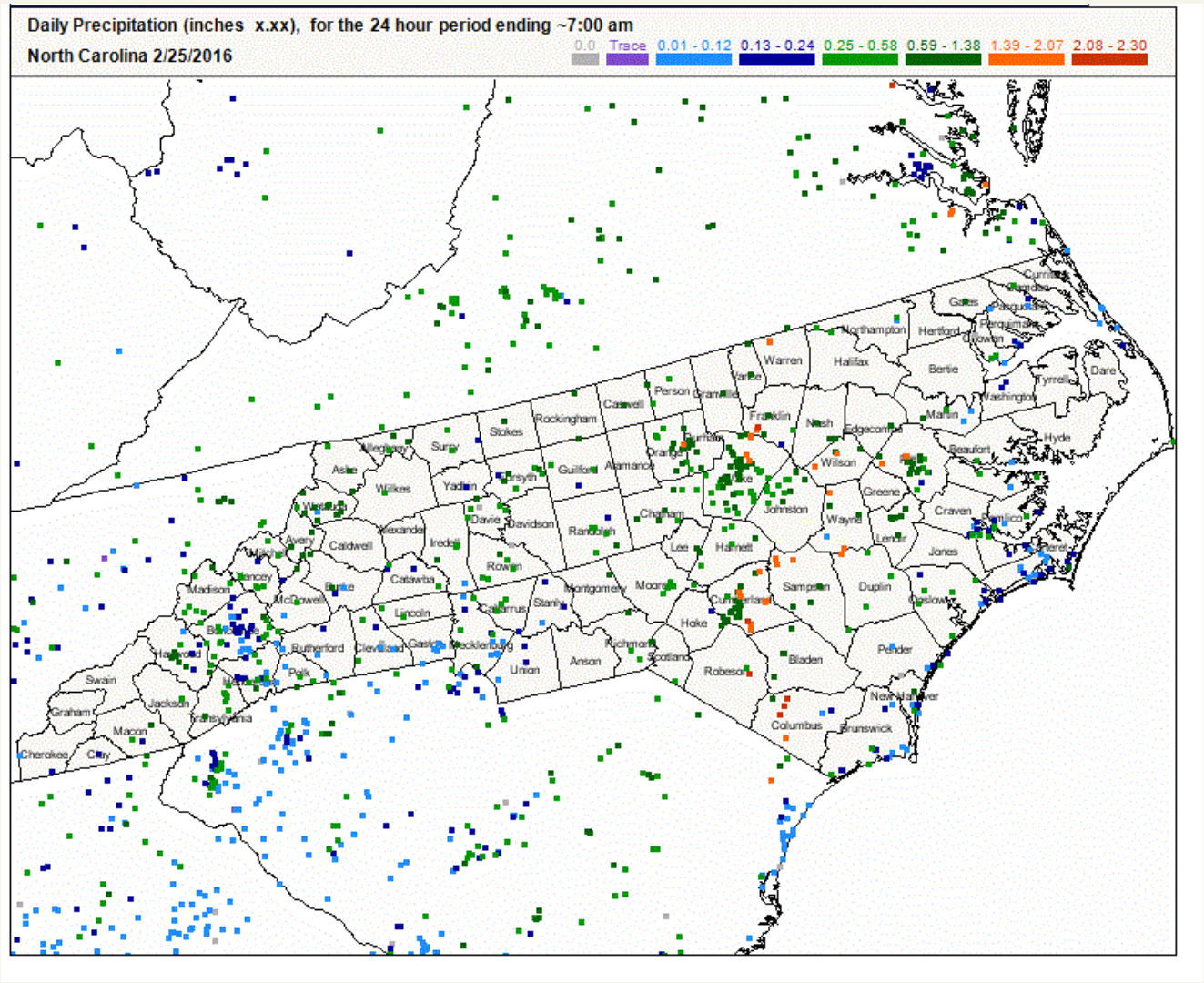
Residents of North Carolina are encouraged to participate as volunteer weather observers by measuring rain,snow, hail, and drought through the CoCoRaHS Program. We are in need of new observers across the region, and especially in the less populated counties of Greene, Jones, Hyde, Martin, Washington,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

So, what is CoCoRaHS?

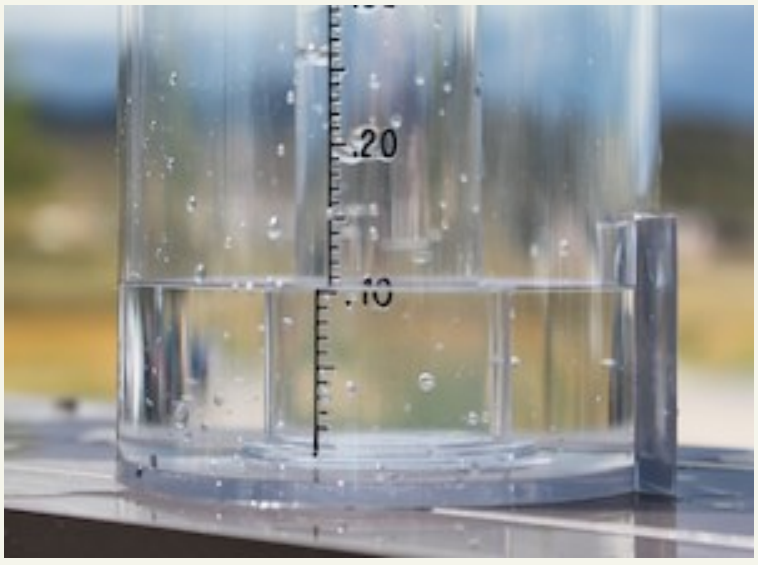
CoCoRaHS stands for Community Collaborative Rain, Hail and Snow Network. CoCoRaHS began at the Colorado Climate Center at Colorado State University in 1998 in response to the damaging Fort Collins flood in 1997. North Carolina became the 21st state to join the CoCoRaHS network in September 2007. Roughly 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.

CoCorahs Network (Continued)



Sample CoCorahs Precipitation Map from Thursday morning February 25, 2016



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