



Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC



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Summer 2015 Edition



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2015 Hurricane Season Preview

The 2014 Atlantic hurricane season was a near-average season, producing eight named storms. This was the fewest named storms since the 1997 season. There were six hurricanes and two major hurricanes. Despite the relatively low number of storms, Hurricane Arthur impacted eastern North Carolina on July 3 and was the earliest hurricane to hit North Carolina since records began in 1851. It was also the first hurricane to hit the U.S. mainland since Issac in 2012 and the first category 2 hurricane to hit the U.S. since Ike in 2008. Arthur produced widespread power outages and storm surges of 4 to 5 feet. The hurricane season runs from June 1 through November 30, even through Tropical Storm Ana affected the area in May. Now is the time to prepare for hurricane season and come up with a plan of action.

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Atlantic Tropical (and Subtropical) Storm Names for 2015

Ana	Ida	Rose
Bill	Joaquin	Sam
Claudette	Kate	Teresa
Danny	Larry	Victor
Erika	Mindy	Wanda
Fred	Nicholas	
Grace	Odette	
Henri	Peter	

Eastern North-Pacific Tropical (and Subtropical) Storm Names for 2015

Andres	Ignacio	Rick
Blanca	Jimena	Sandra
Carlos	Kevin	Terry
Dolores	Linda	Vivian
Enrique	Marty	Waldo
Felicia	Nora	Xina
Guillermo	Olaf	York
Hilda	Patricia	Zelda

Storm Surge Product Changes

By National Hurricane Center

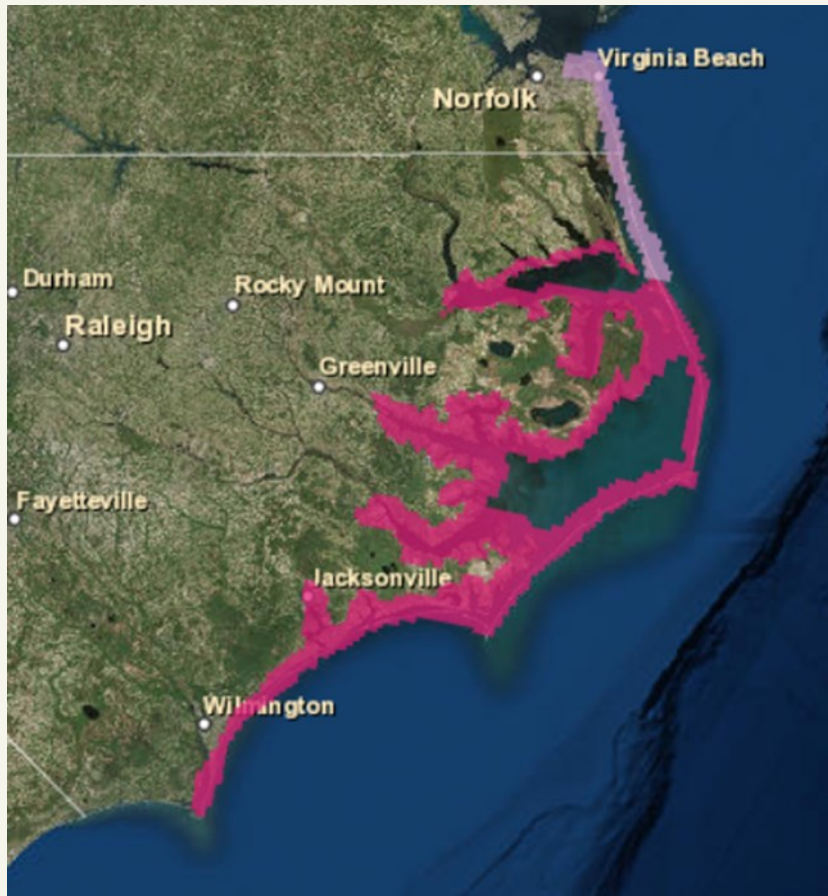
Prototype Storm Surge Watch/Warning Graphic

NOAA's National Hurricane Center (NHC) will offer an experimental graphic to highlight areas along the Gulf and Atlantic coasts of the United States most at risk for life-threatening inundation by storm surge from a tropical cyclone.

Storm surge is often the greatest threat to life and property from a tropical cyclone, and it can occur at different times and at different locations from a storm's hazardous winds. In addition, while most coastal residents can remain in their homes and be safe from a tropical cyclone's winds, evacuations are generally needed to keep people safe from storm surge. The phrase "run from the water, hide from the wind," has been used in the past to highlight the need to evacuate for storm surge. Having separate warnings for these two hazards should provide emergency managers, the media, and the general public better guidance when tropical cyclones threaten. NHC and NWS Forecast Offices will determine the areas most at risk from life-threatening surge through a collaborative process.

The new graphic is designed to introduce the concept of a watch or warning specific to the storm surge hazard, displaying areas that would qualify for inclusion under a storm surge watch or warning system currently being developed by the NWS. As part of a phased implementation plan, experimental storm surge watches and warnings are expected to debut in 2016. After incorporating both user and partner input, the NWS expects to make the new storm surge warning system fully operational in 2017. In addition to the graphic, the risk areas will be mentioned in Hurricane Local Statements issued by NWS Forecast Offices in the affected areas and in the Hazards section of the NHC Public Advisory.

Storm Surge Product Changes (Continued)



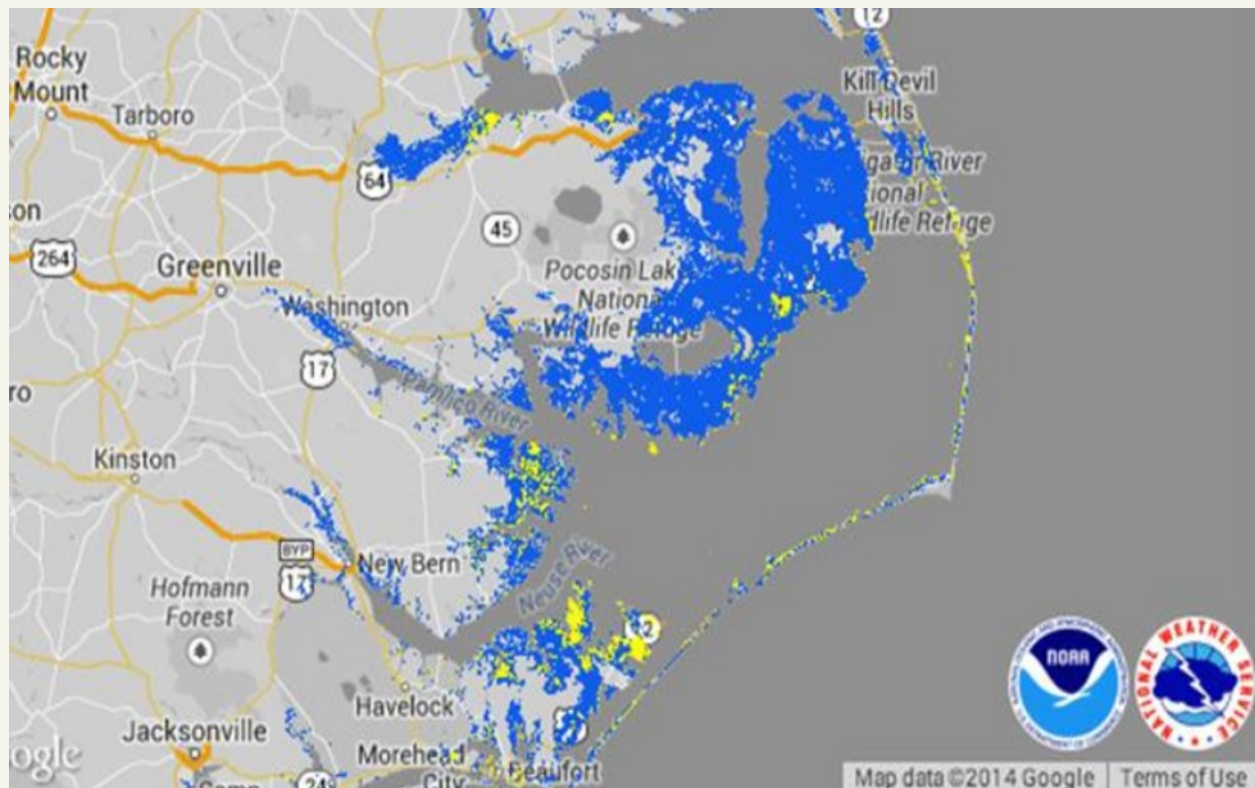
New Storm Surge Watch/Warning Graphic

Experimental Potential Storm Surge Flooding Map

The experimental Potential Storm Surge Flooding Map that debuted during the 2014 hurricane season, with Hurricane Arthur on July 3rd, will be available again during the 2014 hurricane season. This product provides quantitative information on the storm surge hazard associated with tropical cyclones, highlighting geographical areas where inundation from storm surge could occur and the height above ground that the water could reach. The map depicts inundation levels that have a 10 percent chance of being exceeded, which can be thought of as a reasonable worst-case scenario for any individual location.

Storm Surge Product Changes (Continued)

The map will usually be issued at the same time as the initial hurricane watch, although in some cases it will be issued with the initial tropical storm watch. The map is based on the latest forecast track and intensity for the tropical cyclone, and takes into account forecast errors. The map is subject to change every six hours with each new NHC full advisory package, and may not become available until about 60-90 minutes following the advisory release due to processing time required to produce the image.



Experimental Potential Storm Surge Graphic

A Forecaster's Experience in the Hazardous Weather Testbed

By David Glenn, Meteorologist

Each Spring, forecasters across the nation have the opportunity to participate in the [Hazardous Weather Testbed](#) located in Norman, Oklahoma. I was able to partake in the [Experimental Warning Program](#) which is designed to “improve the nation’s hazardous weather warning services by bringing together forecasters, researchers, trainers, technology specialists, and other stakeholders to test and evaluate new techniques, applications, observing platforms, and technologies.”

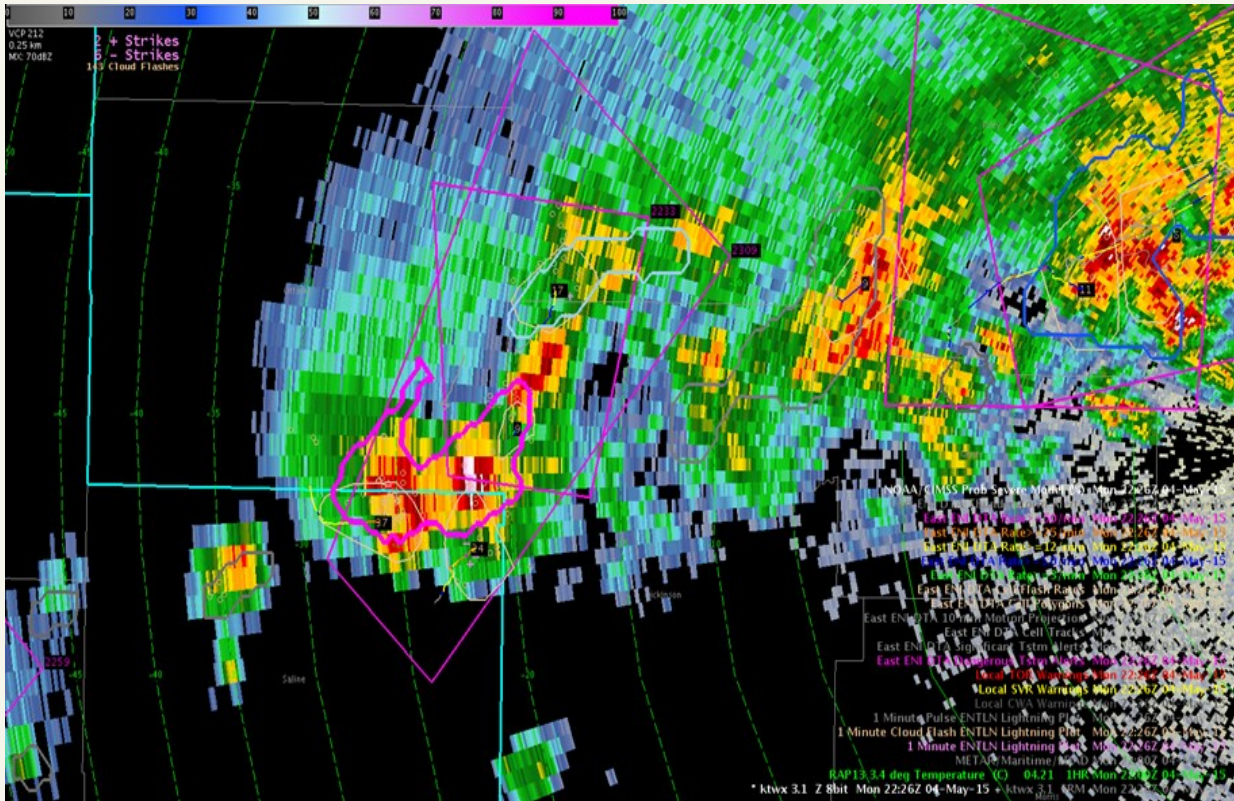
This year, I had the unique opportunity to evaluate several new products such as Earth Networks Inc. Total Lightning data (cloud-to-ground lightning and in-cloud flashes), University of Alabama-Huntsville Convective Initiation (satellite field depicting forecast for onset of storm formation), and a NOAA/CIMMS collaborative experimental statistical severe weather model known as [ProbSevere](#).

Each day we focused on a different area of the United States that was likely to experience severe weather. We were assigned responsibility of handling warning responsibilities while incorporating the experimental products/data into our normal warning operations. We were asked to make multiple blog posts (internal to researchers) about what we saw in the experimental data and how we used (or didn't use) the data, and what impacts it had on our warning decisions. Our shifts occurred from roughly 12pm-8pm, coinciding with the prime convection (thunderstorm) period of the day.

On Wednesday, May 6th, we had two different tornadoes come directly towards the National Weather Center building in Norman and the tornado sirens were activated. The tornadoes remained just west and north of our building but they impacted the area around our hotel with light damage. At the conclusion of the week, each forecaster came up with one or two things that we took away from the experience and we conducted a [national webinar](#) on Friday, May 8th, at noon. Here are examples of some of the products we evaluated:

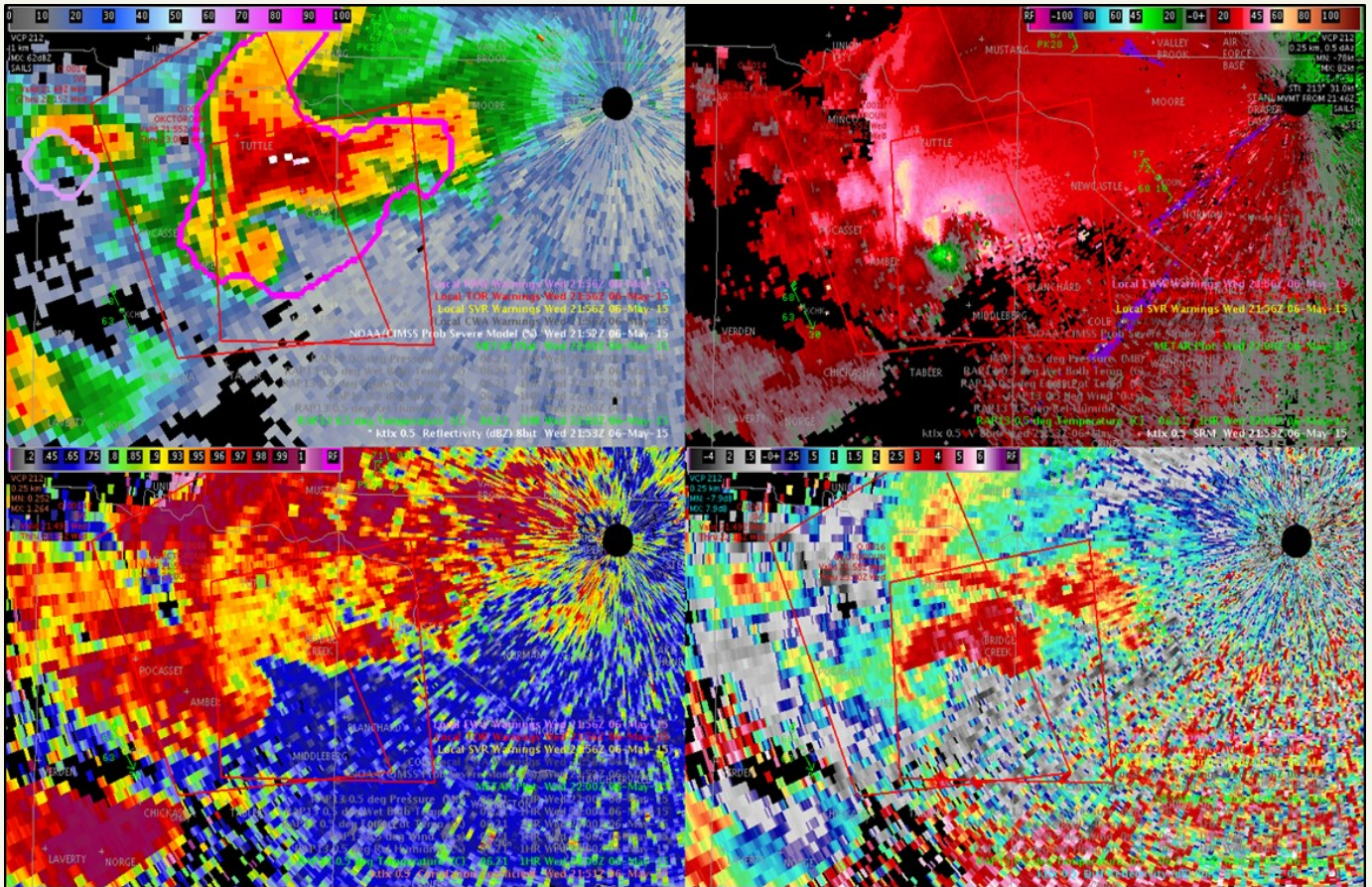
Hazardous Weather Testbed (Continued)

ProbSevere Model & ENI Dangerous Thunderstorm Alerts



ProbSevere is a statistical model that predicts the probability that a storm will ***first*** produce severe weather in the near term (in the next 60 minutes). It does not predict if a storm will continue to pose a severe threat or decay. The model incorporates instability and shear data (from numerical weather prediction) with observational predictors (2 satellite growth rates and 1 multi-radar/multi-sensor field).

Hazardous Weather Testbed (Continued)



Norman, Oklahoma is located a few miles southwest of the “black dot” in the upper right portion of the image (which represents the location of the KTLX Doppler Radar). This tornado was a bit too close for comfort as it approached from the west-southwest.



Introducing the new National Water Center

By Lara Pagano, Meteorologist



On average, more people die annually from flooding than from any other natural disaster. Therefore, it is imperative that a system is built to properly model precipitation and its overall impacts across the United States. The National Weather Center (NWC) was resurrected with this goal in mind. It is located at the University of Alabama in Tuscaloosa. The NWC has officially opened as of May 26th. The Center will not only house NOAA and NWS employees, but also the United States Geological Survey (USGS), US Army Corps of Engineers and Federal Emergency Management Agency (FEMA) in an effort to improve Hydrologic services across all agencies and regions.

One area of concern across Eastern North Carolina is the gap between inland flooding and coastal flooding. We can see this more readily during tropical events where heavy rain moves inland while storm surge creates coastal flooding. One of the many projects at the NWC will be geared toward building a model to bridge the gap between these two flooding regimes. It is the hope that we will one day create a model that will illustrate the cohesive nature of water flow and stage from inland rivers to the sounds and oceans. Understanding the hydrologic aspect of weather forecasting will aid in more informative advisories and warnings and overall decision support in the future.

NWS Newport Aviation Services

By Casey Dail, Meteorologist

National Weather Service Forecast Offices are responsible for preparing Terminal Aerodrome Forecasts (TAFs). TAFs are used heavily around the world. Everyone from general aviation pilots to commercial carriers utilize TAFs to anticipate weather conditions at takeoff and landing. Without question, the TAF content can have a strong impact on fuel loads, the need for alternates, and other aspects of aviation operations due to their stringent regulatory nature. The Newport/Morehead City WFO has the responsibility for preparing TAFs for four local terminals: Pitt-Greenville Airport (PGV), Kinston Regional Jetport (ISO), Coastal Carolina Regional Airport (EWN), and Albert J. Ellis Airport (OAJ).

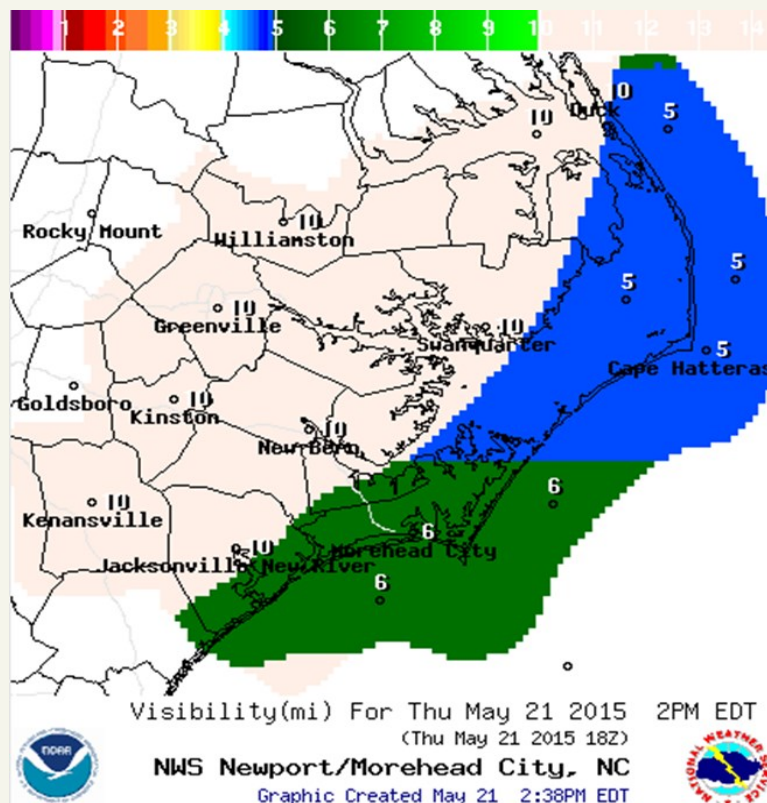
A scheduled TAF consists of the expected meteorological conditions significant to aviation at an airport for a specified period, normally 24 hours. Once issued, they are monitored continuously, and updated to reflect the forecasters latest thinking as conditions warrant. Scheduled TAFs are issued four times a day (every six hours) at 0000 UTC, 0600 UTC, 1200 UTC and 1800 UTC.

Forecasters use many different tools and methods to create the TAFs. We are always monitoring current conditions while utilizing other meteorological tools such as radar, satellite, pilot reports, computer model output and radiosonde (weather balloon) observations. National Weather Service forecasters use several models to aid in aviation forecasts. While these models produce good output, it is the understanding of local effects, weather patterns, and terrain that the forecasters use in conjunction with the models to provide quality TAFs for Eastern North Carolina. Statistics have shown that NWS Newport's TAF forecasts overall show significant improvements over model guidance.

NWS Newport Aviation Services (Continued)

Our office also writes an aviation forecast discussion (AFD), which is updated at least four times a day. In this discussion, forecasters detail the scientific reasoning and uncertainties regarding expected aviation related conditions including ceiling heights, visibility restrictions, winds, and convection. We also like to include site specific information in the AFD when conditions warrant including potential crosswind impacts for a particular runway. Forecasters use the aviation discussion to describe details not permitted in a TAF. This has proved to be a very valuable resource for aviation professionals and enthusiasts.

Our office is now producing visibility grids, which are available to view in the hourly weather graph, as well as the National Digital Forecast Database (NDFD) graphical images under the [Marine section](#). These new grids/forecast parameters will not only benefit the aviation community, but other groups and organizations as well. We will be working on expanding to ceiling grids within the next year.



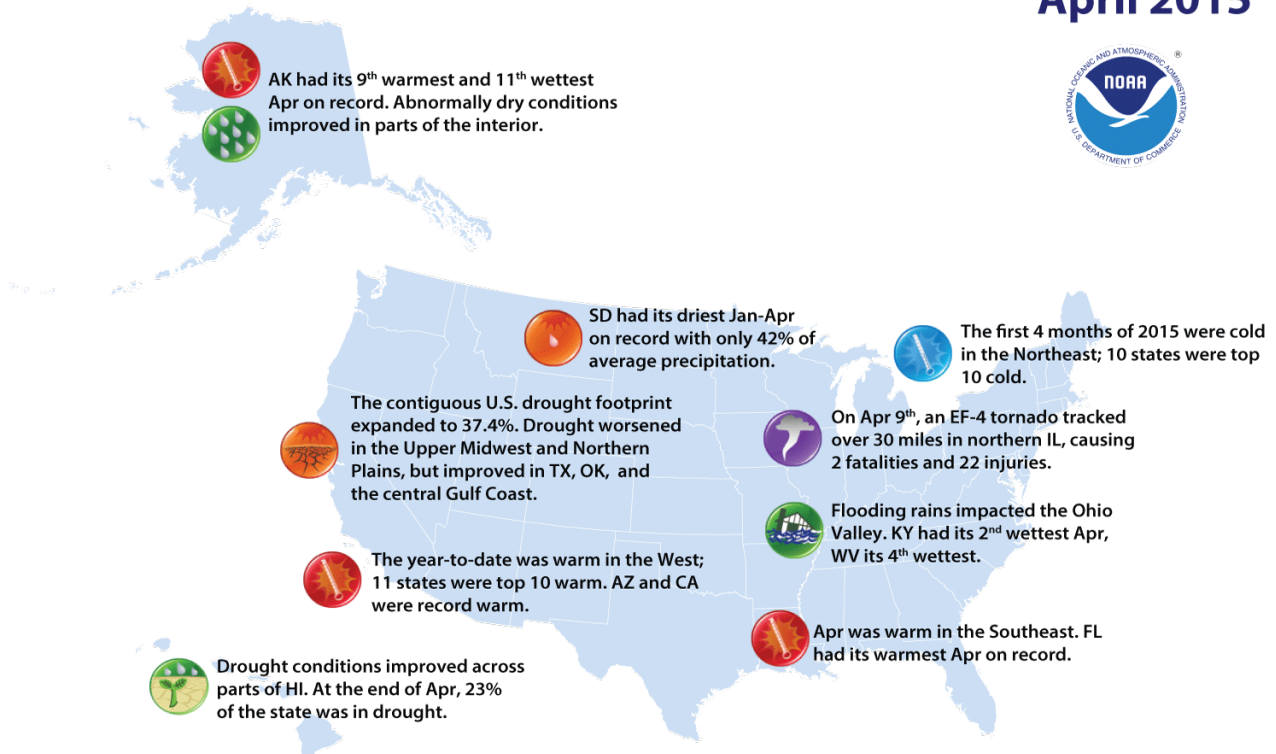
Gridded Visibility Map from NWS Newport/Morehead City

April 2015 Climate

By Chris Collins, Meteorologist

Temperatures across Eastern North Carolina in April 2015 were close to normal, while rainfall showed quite a variation across the region. Rainfall was well below normal near the coast, while wetter than normal across our northwestern and northern County Warning Area (CWA) in places such as Greenville, Williamston and Plymouth. Here are a few climate highlights from across the Nation from April, 2015.

U.S. Selected Significant Climate Anomalies and Events April 2015

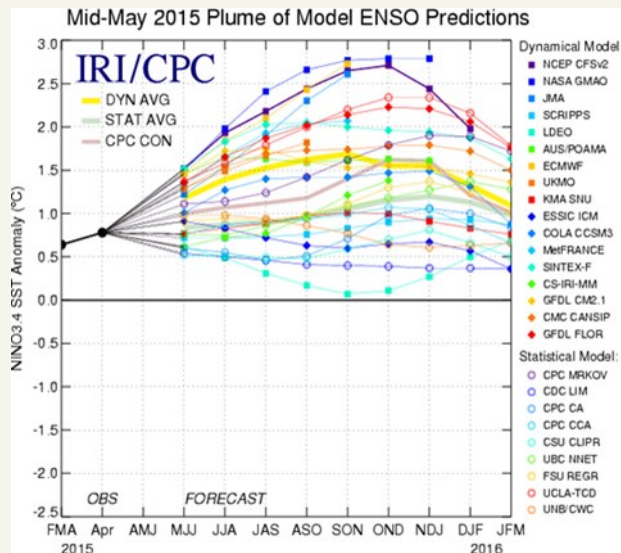


The average U.S. temperature during April was 53.1°F, 2.1°F above average, and the 17th warmest April on record. April U.S. precipitation was 2.78 inches, 0.26 inch above average.

What to Expect This Summer

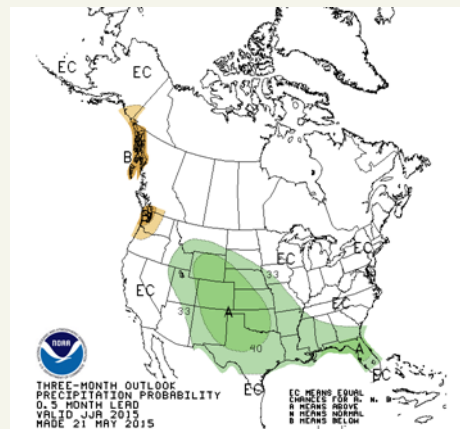
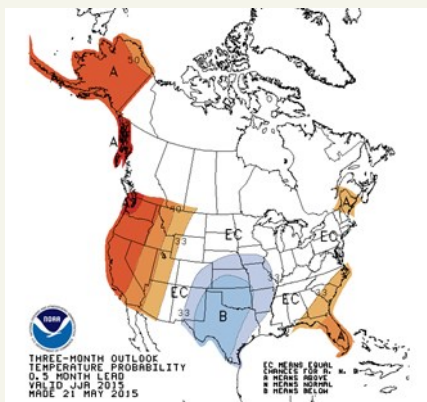
By Bel Melendez, Meteorologist

Recently, there has been a great deal of news about El Niño influencing summer weather this year. Currently, we are in a moderate El Niño and climate models are indicating it will become a strong El Niño by the end of summer /early fall.



The yellow bold line is the average of all models. The yellow

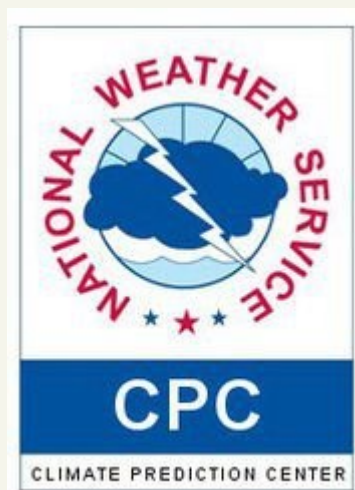
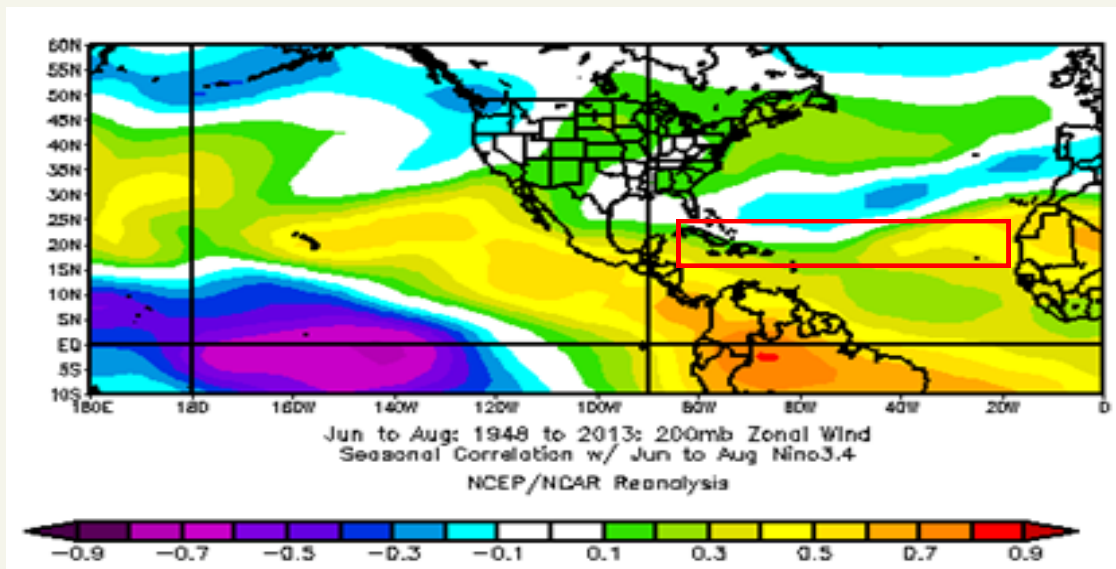
Across eastern North Carolina, El Niño has a stronger influence during winter months, meanwhile during the summer months the impacts are weaker. Climate models for this summer are showing temperatures will be normal to slightly above normal, with equal chances of above or below normal precipitation.

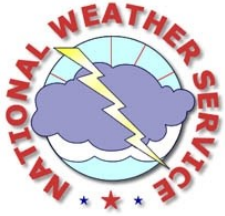


Climate Prediction Center Forecasts for June, July and August 2015

What to Expect This Summer (Continued)

El Niño tends to suppress hurricane activity in the Atlantic Basin, due to an increase of upper-level easterly wind shear in the development region (red box below). This is the major factor in the below normal hurricane season forecast. This year, the Climate Prediction Center is predicting a 70 percent probability of 6 to 11 named storms, 3 to 6 hurricanes, and zero to 2 major hurricanes (Category 3 or higher). Remember that despite a below normal seasonal forecast, it only takes one hurricane making landfall to have significant impacts to our area.





National Weather Service

530 Roberts Road
Newport, NC 28570

Phone: 252-223-5122
Fax: 252-223-3673
Website: <http://weather.gov/Newport>
Twitter: @NWSMoreheadCity
Facebook: [/www.facebook.com/NWSMoreheadCity](http://www.facebook.com/NWSMoreheadCity)



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