The Southern Plains Cyclone

A Weather Newsletter for the Residents of western and central Oklahoma and western north Texas

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Meet Your Weatherman Bruce Thoren

Hi! My name is Bruce Thoren, and I work as a meteorologist at the National Weather Service in Norman, Oklahoma.

I was born and raised in southern Virginia, and I really cannot remember one particular event that sparked my interest in meteorology. However, I do remember two major flooding events, one in 1969 and the other in 1972, that occurred near my hometown during my childhood. Both events were associated with the remnants of hurricanes. The 1969 flood was extraordinary, as nearly 30 inches of rain fell in less than 12 hours in an area about 30 miles north of my hometown of Lynchburg. Three years later, in 1972, Hurricane Agnes brought flooding rains to Lynchburg. We also had our share of winter storms, although these storms usually provided more frustration than enjoyment. Lynchburg would get 15 inches of snow, for example, while some other places nearby in the mountains would have nearly three feet. This was always infuriating because I wanted to have the highest snowfall total. My introduction to severe thunderstorms came during a trip to Colorado in June 1976. While traveling through Kansas on the way out and back we were in

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Surviving the Summer Heat

By Rick Smith, Warning Coordination Meteorologist

There is a common expression that says "it's not the heat, it's the humidity". When it comes to dangerous heat, both are important.

Many parts of the Southern Plains have already seen temperatures over 100 degrees this year. Of course, this does not necessarily mean that we are in for hotter than normal summer. However, even if temperatures do not exceed 100 degrees again, there is a good chance we will see dangerous combinations of heat and humidity again before the summer ends.

When the humidity is high, your body's natural air conditioning system has a much harder time getting rid of the excess heat. The National Weather Service (NWS) uses a special index, called the heat index, to try to estimate how much stress your body may be under in extreme heat.

There are a large number of variables that go into the computation of the heat index, including the air temperature and the amount of moisture in the air. Additional information about the heat index equation can be found on the web, courtesy of the Peachtree City, Georgia NWS office, at *www.srh.noaa.gov/ffc/html/studies/ta_htindx.html*.

Heat index values are commonly reported on evening weathercasts and each hour on Weather Radio, but have you ever wondered just what that number really means? In general, the higher the heat index, the more dangerous the combination of high temperatures and humidity is to your body. The National Weather Service considers the heat index

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Lightning Safety

By Karen Trammell, Student Meteorologist

With the arrival of summer, the 2003 severe weather season across the Southern Plains has become a virtual memory. Surely, many residents of this area are relieved at its passing. However, while the frequency of occurrence of large, damaging hail and tornadoes has decreased, this does not mean that summertime thunderstorms are any less dangerous. All thunderstorms, whether they be of the severe or non-severe variety, are capable of causing serious harm – even death – to humans because they contain lightning.

Lightning often produces a very striking and beautiful image for onlookers. Despite its splendor, the incredible heat from each lightning bolt can set fire to houses and contribute to the onset of grass and forest fires, as well as causing harm to animals. On average, 73 people are killed each year in the United States after being struck by lightning. This total is greater than the annual death toll caused by tornadoes and hurricanes combined. While about 80 percent of those struck by lightning survive, many of these are left with debilitating injuries and disorders, including fatigue, depression, and memory loss. As a result, it is extremely important to take appropriate steps to protect yourself and others from the

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Forecaster Forum: The Fire Weather Program – A Brief History

By Scott Curl, Forecaster and Fire Weather Focal Point

Over the past several years, there has been a renewed interest within the National Weather Service and from land management agencies in fire weather and its impacts. This had been the result of several severe fire seasons both here in the state of Oklahoma and across the nation. In 1988, the fires in Yellowstone National Park first brought the fire concerns to the entire country. Then, in the years 1996, 1998, 2000, and 2002, records were set on a state and/or national level for either the number of fires, acres burned, or a combination of the two. Both the National Weather Service and other land management agencies, such as the National Park Service, United States Forestry Service, Fish and Wildlife Services, and locally, the Bureau of Indian Affairs, saw the need for a fire weather program at all the National Weather Service Forecast Offices.

In 1999, after nearly a decade without an organized fire weather program at the Norman forecast office, the local program was restarted. To begin this task, the various land management agencies with potential fire weather concerns within the state of Oklahoma were identified and contacted to find out more about them and what their needs were. This personal contact makes the fire weather program a unique program within the National Weather Service. The users are explicitly known and are dealt with directly. No other program does this quite like the fire weather program does.

At offices in other parts of the country, such as the mountainous west and parts of the southeast, the fire weather programs never had a break in the fire weather services they provided. Instead of reinventing the wheel here in Norman, a basic outline was produced by using information about what these offices were already doing in order to help organize the local fire weather program. All that was needed was to localize the program to meet the specific needs of the land management agencies in the Southern Plains. This is exactly what has been done.

At the Norman office, daily fire weather forecasts are provided for the local land management agencies. These forecasts are produced at least twice a day. More frequent forecasts are issued if conditions warrant. These forecasts provide the land management agencies with forecasted values of certain weather parameters, such as mixing height, transport wind, and relative humidity, that they need to accomplish their objectives. This includes fire suppression activities like prescribed fire or mechanical work, such as mowing or disking. The forecasts also provide useful information in the event of wildfire activity, whether it is anticipated or already occurring.

Another product forecasters can provide is called a SPOT forecast. This is a special forecast for a specific site where either a prescribed fire is to be conducted or a wildfire is occurring. These types of forecasts must be specially requested by a specific agency.

Other products are produced and available, when weather conditions warrant, to let users know when there is an increased potential for wildfire activity or extreme fire behavior is expected.

Most of the fire weather information can be accessed on the office webpage at *www.srh.noaa.gov/oun/firewx*. Other methods, including FAX, phone, e-mail, and local media outlets, can also help in getting information to the users.

Although the fire season can be year round in Oklahoma, most of the activity occurs from late winter until the spring green-up and again from late summer into fall. These are the times that users depend on these forecasts the most. The Norman forecasters continually strive to provide the best, most accurate forecast possible for the users. Every year during the off-season, interagency meetings are held to discuss how the previous season went and how successful the forecasts were. Ways to improve the performance and receipt of information are also discussed.

Even though the fire weather program is just two years old here in Norman, great strides have been taken and much has been accomplished in those two years.

National Weather Service Radio Notes

By Kevin Brown, Senior Forecaster

As always, feedback from you, our listeners, is very important! This article will inform you of some changes that will be occurring with National Weather Service Radio over the next several months. Please do not hesitate to contact us with any comments or suggestions by phone at 405-360-5928 or by visiting our website at *www.srh.noaa.gov/oun*.

Happy Anniversary! A big "Happy 25th Anniversary" goes out to three area Weather Radio sites. Transmitters WXK-31 in Wichita Falls, Texas, WXK-85 in Oklahoma City, and WXK-86 in Lawton all celebrate 25 years of providing the citizens of Oklahoma and western north Texas with life-saving weather information.

New and Improved Automated Voices. Weather permitting, we will begin upgrading the automated voice system for Weather Radio on July 7. You should notice an improvement with the male and female voices. Due to software advances, the female voice will also be heard on more of our products. Please notify us if you notice any mispronounced words!

Transmitter News. In the very near future, the signal output from transmitter WWG-46 in Woodward will be increased from 500 to 1000 Watts, allowing more people to receive the signal. A new dual-transmitter system will be installed, complete with a backup emergency generator. Many thanks go out to Pioneer Telephone Cooperative for providing the resources to accomplish this very important upgrade. Once this upgrade is complete, NWS personnel will be dispatched to the area to perform signal strength tests. Results of the tests will be broadcast over Weather Radio and posted on our webpage.

In the next several months, we are expecting other Weather Radio upgrades and expansions. Transmitter WWG-97 in Altus is scheduled to increase its power from 95 to 1000 Watts. As far as new transmitters go, Stillwater is the next on the list. There are also plans for a

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Weatherman: From Page 1

areas covered by tornado watches. I thought that was the coolest thing, and I hoped I would see a tornado. Of course, the rest of my family thought I was a little strange. As you can see, I think the accumulation of weather events I was exposed to finally got the best of me.

After graduating from high school in the early 1980s, I attended a local community college because I really was not sure what I wanted to accomplish. For some reason, I started taking accounting classes even though it did not really interest me. After one of my summer school classes, I walked over to the library and researched what schools offered a four-year degree in meteorology. For some reason, the University of Oklahoma intrigued me. I thought, "Is there a better place to go to get a good education in meteorology, have a chance to see tornadoes, and watch great college football?" Oklahoma had it all! Within six months, I was enrolled and attending classes. After a few struggles, I finally graduated in the summer of 1992.

Now, I was faced with an even bigger problem: How am I going to use this degree in meteorology? My first job opportunity was with a private weather company in Wichita, Kansas. After about 18 months, I was fortunate to get a job with the NWS. My first duty station was the Austin/San Antonio office. While in south Texas, I gained a lot of experience in the field of hydrology. During my four years at this office, we had several events where rainfall totals exceeded 20 inches, as well as many other smaller events.

In the summer of 1998, I moved to southeast Michigan where the White Lake office is located. Although my time in Michigan was relatively short, I have fond memories of shoveling 65 inches of snow during the winter of 1998-99. Actually, it was good exercise!

I was blessed enough to return to Oklahoma in March of 1999 as a forecaster at the Norman office. Within two months of my return, I experienced one of the greater success stories of the Norman office. This, of course, came during the May 3rd and 4th tornado outbreak, when the office provided timely, accurate, and life-saving warnings to the residents of central Oklahoma during the largest tornado outbreak in Oklahoma history. Besides my normal operational duties as a meteorologist, I spend my extra time at the office tracking verification statistics of storm warnings and the office's forecasts. I have also done some work in automating everyday procedures.

After living in Oklahoma through my years in college and working at the NWS office, I only recently saw my first tornado. After picking my two boys up from school, we were able to see the May 8th tornado as it tracked across southeastern sections of Oklahoma county. Although my boys were not happy with me at times, we were able to get within a mile of this tornado. It was an impressive sight, although it was very unfortunate that it caused so much destruction.

Heat: From Page 1

to be dangerous when it reaches or exceeds 105 degrees. At this level, health-related problems begin to increase, as the excessive heat and humidity taxes the human body beyond its abilities. In a normal year, about 175 Americans fall victim to the demands of summer heat. Fortunately, there are things you can do to protect yourself from excessive heat and humidity. Here are a few safety tips to follow as the hot summer months approach:

- *Slow down if you can.* Strenuous activities should be reduced, eliminated, or rescheduled to the coolest time of day. Individuals at risk should stay in the coolest available place, which may not always be indoors.

- *Dress for the weather.* Lightweight, light-colored, loose-fitting clothing reflects heat and sunlight and helps your body maintain normal temperatures.

- *Drink plenty of water or nonalcoholic fluids.* Your body needs water to keep cool. Drink plenty of fluids even if you do not feel thirsty.

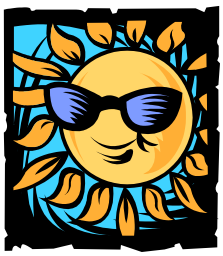
- *Do not get too much sun.* Sunburn makes it much harder for your body's natural air conditioning system to do its job of dissipating heat.

In addition to these general safety rules, there are a couple of other things that one should remember as the mercury rises. The temperature heard on Weather Radio and seen on the local weathercasts is measured in the shade. The actual temperature and the heat index will be much higher than reported for someone working or playing in direct sunlight. Also, vehicles act like a greenhouse. The sun's energy enters freely through the windows and windshield, but much of it remains trapped inside the vehicle. This means the interior of the vehicle will be MUCH hotter than the air outside. As a result, humans and pets should NEVER remain inside a car without an air conditioner working, even if the windows are cracked.

As during severe weather season and winter weather events, meteorologists at the Norman NWS constantly monitor hazardous summer heat and issue appropriate advisories and warnings as conditions warrant. If heat indices are expected to be 105 degrees or higher during the day and low temperatures are greater than 80 degrees for at least two days in a row, a *Heat Advisory* may be issued. When a Heat Advisory is issued for your area, extra precautions should be taken to protect yourself from the heat.

As with all products issued by the Norman NWS, these heat-related warnings and advisories can be heard on local Weather Radio stations and found on the web at *www.srh.noaa.gov/oun*.

Did You Know?



The Warmest Temperature Ever Recorded at Oklahoma City was 113 on July 11, 1936 and at Wichita Falls was 117 on June 28, 1980.

Lightning: From Page 1

threat of lightning.

In order to stay safe during a thunderstorm, there are several general points to remember. The worst place to be in a thunderstorm is outdoors, as there is no completely safe shelter. With the warm summer months upon us, more people are on golf courses, local lakes, and Little League baseball fields, making them more susceptible to the risks from thunderstorms.

Be alert even if a thunderstorm is not directly affecting the immediate area. Lightning can strike as far away as 10 miles from any rainfall associated with the storm. A general rule of thumb to follow is if thunder can be heard, the lightning that caused it is close enough to be dangerous. Also, hair standing on end and static on AM radio stations are excellent indicators that dangerous lightning is nearby.

In honor of Lightning Safety Awareness Week, held June 22nd through 28th, here are some safety rules, for those indoors and outdoors, to follow if a thunderstorm approaches. If caught outdoors in a thunderstorm:

- *Postpone activities immediately, and seek substantial shelter*. Completely enclosed buildings make the best shelter. Do not just look for a roof to put over your head, as this will give no protection. In the absence of such shelter, get inside an all-metal vehicle with the windows rolled up.

- *If appropriate shelter is unavailable, be the lowest object in the area*. Avoid seeking shelter beneath trees. Crouch as low as possible, standing on the balls of your feet, in an exposed area at least twice as far away from nearby trees as they are tall.

- *Get out of the water, and avoid touching metal objects*. Water and metal are both excellent conductors of electricity. Exposure to bodies of water or metal objects could either attract lightning or cause burns.

- *Always keep an eye on the sky*. Increasing winds and darkening skies are good indicators of an approaching thunderstorm. Also, listening to local Weather Radio can alert you to thunderstorm activity in the area.

If indoors during a thunderstorm:

- *Stay inside away from windows and doors*. Going outside is the worst possible thing to do during a thunderstorm, as it exposes you to the storm.

- *Avoid using corded telephones, computers, and other electrical appliances*. Lightning can enter buildings through electrical wires. If this happens, anyone or anything handling objects attached to the wires could feel the effects from the strike. Unplug electrical appliances prior to the storm.

- *Avoid contact with plumbing*. Do not take showers, wash dishes, or do laundry during a thunderstorm, as both the water and metal pipes conduct electricity.

While following these safety rules give the best chance to avoid being hurt by lightning, accidents do occur, especially if caught outdoors. Any persons struck by lightning should receive medical attention as soon as possible. Call 911 or the local ambulance service immediately. A trained individual should give CPR to the victim if he or she has stopped breathing. Also, tend to any other injuries the victim may have incurred, as adequately as possible. Check the victim for burns caused by the electric current from the lightning strike. It is very important to remember that persons who have been struck by lightning do not carry an electric charge after being hit. They can be tended to without fear of hurting yourself.

Lightning is a dangerous consequence of thunderstorm activity in this area. Fortunately, if these safety rules are closely followed, lightning can merely be a beautiful phenomenon rather than a deadly one. For more information about lightning safety and Lightning Safety Awareness Week, see *www.lightningsafety.noaa.gov*.

Weather Radio: From Page 2

Transmitter site near Byng in Pontotoc County, which will service Ada, Seminole, and much of Hughes county.

Weekly Test. The Norman Forecast Office conducts an alert test each Wednesday around noon, unless there is ongoing severe weather. If the test is cancelled, a statement stating such will be included in the broadcast program, and the test will be planned for the following Wednesday. This weekly test is provided to allow radio owners to verify that their radios are functioning correctly. It is common for radios located near the edge of the reliable broadcast area to fail to receive the test. If this occurs repeatedly, you should attempt to improve the radio's reception by relocating the radio, adjusting its antenna, or adding an external antenna. In a few cases, this situation may be alleviated by tuning your radio to a different transmitter frequency.

These test messages are also used to advertise upcoming changes and to solicit feedback from YOU, our valued customers and partners. To learn more about National Weather Service Radio, we encourage you to visit *www.srh.noaa.gov/oun* or *www.nws.noaa.gov/nwr*.

2003 Severe Weather Statistics

The 2003 severe weather season across Oklahoma and western north Texas has been near to above average in many respects. Across the Norman county warning area, 901 total county warnings have been issued as of May 31st. This compares to the 1986 to 2002 average total of 931 county warnings over this same time period.

This season has been above normal in the number of reported tornadoes. Preliminary estimates indicate that 59 tornadoes have affected the state of Oklahoma since the beginning of the year. The first reported tornado in the area touched down near Hobart on March 17th. The long-term average number of tornadoes in Oklahoma each year is 54, a number that has already been surpassed in only the first 6 months of 2003. In the Norman county warning area, preliminary estimates show that 35 tornadoes have occurred this year, with 31 in Oklahoma and 4 in western north Texas.

Weather in Review: The Oklahoma City Area Tornadoes of May 8 and 9, 2003

By Doug Speheger, Forecaster

At 415 pm on May 8, 2003, there was one thunderstorm in the state of Oklahoma, near Pocasset in Grady County. As residents of south Oklahoma City, Moore, and Choctaw soon discovered, it only takes one thunderstorm to do significant damage. This lone thunderstorm eventually produced the F4 tornado that moved through the southern Oklahoma City metro area. In a virtually unprecedented occurrence, late the next evening, another thunderstorm produced a series of tornadoes, the strongest of which garnered an F3 rating, in the northern part of the metro area.

On the afternoon and evening hours of May 8th and 9th, two separate strong and damaging tornadoes moved through different portions of the Oklahoma City metro area. These tornadoes were a part of a record-setting week of severe weather across the Plains and the Midwest. Many of the same areas that had been hit by other twisters in recent years were affected by these tornadoes. Fortunately, unlike the devastating tornadoes of May 3, 1999, which killed 42 people, there were no direct fatalities caused by either of these tornadoes, and fewer than 200 people were injured. The lone fatality occurred during the May 9th tornadoes, when a gentleman tripped and hit his head while seeking shelter.

On May 8th, meteorologists were prepared for a significant severe weather outbreak across portions of central Oklahoma. Much of the area was placed under a High risk for severe weather, a distinction reserved for only the very worst severe weather days. Around 345 pm, a thunderstorm developed near Anadarko in Caddo County. As it moved northeast, it produced a weak tornado in rural north Newcastle at 500 pm and another in far southwest Oklahoma City, near SW 149th Street and Pennsylvania Avenue, at 505 pm. Shortly after this, a larger and more damaging tornado developed north of SW 134th Street and Santa Fe Avenue in the western part of Moore.

This tornado tracked across Moore, south Oklahoma City, far southeast Midwest City, and south Choctaw. Along its 17-mile path, numerous homes and businesses, including the General Motors factory in southeast Oklahoma City, were damaged or destroyed. This tornado was given an F4 rating on the Fujita scale based on damage at the General Motors plant, a manufacturing plant along Sunnylane Avenue, and a few homes near SE 44th Street and Post Road and SE 15th and Hiwassee Road. Some areas in east Moore and southeast Oklahoma City, from the Highland Park area in Moore to just north of SE 89th Street and Bryant Avenue, that were devastated by the May 3, 1999, tornado were struck again by this tornado. Also on the 8th, a separate thunderstorm produced a weak tornado near Red Rock in Noble County, bringing the day's tornado count to four.

The next day, as cleanup continued across the southern part of the Oklahoma City metro area, the atmosphere was again ready to produce severe thunderstorms across Oklahoma. Thunderstorms developed in far southwest Oklahoma and the southeastern Texas panhandle during the afternoon. Although many of these storms were severe, producing hail as large as baseballs, they did not produce any tornadoes for several hours. This was unlike the thunderstorms the previous afternoon, as the first reports of a tornado occurred only about an hour after the first echoes appeared on radar. At 800 pm, as one of the storms approached central Oklahoma, it produced two weak tornadoes in northeastern Caddo County, near Cogar, and another weak tornado four miles north of Union City in Canadian County.

The storm continued to move into the Oklahoma City metro area, and as it approached the Yukon area, spotters reported numerous power flashes. Contrary to what many thought, these power flashes were not caused by a tornado but rather by very strong thunderstorm winds that produced damage in far western Oklahoma City and Yukon. However, as the storm continued to move northeast, it eventually produced another tornado in northern sections of Bethany that also affected the southeastern part of Wiley Post Airport and Warr Acres. Damaging winds, not associated with a tornadic circulation, continued across Warr Acres and into Oklahoma City past Northwest Expressway. Winds were also reported in Nichols Hills. A strong tornado, rated an F3, developed just northwest of Wilshire Boulevard and Eastern Avenue in northeast Oklahoma City and moved south of Luther. Other tornadoes, almost paralleling the Turner Turnpike, moved from south of Luther to southwest of Wellston, in Lincoln County, and also from Davenport to Stroud. Fortunately, the tornado that moved through Stroud was weaker than the tornado that hit the community during the May 3, 1999, tornado outbreak, which damaged the local hospital and destroyed a popular outlet mall along the Turner Turnpike.

Although it is very unusual for a city to be hit by tornadoes on consecutive days, it has happened before. After the tornadoes caused extensive damage to the Oklahoma City area on May 3, 1999, a weak tornado was observed near Lake Stanley Draper in southeast Oklahoma City on the morning of May 4th. In addition, several times throughout historical record, Oklahoma City has been struck multiple times within a week's time. The most notable occurrence happened in 1948, when tornadoes struck south Oklahoma City, including Will Rogers airport and Tinker Air Force Base, on March 20th. Just five days later, another strong tornado again hit Tinker. This was an historic event in that on the day of the second tornado, forecasters at Tinker noticed similar conditions to those that caused the tornado on March 20th, and as a result, they issued the first successful tornado forecast. Two tornadoes also hit Oklahoma City in the same week in May 1896 and May 1986.

Additional information about the May 8th and 9th tornadoes, including radar images, tornado photos, track maps, and product chronologies, can be found on the web at *www.srh.noaa.gov/oun/storms*. Also, information about previous tornadoes that have affected the Oklahoma City metro area can be found at *www.srh.noaa.gov/oun/tornadodata/okc_tornado.php*.

In Weather History: The 1980 Summer Heat Wave

By Karen Trammell, Student Meteorologist

The summer of 1980 is one that few residents of Oklahoma and western north Texas have forgotten. Intense heat and drought plagued much of the Southern Plains throughout the months of June, July, and August of that year, breaking many temperature records and causing billions of dollars in damage and thousands of deaths nationwide. Estimates reported by the National Climatic Data Center show that about 20 billion dollars in agricultural losses and about 10,000 heat-related deaths resulted from this event across the central and eastern United States. In Oklahoma alone, 37 people died during the month of July as a result of the heat, and millions of dollars in damage occurred.

A persistent area of high pressure aloft perched atop the south central United States for most of the months of June and July, before shifting to the southeastern states during August and September. The high pressure acts in a manner similar to a pressure cooker, which keeps temperatures very warm. Consequently, the hottest temperatures in Oklahoma and western north Texas were reported during late June, July, and August.

At both Oklahoma City and Wichita Falls, the months of June, July, and August remain in the list of top ten warmest Junes, Julys, and Augusts for each respective site. The following table summarizes the average temperature at Oklahoma City (OKC) and Wichita Falls (SPS) for these months, including the normal average temperature and the month's ranking in the location's top ten.

		1980	Normal	Rank
OKC	Jun	81.4°	76.8°	8th
	Jul	88.3°	81.5°	1st
	Aug	88.0°	81.1°	2nd
SPS	Jun	84.8°	81.3°	7th
	Jul	91.9°	85.8°	1st
	Aug	88.8°	85.5°	4th

Note that the average temperature is the computed by averaging the daily maximum and minimum temperatures over an entire month. The temperature top ten lists for each month at Oklahoma City and Wichita Falls can be found at *www.srh.noaa.gov/oun/climate/records.php*.

In addition to the very warm average temperatures, both Oklahoma City and Wichita Falls experienced a record number of days with a high temperature in excess of 100 degrees. During this year, Oklahoma City reached or exceeded the century mark 50 times, while Wichita Falls did so 79 times. On average, Oklahoma City has about twelve 100 degree days, and Wichita Falls has 32. Included in the 79 total 100 degree days at Wichita Falls is a streak of 42 consecutive hundred degree days from June 23rd to August 3rd, 28 consecutive days of temperatures greater than 102 degrees, and a remarkable 10 straight days of at least a high of 110 degrees.

The warmest temperature ever recorded in Wichita Falls was set three times during this heat wave. On June 25th, the high of 114 degrees surpassed the previous record of 113 degrees set in August 1964. Two days later, on June 27th, Wichita Falls reached a high temperature of 116 degrees again breaking the record. This new record stood for one day, as Wichita Falls warmed to a high of 117 degrees on the 28th. This remains today as the warmest temperature recorded in the Wichita Falls area. The beginning of record for the observing site at Wichita Falls is 1949.

The warmest temperature at Oklahoma City during this event was 110 degrees and occurred on August 2nd. This ranks as the third warmest daily high of all time and is three degrees below the record of 113 degrees, set in 1936.

The heat wave of 1980 remains one of the most destructive droughts of all time, causing millions of dollars in damage and killing hundreds in Oklahoma and Texas alone. The magnitude of this event surpasses droughts of recent memory, such as the 1998 and 2000 events. Information about current drought and heat wave conditions can be found at *www.srh.noaa.gov/oun/drought*.

New Storm Reporting Methods Available

By Steve Kruckenberg
Service Hydrologist and Webmaster

In an effort to acquire more storm information during and after a severe weather event, the Norman NWS office recently made two new storm report options available to the public via our web site.

A new storm report form web page was established on the NWS Norman web site in mid-April 2003. The storm report form allows the user to relay near real-time information to the forecast office, including reports of tornadoes, funnel clouds, wall clouds, wind gusts, wind damage, large hail, and flooding. When a report is submitted, the data are collected, processed, and relayed to our staff every five minutes. The storm report form web page can be found on the NWS Norman web site at *www.srh.noaa.gov/oun/stormreport*.

A new storm report e-mail address has also been made available through the web site. Users can use this address to send digital images of severe weather phenomena or storm damage, in addition to severe weather reports, to the NWS Norman office. The new storm report e-mail address is *sr-oun.spotter@noaa.gov*.

Since these reporting options were made available during this severe weather season, many have already used these resources. In just over three months, we received 75 reports through the storm report page. This critical information came from multiple sources, including emergency managers, news media, meteorology students, storm spotters and chasers, and concerned and interested citizens. Dozens of storm images were also made available to our office, and these images are being used for storm verification and severe weather research.

We would like to thank everyone who has used our new storm reporting form and storm report e-mail address to send important weather information to the forecasters here in Norman. The severe weather season was very busy across Oklahoma and western north Texas, and these reports were extremely helpful to warning forecasters and others involved in the warning process. Thank you!

Cooperative Observer Notes

New Cooperative Observer Weather Reporting System Arrives

By Forrest Mitchell, Hydrometeorological Technician

For the past seven years, NWS cooperative observers have used the Remote Observation System Automation (ROSA) to report daily observations to the Norman forecast office. With this system, observers report daily rainfall, maximum and minimum temperatures, soil temperatures, pan evaporation, and river levels by entering a series of numeric codes to indicate the value of each measurement. This system has its disadvantages, including the ease with which numbers are transposed or inadvertently keyed and the inability of the phone line to handle many observers calling at once.

To correct some of these problems, a new reporting system has been made available for use in place of ROSA. The new system is called the National Weather Service Data Collection System, or IV-ROCS. IV-ROCS is easier to use and requires fewer button punches on the phone. It can also handle more phone calls simultaneously so it should eliminate busy signals.

By dialing a toll-free phone number, a female voice (fondly dubbed "Ivy") answers and prompts the user for various parts of the cooperative observer's weather report. Ivy is bilingual, and each observer is allowed to choose whether the voice speaks English or Spanish. Pressing *1* after the language prompt tells Ivy to speak English.

As with ROSA, the observer enters the station identification number, time of report, and the temperature and/or precipitation data on the phone after the appropriate prompts from Ivy. As each part of the report is entered, Ivy repeats what was entered and asks the observer to confirm that the correct data was entered. The observer then either confirms that the entry is correct by pressing *1* for "yes" on the phone or that the entry is not correct by pressing *2* for "no". If the number *2* is pressed, the observer is prompted to reenter the correct data. This new feature corrects many of the keystroke problems that occurred with the ROSA system.

IV-ROCS does not require any special codes for temperature and precipitation, as was the case with ROSA. In addition, a decimal code is not required in the precipitation report. For example, 0.01 inch of rain would be entered as 1, 0.34 inches would be 34, and 4.71 inches of rain would be 471. With the ROSA system, the asterisk key (*) was used to represent a decimal point in the precipitation report, but with IV-ROCS, the asterisk is used to report a trace (T) of precipitation. Additionally, IV-ROCS requires the observer to enter a code number to describe the type(s) of precipitation that occurred. A list of codes will be provided to each observer.

There is one major change for temperature reporting with IV-ROCS. With ROSA, the order of temperature reports was first maximum, then minimum, and finally current. With IV-ROCS, the order is current, maximum, and minimum. Also, negative temperatures are now preceded by a single asterisk (*) rather than a double asterisk.

Another unique feature of IV-ROCS is that it asks if the observer's weather equipment is working properly, with *1* meaning "yes" and *2* meaning "no". If the observer indicates the equipment is not working properly, the system sends an e-mail to the Norman office to notify the staff of the equipment problem.

Detailed instructions on using IV-ROCS have been mailed to all cooperative observers so that the system may be used as soon as possible. As always, the Norman staff is available to offer any assistance needed.

New Observers

The NWS staff would like to welcome Kenny Bailey, Richard Keahey, Becky Lutes, Phillip and Terri McCoy, Truman Smith, and Tommy Thornton to the NWS Norman cooperative observer program. We look forward to working with all these new observers for many years to come.

Award Recipients

The following observers have recently received Length of Service awards:

South Central Research Station – 50 year
Grover Bayless – 45 year
C. Lowell Cooper – 30 year
City of Ponca City – 25 year
Mike Payne – Special Service Award
Lonnie Helderman – 20 year
Arnold Rice – 10 year

Thank you for the hard work and valuable meteorological data you have collected. We look forward to working with all of you for many more years.

100 Degree Days

Despite the fact that summer has only just arrived, many locations across the area have already surpassed the 100 degree mark at least once this year. Vernon, with a high temperature of 102 degrees on May 7th, was the first location in Oklahoma or western north Texas to reach the century mark. The warmest temperature reported in the area so far was 108 degrees and occurred in Altus on May 30th.

Remember to mail the previous month's cooperative observer forms and recording rain gage tapes by the 5th of the month!

South Central and Southeast Oklahoma
Daryl Williams

Northern Oklahoma
Forrest Mitchell

Southwest Oklahoma and Western North Texas
Steve Smart

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Check out our text-based and graphical forecasts for your county at *www.srh.noaa.gov/oun*.

Please share this with friends, relatives, and colleagues. Comments and suggestions are always appreciated, by phone at 405-360-5928 or by e-mail at Karen.Trammell@noaa.gov.