Carolina SkyWatcher

National Weather Service, Newport/Morehead City, NC

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Summer 2017 Edition

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2017 Hurricane Season Arrives

June 1 through November 30 marks the 2017 Hurricane Season. Eastern North Carolina had an active tropical year in 2016. On June 7, post-Tropical Cyclone Colin produced 3 to 5 inches of rain and minor flooding. On September 2 and 3, Tropical Storm Hermine produced very heavy rainfall, rip currents and three tornadoes. Rainfall amounts of up to 13 inches were observed in Carteret County. EF-1 tornadoes were confirmed in the Straits and Marshallberg areas of Carteret County. Another tornado occurred in Hatteras Village. A Wireless Emergency Alert got a few families to shelter in a more substantial building, instead of small travel trailers, with only minor injuries, and no fatalities. Finally, on October 8 and 9, Hurricane Matthew brought devastating flooding, strong winds and storm surge to the coast of eastern North Carolina. The main legacy of Hurricane Matthew will be the catastrophic flooding over the Coastal Plains of eastern North Carolina. River flood levels not seen since Hurricane Floyd in 1999 caused millions of dollars of damage and multiple deaths across the eastern third of the state. Record storm surge levels were also recorded at Cape Hatteras. Now is the time to prepare for hurricane season and come up with a plan of action.

CONTENTS

2017 Atlantic Hurricane Names

Arlene	Harvey	Ophelia
Bret	Irma	Philippe
Cindy	Jose	Rina
Don	Katia	Sean
Emily	Lee	Tammy
Franklin	Maria	Vince
Gert	Nate	Whitney

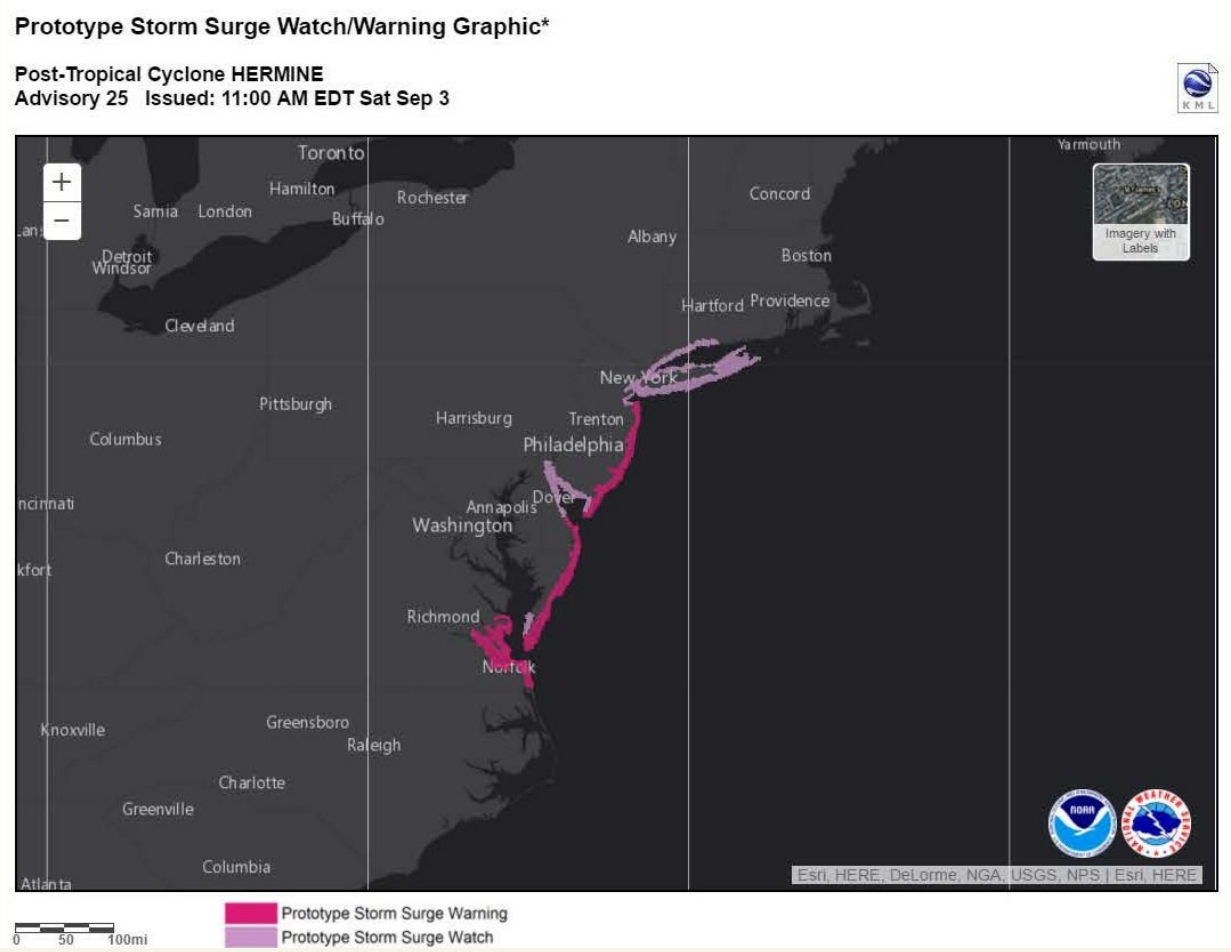
Hurricane Center Product Changes for 2017

By Chris Collins, Meteorologist

Several changes have been made to NOAA's National Hurricane Center products for the 2017 hurricane season.

1. Storm Surge Watch/Warning Becomes Operational:

Beginning with the 2017 hurricane season, the NWS will issue storm surge watches and warnings to highlight areas along the Gulf and Atlantic coasts that have a significant risk of life-threatening inundation from a tropical cyclone. Storm surge is often the greatest threat to life and property from a tropical cyclone, and it doesn't always occur at the same times or locations as a storm's hazardous winds. A graphic depicting the watch and warning areas will be available on the National Hurricane Center website whenever these watches or warnings are in effect. Below is an example of the graphic.

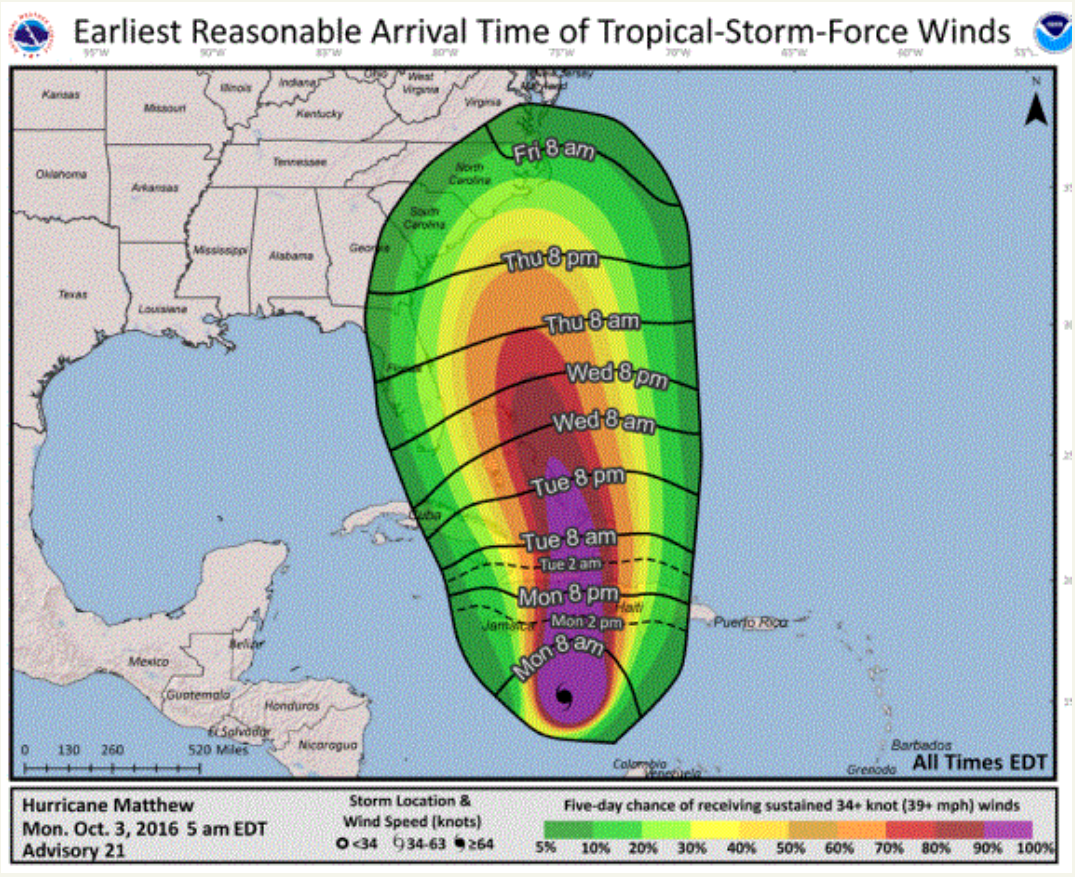


Example of Surge Surge Watch/Warning graphic from Hermine in September, 2016.

Hurricane Center Product Changes for 2017 (Continued)

2. Issuance of Watches, Warnings and Advisories for Potential Tropical Cyclones: The National Hurricane Center will, in 2017, have the option to issue advisories, watches and warnings for disturbances that are not yet a tropical cyclone, but which pose a threat of bringing tropical storm or hurricane conditions to land areas within 48 hours. Advisory packages on potential tropical cyclones will be issued until watches or warnings are discontinued or until the threat of tropical-storm-force winds for land areas sufficiently diminishes, at which point advisories would be discontinued.

3. **Experimental Time of Arrival of Tropical-Storm-Force Winds Graphic**:
The arrival of sustained tropical-storm-force winds is a critical planning threshold for coastal communities, as many preparedness activities become difficult or dangerous once winds reach tropical storm force. To provide guidance on when users should consider having their preparations completed before a storm, NHC will begin issuing in 2017 experimental Time of Arrival of Tropical-Storm-Force Winds graphics. Below is an example of one of the graphics.

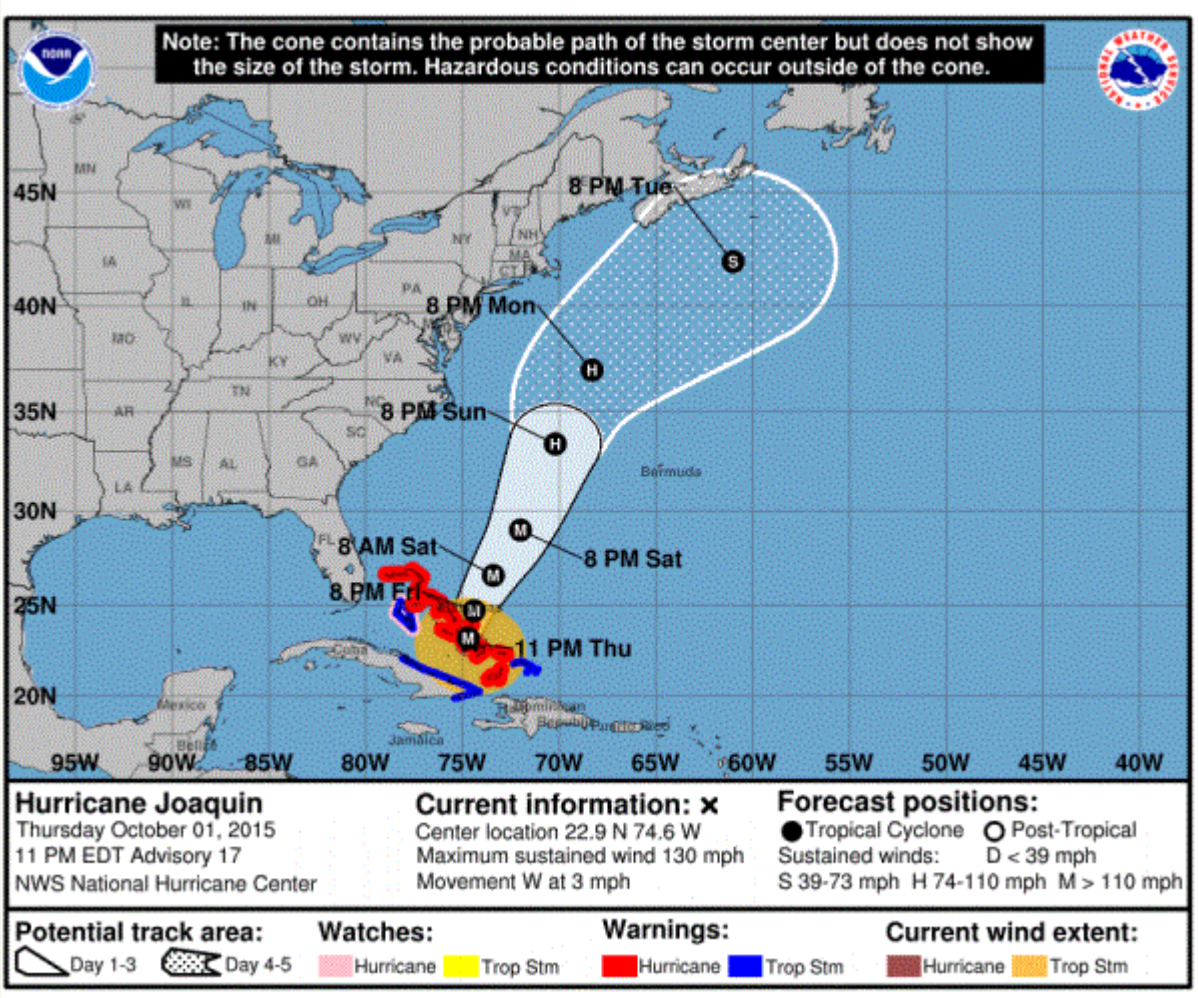


Example of Time of Arrival of Tropical-Storm-Force Winds.

Hurricane Center Product Changes for 2017 (Continued)

4. Update to tropical cyclone advisory graphical products:

The National Hurricane Center has updated the look of its tropical cyclone advisory graphics. The graphics now have a consistent look. One significant enhancement is the addition of the current extent of hurricane and tropical-storm-force winds to the cone graphic, which will help illustrate that hazardous conditions can occur well outside the track forecast cone. Below is an example:



Example of tropical cyclone track and cone graphic.

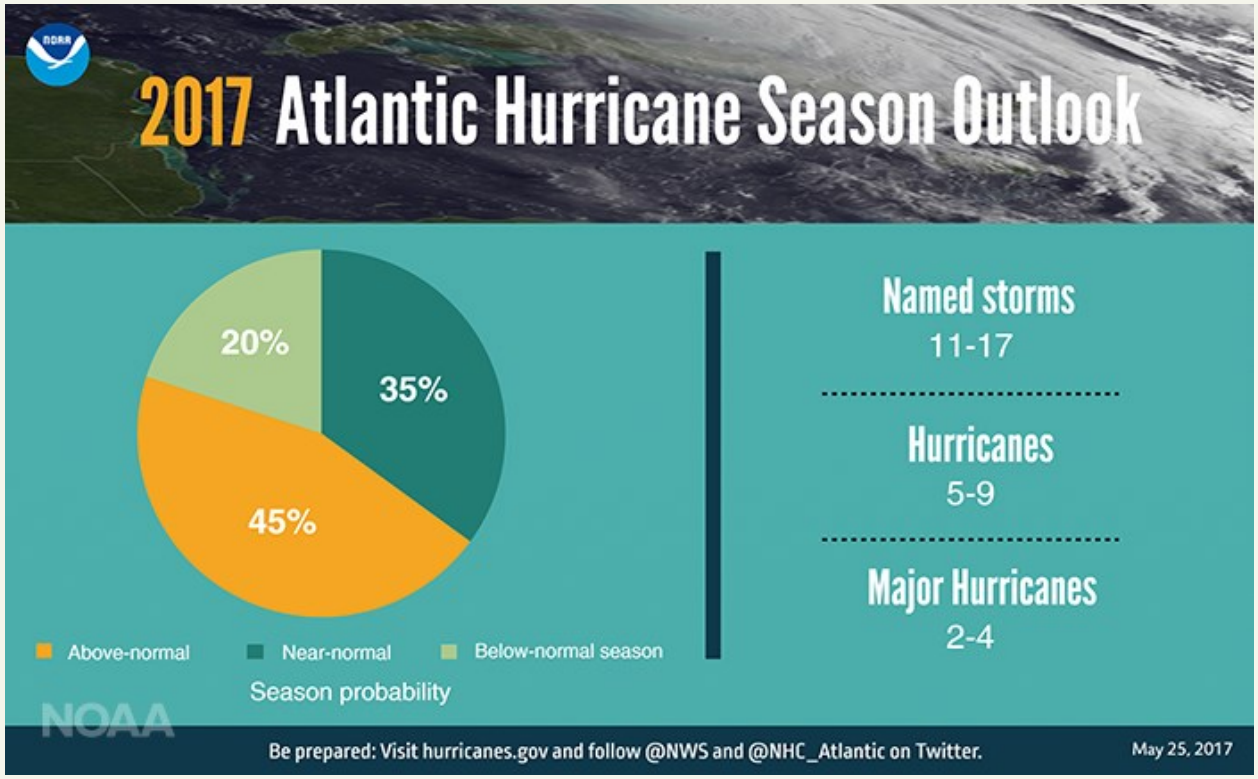
In additional to the other changes previously mentioned, the size of the tropical cyclone forecast error cone will be smaller this year. The cone represents the probable track of the center of a tropical cyclone, and is formed by enclosing the area swept out by a set of imaginary circles places along the forecast track (at 12, 24, 36 hours etc.). The size of each circle is set so that two-thirds of the historical official forecast errors over the previous five years (2012-16) fall within the circle.

2017 Seasonal Hurricane Outlook

By Bel Melendez, Meteorologist

The 2017 Tropical Outlook is out, and NOAA experts are calling for an above-normal Atlantic hurricane season! The Atlantic hurricane season officially starts June 1 through November 30, but there are occasions that tropical cyclones can develop outside of this time frame. This season, experts are forecasting a 45% chance of an above-normal, 35% of a near-normal and 20% chance of a below-normal season. Forecasters are predicting a 70% likelihood of 11 to 17 named storms (winds greater than 39 mph), which 5 to 9 could become hurricanes (winds greater than 74 mph) including 2 to 4 major hurricanes (greater than Category 3; winds higher than 111 mph). A typical normal tropical season is 12 named storms which 6 become hurricanes.

The Tropical Outlook is a prediction of what will happen over the Atlantic Basin, but is not a forecast of how many storms will strike land. Regardless of how many tropical systems develop this season, it's best to be prepared as it only takes one system to affect your life. Take the opportunity to look at our National Weather Service's "Hurricane Safety Tips and Resources" . There you will find hurricane preparation, hurricane climatology and educational information.



Late April Major Flooding Event

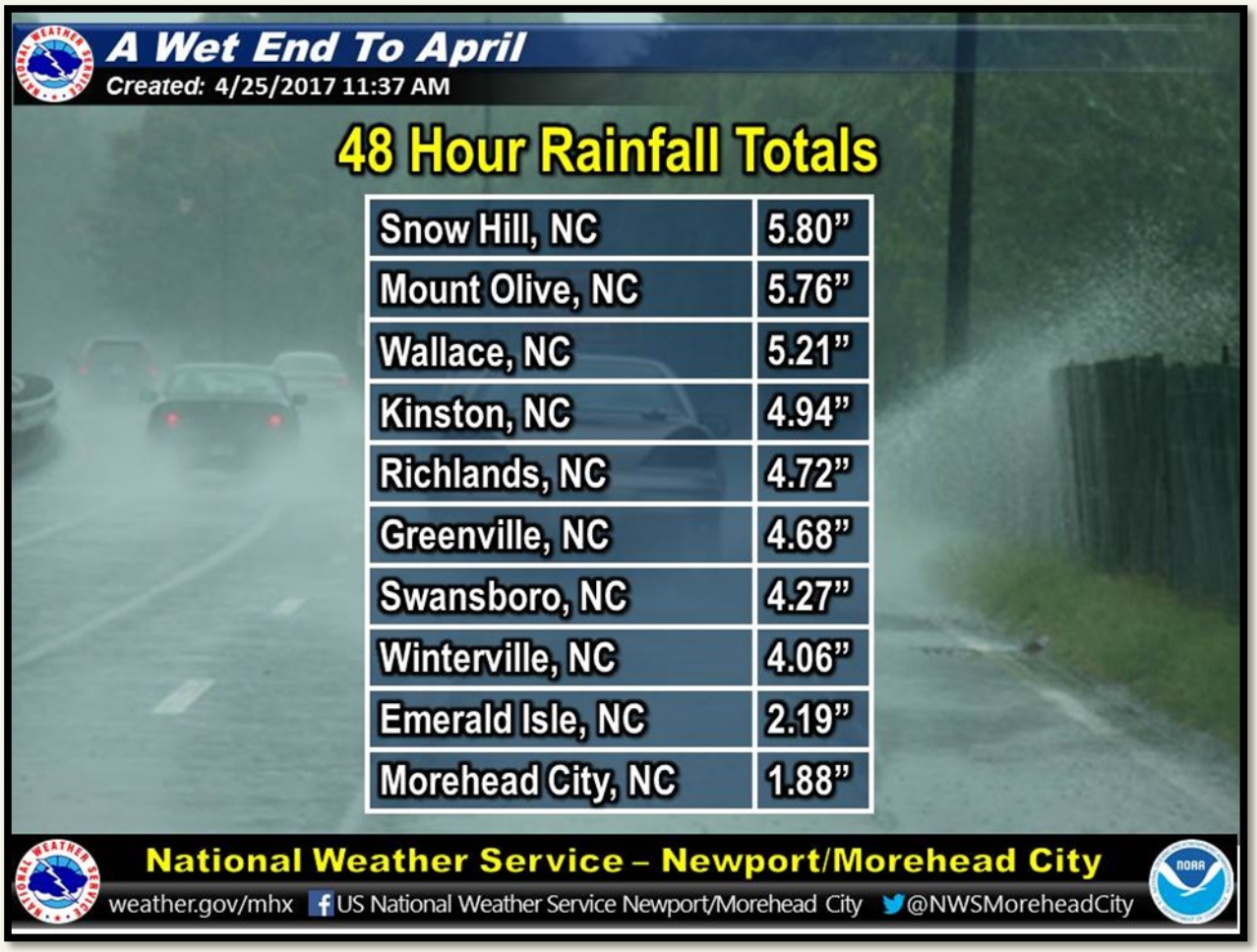
By Shane Kearns, Meteorologist

Just seven months after Hurricane Matthew, residents of Eastern North Carolina experienced another major river flooding event at the end of April. A low pressure system off the NC coast caused heavy precipitation to fall April 24th and 25th totaling 3 to 6 inches across much of Eastern NC. Even higher totals around 8 inches were seen farther west in the headwaters of the Tar River, Neuse River, and Contentnea Creek. River flooding began quickly along the Contentnea Creek in Greene County, and caught some residents off guard, mostly because only 3 to 4 inches of rain had fallen in this area. However, farther west, in the headwaters of the Contentnea Creek, over 8 inches of rain had fallen over this portion of the basin. As a result, a few residents needed to be evacuated, and one person died attempting to drive through the flooded roadway. Many other residents once again had to take action and prepare their properties for water damage. The floodwaters continued slowly travelling downstream, causing problems in Snow Hill, Hookerton, and Grifton. The river gage located in Hookerton crested at 20.18 feet, around 4 feet lower than in Hurricane Matthew. However, this was the second Major Flood in seven months, and only the sixth Major Flood in the close to 100 year period of record.

Major flooding also occurred on the Neuse River at Kinston. As with the other rivers, much heavier rain fell in the headwaters of the Neuse than in Lenoir County. Along the Tar River, moderate flooding occurred in Greenville. Both the Northeast Cape Fear River in Chinquapin and the Roanoke River in Williamston experienced Minor Flooding. The National Weather Service will once again review our impact statements and flood stages to accurately capture what areas will flood at different river levels. You can view all of our river levels at the following link:

https://water.weather.gov/ahps2/index.php?wfo=mhx

Late April Major Flooding Event (Continued)



48-hour Rainfall Totals from April 24 and 25, 2017.

Flooding on NC 58 near Stantonsburg. One fatality occurred here when a driver attempted to cross the flooded roadway and was swept away.

New Geostationary Satellite (GOES-16)

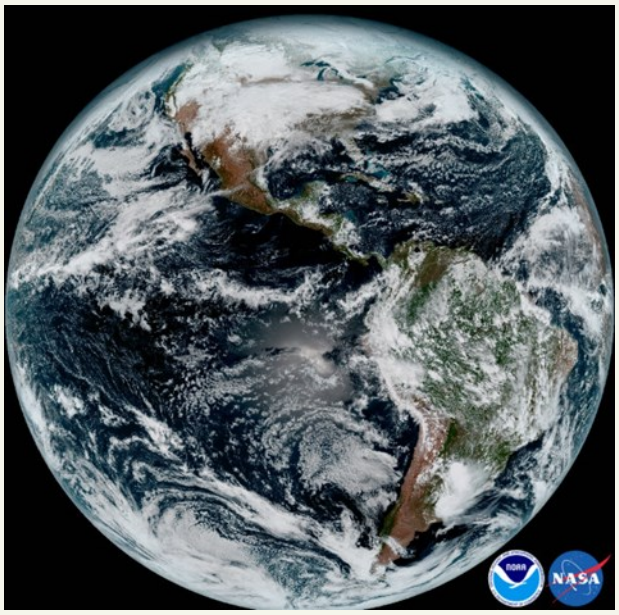
By David Glenn, Meteorologist

The Geostationary Operational Environmental Satellite-R Series (GOES-R) was launched from Space Launch Complex 41 at Cape Canaveral Air Force Station, Florida, on November 19, 2016. The GOES-R generation of satellites will be the nation's next generation of geostationary weather satellites, and will significantly improve the detection and observation of environmental phenomena that directly affect public safety, protection of property and our nation's economic health and prosperity. Now that GOES-R is successfully in orbit, it becomes GOES-16, and will become the new GOES-EAST in November of 2017.

GOES-16 will provide advanced imaging with increased spatial resolution and faster coverage for more accurate forecasts, real-time mapping of lightning activity, and improved monitoring of solar activity. Check out these links for real-time satellite imagery and interesting case studies:

GOES-16 Data and Imagery -
http://www.goes-r.gov/multimedia/goes-16DataAndImagery.html
GOES-16 Loop of the Day -
http://rammb.cira.colostate.edu/ramsdis/online/loop_of_the_day/
College of DuPage -
http://weather.cod.edu/satrad/exper/
NOAA National Environmental Satellite, Data, and Information Service (NESDIS) - https://www.nesdis.noaa.gov/

GOES-16 satellite data are considered "preliminary, non-operational data" at this time.



Left: First high-resolution GOES-16 Visible image from the Advanced Baseline Imager (ABI) instrument. Bottom: Example of Infrared satellite imagery from GOES-16 ABI.

Weather Ready Nation Ambassador Program

By Erik Heden, Meteorologist

Have you considered signing up to be a Weather Ready Nation Ambassador? Whether you're a local business that is directly impacted by weather, an organization looking for more weather preparedness information or a group that would like more communication with us, our new initiative may be for you! The Weather Ready National Ambassador initiative is an effort to formally recognize NOAA partners who are improving the nation's readiness, responsiveness, and overall resilience against extreme weather, water, and climate events. Traditionally we as the National Weather Service have worked most directly with our partners in Emergency Management and the media. These lines of communication will continue. However, to make our communities more resilient to weather disasters, we need to be engaged with the ENTIRE community! Our mission in the National Weather Service is to protect life and property and we need your help. Signing up to be an ambassador is free, easy to do, and you determine your level of commitment. As an ambassador you will receive pre-packaged weather materials and training from us that you can use to prepare for weather hazards in your workplace or home. We ask that you continue to communicate your needs to us and let us know about any opportunities to partner with you.

A Sample of Current Local Ambassadors

Carteret and Jones County schools
MCAS Cherry Point
Craven Community College
Emerald Isle Reality
Haystacks HOA
Carolina East Medical Center

Sign Up Today: http://www.nws.noaa.gov/com/weatherreadynation/amb_tou.html. If you have any questions please contact Erik at erik.heden@noaa.gov. For more information please visit our website: http://www.nws.noaa.gov/com/weatherreadynation/ambassadors.html

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Large Hail Occurs in Jones County

By Chris Collins, Meteorologist

Strong surface heating ahead of a mid-level trough of low pressure led to increased instability during the mid afternoon hours of Tuesday March 28, 2017. This led to the formation of some isolated strong to severe thunderstorms, which produced large hail of 1 to 2 inches in diameter over portions of Jones County between 4:30 and 5 pm.

The initial Severe Thunderstorm Warning of the day was issued at 4:14 pm for portions of central Jones, Lenoir and Craven Counties. A second Warning was issued farther east at 4:52 pm for eastern Jones, along with portions of Craven and Onslow Counties.

Large hail that occurred in Jones County on March 28, 2017.

EF-1 Tornado Hits Bethel in Pitt County

By Chris Collins, Meteorologist

An EF-1 tornado formed along a frontal boundary during the evening hours of June 5, 2017 in Bethel in northern Pitt County. The tornado produced some significant structural and tree damage along Highway 30. An EF-1 tornado produces estimated wind speeds in the 86 to 110 mph range. The tornado had a path length of about one-half mile and a width of 100 yards.

At approximately 7:25 PM EDT, the tornado touched down near the intersection of Whitehurst Station Road and Highway 30, where it produced significant damage to one older building and uprooted and snapped hardwood trees. The tornado crossed Highway 30 and caused significant damage to a Woodshop storage building and knocked down powerlines, while debris caused damage to two residential homes. The tornado moved across a crop field where it lifted multiple times before moving into a field of trees where additional trees were knocked down, blocking train tracks.

Tornado near Bethel, NC, June 5, 2017 (Courtesy WITN TV).

Damage near Bethel, NC (Photo by Caty Whitehurst)

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