Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC

http://weather.gov/Newport —> Bookmark it!!

Find us on: facebook

follow us on twitter

November 2013 Early Season Snow

By Tom Lonka, Meteorologist

An Arctic front raced southward in eastern North Carolina on November 12, 2013. Temperatures plunged from early afternoon highs in the upper 60s to lower 70s, down into the 30s by early evening. Light snow developed behind the frontal boundary, and for some places, this was the earliest snowfall in recorded history.

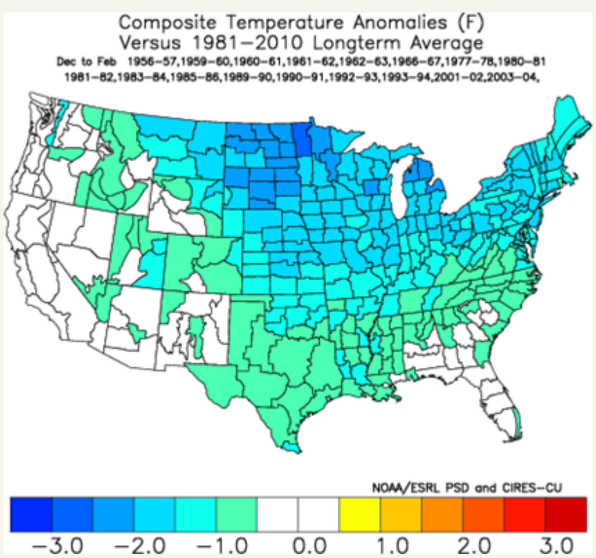
INSIDE THIS ISSUE:

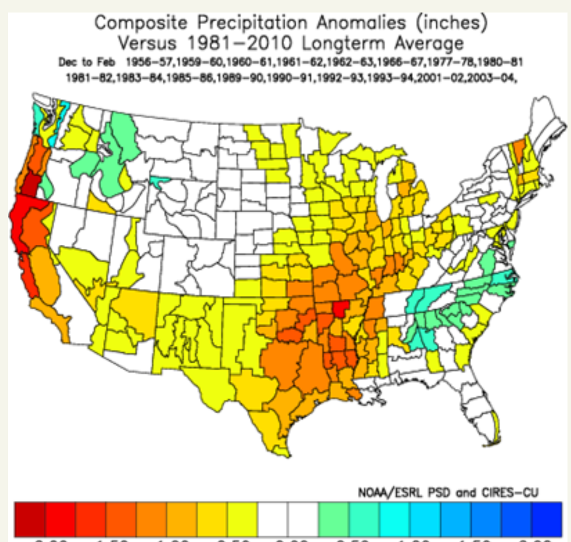
What’s to come this winter?

By Belkys Melendez, Meteorologist

Since the summer, your local National Weather Service has been looking at atmospheric patterns to determine what type of weather can be expected in eastern North Carolina this coming winter. With no El Nino nor La Nina in play, Mike Halpert, acting director of Climate Prediction Center summed it up nicely, “it has been challenging…” With the neutral phase of ENSO (meaning neither El Nino nor La Nina) in place, there is no strong climate pattern influencing the United States. This year’s Winter Weather Outlook for North Carolina is considered “equal chances”, meaning there is no strong enough climate pattern for the area to indicate if there will be above, near or below-normal temperature and/or precipitation.

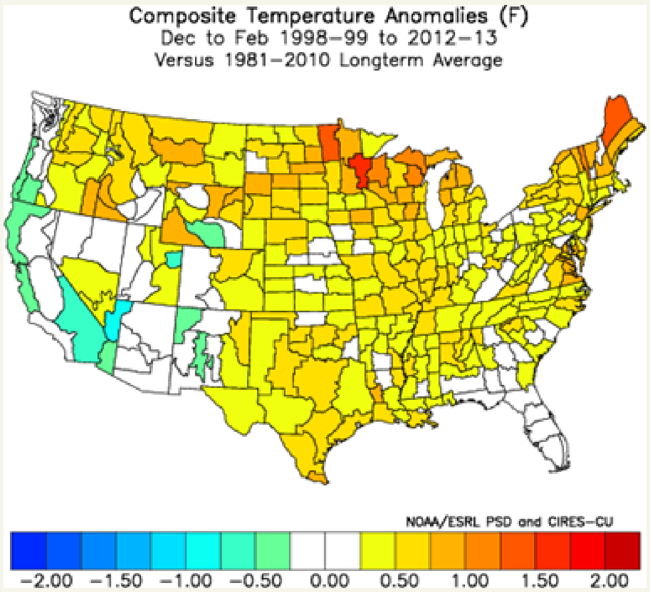
The Climate Prediction Center looks at various indices/guidance including the previous neutral phase ENSO and previous winter weather trends to assist in making a winter weather outlook. Recently, your local NWS office did some composite temperature and precipitation anomaly research; one for neutral ENSO and the last 15 winters in United States. The two figures below are composite anomaly maps during Neutral Phased ENSO. The temperature composite maps indicate temperature being slightly below normal with precipitation slightly above normal.



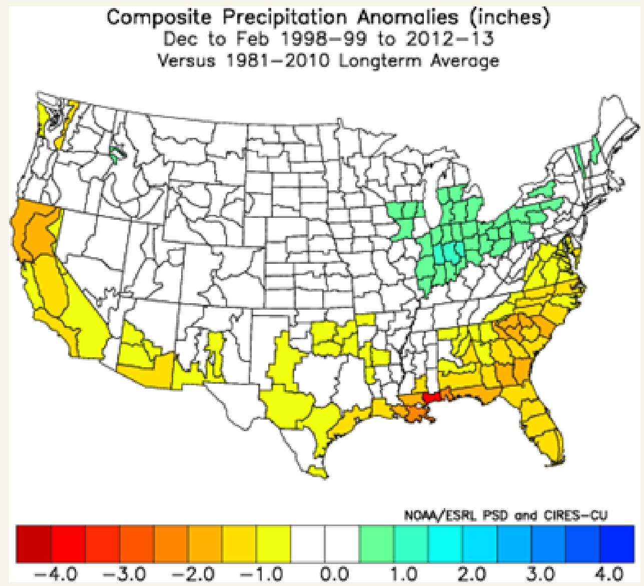


What's to come this winter? (Continued)

The figure below shows the composite charts for the past 15 winters. The temperature anomaly composite map shows North Carolina has been trending slightly warmer winters and slightly below normal in precipitation, compared to neutral ENSO composite anomaly maps.



Temperature Anomalies over the Past 15 Winters. Eastern North Carolina was generally above normal.



Precipitation Anomalies over the Past 15 Winters. Eastern North Carolina was drier than normal.

In summary, there will likely be occasional warm and cold spells across eastern North Carolina this winter, but no prolonged pattern of extreme warmth or cold. Current trends also indicate drier than normal conditions across the region.

NATIONAL WEATHER SERVICE
CPC
CLIMATE PREDICTION CENTER

The 110th Anniversary of the First Flight

By Casey Dail, Meteorologist

December 17th, 2013 marks the 110th Anniversary of The First Flight. On December 17, 1903, Wilbur and Orville Wright made four brief flights in Kitty Hawk, North Carolina with their first powered aircraft. The initial flight lasted 12 seconds and covered 120 feet. Three more flights were made that day with Wilbur Wright piloting the record flight lasting 59 seconds over a distance of 852 feet. Previously, in 1900, The Wright Brothers had journeyed to Kitty Hawk, from Dayton, OH, to begin their manned gliding experiments, as the Mid-Atlantic coast was known for its regular breezes and soft sandy landing surfaces.

The National Weather Service, then known as the U.S. Weather Bureau, played an important role in the First Flight. In determining the best location to test their flying machine, the Wright Brothers wrote to the Weather Bureau office in Kitty Hawk, for local and weather information. In fact, the telegraph which alerted the world to the historic first flight came from the Weather Bureau. Orville Wright walked to the Kitty Hawk Weather Office late in the afternoon of December 17, 1903 and sent a telegraph to his father detailing the successes of the day.

On Dec. 1, 1918, the U.S. Weather Bureau issued its first aviation weather forecast. The National Weather Service continues its support of the aviation industry today. National Weather Service Forecast Offices issue almost 2,500 routine and amended aviation weather forecasts for 537 airports around the nation daily. National Weather Service aviation forecasts help mitigate air traffic delays, and reduce weather-related aviation accidents

The National Weather Service is currently moving towards enhanced digital aviation services. The goal moving forward with this initiative is to provide high-quality, and consistent forecasts by having the Terminal Aerodrome Forecasts (TAFs) derived directly from the gridded forecast database. New hourly graphical aviation elements, ceiling and visibility, will be added to the NDFD database and will be available to users. This is a new way of thinking about aviation forecasting, going from a point forecast to an aerial forecast. The NWS Newport/Morehead City is currently working towards enhanced digital aviation services at our local office.

The Wright Brothers National Monument, located in Kill Devil Hills, NC, commemorates the famous first flight.

The Nearshore Wave Prediction System (NWPS)

By John Elardo, Meteorologist

The Nearshore Wave Prediction System (NWPS) is a high resolution wave model run locally and used operationally by many coastal National Weather Service Forecast Offices. The NWPS output includes displays of significant wave height, peak wave direction and dominant wave period.

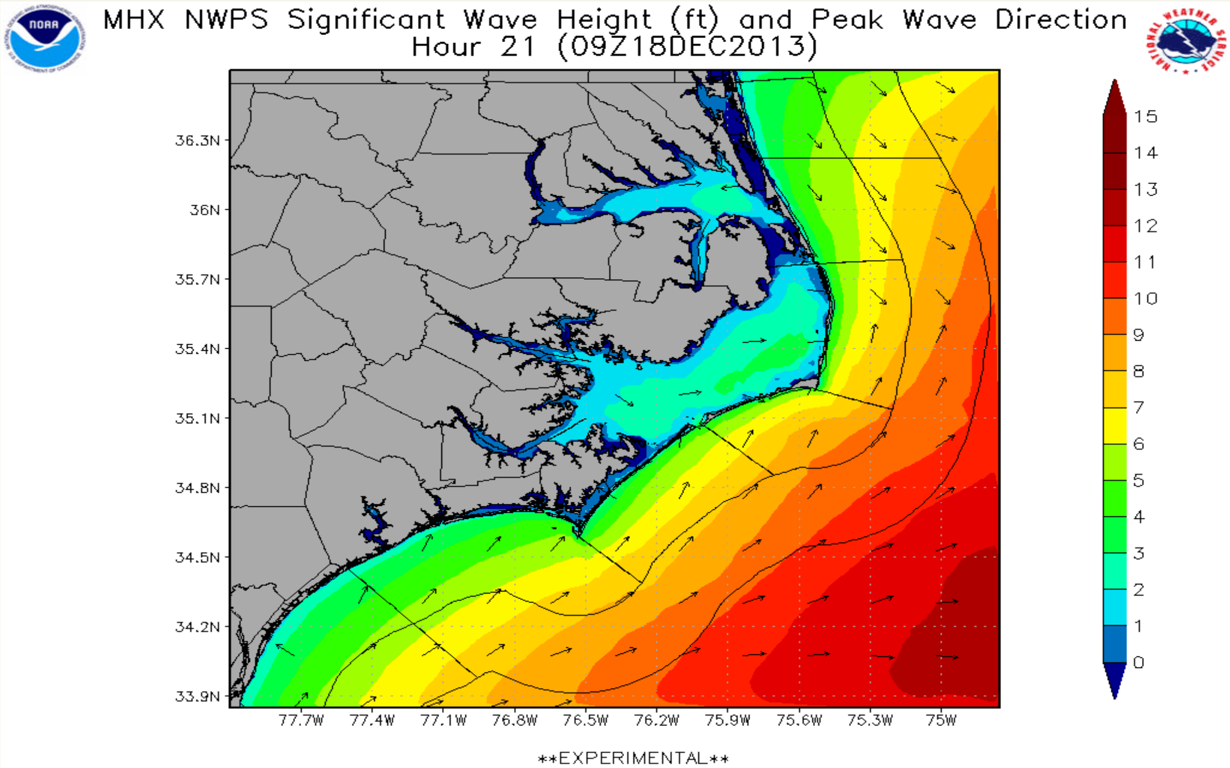
The NWPS model is able to run in waters as shallow as 1 meter and takes into account deep to shallow water effects on wave propagation and enables the coastal Forecast Offices (such as the National Weather Service Forecast Office in Newport/Morehead City) to more accurately predict the nearshore marine environment (especially with 5 miles of shore).

The advantages of the NWPS are that it uses a high resolution wave model, the Simulating WAves Nearshore (SWAN) wave model and forecaster derived winds instead of relying on model specific winds. The SWAN model was developed to more accurately forecast waves in the shallower waters within 10 miles of the coast. In addition the model is run using wind fields developed by marine forecasters instead of being tied to a specific numerical weather model where incorrect winds will negatively bias the wave forecast.

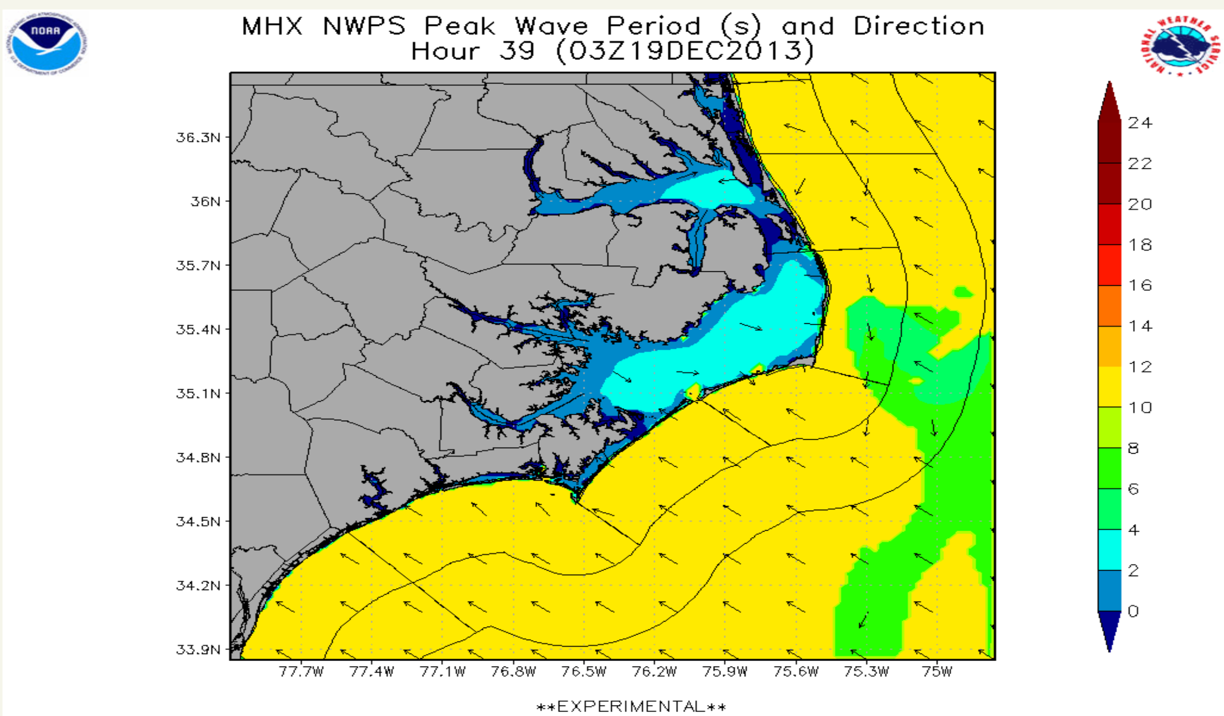
The Weather Service Office in Newport/Morehead City, NC was one of the first Weather Service Offices to use the SWAN wave model beginning in 2008 and feedback from that project was used to develop an even more robust version of the SWAN that is being used in the NWPS. The NWPS is currently being tested at several Weather Service Offices, including here at Newport/Morehead City. The model is being run at least twice daily and the results are being used to produce the text and graphical Coastal Waters Forecasts that are issued 4 times daily.

In the near future, the Real Time Ocean Forecast System (RTOFS) model for predicting ocean currents, and the Extratropical Surge and Tide Operational Forecast System (ESTOFS) model for forecasting water levels, will be integrated into the NWPS to help provide even more detailed and accurate wave forecasts for the entire United States coastline.

The Nearshore Wave Prediction System (NWPS) (Continued)

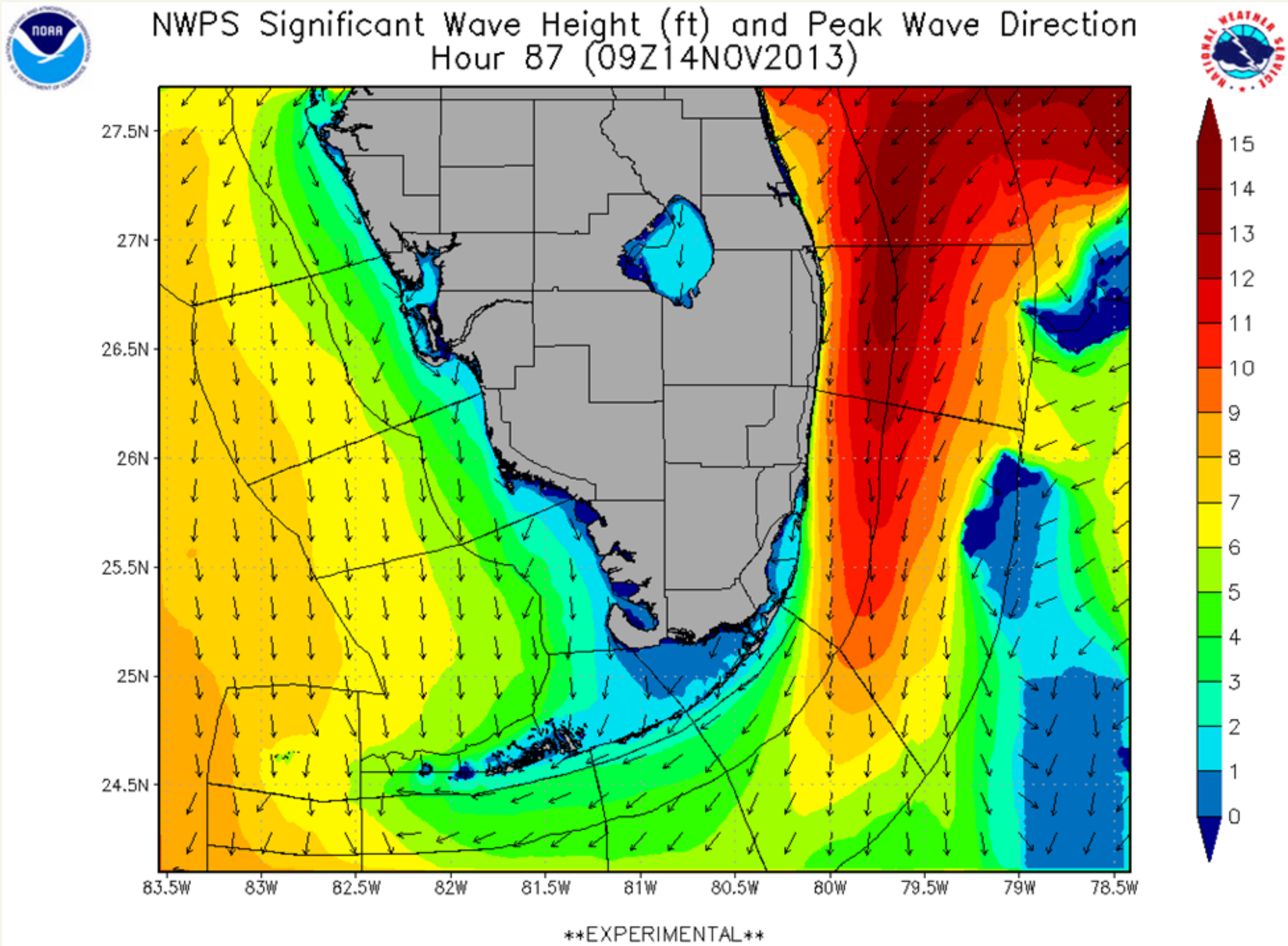


NWPS Waveheight Forecast for the Eastern North Carolina Waters. Notice the gradient in wave heights from the coast to offshore. Also notice the higher wave heights over the warmer waters of the Gulfstream.



NWPS Forecast of Dominant Wave Period in offshore flow. Notice regions of higher periods near the coast along the Core Banks and southern Outer Banks.

The Nearshore Wave Prediction System (NWPS) (Continued)



The above image is an example of using an ocean current forecast (RTOFS) in the NWPS to forecast waves. Notice the region of higher waves in the Gulfstream east of Florida that is occurring in northerly flow. This situation happens often off of the coast of North Carolina when cold air pours over the warm Gulfstream waters to produce large dangerous waves. This capability will become to our office in the near future.

NWS Newport Moves to Polygon-Shaped River Flood Warnings versus County-Based Warnings

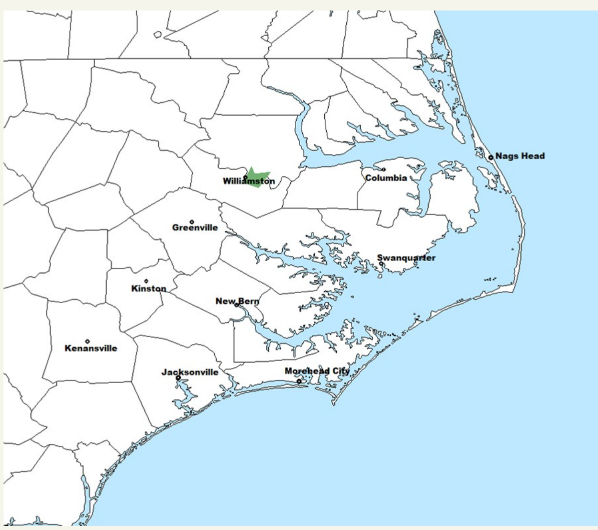
By Brian Cullen, Meteorologist

In an effort to highlight areas most vulnerable to river flooding in eastern North Carolina, the National Weather Service office in Newport/Morehead City will change the look of some river flood warnings beginning January 2, 2014. The new polygon-shaped warnings will represent the area that will have the greatest impacts from rising river levels instead of highlighting the entire county, much of which in many instances will see little if any impacts from flooding.

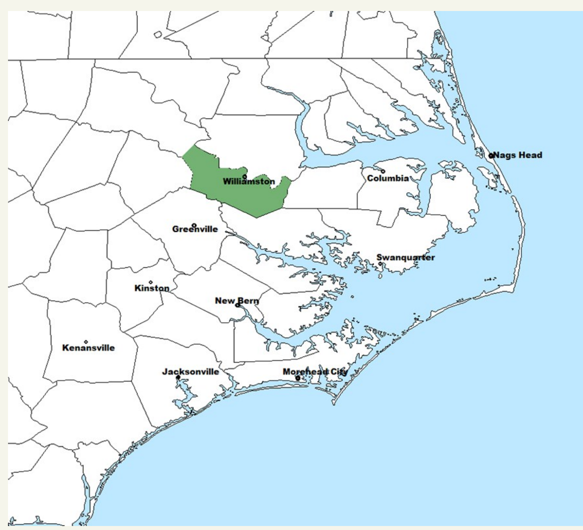
Issuing threat-based polygon warnings for rivers offers several advantages. The graphic version of the warning allows you to clearly see the specific area that is under the threat for flooding. Also, fewer people are needlessly warned for river flooding that will not affect their location. The polygon warnings will show the specific hydrological threat area and are not restricted to geopolitical boundaries. In fact, some warning polygons will cover several counties at a time in cases where there are known threats from flooding along a river that crosses into a different county.

The polygon warnings will be visible on the National Weather Service's websites for national, regional, and local weather watches, warnings and advisories. There are five locations for river forecast warnings that will be represented by polygons in eastern North Carolina. These include the Roanoke River at Williamston, the Tar River at Greenville, the Neuse River at Kinston, Contentnea Creek at Hookerton, and the NE Cape Fear River at Chinquapin. River flood warnings for areas that do not have specific water level forecasts will continue to be county-based for the time being.

By focusing on the true threat area, warning polygons for rivers will improve NWS warning accuracy and quality. Threat-Based warnings will promote improved graphical warning displays, and in partnership with the private sector, support a wider warning distribution through cell phone alerts, and social media. NOAA Weather Radios will work as before and continue to alert entire counties.



New polygon warning for Williamston as seen on National Weather Service website.



Old county-based warning for Williamston NC as seen on National Weather Service website.

NWS Newport Visit to the River Forecast Center

By Lara Pagano, Meteorologist

Within any National Weather Service (NWS) office, it is of the utmost importance to keep in good contact with supporting offices in an effort to streamline operations and increase efficiency. Two of our Meteorologists headed to the suburbs of Atlanta to do just that. They met with local Meteorologists and Hydrologists at the Southeast River Forecasting Center (SERFC) and the NWS in Peachtree City, GA. This was a wonderful opportunity to touch base with our colleagues from afar in an effort to increase our communication and productivity within both offices.

The SERFC is in charge of forecasting all rivers that flow into the Atlantic Ocean along the Carolina's, Georgia and Florida coastlines. The SERFC also forecasts for rivers that flow into the Gulf of Mexico between Mobile Bay and the southern tip of Florida. This adds up to be more than 270,000 square miles of responsibility, not to mention Hydrologic support for Puerto Rico. The SERFC plays a vital role in advance warning of inland floods associated with tropical systems. While the SERFC provides hydro forecasts out to five days, they also focus their efforts on seasonal and yearly outlooks for water management agencies.

The visit in mid-September provided our staff with insight into operations within the RFC. Some of our products we disseminate from the Newport Weather Forecast Office will impact operations at the River Forecast Center. As an example, each morning, automated weather sites and many of our volunteer observers will report the past 24-hour precipitation totals. Our office must quality control these values, because they highly influence the river forecasting at the RFC. These values are then ingested into models to help predict streamflow for our area rivers. These models will forecast the stage of rivers and potential flood situations. At the local level, our Hydrology Program Manager in conjunction with the Hydrologist in Wilmington has developed local flood impacts based on the RFC forecast. It is imperative we provide quality data to the RFC to ensure they output the best river forecast possible so our office can notify those who will be impacted.

One of the highlights of the trip was conversing with the local Hydrologist (Kent Frantz) at the Atlanta, Georgia WFO. By exchanging ideas with a veteran Hydrologist we were able to adapt new tools to increase efficiency, productivity and quality of data received. Sharing knowledge and experience is invaluable in any line of work, but especially in the ever changing field of Meteorology.

SERFC Hydrologist Jeff Dobur

Operations Area of the SERFC

Tornado Hits Atlantic Beach, Morehead City

By Chris Collins, Meteorologist

At approximately 10:18 PM, on Tuesday November 26, 2013, a tornado quickly spun up just south of Bogue Banks in Carteret County and came ashore in the western part of Atlantic Beach, causing EF-2 damage to the Ocean Sands and Island Beach and Racquet Club Condominiums with extensive damage to several units. The tornado then tracked across Bogue Banks producing EF-1 damage along Hoop Pole Road snapping many hard and softwood trees and causing minor damage to several homes with the greatest damage due to falling trees.

The tornado then passed across Bogue Sound and came ashore in Morehead City at Carteret Community College and passed by Carteret General Hospital. Strong EF-1 damage occurred to several buildings on campus, blowing out windows and causing significant structural damage to one wall of the historical Camp Glenn Building there. Many trees on campus were also uprooted and snapped. The hospital only received minor damage but many trees, out buildings and vehicles at the facility also had strong EF-1 damage. The tornado continued north-northeast through the residential areas of Mandy Farms, Country Club East and Crab Point causing extensive EF-1 damage to trees and homes. Most damage to homes were limited to loss of roofing material and damage to siding, however many hard and softwood trees were snapped with many falling on homes causing extensive damage to the dwellings. The path length was estimated at 5.25 miles but is likely slightly longer as the tornado started as a waterspout over the Atlantic Ocean and continued into the Newport River before lifting. The width of the tornado remained fairly consistent at around 150 to 200 yards through the entire path.

Damage to Ocean Sands Condominiums in Atlantic Beach

Damage in Morehead City

EF 0	65-85 mph
EF 1	86-110 mph
EF 2	111-135 mph
EF 3	136-165 mph
EF 4	166-200 mph
EF 5	Over 200 mph

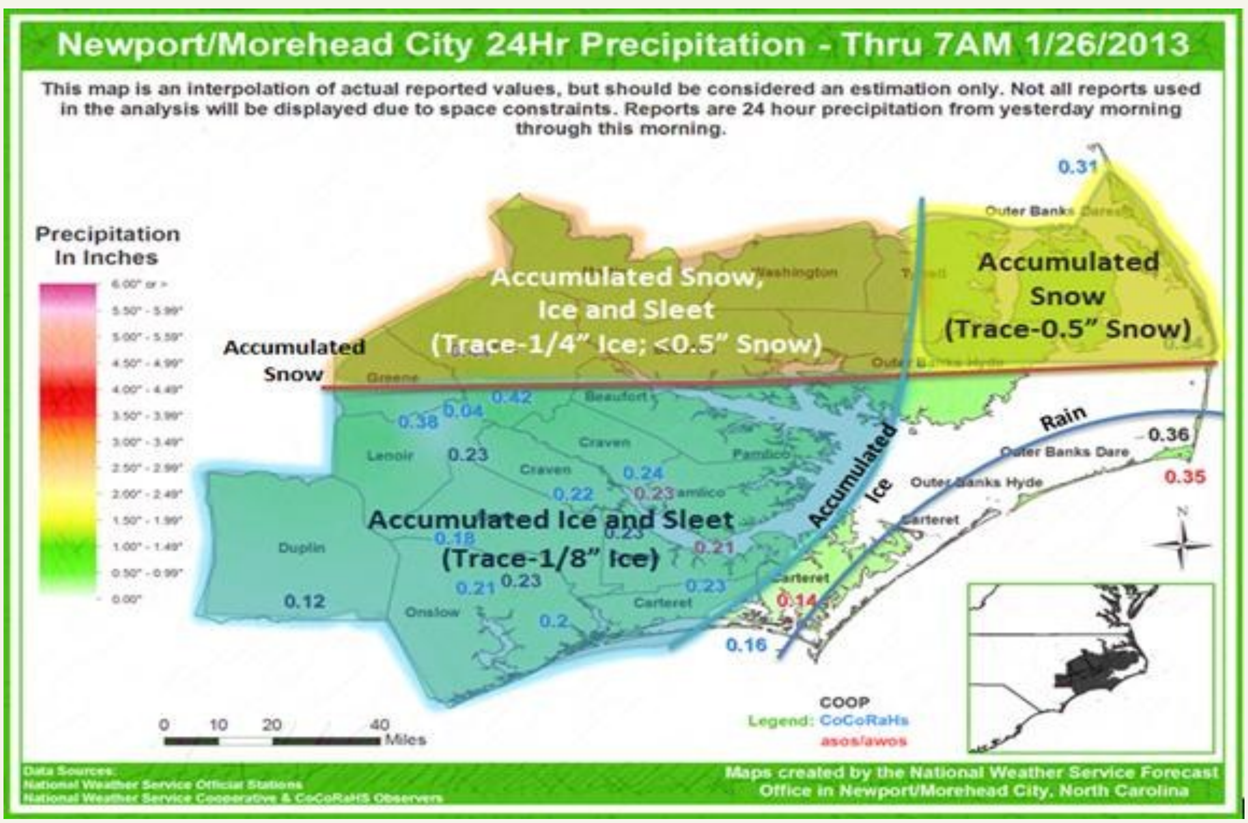
The Fairly Quiet Winter of 2012-13

By Tom Lonka, Meteorologist

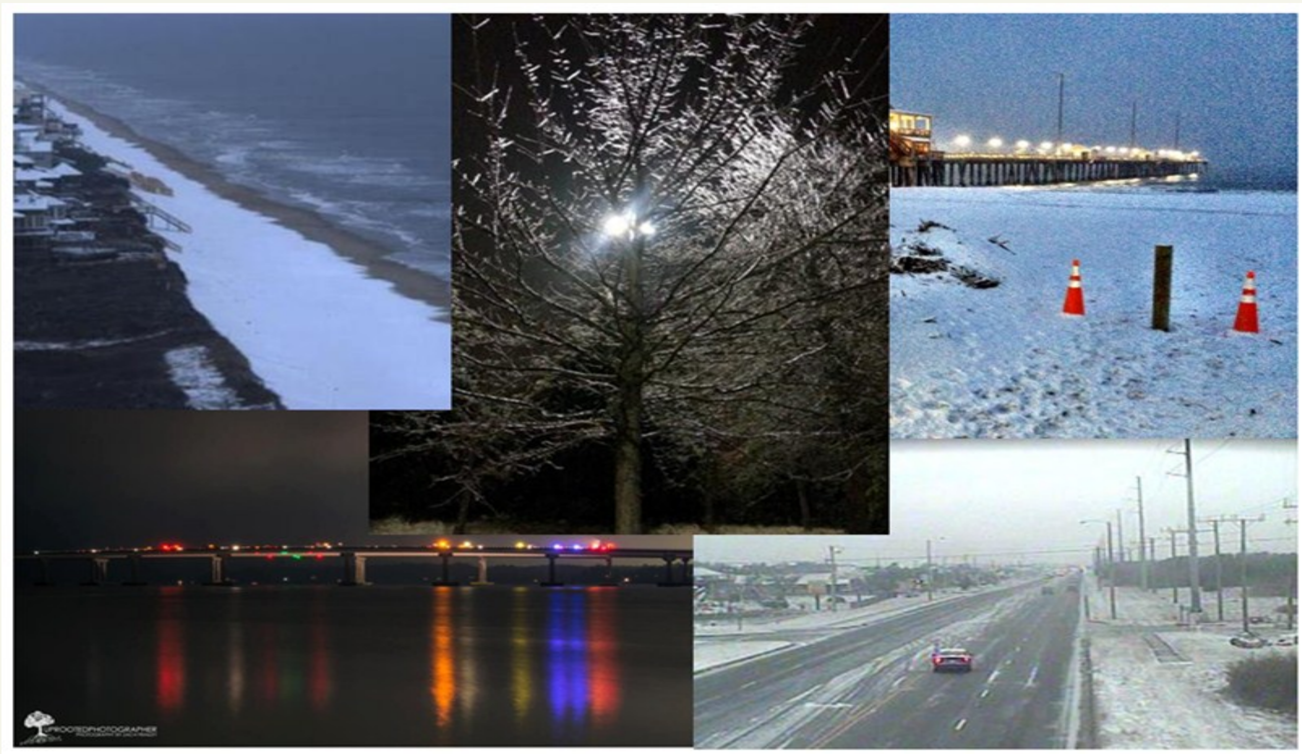
The warmer-than-normal winter of 2012-2013 meant one thing, a lack of appreciable winter weather. Eastern North Carolina usually gets at least a taste of winter weather even in a mild winter regime. Last season was no exception.

The first taste of winter came on January 25, 2012, when a variety of wintry precipitation fell across the area. As is typically the case in light winter weather events for Eastern NC, strong and dry high pressure ridging southward from New England supplied the first ingredient, cold air, for the winter mix. In addition, dew points were well down into the 20s for much of the day and just prior to the precipitation onset, which caused dynamic cooling once precipitation began.

A weak low pressure area and cold front provided the lift and moisture necessary for precipitation production. The precipitation fell into the cold, dry air mass, cooling the atmosphere due to the process of evaporational cooling. A mixture of snow, sleet, and freezing rain fell as a result across the area. As many as 20 vehicle accidents occurred on the Neuse River Bridge in New Bern due to icing, therefore prompting the closing of the bridge for a time. The figure below shows the wintry precipitation totals across Eastern North Carolina.



The Fairly Quiet Winter of 2012-13 (Continued)



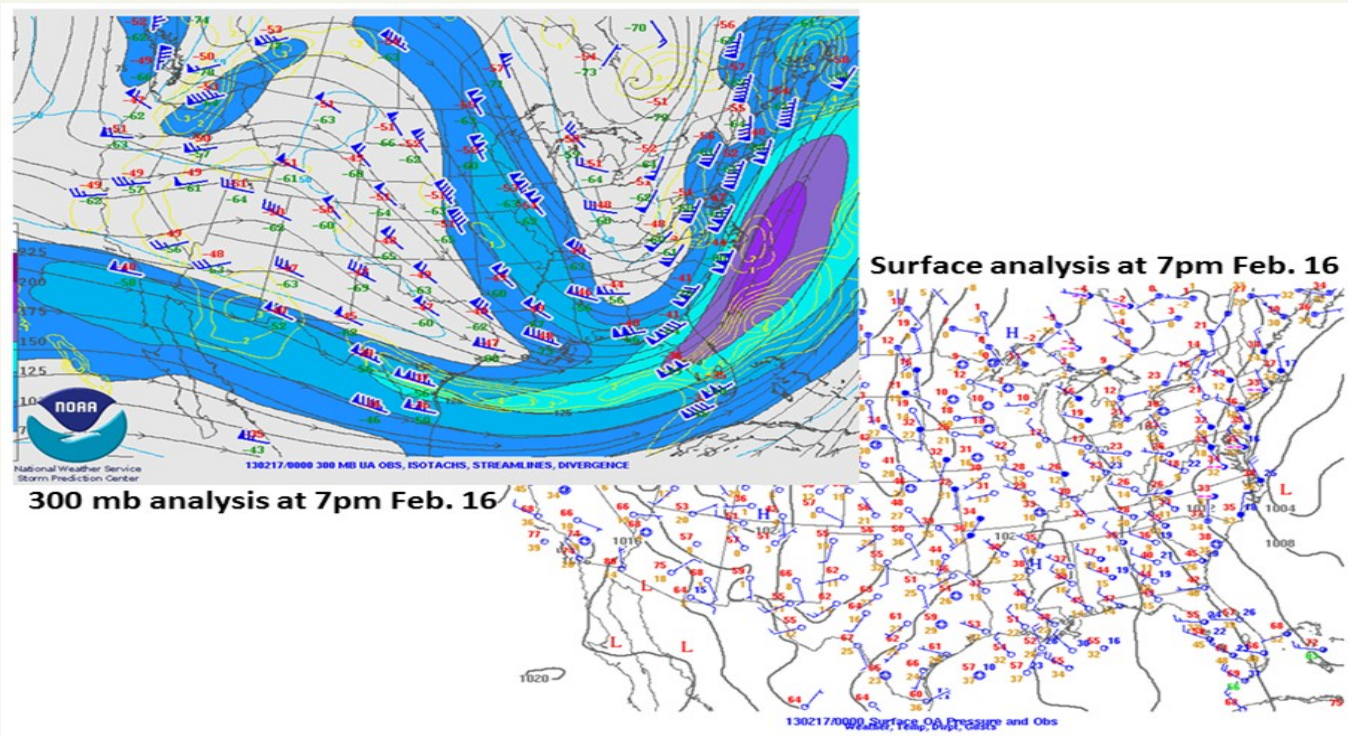
Top left: Snowy beachfront in Duck, NC
Top center: Icy tree in Washington, NC
Top right: A snow-covered Jeanette's Pier, Nags Head, NC
Bottom left: Emergency vehicles on an icy New Bern Bridge (credit Zach Frailey)
Bottom right: A snowy Highway 158 in Kitty Hawk, NC

Light snow fell across eastern North Carolina during the afternoon and evening hours of February 16, 2013. An active subtropical jet stream phased with a northern stream to produce the wintry precipitation. The southern stream acted as a moisture source, while the northern stream provided the cold air. The two systems acted in tandem to develop low pressure off the North Carolina coast.

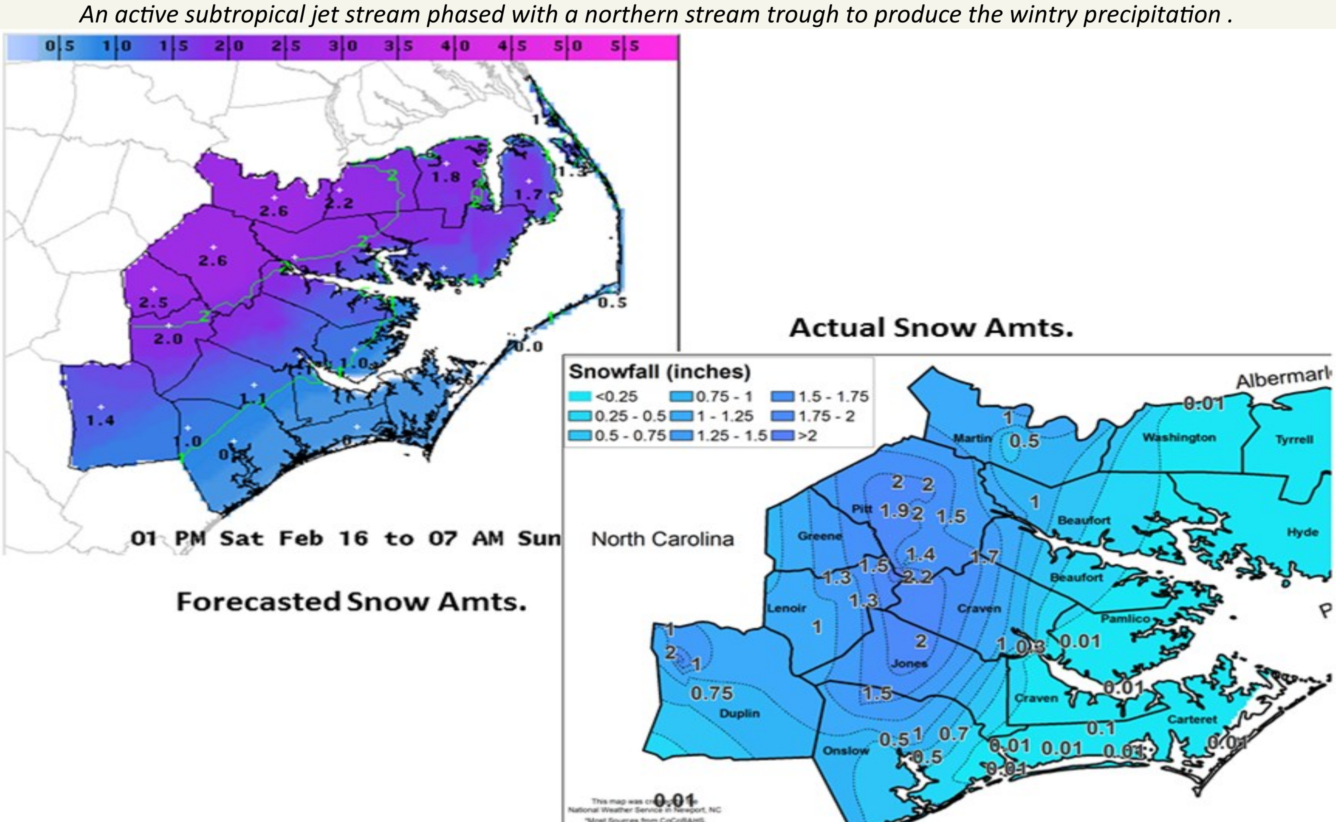
Afternoon temperatures reached the 40s to lower 50s for a good portion of the area. A cold front then worked through the area dropping temperatures through the 30s during the afternoon. The front was an anafront, with clouds and precipitation lagging behind the surface front. This type of frontal boundary allowed the low levels to cool during and prior to precipitation onset. Rain developed around the noon hour across the coastal plain, then quickly transitioned to snow as cooling processes lowered surface temperatures to near freezing. As cold air filtered eastward, rain changed to snow across coastal locations during the early evening hours. A general 1 to 2 inches of snow fell with this event.

This event shows that even a seemingly minor winter event can cause major travel problems in eastern North Carolina.

The Fairly Quiet Winter of 2012-13 (Continued)



An active subtropical jet stream phased with a northern stream trough to produce the wintry precipitation .



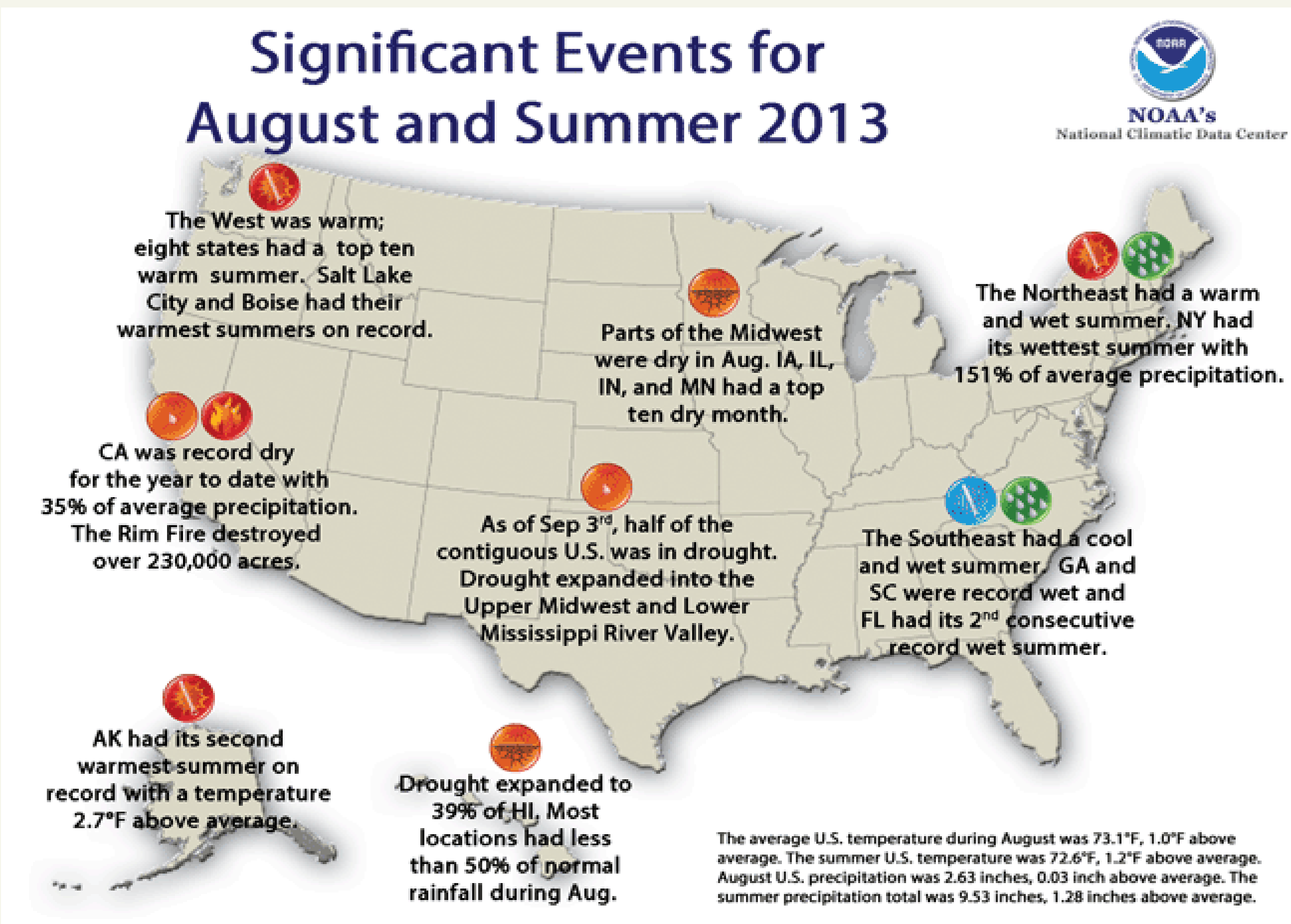
A general 1 to 2 inches of snow fell with this event.

Unusually Cool Summer in 2013

By Chris Collins, Meteorologist

The Summer of 2013 was one of the coolest in recent years across Eastern North Carolina. The average temperatures for June through September were all below normal with the greatest departures in August and September, which were both nearly 2 degrees below normal. Only 4 days of 90 degrees or greater were recorded at the National Weather Service in Newport during the summer, and for the first time in recent memory, no Heat Advisories were issued through the summer for eastern North Carolina. Low temperatures in the 50s were observed in both June and August with lows as cool as the lower 60s in July. The cooler than normal summer weather was caused by a persistent trough across the eastern United States.

Rainfall was not as prolific during the summer of 2013, but was well distributed through the summer. Most areas received between 4 and 6 inches during June, July and August, with 7 inches or more in September. Drought conditions that were present in late Spring, were alleviated by the well-distributed rainfall of the summer season.



Summer Internship Opportunities

By Casey Dail, Meteorologist

The NWS Weather Forecast Office in Newport, NC is currently accepting applications through March 1, 2014, for student volunteers for the summer of 2014. The student volunteer program is available for current college students (majoring in meteorology or other related fields), and is designed to provide students with an opportunity to learn about the science of weather forecasting.

The volunteering program will be available for students:

- Majoring in meteorology or other related sciences.
- Available to volunteer for at least 50 hours between late May and early August.
- Be in good academic standing.

Students will be required to complete a research project during their time at the office. The research can cover a range of topics from specific forecasting challenges to significant event reviews. Through prearranged coordination with their schools, some students have been able to gain college credit for their research conducted at the NWS. The primary goal of the volunteer program is that the research skills and understanding of weather forecasting that the volunteer will gain will ultimtely help the student in future career choices.

Expectations of the students volunteering at the NWS Newport include:

- Volunteer for a minimum of 50 hours between late May through early August
- Conduct ones-self in a professional and respectful manner
- Complete specified goals of both the school and the NWS
- Abide by all security and safety rules
- Work on an assigned research project with designated mentor
- Proper casual-business attire

For additional information, go to the following website http://www.weather.gov/mhx/StudentInterns or contact Casey.Dail@noaa.gov.

National Weather Service

530 Roberts Road
Newport, NC 28570

Phone: 252-223-5122
Fax: 252-223-3673
Website: http://weather.gov/Newport

Find us on: facebook®

follow us on twitter

Wind Chill Chart

Temperature (ºF)

Wind (mph) / Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (ºF)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T = Air Temperature (ºF) V = Wind Speed (mph)

Effective 11/01/01

To report adverse weather conditions 24/7, please call us at: **1-800-889-6889**