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In This Issue... **Severe Weather**

Carolina Sky Watcher **Vol. 11, Number 1 (#38) April 2004 - June 2004**

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Comments concerning this publication or questions about the National Weather Service can be directed to us. We invite submissions for inclusion in this publication

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This quarterly newsletter is for Skywarn Spotters, schools, emergency managers, media, and other interested parties in the 15 county area in east- central North Carolina served by the National Weather Service Office in Newport, NC.

This publication, as well as all of our forecast products, are also available on our internet page at:
www.erh.noaa.gov/mhx/

Carolina Sky Watcher

National Weather Service, Newport, NC *Vol. 11, Number 1 (#38) April 2004 - June 2004*

Severe Weather Season Is Back Again

Spring arrived in late March and ushered in another severe weather season to Eastern North Carolina. The peak of severe weather season in our area is during the months of April, May, and June. While thunderstorms, hail, and tornadoes occur year-round, they are most likely during the spring months.

In an average year, nearly 800 tornadoes are reported across the United States. Here in Eastern North Carolina, we average around 10 each year. Most occur during the spring months, although they can occur during any month of year. They are most likely to occur between 3 pm and 9 pm but they can occur during any hour of the day.

Waterspouts are also a fairly regular occurrence during the spring and summer months.

How far away is the Thunderstorm?

* **Count the number of seconds between a flash of lightning and the next clap of thunder.**
* **Divide this number by 5 to determine the distance to the lightning in miles.**

Waterspouts are much weaker than their tornado cousins but they are capable of causing damage and injuries when they move on shore. They are most likely to occur during the morning and afternoon hours.

Severe thunderstorms also are capable of causing damage, injuries, and even death. Severe thunderstorms produce winds in excess of 60 mph and/or produce penny size or larger hail. All thunderstorms produce lightning which kills around 80 people every year.

Most lightning deaths and injuries occur when people are caught outdoors during the afternoon and evening.

The staff here at the National Weather Service office in Newport monitors severe weather over Eastern North Carolina 24 hours a day, seven days a week. Our job is to issue life-saving severe thunderstorm and tornado warnings for 15 counties in Eastern North Carolina. Over the past five years, we have provided about 20 minutes of lead time for severe thunderstorms, and ten to 13 minutes of lead time for tornadoes. People should use this precious time to take protective and possibly life-saving actions. But even if warnings are issued with 10 to 20 minutes of lead time, it will not do any good if people do not receive the warnings and take action. When weather threatens, people should

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make sure they are near a good source of weather information. They should monitor radio, television or NOAA Weather Radio. Weather radios transmits information directly from our office and can be purchased at local electronic stores for as little as 20 dollars. Obtaining a weather radio may be the most important purchase you ever make!

By Tom Kriehn

Tornado Safety Rules

- **In a home or building, move into the basement. If basement is not available, move to an interior room or hallway on the lowest floor and get under a sturdy table or piece of furniture.**
- **Stay way from windows and doors. If caught outside, lie flat in a nearby ditch or depression.**

Thunderstorm Safety Rules

- **If you hear thunder, go to a safe shelter immediately!**
- **Move inside a building or car. Do not take shelter under an isolated tree.**
- **Get out of boats and stay away from water.**
- **Unplug appliances. Avoid using the telephone or any electrical appliances. Use phones only in an emergency. Do not take a bath or shower. Stay away from metal pipes. Move to higher ground if flash flooding is possible.**

Severe Weather Training

All forecasters in the National Weather Service are required to take a severe weather warning decision making class before they can issue warnings for severe thunderstorms, tornadoes and other forms of severe weather. The warning decision making class is held annually in Boulder, CO and covers weather radar theory, operations of the radar, and the integration of current meteorological techniques with Doppler radar capabilities. In short, forecasters learn about the structure and dynamics of severe thunderstorms, how to observe them and ultimately how to warn for them using the latest technology available in the field. The class includes lectures from severe weather experts and 'hands on' training using a computer that contains a program known as a Warning Event Simulator (WES). The WES allows forecasters to practice issuing various warning products (i.e., severe thunderstorm warnings, tornado warnings) by setting up a past severe weather event as a scenario where the practicing forecaster is given the same information as the actual forecaster(s) who worked the event. Basically, the WES allows forecasters to practice issuing warnings based on real data archived from a past event. After the week-long series of lectures and WES training sessions, forecasters who complete the warning decision making class are given a certificate and the authority to issue warning products. However, the training doesn't stop there. Every year, as severe weather season approaches Eastern North Carolina, forecasters at the National Weather Service in Newport/Morehead City, NC prepare by undergoing training (in the office) that focuses specifically on the threat that severe thunderstorms represent for their area of responsibility. This training, known as 'seasonal familiarization' training, serves as a refresher course for forecasters so that they can make the best decisions possible when severe weather threatens life and property in the area. This training includes practicing the issuance of severe thunderstorm and tornado warnings on the WES from locally archived severe weather events. Seasonal familiarization does not just apply to the spring months and severe weather. In addition to severe weather, forecasters undergo seasonal training for tropical weather and winter weather, as well.

By Brandon Vincent

Simulator Training

April 23: Eastern North Carolina is covered by a hot, humid air mass streaming up from the Gulf of Mexico. A low pressure trough is sliding eastward. A strong upper-level jet stream is pushing in from the west. The sea breeze front is making its move inland. Surface heat and humidity build through the day. Thunderstorms should be forming soon, and when they do, will they become severe?

A Severe Thunderstorm Watch is issued by the Storm Prediction Center. Thunderstorms start forming, they are developing rapidly. Is that a tornado signature on the WSR-88D Radar velocity image? It is, time to issue a Tornado Warning! Two more counties need Severe Thunderstorm Warnings as more thunderstorms show signs oft becoming severe! The phones ring with reports of severe weather. The computer goes down as the office experiences a nearby lightning strike! What else can happen?

Fortunately, for the forecaster, this is just a simulation, a software program developed to provide displaced real time training experience for forecasters throughout The National Weather Service. Following a deadly tornado outbreak in downtown Fort Worth, Texas, on March 28, 2000, the National Weather Service recognized the need for a more advanced, high-tech training tool to help its meteorologists better forecast Mother Nature at her worst – from monster tornadoes and blinding snow storms, to floods – the nation's costliest weather phenomenon. Thus, the Weather Event Simulator (WES) was developed.

The WES is similar in concept to flight simulators used for pilot training, and is an effort to keep National Weather Service forecasters ready to deliver accurate, life-saving forecasts. Simulations are a very effective training tool. Various studies have shown that 25 hours of quality simulation training can achieve about two years worth of experience. Airlines all use simulators to train their pilots to handle a variety of emergency situations and equipment malfunctions. Meteorologists need a similar type of preparation to forecast dangerous weather conditions.

Experience is the best teacher, but it can be costly on many levels when the lessons are in real time. The WES simulates significant weather events in a displace-real-time environment, and it allows National Weather Service forecasters to gain valuable experience without having lives at stake.

All National Weather Service offices across the country have been equipped with the Weather Event Simulator. It was initially delivered with data from four situations. In addition, each office has the ability to save interesting weather events in real time, and play them back in displaced real time mode, to help forecasters maintain their proficiency, and learn new forecasting techniques in a simulated operational environment. Whether forecasters have been on the job for two weeks or 20 years, the WES will allow them to work the “big event.”

By Carin Goodall

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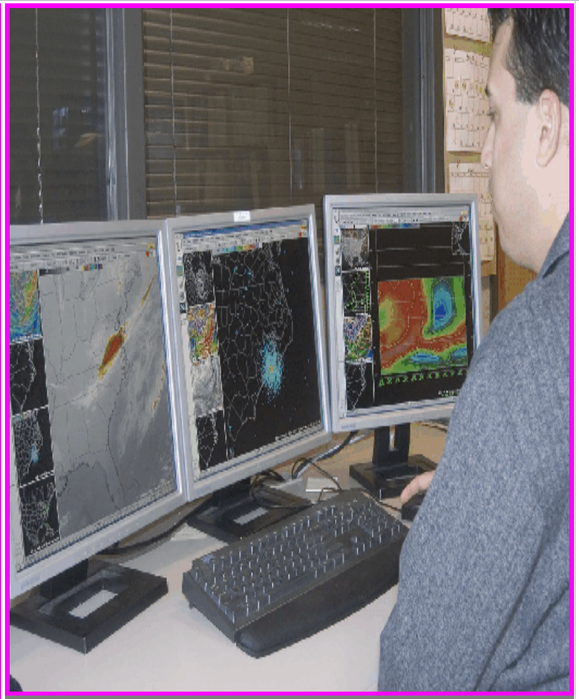
warnings by overlaying past and future storm tracks on top of radar images and allowing the operator to pick appropriate action statements. The program then automatically determines the storms position, movement and future path, and finally generates the text of the warning that is disseminated to the public. Once a radar operator concludes that a storm is severe, the process of creating the warning and disseminating it through WARNGEN may take as little as 30 seconds! This streamlined process gives the public valuable lead-time to protect themselves and their property during severe storms. Finally, after a severe storm weakens or exits the area, AWIPS programs are used to create damage reports that are used by local emergency management and the media.

In summary, AWIPS combines a multitude of weather data and forecasting tools into one complete concise computer package, used by NWS staff for routine duties and during severe weather operations. It is instrumental in the NWS mission of protection of life and property.

By Nick Petro



AWIPS STATION

More Snow Than Normal Across Eastern North Carolina...

Since the first of the year eastern North Carolina has received four snowfall events. On January 9th snowfall totals ranged from 1/4 inch at Ocracoke to 2.5 inches across parts of the coastal plain. Most of the snow that fell during this event was east of highway 17 and melted as it fell. On January 25th there was snow and sleet with most of the accumulation occurring over Beaufort county. Washington reported snow, 2 inches. On February 16th 2 to 4 inches was common across eastern North Carolina with northwest Martin county getting up to 5 inches. The last snowfall event was February 26th with 1 to 3 inches. The highest amount received was 3 inches from Richlands to La Grange to Greenville. Normal annual snowfall amounts range from 1 inch near the coastal areas to 3.6 inches over the coastal plain.

By Wayne Shaffer

WFO Newport Forecasters Participate in Prescribed Burn

Holy Smokes! Great Balls of Fire! Can you smell what the NWS was cooking?! In an effort to interact with some of our customers, several WFO Newport forecasters took part in a U.S. Forest Service (USFS) prescribed burn on March 24th. The burn took place in the Croatan National Forest about 3 miles north of Cape Carteret in western Carteret County and covered about 642 acres.

The burn was "prescribed" in that it was planned and was done with the intention of reducing heavy fuels on the forest floor that could potentially lead to explosive wildfire conditions.

The familiarization visit was coordinated with the USFS Fire Management Officer (FMO) James Cherry of the Croatan National Forest and had been in the works for several years. WFO Newport produces Fire Weather Forecasts twice-daily for state and federal fire land management agencies.

These forecasts provide detailed information on winds, humidity and other weather parameters that are not included in routine public forecasts. In addition, when requested we also produce site-specific "spot" forecasts for prescribed burns and wildfires. The spot forecasts provide even more detailed weather information based on the local topography, aspect and elevation. Before the burn could take place, the process began back at the NWS office where forecaster Nick Petro received a Spot forecast request from FMO Cherry. The original planned burn site was in Havelock but based on input from Nick, it was changed to western Carteret County. After the burn was confirmed as a go, WFO Newport Meteorologist-in-Charge Tom Kriehn, Fire Weather Focal Point Jim Merrell and forecaster Petro traveled to the Croatan National Forest Rangers Office for some initial familiarization and the burn briefing. Nick Petro took part in the briefing by reviewing the spot forecast he had issued about an hour before. Along with the rest of the burn crew, the NWS personnel were issued fire retardant Nomex shirts and pants as well as hard hats for basic personal protection during the burn. They then traveled to the burn site where FMO Cherry wasted no time in setting a small test fire to determine how local fuel and weather conditions were interacting. After determining that conditions were within "prescription" limits, the burn was initiated. The NWS personnel assisted by taking temperature, humidity and wind readings every 15 to 30 minutes

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Tom Kriehn, Jim Merrell, & Nick Petro

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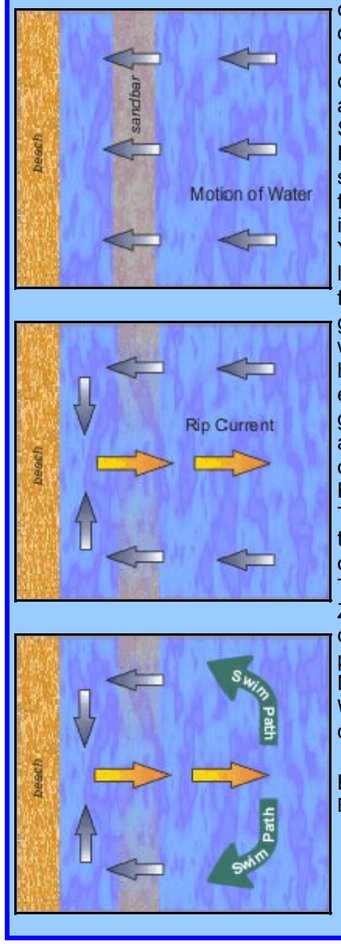
but generally just observed and asked many questions about the details of the operation. The burn started about 12 noon and was completed by 4 pm and was deemed an outstanding success on all accounts. All of the NWS participants thought it was an excellent opportunity to interact with our customers and to see what they do with our forecasts and how dependent they are on the details. The USFS burn crew appreciated having the extra "weather support" and considered the visit mutually beneficial. It was agreed to continue the burn participation visits in the future with the ultimate goal being to have all WFO Newport forecasters out on at least one fire in the next several years.

By Jim Merrell

Prescribed Burn at Croatan National Forest

Rip Current

The National Weather Service in Newport began issuing rip current forecasts in mid April as water temperatures rose along the coast. Forecasters look at winds...waves and tides to determine the rip current threat. A **Low** Threat means wind and or wave conditions do not support the development of rip currents, however rip currents can occur at anytime. A **Moderate** threat means there is an increased threat of strong rip currents, caution should be used when entering the water. A **High** threat means winds, waves and tides support the development of strong, life threatening rip currents, extreme caution is advised for anyone who enters the water. The graphics below show how rip currents form and the best way to escape if caught in one. The rip current forecast is available in the Surf Zone Forecast issued by forecasters in our office. You can look at the forecast by going to our website http://www.erh.noaa.gov/mhx and clicking on the Beach/Rips/Tides link on the left side of the page. The Surf Zone Forecast also plays on NOAA Weather Radio.



By
Bob Frederick

When visitors enter the NWS Newport operations center, their first thought is usually "look at all those computers"! Aside from a few PCs, most of the computers in the NWS Newport operations area are part of what is known as AWIPS workstations. AWIPS stands for Advanced Weather Interactive Processor System, and is the heart of how NWS staff examine and predict the weather.

Each AWIPS workstation consists of four monitors, three used to display graphical products and one used to display text-based products. These linux-based computers allow the users to simultaneously display and interrogate a multitude of weather maps, computer forecast model images, graphical forecast images, and satellite and radar data. Forecasters can use other programs within AWIPS to perform routine tasks such as creating and adjusting the daily gridded forecast database using the Graphical Forecast Editor Much of the data you see on our web site (http://www.erh.noaa.gov/mhx) is a result of data processed through AWIPS. Just about all the weather data and products processed, used, and disseminated by the NWS is done through AWIPS.

During the severe thunderstorm and tornado season, AWIPS is especially important. When a strong thunderstorm is occurring in the NWS Newport forecast area, our radar operators use AWIPS to examine and interpret an array of data from our Doppler radar. Radar operators can examine things such as a thunderstorms strength, track, height, ice content, internal wind speed, rainfall amount, and whether or not the storm is capable of or producing a tornado.

If it is determined that a thunderstorm is severe or producing a tornado, our forecasters use AWIPS to generate the appropriate warnings using a program called WARNGEN. WARNGEN allows the radar operator to quickly generate

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AWIPS

WFO Newport Operations Area