The Wilmington Wave

National Weather Service, Wilmington, NC

VOLUME II, ISSUE I FALL 2012

Dual-Polarization Doppler Radar Comes to SE North Carolina and NE South Carolina

- Reid Hawkins

The National Weather Service office in Wilmington, NC began upgrading the WSR-88D conventional Doppler radar in Shallotte, NC to Dual-Polarization radar in early June 2012. The system was installed, calibrated and commissioned the week of June 7th, 2012. Dual-Polarization radar or Dual-Pol for short is the most significant enhancement to the weather radar since the Shallotte Doppler radar was installed in 1994.

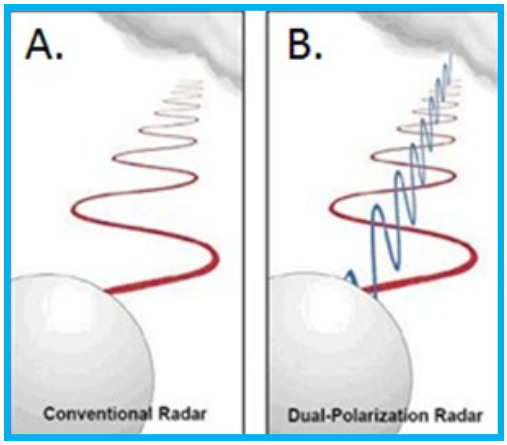

Figure 1. Conventional radar pulse (A) and Dual-polarization radar (B).

Courtesy of NOAA's Radar Operations Center.

What is the difference between conventional and Dual-pol radar? The conventional radar sends out a horizontal pulse of energy that gives the meteorologist a one dimensional image of whatever is in the atmosphere, Fig 1A. The conventional radar can see precipitation but cannot tell the difference between rain, snow, hail or non-meteorological targets. The Dual-pol radar sends and receives both horizontal and vertical pulses, Fig 1B, which provides the meteorologist with a 2 dimensional image of the reflected targets. This 2-D image allows the identification of the shapes of the targets in the air, thus the radar can tell the difference between a raindrop, snow flake, ice pellet or non-meteorological targets.

NWS Wilmington, NC Radar in Shallote, NC

So how does this new system help in providing more accurate warning and forecast services? With Dual-pol radar, a meteorologist can see the different weather types with increased certainty.

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Dual-Polarization Upgrade

For example, they can delineate the difference between hail and very heavy rain based on their shape and size. Also, the relative size of the hail can be established. This additional information gives the meteorologist a better understanding where severe hail may or may not fall and if a Severe Thunderstorm Warning should be issued or not.

Can Dual-pol help in detecting flash flooding? Yes, because Dual-pol can determine the size and shape of the precipitation. It allows the radar to more accurately estimate how much rain has fallen to the ground. For example, raindrops come in different sizes. It is generally accepted that typical summertime thunderstorms have larger size drops than do tropical storms. The radar's improved accuracy of rainfall estimation will provide the meteorologist with more accurate information so that they can determine if a flash flood warning is required.

Can Dual-pol tell where it is snowing or raining? Dual-pol provides more precise information during a winter weather event. The new radar can distinguish between rain, snow, sleet, and mixed precipitation. This past winter the increased detection capability from the newly installed Dual-pol radar allowed the National Weather Service offices in the northeast and northwest United States to provide better decision support services to motorists, emergency managers, state transportation departments, schools systems, and the public.

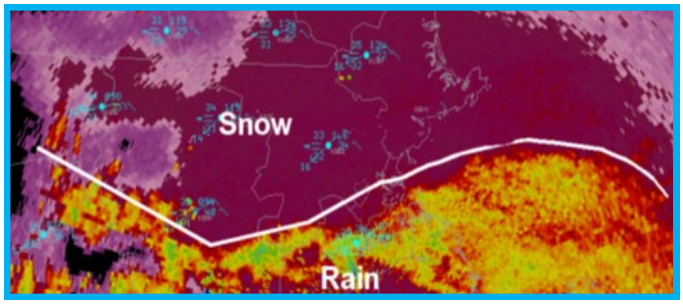

Figure 2. Rain/Snow line depicted on Dual-pol correlation coefficient product. White line generally depicts the transition zone between rain and snow.

Can the Dual-pol radar see tornados before they form? Dual-pol cannot provide any additional information if a tornado will form ahead of time, but the Dual-pol radar can detect flying tornado debris. This debris detection provides the meteorologist with a high degree of certainty that a tornado is occurring and its path can be tracked on radar as long as the debris remains aloft. Since tornados are difficult to view at night the Dual-pol provides additional information to the meteorologist when visibility is poor.

Check out these pictures from the upgrade!

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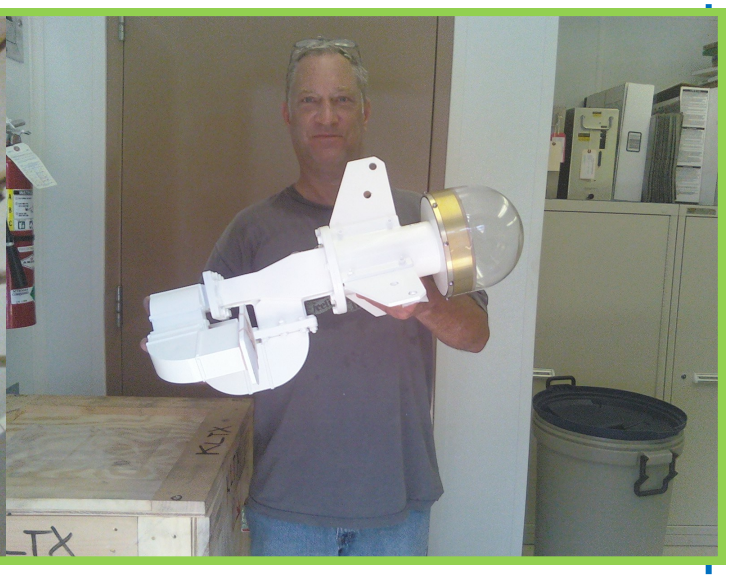


NEW

Skywarn Webpage in Development

- Steven Pfaff

A new webpage created entirely by volunteer Amateur Radio Operators within the NWS Wilmington area of responsibility is currently under development. The web address for the new ILM Skywarn webpage is: http://ilm-skywarn.net/. Once completed during Fall 2012 the webpage will connect Skywarn Storm Spotters and Amateur Radio Operators within the area, resulting in consistent reporting procedures between the groups, and will become a very effective way to provide weather reports to the NWS during severe weather events. The Amateur Radio Event Coordinators (ECs) who operate the Skywarn networks in the NWS Wilmington area of responsibility will be able to submit reports during any type of hazardous weather situation. "*As a webmaster for many non-profit organizations, I felt that a website would greatly assist in the coordination efforts of the counties in the NWS Wilmington area of responsibility*", explains Mike Leek, volunteer Assistant Event Coordinator for Grand Strand Skywarn.

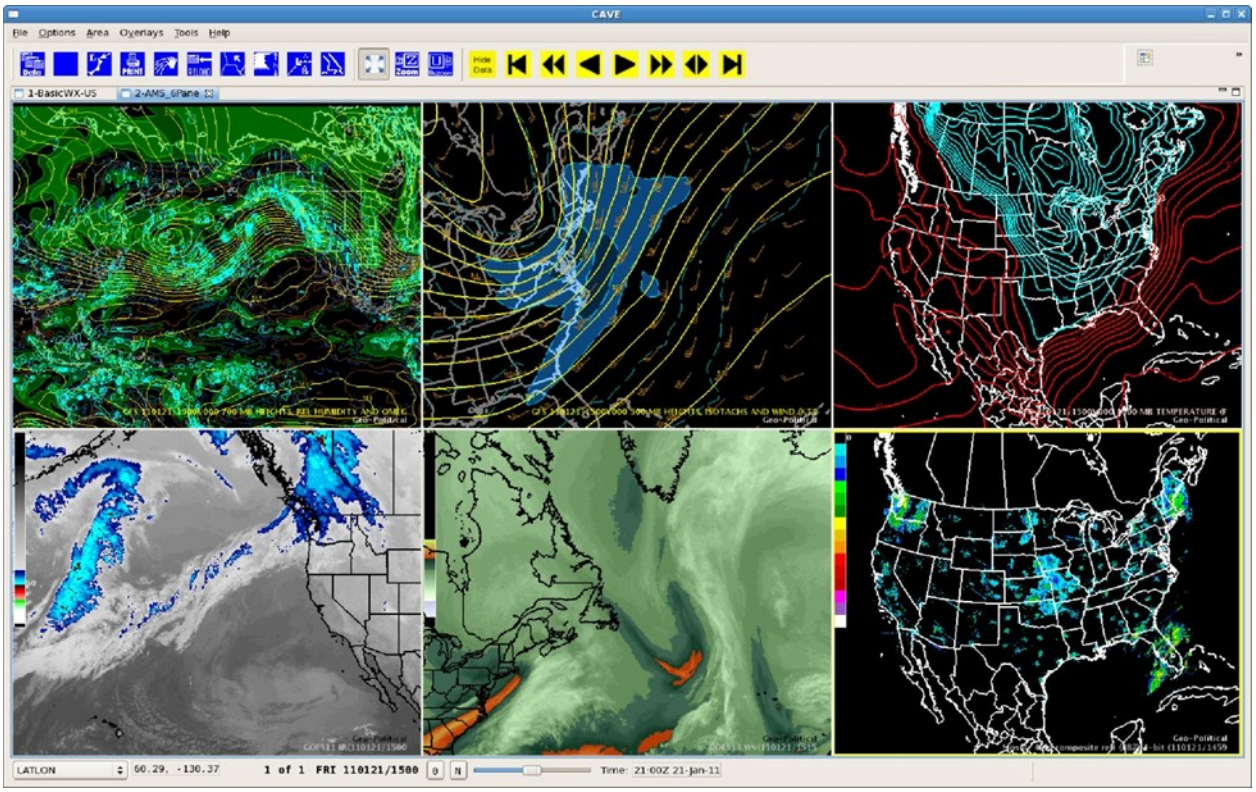
The webpage is also designed to be a resource for a variety of other Skywarn related information. Glenn Cox, volunteer Cape Fear Area Skywarn Event Coordinator states "*The Skywarn program has shown itself to be a valued asset in providing critical weather reports from trained spotters to the NWS*". Additional information includes: a schedule for upcoming Spotter training, links to online training, reporting guidelines and procedures, listing of the Event Coordinators and Assistant Event Coordinators, and details about the repeater frequencies of the Skywarn nets in the area. Lastly, the new Spotter's Field Guide is also available for download.

Another unique feature about the web page is a section dedicated to a growing network of "Sky Cams". Since rapid advances in video technology have resulted in cheaper equipment people are setting up "Sky Cams" so that weather can be directly observed at their location remotely. Anybody with a video camera hooked up to their PC can help the NWS by directing their camera links to the new Skywarn webpage. For more information about setting up and helping the NWS with "Sky Cams" please contact Mike Leek, Grand Strand Skywarn, at w2swr@w2swr.com or Glenn Cox, Cape Fear Skywarn at ke4bmy@hotmail.com.

Technology Upgrade: AWIPS-2

- Carl Morgan

The National Weather Service (NWS) is in the midst of one of the most significant technological upgrades of the decade. Currently, each of our 122 local Weather Forecast Offices (WFO) utilizes a computer system called AWIPS, which stands for Advanced Weather Interactive Processing System. In use since the late 1990's, AWIPS is an integrated suite of automated data-processing equipment that supports complex analysis, interactive processing, display of hydrometeorological data, and the rapid dissemination of warnings and forecasts in a highly reliable manner. Although AWIPS represented a great technological leap for the NWS, it still has its limitations. One of these is its incompatibility with the software being used by NWS National Centers such as the National Hurricane Center, Storm Prediction Center, River Forecast Centers, and the National Center for Environmental Prediction.



In order to overcome these deficiencies, development has been underway for the last several years on the next generation of AWIPS, known as AWIPS-2. AWIPS-2 was developed using the Java computer programming language, which allows it to run on more platforms than the current AWIPS software. It also makes use of other open-source projects, which will better position the NWS and our partners for adopting new technologies. AWIPS-2 will be used by both local WFO's as well as the National Centers, which will reduce development time, expand data access, and provide better integration and collaboration between the WFO's, River Forecast Centers and National Centers. Rollout of AWIPS-2 began in the spring of 2012, and will be installed at WFO Wilmington, NC in November.

Summer 2012 Ends with Temperatures Averaging Near Normal

- Timothy Armstrong

There was nothing normal about the Summer of 2012: the exceptionally hot temperatures of July broke multiple records for extreme heat in Wilmington. What's surprising is the average temperature for June, July and August turned out very near the climatological 30-year normal temperature for the Eastern Carolinas.

June was actually the 9th coolest in Wilmington's 138-year climate history, while in Florence it was the 11th coolest since weather observations began there in 1948. The heat cranked up in July to all-time record levels with Wilmington recording its hottest month in history, blowing away the previous record by half a degree! Florence recorded its 4th hottest July in history. The heat abated in August with temperatures averaging near-normal for the month.

When the extreme heat of July is averaged with the cooler temperatures observed in June and August, Summer 2012 will go down in the record books as a near-normal summer in terms of temperatures across the Eastern Carolinas.

	June Avg Temp	Dep.	July Avg Temp	Dep.	August Avg Temp	Dep.	Summer Avg Temp	Dep.
Wilmington	75.2	-2.7	84.7	+3.6	79.4	-0.3	79.7	+0.1
Florence, SC	76.0	-2.2	84.2	+3.0	79.9	0.0	80.0	+0.2
Myrtle Beach	74.5	-2.4	82.8	+2.5	79.2	+0.3	78.8	+0.1
Lumberton, NC	75.4	-2.6	83.3	+2.2	78.7	-0.3	79.1	-0.3

Preliminary numbers until final quality control is performed by NCDC

Some other interesting temperature records established this summer:

- Wilmington recorded 56 consecutive days with low temperatures of 70 degrees or warmer, extending from June 29th through August 23rd. This is the most in history and breaks the old string of 52 consecutive days of low temperatures 70 degrees or warmer that ended on August 12, 1941.
- Wilmington hit 100 degrees or hotter five times during July, tying July 2011 for the most 100 degree days ever recorded in a single month. Wilmington hit 100 degrees seven times in all this summer, tying the all-time record for the most 100 degree days set in 1952 and 2011.
- Wilmington also had nighttime lows of 80 degrees or warmer on four separate nights this July, breaking the old record of three 80+ nights in a single month.

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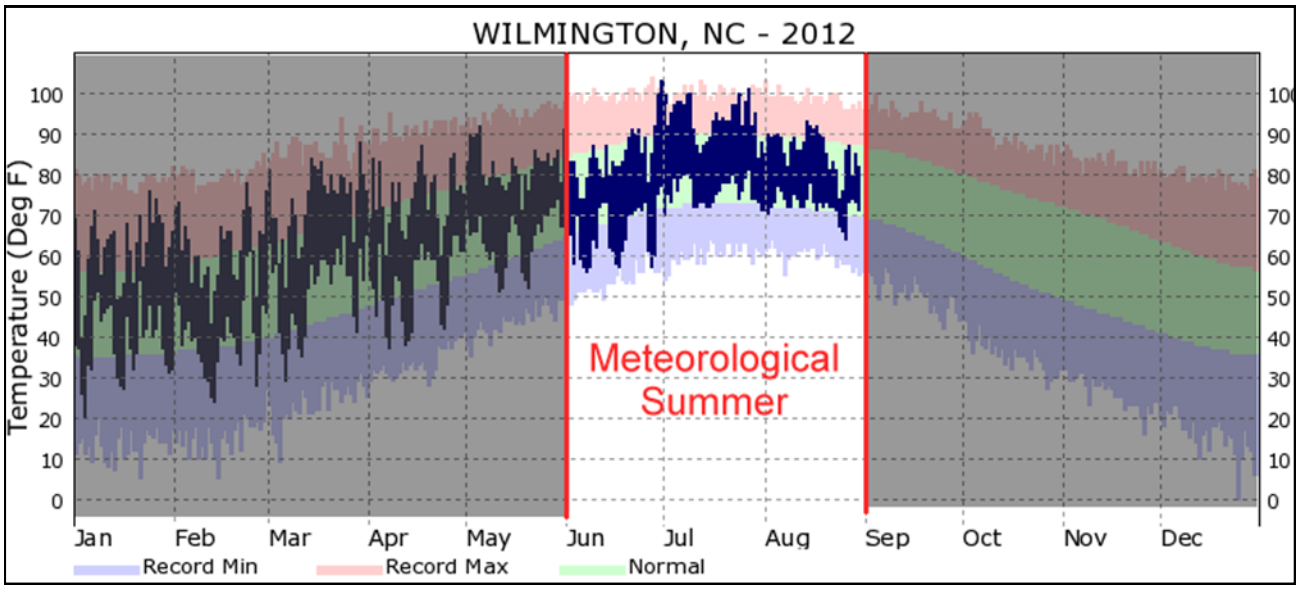
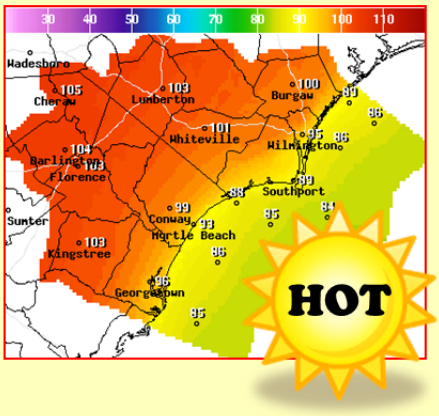


Meteorological Summer is defined as the calendar months of June, July and August. This delineation is often used in the climatology world since it's easier to deal with whole months when computing average temperatures.

Dangerous, Near Record-Breaking Heat Expected This Weekend!



Heat is the #1 weather-related killer!

Drink PLENTY of water and stay hydrated!

Limit activity outside

Remember to take care of outside pets and livestock

BEAT THE HEAT, CHECK THE BACKSEAT!

For information and more safety tips, visit:
http://www.nws.noaa.gov/os/heat/index.shtml

Friday – Monday
High Temperatures: 95 – 105°F
Heat Indices: 105 – 115°F

For up-to-date information regarding current watches, warnings, and the forecast, please visit our website: http://www.erh.noaa.gov/ilm/

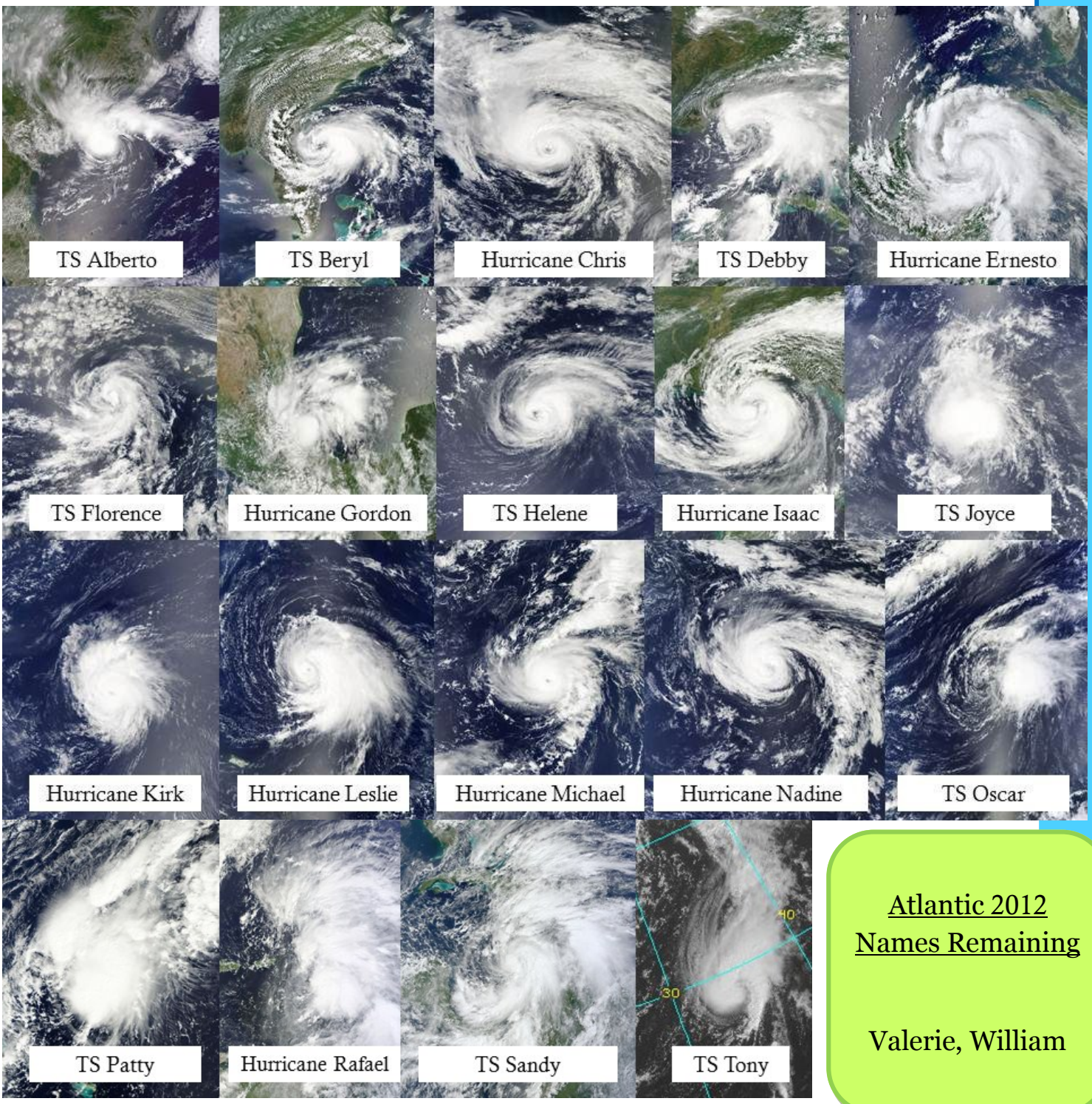
National Weather Service Wilmington, NC – Graphic Updated 8:00AM, June 27th, 2012

Graphic published to our facebook page the morning of June 27th to help raise awareness of the hazardous, near record-breaking heat for the end of June and early part of July.

2012 Atlantic Hurricane Season - Preview

As of October 23rd, there have been 19 named storms this hurricane season, with the most recent being Sandy and Tony. Since the Atlantic Hurricane season does not officially end until November 30th, we will wait until our next edition in the Spring to give a full overview of the 2012 season.

Do you think we will make it through the list?! Stay tuned!



Atlantic 2012 Names Remaining

Valerie, William

A Rare Heat Burst affects Georgetown County, SC

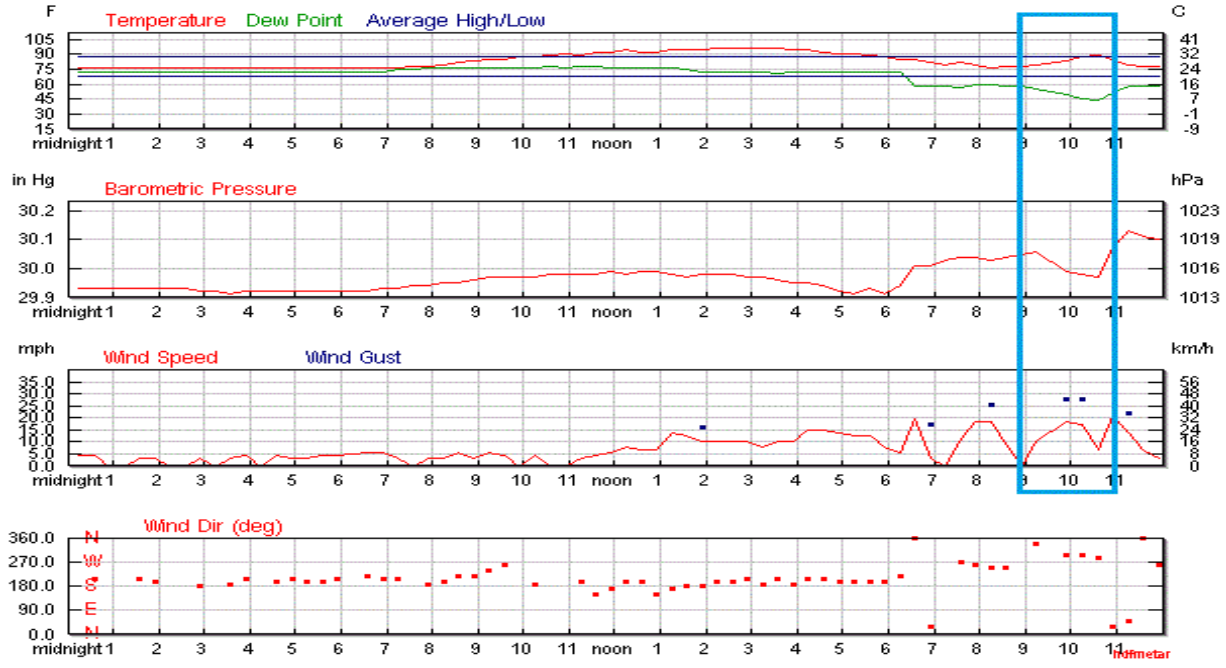
- Josh Weiss

On Sunday, July 1, 2012, much of the southeastern United States was in the grip of a record-breaking heat wave. Temperatures had soared well above 100 degrees Friday, Saturday, and Sunday, and heat indices had reached nearly 120 degrees across much of the area. Eventually this heat had to break...and as is typical with significant heat waves, it broke in grand fashion with a severe weather outbreak.

During the evening of Sunday, July 1, 2012, a significant severe weather event occurred across southeast North Carolina and northeast South Carolina. Although widespread wind damage affected much of the area, with more than 60 reports of severe weather received by the National Weather Service (NWS) office in Wilmington, a more interesting, and possibly overlooked phenomenon occurred late that night: A heat burst.

What is a Heat Burst?

Heat Bursts are relatively rare phenomena that occur mainly across the midwest, and are considered quite rare in the southeast. A heat burst is a term used for an event in which temperatures rise dramatically, nearly always occurring very late at night, and are associated with very strong winds and rapidly lowering dewpoints. There are some cases in history of heat bursts causing temperatures to rise to well over 100F in the middle of the night, and others with wind speeds in excess of 80 mph! Fortunately, the heat burst that occurred this night was not this severe.



Meteograms from Georgetown, SC (KGGE) on July 1, 2012. Note the temperature, dewpoint, and wind speeds during the time highlighted in blue.

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Between the hours of 8 p.m. and 11 p.m., the temperature at Georgetown rose dramatically. The most rapid warming occurred between 9 p.m. and 1030 p.m. when the temperature rose from 79F to 90F! This occurred at the same time the dewpoint fell from 59F to 45F, and wind speeds gusted to nearly 30 mph. All classic signatures of a heat burst!

8:15 PM	77.0 °F	-	60.8 °F	57%	30.03 in	10.0 mi	WSW	18.4 mph	25.3 mph	N/A	Thunderstorm	Clear
METAR KGGE 020015Z AUTO 25016G22KT 10SM VCTS CLR 25/16 A3003 RMK AO2 LTG DSNT S THRU W												
8:35 PM	78.8 °F	-	59.0 °F	51%	30.04 in	10.0 mi	WSW	9.2 mph	-	N/A	Thunderstorm	Clear
METAR KGGE 020035Z AUTO 25008KT 10SM VCTS CLR 26/15 A3004 RMK AO2 LTG DSNT ALQS												
8:55 PM	78.8 °F	-	59.0 °F	51%	30.05 in	10.0 mi	Calm	Calm	-	N/A	Thunderstorm	Thunderstorm
METAR KGGE 020055Z AUTO 00000KT 10SM TS SCT120 26/15 A3005 RMK AO2 LTG DSNT ALQS												
9:15 PM	80.6 °F	80.5 °F	55.4 °F	42%	30.06 in	10.0 mi	NNW	10.4 mph	16.1 mph	N/A	Rain , Thunderstorm	Light Thunderstorms and Rain
METAR KGGE 020115Z AUTO 34009G14KT 10SM -VCTSRA BKN120 27/13 A3006 RMK AO2 LTG DSNT S THRU NW												
9:55 PM	84.2 °F	-	50.0 °F	30%	29.99 in	10.0 mi	WNW	18.4 mph	27.6 mph	N/A	Rain	Light Rain
METAR KGGE 020155Z AUTO 30016G24KT 10SM -RA SCT050 SCT070 BKN075 29/10 A2999 RMK AO2 LTG DSNT SW AND W												
10:15 PM	87.8 °F	-	46.4 °F	24%	29.98 in	10.0 mi	WNW	17.3 mph	27.6 mph	N/A		Clear
METAR KGGE 020215Z AUTO 30015G24KT 10SM CLR 31/08 A2998 RMK AO2 LTG DSNT N AND SW												
10:35 PM	89.6 °F	-	44.6 °F	21%	29.97 in	10.0 mi	WNW	6.9 mph	-	N/A		Scattered Clouds
METAR KGGE 020235Z AUTO 29006KT 10SM SCT120 32/07 A2997 RMK AO2 LTG DSNT N AND W												

Observations from Georgetown, SC (KGGE) on July 1, 2012. Note how the temperature rose dramatically from 9 p.m. to 1030 p.m., accompanied by rapidly falling dewpoints and increased wind speeds.

From these observations at KGGE, we infer that a heat burst did occur. So what caused this rare event?

What causes a Heat Burst?

A heat burst is caused in the vicinity of a decaying thunderstorm. When a thunderstorm is in its dissipating stage, it becomes *downdraft dominated*, meaning it has lost all of its updraft-related fuel. When this occurs in an environment characterized by very hot and dry air aloft, and a temperature inversion near the ground, a heat burst can occur. What happens is that the moisture in the downdraft evaporates into the very dry air, which then causes the air parcel temperature to cool. This is known as *evaporational cooling*. As the air parcels within the downdraft cool, they become more *negatively buoyant* (move faster towards the ground). Once all the moisture has evaporated out of the downdraft, it's cooling stops, and adiabatic (compressional) warming then begins as the parcel approaches the surface. If the air is moving fast enough, it will penetrate through the surface inversion causing mechanical mixing within the surface layer, and bring the now very warm air all the way to the ground.

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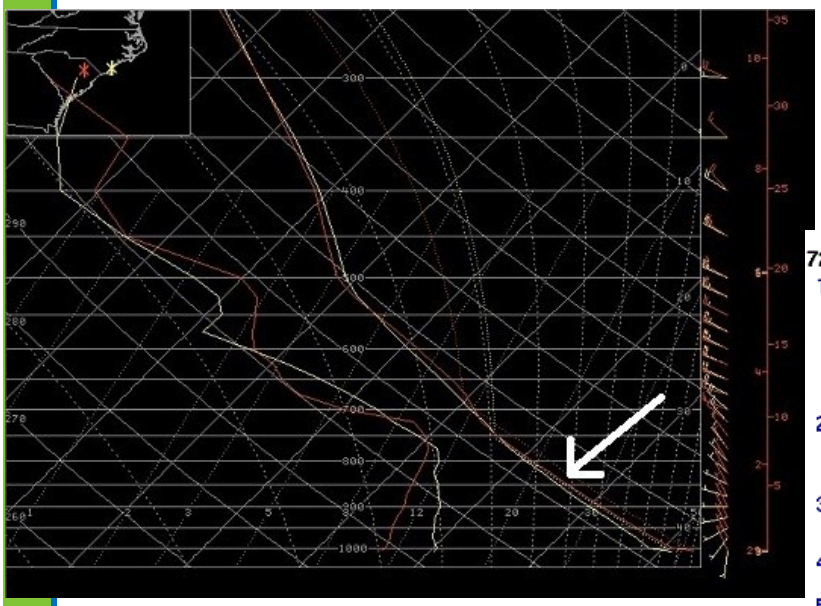
The higher the thunderstorm base is from the ground, and the drier the mid-level air mass, the more significant the heat burst is likely to be.

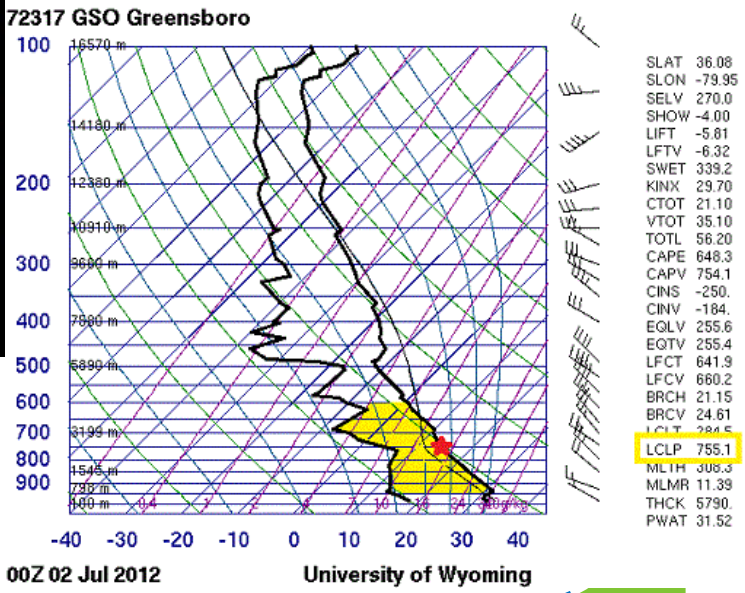
Examination of forecast soundings reveals that the environment was ripe for heat bursts during the night of July 1st. Below, the NAM forecast soundings at 2 p.m. for Florence, SC and Wilmington, NC, as well as the observed 8 p.m. sounding from Greensboro, NC are shown.

Note in the NAM forecast soundings the arrow pointing to 850mb temperatures of 25-26C...near record high levels! This shows just how warm the mid-level air mass was this day. Additionally, note the large dewpoint depressions (difference between the temperature line on the right and dewpoint line on the left) above 700mb. Finally, the Lifted Condensation Level (LCL) was nearly 9000 feet AGL this day, meaning thunderstorms bases were extremely elevated, especially for South Carolina in July! This all pointed to the potential for heat bursts if any decaying convection was around during the night.

In the Greensboro, NC sounding an incredible amount of dry air above the surface inversion was present (highlighted in yellow) with dewpoint depressions ranging from 12C to 20C within that layer. Additionally, a very high LCL (the red star) is present around 750mb, and 900-850mb temperatures are well above 23C. The warm and dry air aloft combined with the continued elevated instability all show the potential for a heat burst this night.



(Left) NAM forecast soundings for KFLO (red) and KILM (white) for 2pm on Sunday, July 1, 2012.



(Right) Observed upper air soundings from KGSO at 8pm Sunday, July 1, 2012.

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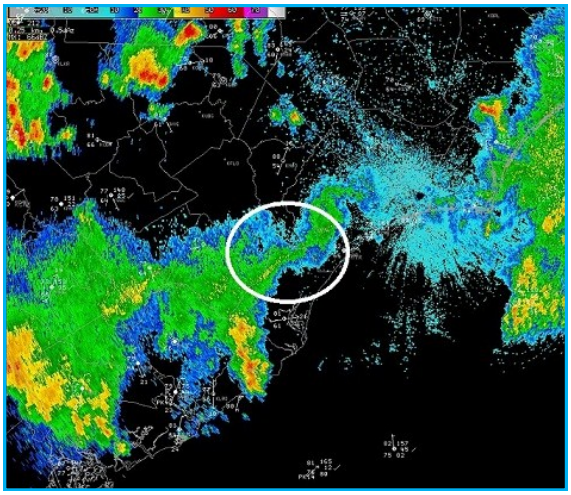
Identification on Radar

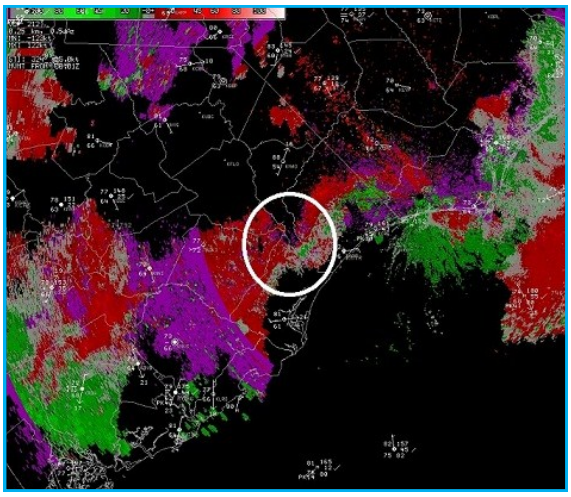
A few observational studies on identification of heat bursts on radar have been completed, with a very good one from the NWS in Albuquerque, NM (ABQ) available here: http://www.srh.noaa.gov/abq/?n=localfeatureheatburst. The NWS ABQ study found a "serpentine-like" structure with weak reflectivities and decent surface wind divergence associated with heat bursts. Identifying this signature can help forecasters determine the potential for ongoing heat bursts when the other parameters described previously come together. Were any of these features evident near Georgetown on the 1st?

In the images below are the 0.5 degree reflectivity and base velocity for KLTX radar in Shallote, NC just after 8 p.m. Note the circled areas on both images. We do see the serpentine like structure noted from NWS ABQ, and this was associated with convection that was rapidly dissipating. Additionally, although it is quite weak, we see weak divergence as well. Is this the heat burst signature? It is impossible to say for sure, especially since there are very few if any observations sites across northeast Georgetown county. However, it appears at least plausible that this is in fact the heat burst as it was happening.

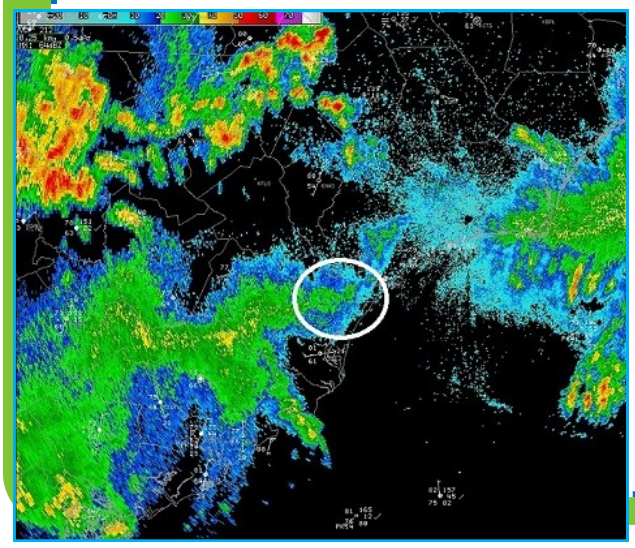


(Left) KLTX base reflectivity at 8pm. The circled region is the likely location of the heat burst.

(Right) KLTX base velocity at 8pm. The circled region shows weak surface divergence associated with the heat burst.



As this drifted southward towards Georgetown, it clearly weakened as noted in the image below from just before 9 p.m. Many heat bursts in literature occur very rapidly with incredible temperature rises and wind gusts. However, in this case, winds peaked below 30 mph and the temperature rose only (although still impressively) 11 degrees in 90 minutes. It appears that the heat burst did not occur directly over Georgetown, and instead advected southward into the area causing the more gradual temperature rise and weaker wind gusts. A further example of this advection idea occurred at a mesonet site located north of Georgetown. This site, which was closer to the theorized heat burst origin in the images above, experienced a dramatic temperature rise from 77F to 90F in only 46 minutes! Since Georgetown was further south, it makes sense that the temperature rise here was less extreme.



(Left) KLTX base reflectivity just before 9pm showing the weakening reflectivity structure of the heat burst.

While most of us were focused on the extreme heat and significant severe weather outbreak that occurred this day, a rare heat burst caught a few by surprise across Georgetown County. Heat Bursts are quite rare in the southeast, and this was a neat event that will likely not occur again for a long time in this area.

StormFest 2012: Raging the Coastal Carolinas!

- Tim Armstrong & Sandy LaCorte

For the 2012, there were two Stormfests that came to the Coastal Carolinas this past June. If you're fascinated by the weather and/or want to learn morne about severe weather and how you can stay safe, then Stormfest is an event you must mark on your calendar for next year if you missed it! Stormfest is a free weather festival that is geared towards educating the public on severe weather preparedness, with the added bonus of meeting local TV meteorologists, emergency managers and responders who work to inform you about the impact severe weather can have on lives, and us, your National Weather Service meteorologist for the Cape Fear region.

The third annual Wilmington Stormfest was held at the Cape Fear Museum on Saturday, June 2nd, which attracted approximately 800 attendees of all ages and brought together 15 organizations to promote the common theme of hurricane and severe weather preparedness. The event was designed as an expo with exhibitor tables scattered throughout the museum. Local TV stations WWAY and WECT both brought portable "green screen" weather studio equipment so kids (and adults) could create their own weather reports in front of computer-generated maps and graphics. A number of weather and preparedness-related Q&A sessions were held in the auditorium throughout the day and Skywarn training was offered by the NWS meteorologist Tim Armstrong and Sandy LaCorte.

Wilmington Stormfest - handouts, interactive weather quiz, tornado machine, and more!

Sandy LaCorte trains a new group of Skywarn Storm Spotters.

It was a first for the Stormfest in Murrells Inlet, SC at Inlet Square Mall on June 9th, 2012. With an estimated attendance of 4,000 people and collaborative partnerships with over 36 organizations, including local media, American Red Cross, SC Sea Grant, local Skywarn and US Coast Guard, this informative weather festival was a huge success. Meteorologist, Sandy LaCorte, and Warning Coordination Meteorologist, Steven Pfaff, worked closely with Horry County Emergency Management for the planning logistics of this event over the past several months. During the event, 2 Skywarn Spotter training courses were offered. In addition, distributing weather safety information and stressing the importance of owning a NOAA Weather Radio (which were being sold during the event by Kroger), children learned about the water cycle and its importance to our planet through the craft of making water cycle bracelets.

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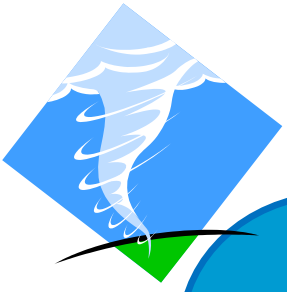
NWS Meteorologist Josh Weiss at Murrells Inlet, SC Stormfest.

NWS WCM Steven Pfaff uses flood model to show affects of flooding to a group of Stormfest attendees.

Two educational demonstrations were on-going at the NWS booth - a large size tornado simulator and a flood plains model demonstration. The flood model was a great tool for showing the public what happens when a substantial amount of rain falls in a short period of time. This great opportunity allowed us to work closely and build our relationship with our partners, and allowed us to educate the public on severe weather and safety.

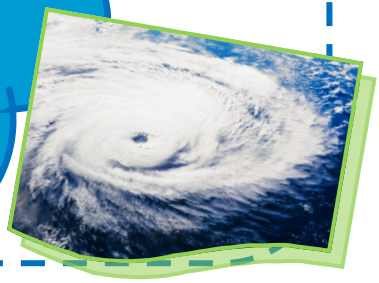
We hope that you were able to join us! We'd like to thank you to all of our partners – these events could not have happened without your collaboration, participation and support!

For information from Stormfest 2012, including event information and a list of partners, visit http://www.erh.noaa.gov/ilm/stormfest/2012/



Ready for Stormfest 2013?!

Stay tuned for details in the next Wilmington Wave edition!



Winter Weather: Are you Prepared?

- Sandy LaCorte

Exposure to extreme cold, fires and poisoning due to the improper use of heaters, and vehicle accidents are just a few reasons as to why dozens of fatalities are reported each year due to winter weather, an overlooked significant threat. Now you may be thinking that a winter season across the Coastal Carolinas is nothing compared to, for example, the New England region. Well, we have our share of winter weather across the Carolinas, thus you should always be prepared.

In preparation for a winter weather event, keep in mind that the primary concern will be the loss of heat, power outages, and shortage of supplies if storm or proceeding conditions persist for more than one day.

Before winter weather strikes, be sure to take necessary precautions such as maintaining, cleaning, and annually inspecting chimneys and other heating equipment, and making sure your vehicle is prepared by having a full gas tank and inspecting the antifreeze levels, brakes, battery, and more!

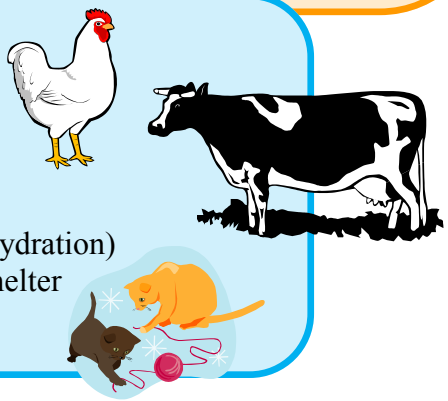
For additional information, visit www.ready.gov

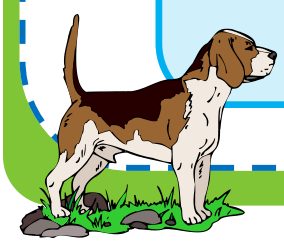
Disaster Kit: Home/Work

- Flashlight and extra batteries
- Battery-powered NOAA Weather Radio
- Extra food and water (one gallon of water per person, per day)
- Prescription medicines
- Special items for infant, elderly or disabled family members
- Emergency tools
- Cash and a credit card, emergency phone numbers
- Important documents
- Blankets and change of clothing per person
- First aid supplies
- Fire extinguisher/smoke alarm/carbon monoxide detector
- Heating fuel
- Emergency heat source (fireplace, space heater, etc)

Safety Tips: Animals/Pets

- Move animals to sheltered locations
- Have extra feed on hand or near feeding areas
- Have water available (animals may die from dehydration)
- Make sure pets have plenty of food, water and shelter





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Disaster Kit: Vehicle

- Mobile phone, charger, batteries
- windshield scraper and small broom
- flashlight with extra batteries
- battery powered radio
- compass and road maps
- water and snack food
- matches
- extra hats, socks, mittens, and clothing
- first aid kit with pocket knife
- necessary medications
- blanket(s)/sleeping bags
- tow chain and/or rope
- road salt and sand, booster cables
- emergency flares/fluorescent distress flag

Safety Tips: Vehicle

- Drive only if it is absolutely necessary. If you must drive: travel in the day; don't travel alone; keep others informed of your schedule; stay on main roads and avoid back road shortcuts.
- If driving on snow or ice-covered roadways, reduce your speed. Driving at the regular speed limit will reduce your ability to control the car if you begin to slide. Leave plenty of room between you and other vehicles.
- If conditions worsen and you can no longer drive safely, pull off the highway. Stay calm and remain in your vehicle. Do not set out on foot unless you can see a building close by where you know you can take shelter.
- Let someone know your destination, your route, and when you expect to arrive. If your car gets stuck along the way, help can be sent along your predetermined route.

Carbon Monoxide: The Invisible Killer

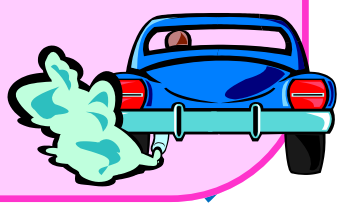
Carbon monoxide (CO) is a deadly odorless, colorless, and poisonous gas that is the cause of fatalities each year, especially during the winter weather season. It is a result of the incomplete burning of various fuels (ie coal, wood, kerosene, propane) from equipment such as generators and cars.

Symptoms

- Dizziness, nausea, fatigue, headache, shortness of breath
- High level of CO poisoning: vomiting, mental confusion, loss of consciousness

Prevent CO poisoning:

- Never operate equipment in enclosed spaces, such as a garage or locations within a home.
- Never leave car running in an attached garage (even with garage door open)
- Never burn charcoal inside home, vehicle, garage
- Never use gas appliances to heat your home (ovens, clothes dryers, etc)
- Never operate equipment where people are sleeping
- Install carbon monoxide alarms in central locations on every level of your home
- If carbon monoxide alarm sounds, move quickly to fresh air



ILM News

NEW STAFF!

Brad Reinhart, a native of Diamondhead, MS (located on the MS gulf coast), joined our team of staff in September after recently earning his M.S. in Meteorology at Florida State University. Prior to that, Brad earned a B.S. in Meteorology from Texas A&M, where he was a four year member of the Texas A&M bowling team. His National Weather Service career began during the summer of 2009 while he was a Hollings Intern at the NWS in Melbourne, FL, followed by a SCEP Student position at the National Buoy Data Center from June 2010 to 2012. The interest of weather, specifically hurricanes, began at a young age for Brad, as he has had several encounters with major hurricanes over the years, including Georges (1998), Katrina (2005), and Ike (2008). Hurricane Katrina actually made landfall during his senior year of high school, causing a lot of damage in his hometown and surrounding cities. In addition to weather, Brad's hobbies include going to the beach, running, traveling and watching his favorite TV shows. He's a huge fan of both college and professional sports, as he is proud to say that he is a loyal Fightin' Texas Aggie, but will also root for the Noles as well. Growing up near New Orleans, his favorite NFL team is the New Orleans Saints, and his favorite baseball team is the Houston Astros.

We're now on Twitter!!

Be sure to follow us!

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