



Changing Skies

Over Central North Carolina

VOLUME 13, ISSUE 1

WINTER 2016

NOAA'S NATIONAL WEATHER SERVICE RALEIGH, NC

INSIDE THIS ISSUE:

El Niño / Winter Outlook 1

MIC Leaving NWS Raleigh 4

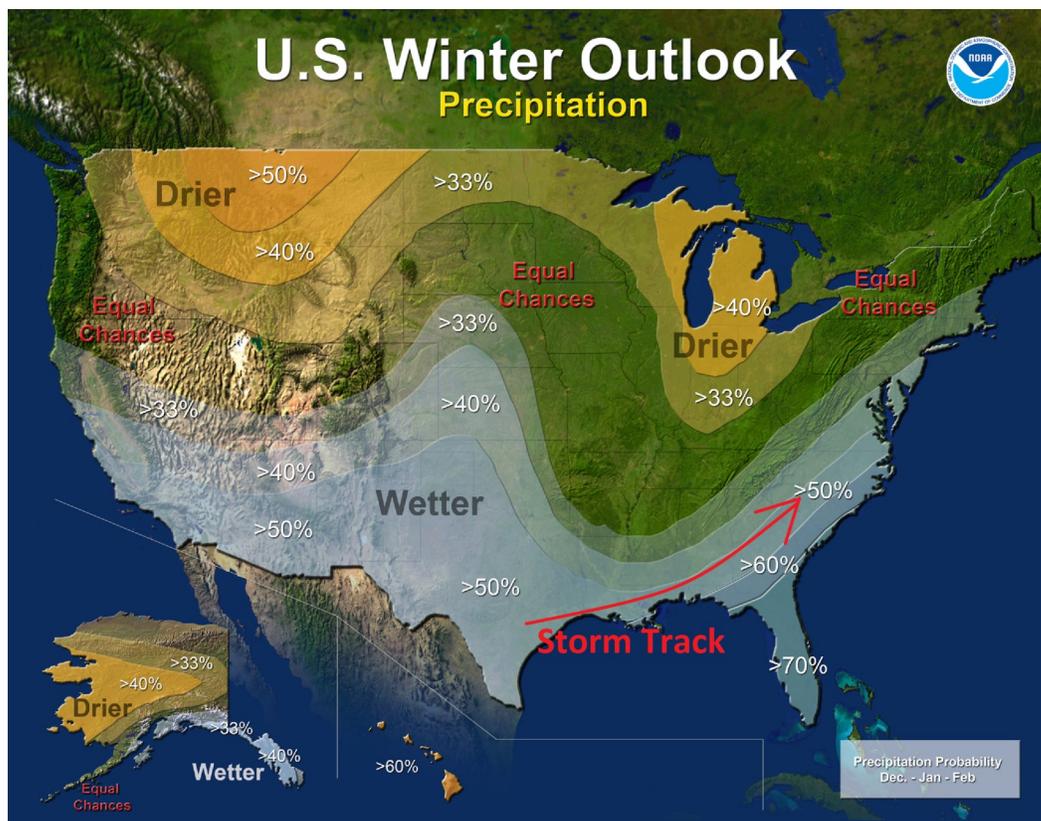
Hollings Scholar 5

Hurricane Season Recap 6

If I were a Cloud 7

NWS Mobile Website 8

El Niño on Track to be one of Strongest Ever: What it Means for Winter



El Niño is back. In fact, one could say that El Niño has “comeback with a vengeance”, with sea surface temperatures in the central equatorial Pacific at near-record highs, right in line with the the benchmark 1997-1998 El Niño event. The official monthly Niño 3.4 region (the area of the Pacific Ocean sampled by scientists to track El Niño) temperature anomaly for November is 2.35° Celsius.

Strong El Niño episodes are well-known to have a signifi-

cant influence on weather and climate patterns over North America during the winter months by impacting the strength and position of the subtropical jet stream. During an El Niño event, the subtropical jet stream becomes stronger and takes a more southerly track across the southern U.S. and the Gulf of Mexico. Since storm systems tend to follow the subtropical jet, the more suppressed southern storm track can tap into the moisture rich flow from the Gulf of Mexico,

typically resulting in above-average precipitation across the southern tier of the country. So, it’s not surprising that the 2015-2016 seasonal winter outlook resembles composites derived from the previous six strong El Niño composites of the 1957-58, 1965-66, 1972-73, 1982-83, 1991-92, and 1997-98, indicating an increased likelihood of above median precipitation for the Southeast.

However, it is very important **(continued on page 2)**





El Niño and Winter Outlook (continued from page 1)

to remember that the seasonal outlook maps show only the most likely outcome. While much less likely, there is some chance that precipitation amounts could end up below or near average. If we look more closely at how the temperature and precipitation varied greatly among the six strong El Niño events, we find that no two El Niño events are ever the same. For example, the composite December-February precipitation maps show that North Carolina has tended to be wetter than average during strong El Niño events, but that was not the case for the specific El Niño events of 1965/66 and 1991/92. The El Niño events during 1972/73, 1982/83 and 1997/98 were

exceptionally wet for North Carolina, which no doubt skewed the six event composite values and in effect mask the two near or below normal precipitation episodes.

Don't forget El Niño is just one climate pattern that will determine our winter. Other factors and teleconnections such as the Arctic Oscillation, which influences the number of arctic air masses that penetrate into the Southeast US, at times can dominate the winter temperature and precipitation outcomes in the United States.

Finally, keep in mind that this seasonal outlook does not project where and

when snowstorms may hit or provide total seasonal snowfall accumulations. Snow forecasts are dependent upon the strength and track of winter storms, which are generally not predictable more than a week in advance.

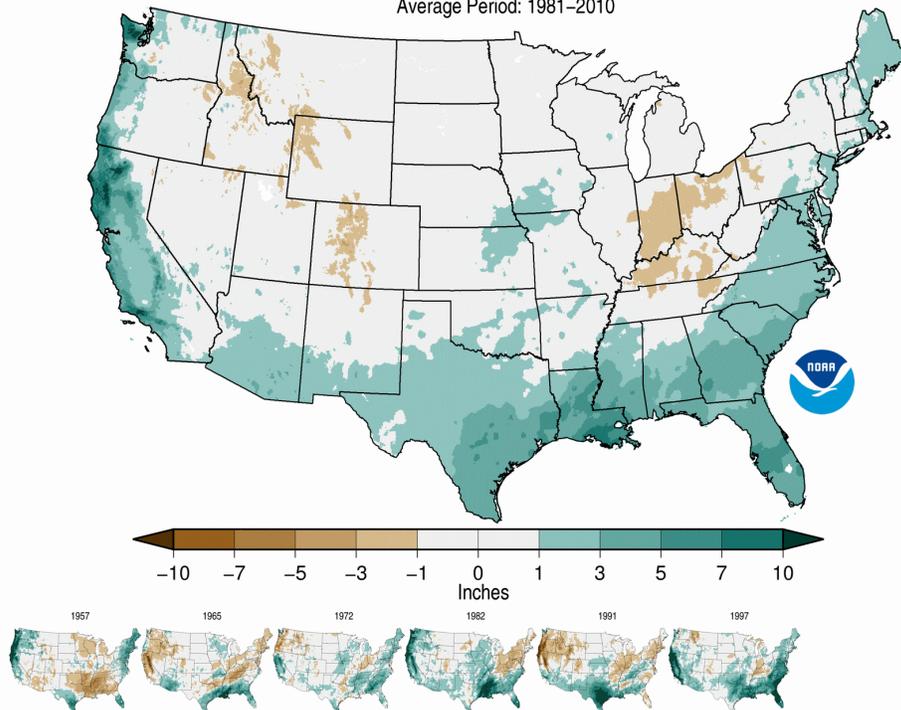
We are just at the very beginning of finding out what this El Niño event will bring to the U.S. There is no doubt that El Niño 2015-2016 will play a prominent role in the U.S. winter and will be one that the climate community and researchers will talk about for years and years to come.

-Brandon Locklear

Strong El Niño Precipitation Departure from Average

Composite: December-February 1957/1958, 1965/1966, 1972/1973, 1982/1983, 1991/1992, 1997/1998

Average Period: 1981-2010

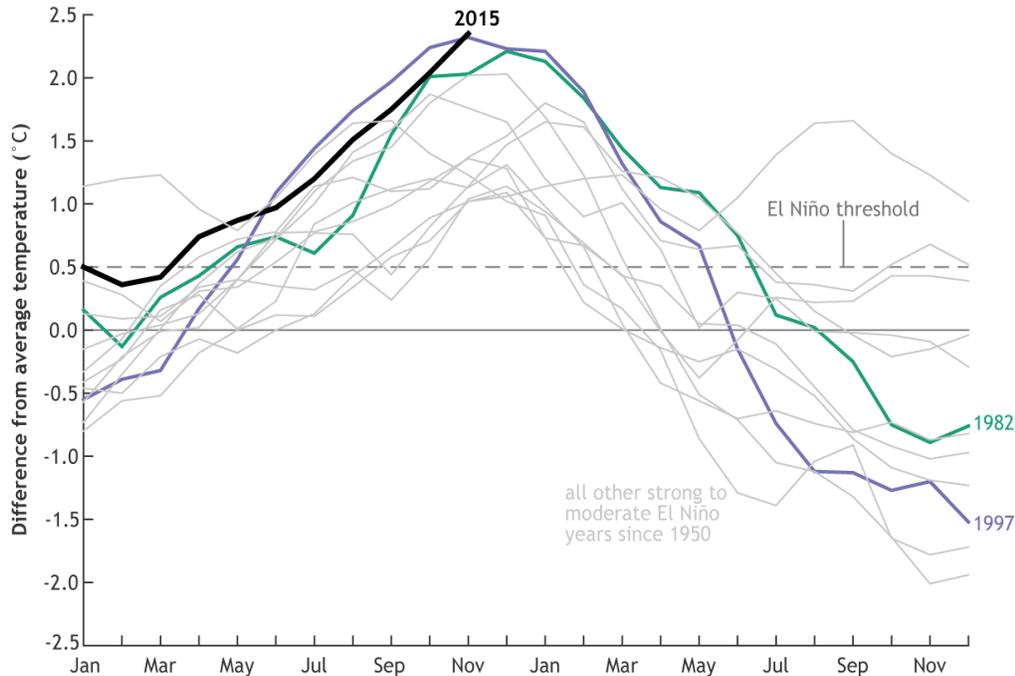


Data Source: 5km Gridded Dataset (nClimGrid)

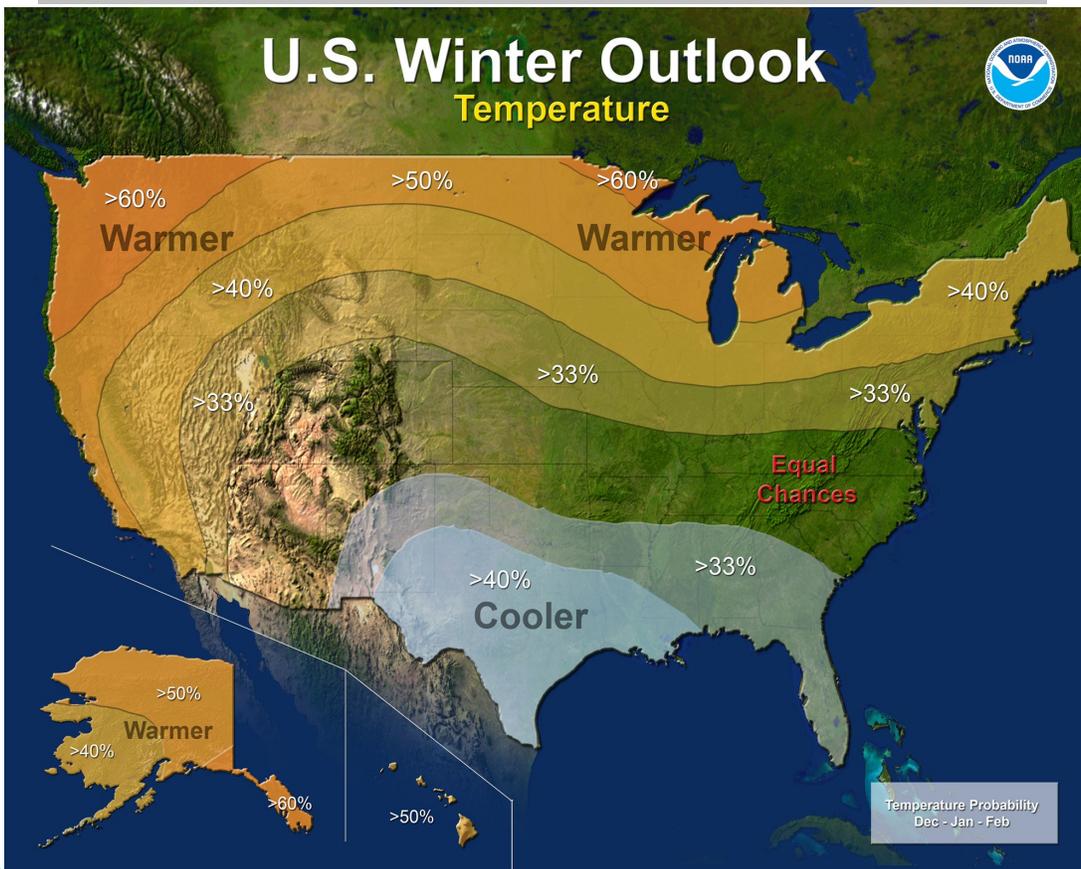
Created by: National Centers for Environmental Information



Monthly sea surface temperature Niño 3.4 Index Values



Graph showing current El Niño outpacing strongest on record as of November 2015

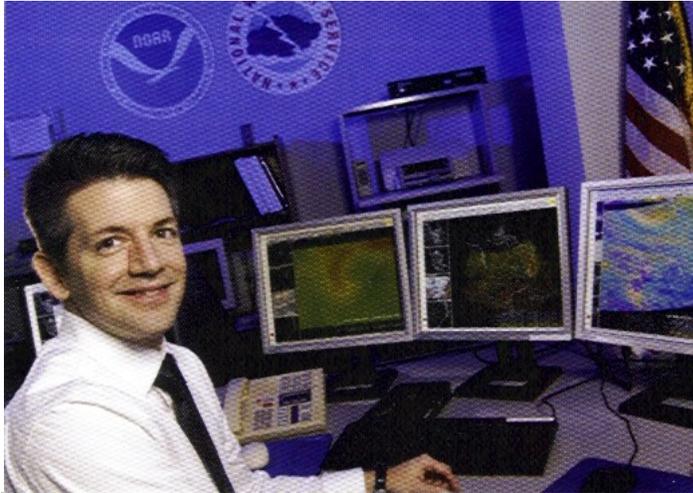




“After just over 11 years as the Meteorologist-in-Charge at the NWS office in Raleigh, I have moved to College Park, Maryland, taking on the role of the Operations Branch Chief of the Ocean Prediction Center (OPC).”



NWS Raleigh Meteorologist in Charge Leaving After 11 Years



Darin Figurskey

After just over 11 years as the Meteorologist-in-Charge at the NWS office in Raleigh, I have moved to College Park, Maryland, taking on the role of the Operations Branch Chief of the Ocean Prediction Center (OPC). The OPC is housed in the NOAA Center for Weather and Climate Prediction (NCWCP), and is part of the National Centers for Environmental Prediction (NCEP). My start date at the OPC was December 14.

When I first arrived in Raleigh in September, 2004, I received a great North Carolina welcome from Frances, Ivan, and Jeanne, three of the seven tropical cyclones to affect North Carolina that hurricane season. On my first day at the Raleigh office, September 8, the remnants of Hurricane Frances were giving the state areas of heavy rain and isolated tornadoes. This was followed by the remnants of Ivan and Jeanne in mid and late September. After my first three weeks in

around 105F in late June and early July, 2012, periods of drought, and a few other tropical systems and their remnants.

During the time I was at the NWS office in Raleigh, I had the privilege and honor to work with staff members dedicated to science and service, and to meet and work with many great individuals in central North Carolina, across the state and around the nation. I would like to express my appreciation for the partnerships and friendships developed and enhanced over the last decade. It has been my pleasure and honor to serve you, and to work with you to serve the people of central North Carolina and beyond. May you and yours have a great upcoming holiday season and 2016, and I wish you happiness and success in your future endeavors.

-Darin Figurskey

Raleigh, I had already been through three tropical systems and two storm damage surveys! Since then, there have been many other significant weather events, including the April 16, 2011 tornado outbreak in central and eastern North Carolina, the largest single-day tornado outbreak on record in the state, several winter storms and heat waves, the latter including temperatures



Hollings Scholar Spends Summer at NWS Raleigh



Raelene Campbell assisting NWS Raleigh staff with on site support at the Rolling Stones Concert at Carter-Finley Stadium

My name is Raelene Campbell and I was honored to be selected as a Hollings's Scholar from Valparaiso University. This summer, NWS Raleigh hosted me for a ten week internship where I worked on a project entitled: "A Detailed Climatology of Central North Carolina Tornadoes".

Taking data from various sources, I was able to combine them to make one large dataset to be used for the project to include years from 1950 thru 2014. Using GIS to spatially analyze the data, trends in tornado frequency were found across the entire state of North Carolina, and more exclusively in the NWS Raleigh county warning area. It was found that the largest density of tornado occurrence is in the Eastern portion of the state with a secondary maximum density in the Charlotte area.

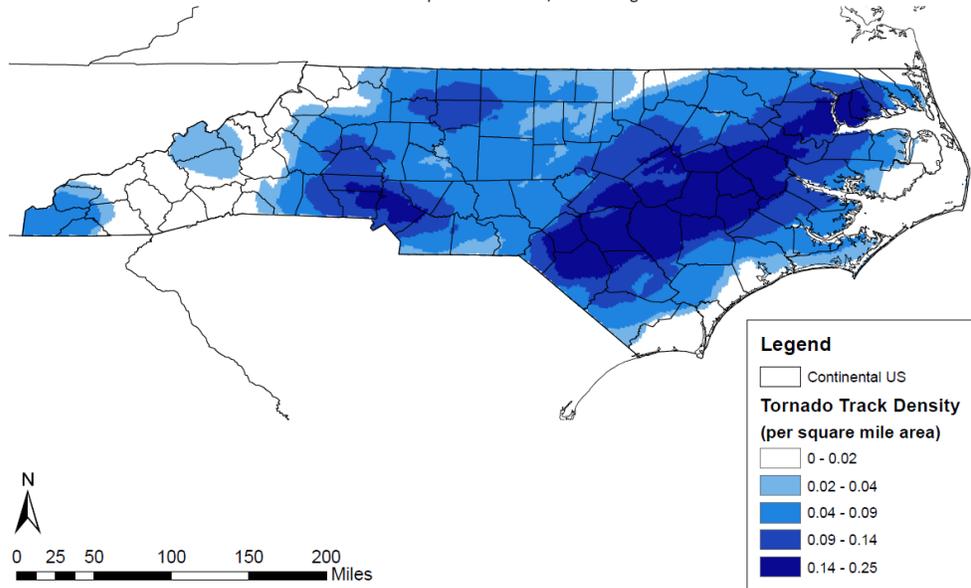
After statistical analysis of the data, it was found that of all the tornadoes that occurred in North Carolina, only 19.6% are considered significant tornadoes (EF2 or greater), but those tornadoes account for 93.88% of all

the tornado related deaths and 89.29% of all tornado related injuries. It was also found that only 38.9% of tornadoes are considered nocturnal (occurred between sunset and sunrise), but those account for a whopping 74.2% of deaths. Finding these statistics

search project, I was able to participate in various activities around the office with the wonderful staff. I had the opportunity to sit along forecasters during severe weather events and help submit storm reports, was able to participate in a tornado damage survey in Lee County which turned out to be ranked as an EF1 tornado, and helped with on site support for the Rolling Stones Concert held at Carter-Finley Stadium amongst many other things. During my time in Raleigh I have learned a lot about the field I am embarking in for the rest of my life, along with being able to participate in some

North Carolina Tornado Track Density (1950-2014)

Raelene Campbell with NOAA/NWS Raleigh



has backed up the assumption that stronger tornadoes do more damage to both life and property and to the assumption that not being able to see the tornado coming is also a hazard that can lead to more deaths. Outside of working on the re-

search project, I was able to participate in various activities around the office with the wonderful staff. I had the opportunity to sit along forecasters during severe weather events and help submit storm reports, was able to participate in a tornado damage survey in Lee County which turned out to be ranked as an EF1 tornado, and helped with on site support for the Rolling Stones Concert held at Carter-Finley Stadium amongst many other things. During my time in Raleigh I have learned a lot about the field I am embarking in for the rest of my life, along with being able to participate in some

-Raelene Campbell





Below Normal Atlantic Hurricane Season Ends

The Atlantic, eastern and central Pacific hurricane seasons officially ended on December 1st, and as predicted, the Atlantic season stayed below normal with 11 named storms, while the eastern and central Pacific were above normal with both regions shattering all-time records.

during the month of October. NOAA scientists credit El Niño as the leading climate factor influencing both the Atlantic and Pacific seasons this year. “El Niño produces a see-saw effect, suppressing the Atlantic season while strengthening

the eastern and central Pacific hurricane seasons,” said Gerry Bell, Ph.D., lead seasonal hurricane forecaster at NOAA’s Climate Prediction Center. “El Niño intensified into a strong event during the summer and significantly impacted all three hurricane seasons during their peak months.”

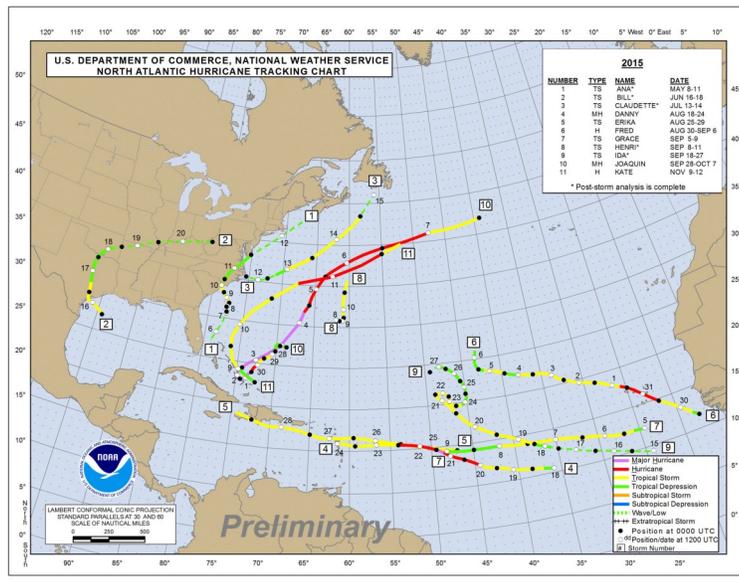
Bell said El Niño suppressed the Atlantic season by producing strong vertical wind shear combined with increased atmospheric stability, stronger sinking motion and drier air across the tropical Atlantic, all of which make it difficult for tropical storms and hurricanes to form and strengthen. However, El Niño fueled the eastern and central Pacific seasons this year with the weakest vertical wind shear on record.

Researchers from NOAA’s Atlantic Oceanographic and Meteorological Laboratory tested new instruments such as a wind LIDAR that complements radar observations by measuring wind velocity in regions without rain. NOAA’s use of unmanned systems advanced this season with the first transmission of real-time data into operational hurricane models from NASA’s Global Hawk, part of NOAA’s Sensing Hazards with Operational Unmanned Technology (SHOUT) project.

Below the ocean’s surface, two underwater gliders collected and transmitted real-time data on Tropical Storm Erika’s interaction with the upper ocean as the storm passed through the Caribbean.

Hurricane hunter aircraft flew a total of 96 missions during the 2015 season; the U.S. Air Force Reserve 53rd Weather Squadron flew 75 missions and NOAA’s Aircraft Operations Center flew 21 missions.

-NHC/NOAA



Overall, the Atlantic hurricane season produced 11 named storms, including four hurricanes (Danny, Fred, Joaquin and Kate), two of which, Danny and Joaquin, became major hurricanes. Although no hurricanes made landfall in the United States this year, two tropical storms – Ana and Bill – struck the northeastern coast of South Carolina and Texas, respectively. Ana caused minor wind damage, beach erosion and one direct death in North Carolina, and Bill produced heavy rain and flooding while it moved across eastern Texas and Oklahoma. Hurricane Joaquin is the first Category 4 hurricane since 1866 to impact the Bahamas

vertical wind shear combined with increased atmospheric stability, stronger sinking motion and drier air across the tropical Atlantic, all of which make it difficult for tropical storms and hurricanes to form and strengthen. However, El Niño fueled the eastern and central Pacific seasons this year with the weakest vertical wind shear on record.

Hurricane research

The Atlantic hurricane season provided opportunities for NOAA to conduct research to benefit future forecasts. Highlights include: More than 15 successful



“If I Was A Cloud” by Trinity Academy 4th Graders

Occasionally, our jobs take us back to basics, into the schools and face to face with ourselves of many years ago. While reaching out to youngsters in an effort to bring weather education and safety to young minds, we often get a chance to realize why we fell in love with the weather in the first place and what it was like just starting out on our weather journeys. Our hydrologist, Mike Money Penny had the chance to visit Mrs. Talley's 4th grade class at Trinity Academy in Raleigh. Each student wrote a short essay on what they would do if they were a cloud. What follows is a sampling of some of their work. Enjoy!

-Ryan Ellis

“If I were a cloud on a journey, I would be a cumulus cloud. I would go to India, and Kitty Hawk because India seems interesting to see. We are learning about Kitty Hawk. Oh no! I'm getting heavier. Uff! Watch out kids, I'm starting to pour out rain... oh! That felt so good. Bye bye now! I'm heading east to Asia. Toodles!” -Ellie Reed

“If I were a cloud I would be a cumulus cloud. Cumulus clouds are white and fluffy. Their height is usually 2,000 ft. to 4,000 ft. I would not want to rain on children and spoil their day. I would travel everywhere and look down at the events below me. I would really want to travel to beautiful places such as Hawaii. I would make a beautiful sum-

mer's day. When I rained, I would just sprinkle a little water on all the gardens below me. I would love to be a cloud.” - Channing Stone

“If I were a cloud I would be a cumulus cloud. I would be about 4,000 feet in the air. I would be bright white. A couple of days ago I didn't exist. I was just a bunch of water vapor. Then it got too cold for me so I condensed into a cloud. I would glide smoothly and gracefully through the air. I would travel all over the world. I would be bright white.” -Sam Feldman

“If I were a cloud I would be a cumulus cloud. I would be pink, and fluffy, and be sparkley. I would go around the world watching people playing and having fun. I would go closer to the ground and play with the little animals. Then, I would go back up to where I am supposed to be and sit there playing with my cloud friends. I would also make myself look like certain things so the children could look at me and guess what shape I am. I would dream of all the wonderful things I did and what I could do tomorrow. The next morning, I would travel all around the world.” -Lindzy Marquez

“If I were a cloud I would be a cumulus cloud. I would be big and fluffy floating a mile above the Earth, drifting

peacefully around as a white, fluffy, soft, beautiful, kind of soggy ball of cotton. I would take the shape of a variety of things all seen different by other eyes. I move from town to town, state to state, bringing some rain to places that have had a drought. Then at the end of a wonderful day, I take a nap.” - Dunn Johnson

“If I were a cloud on a journey, I would be an altostratus cloud. I would form over an Alaskan sky. I start to head southeast. North Carolina, here I come! Oh no! I am getting heavier! Yikes! I feel a tug. Uff! Here it goes. Watch out kids I'm coming down hard too! Ahh! Finally, I am done, and it felt good to storm a little. Well, anyway, now I'm heading southwest to give a down-pour on Hawaii!

-Maddie Karl

“If I were a cloud on a journey, I would be a cumulus cloud because I would like to be big. I would like to travel to Ukraine. I would love to be a cloud because I would be high above everything. I would also like to show a sign of good weather like cumulus clouds do. I would love to be a cloud.

-Anna Grace Stone





NOAA's National Weather Service

Raleigh, NC

1005 Capability Drive
Suite 300
Centennial Campus
Raleigh, NC 27606

Phone: 919-515-8209

Fax: 919-515-8213

NWS Mobile Website Great Alternative to Weather App

A question we are often asked is, "does the National Weather Service have an app for my phone?" Unfortunately, we must answer "no", since the NWS does not develop any device-specific mobile applications. However, we are always pleased to point out that there is alternative option that allows you to take the NWS Forecast with you; The mobile version of www.weather.gov.

By visiting www.mobile.weather.gov, you can add a point specific forecast to the home screen of your device and access that forecast from anywhere. The mobile website will give you many of the same options, such as satellite and radar imagery, or the latest forecast discussion. For more information and instructions on how to add the mobile website to your home screen you can [visit this web site](#).

-Barrett Smith

