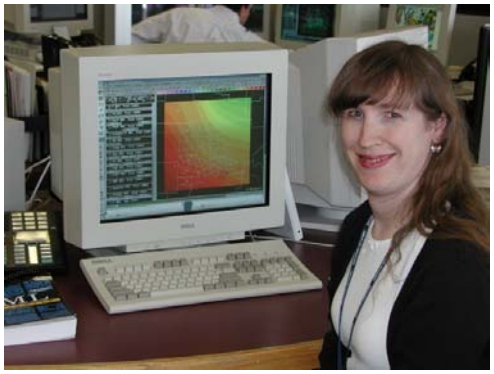
The Southern Plains Cyclone

A Weather Newsletter from your Norman Forecast Office for the Residents of western and central Oklahoma and western north Texas

We Make the Difference When it Matters Most!

Volume 2 | Summer 2004 | Issue 3

Meet Your Weatherman Cheryl Sharpe



¡Hola! I am Cheryl Sharpe, one of the general forecasters at the Norman Forecast Office. In addition to my regular duties as a meteorologist, I also assist the Webmaster with articles for the office website, answer e-mail addressed to the Webmaster – sometimes in Spanish!, and do miscellaneous computer tasks. During my first several years at Norman, I actually worked primarily as a computer programmer, but now, my programming activities are relegated to mostly minor applications and troubleshooting.

My path to this position was a long and twisty one. It all began with my interest in weather when I was growing up in central Illinois. The strong summer thunderstorms fascinated me. However, I had many other competing interests, and meteorology did not become a long-term interest until I was in my teens. About that time, my hometown was hit by a deadly F3 tornado. Earlier that same year was the very intense January 10th, 1975 storm that brought quite a variety of weather to the Midwest. Of course, the Super Outbreak of April 3rd and 4th, 1974 was still recent history. After experiencing these events, I knew what I wanted to after high school; I

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Behind the Scenes at the Norman Forecast Office

By Rick Smith, Warning Coordination Meteorologist

The National Weather Service's main mission is to provide information to help save lives. This is the reason we come to work everyday. We are part of a network of 122 local weather forecast offices that cover the entire United States, with each office responsible for a specific group of counties. The people at each of these offices work hard to provide the best local weather information possible.

At the Norman Forecast Office, we take this responsibility seriously and strive to be the best when it comes to providing information you can use to help make decisions, plan activities, or just live your day-to-day life in Oklahoma and north Texas.

The main reason we are here is to help manage significant events. Most often, these events are ones that are either caused by the weather or made worse by the weather – tornadoes and severe thunderstorms, flooding, ice storms, blizzards, wildfires, and heat waves, among others. But, did you know that the Norman Forecast Office also plays a key role in assisting with non-weather related disasters?

From the Murrah Building bombing in 1995 to wildfires and other non-weather related emergencies, the NWS provides support and information in a variety of situations.

We are staffed 24 hours a day everyday of the year with at least two people on shift at all times to allow us to respond. However, when there is a significant event, it takes many more people to provide the information and services you

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Fire Weather Services from NWS Norman

By Scott Curl, Forecaster

The National Weather Service forecast office in Norman provides continuous information to the fire fighting community across Oklahoma and western north Texas. The staff at the Norman office provides the fire fighting community a suite of fire weather products to help keep your land and property, as well as yourself and your family, safe year-round. The following is a summary of the products that the forecast office in Norman provide to aid the fire weather community in keeping you safe.

Fire Weather Forecast...The Fire Weather Forecast is a routine product issued twice a day to provide forecasted values of the weather parameters necessary to the fire community for planning and prescribed burn purposes. Forecasts are subdivided either by county or into meteorologically similar zones. Some of the weather elements that are forecast for the first three or four 12-hour periods are:

- Cloud cover
- Precipitation type
- Precipitation chance
- Air temperature
- Humidity
- Wind speed and direction

Beyond 36 to 48 hours, the forecasts contain general guidance information.

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Site-specific or Spot Forecasts... Spot forecasts are a site-specific fire weather forecast product that usually covers the next 24 to 36 hours. They include forecasted values of many of the same weather elements as the routine Fire Weather Forecasts but are valid for a much smaller area. Spot Forecasts are issued for wildfires, prescribed burns, smoke management, search and rescue operations, aerial spraying, and other similar instances, and are available to any federal, state, or municipal agency at any time upon request.

Fire Weather Watch...Much like when a Severe Thunderstorm Watch is issued to alert you when conditions are right for the development of severe thunderstorms, a Fire Weather Watch is issued to alert fire and land management agencies that there is a high potential for conditions to become favorable for extreme fire behavior with any fire that ignites within the next 24 to 72 hours. A Fire Weather Watch also means there is a high potential for the development of a Red Flag Warning to be issued in the subsequent 24 to 72 hour period. The watch remains in effect until it expires, is canceled, or upgraded to a Red Flag Warning.

Red Flag Warning...A Red Flag Warning is issued by the NWS when current or forecasted future conditions are capable of making fighting fires extremely dangerous and controlling fires nearly impossible. When red flag conditions exist, extreme fire behavior can be expected with any fire that ignites. A Red Flag Warning will be issued immediately when there is high confidence that Red Flag criteria have been or will be met within the next 24 hours. These criteria are based on the state of the local vegetation, temperature, humidity, and wind speed. The warning is continued until the critical fire weather pattern ends.

Red Flag Fire Alerts...Red Flag Fire Alerts are issued by the Oklahoma Department of Agriculture, Food, and Forestry if weather conditions favorable for unusual or extreme burning conditions are occurring and are expected to continue for a prolonged period. Red Flag Fire Alerts, which should not be confused with *Red Flag Warnings*, serve as an advisory to the need for added safety precautions prior to burning anything outdoors. While the NWS is not explicitly responsible for these alerts, forecasters are often consulted to gauge future weather conditions. State emergency management officials and the State Fire Marshal are also consulted prior to issance of an alert. Information about Red Flag Fire Alerts can be found at *www.oda.state.ok.us/redflag/forred.html*.

Fire Danger Statement...Fire Danger Statements are issued when there is a very high or extreme fire danger. Unlike the other fire weather products, which are directed to fire and land management agencies, this product is the only *public* fire weather product issued by the Norman forecast office. Very high and extreme fire danger conditions are determined based on greenness and dormancy of vegetation and forecast afternoon maximum temperature, afternoon minimum relative humidity, and wind speed. Any *Red Flag Fire Alerts* or burning bans that may be in effect are also included in the product.

The forecasters in Norman will be continuously monitoring the fire weather conditions across Oklahoma and western north Texas to help the fire and land management agencies across the area keep you and your property safe. Help yourself as well by staying informed by visiting the Norman forecast office website at *www.srh.noaa.gov/oun* for the latest forecasts and fire weather conditions.

New National Weather Service Radio Transmitter On the Air

The eleventh National Weather Service Radio transmitter in the Norman Forecast Office's area of responsibility is now broadcasting forecasts and statements and ready to warn Oklahomans of threatening weather. The newest transmitter, station WNG654 located in Stillwater, was officially brought on air at 1:00 pm on July 14th. The 1000 Watt transmitter broadcasts at a frequency of 162.500 megahertz and currently covers Lincoln, Logan, Noble, Payne, Creek, and Pawnee counties. Additional information on National Weather Service Radio in the Norman area can be found at *www.srh.noaa.gov/oun/nwr*.

In Weather History: The Ten Year Anniversary of the Lahoma Storm

By Karen Trammell
Meteorologist Intern

The morning of August 17th, 1994 began pleasantly for residents of Oklahoma and western north Texas, but what began as a serene summer day on the Plains ended as anything but for many residents of northern and central Oklahoma. Giant hail driven by winds in excess of 100 miles per hour pounded homes and businesses across Major, Garfield, Kingfisher, and Canadian counties. Other severe thunderstorms also affected residents of western Oklahoma and western north Texas, although not to the extreme extent as those to the north and east.

Thunderstorms were ongoing in Kansas as the day broke on the 17th but early in the day, were not expected to affect Oklahoma or western north Texas. However, these storms eventually moved into the area during the afternoon hours. An outflow boundary from the initial round of storms helped produce the evening storms in western Oklahoma and western north Texas.

The worst severe weather and majority of the damage were produced by a single supercell thunderstorm that moved south-southeastward along a path from near Manchester to near El Reno during the early afternoon hours. As the storm first entered Oklahoma, penny-sized hail and wind gusts to 70 miles per hour were reported in the Manchester area. The severity of the hail and wind reports soon grew to mammoth proportions. The city of Lahoma took a direct hit from the storm, as hail to 3 inches in diameter fell and wind gusts to 113 miles per hour were measured. Remarkably, the thunderstorm winds were strong enough to destroy the anemometer on the Oklahoma Mesonet's weather observing station located just west of Lahoma.

As the storm moved southward into Kingfisher and Canadian counties, reported hail sizes increased, although, fortunately, the winds slowed considerably. Five miles south of Kingfisher, hail, described simply as *football*-sized, was

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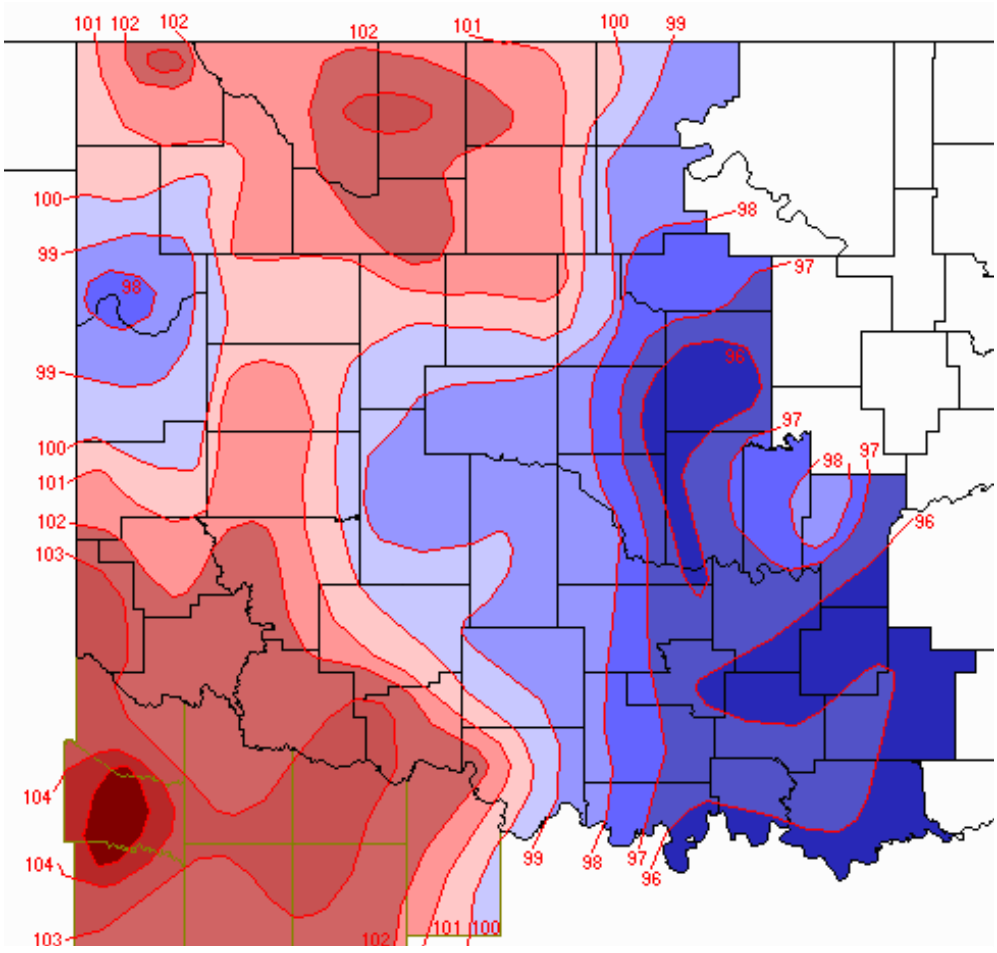
Forecaster Forum: Local Influences on Summer High Temperatures

By Doug Speheger, Forecaster

There are a lot of things to consider when meteorologists forecast high temperatures. Many of them are things that you probably already know about – how many clouds are expected to block heat from the sun, or if there is going to be a cold or warm front moving into the area. Even these things can be difficult to forecast sometimes, but there are also subtle features that influence high temperatures that can make this forecast even more complex. In Oklahoma and western north Texas, two factors that can affect temperatures are the different uses and types of land and elevation.

You may have noticed on weather reports during the heat of the summer that portions of north central Oklahoma and southern Kansas will often be much warmer than surrounding areas, which at first glance, would surprise a lot of people. As seen on the map, the average high temperatures measured during the month of July 2001, calculated using data from the Oklahoma mesonet and cooperative weather observers across the NWS Norman area of responsibility, shows hotter temperatures observed over northern Oklahoma as compared to central Oklahoma. This hot area often includes areas in southern Kansas from Medicine Lodge to near Wichita. It is not unusual for temperatures to be five degrees warmer in this region than in areas just to the south.

This warm area corresponds to the winter wheat belt of Oklahoma and Kansas, and one of the primary reasons for this hot weather may be how the land changes after the winter wheat is harvested. Under similar conditions, dry, barren soil or rocky terrain will radiate more heat back into the air than moist soil or areas with more vegetation, creating slightly higher temperatures. It is similar walking over an asphalt parking lot as compared to walking over grass on a summer day. You can feel the asphalt producing more heat. After the winter wheat is harvested, the remaining bare soil can help to produce this warmer temperature. The type of land and soil likely also explain the very hot temperatures seen in the area near Crowell, Texas, and why the eastern part of the area is typically cooler than the western part of the area.



Average daily high temperatures for the month of July 2001 across the counties in the Norman forecast office's area of responsibility. The red shading indicates temperatures above 100 degrees, while blue indicates temperatures below 100 degrees.

The influences of these weather conditions and types of land still cannot explain all of the variability in temperatures that we see across the area. Another factor is elevation. In the part of the atmosphere closest to the earth, the temperatures generally decreases as you go to higher elevations. Of course, that is why the tops of large mountains remain cooler than the adjacent areas of lower land. However, even with smaller differences in elevation, this factor can contribute to a difference of a couple of degrees. On sunny summer days, the change in temperature with height may be as much as 18 degrees Fahrenheit per mile, or about three and a half degrees for every 1000 feet.

A look at the average high temperature map shows that the average temperature in Roger Mills and southern Ellis counties of west central Oklahoma is a few degrees cooler than surrounding areas. This area corresponds with a ridge that has elevations of up to 2500 feet, while the surrounding counties in Oklahoma have elevations between 1600 and 2000 feet. Again, elevation is not the sole factor in determining maximum temperatures. If this were the case, eastern Oklahoma would generally be warmer than western Oklahoma. However, elevation differences help to explain some of the temperature differences on a smaller scale.

Of course, the weather pattern itself is the primary thing that determines how warm or cold a location will be, but land use and elevation are a couple of other factors that help explain why some areas are warmer or cooler than others.

Weather in Review: The 2004 Severe Thunderstorm Season

By Chris Sohl, Senior Forecaster

The following summary of the 2004 severe weather season highlights some of the more significant events that have occurred through the end of June. However, the official reports will be released later this year.

March...The 2004 severe weather season started early as severe thunderstorms packing strong winds and flood-producing heavy rains moved through northern Oklahoma on March 4th and 5th. (For detailed information on this event, see the Spring 2004 issue of the *Cyclone*.) Near the end of the month, on the 27th, several weak tornadoes touched down mainly in northwest Oklahoma. While most caused no damage, two of the tornadoes south of Sharon blew a car off the road and damaged cedar trees. Tennis ball sized hail also fell near Sayre.

April...While some severe weather did occur early in the month, the last ten days of April were the most active. On the 6th, a weak, narrow tornado dipped down 7 miles south of Hollister in southwest Oklahoma but apparently caused no damage. Three days later, strong storms produced hail over central and southeast Oklahoma, with the largest stones being the size of golfballs just north of Norman and in Seminole County.

Widespread thunderstorms, many of them severe, affected all but southwest Oklahoma on April 21st. There were numerous reports of hail, especially in the Oklahoma City area, along with occasional wind gusts to near 60 miles per hour. Giant hail to the size of baseballs also pounded portions of Marshall and Bryan counties in southern Oklahoma. The next day, a weak tornado briefly touched down 6 miles northwest of Gage but caused no damage.

Southwest Oklahoma finally got a share of the action on the 23rd, as several severe thunderstorms roamed across western and central Oklahoma, producing large hail and strong winds. Golfball, and occasionally baseball, size hail along with winds to near 60 miles per hour pounded the Duncan area. Golfball sized hail also fell near Lawton and along Interstate 40 near Erick, and minor wind damage occurred in Newkirk.

A few storms tracked across western north Texas on the 25th producing wind gusts over 60 miles per hour near Tolbert. There was a repeat performance of high winds on the 29th just south of Chillicothe.

The month ended on an active note as severe thunderstorms rocked a large part of the area. Hail larger than baseballs broke car windshields in Piedmont, while golfball hail fell at several locations in southern Oklahoma. A weak tornado briefly touched down south of Petrolia in north Texas.

May...Although May is typically one of the most active months for severe weather in Oklahoma and western north Texas, this year, the month began relatively quiet and dry. The stronger westerly winds aloft, usually required for the formation of large supercell thunderstorms, retreated northward into the central and northern Plains during the first half of the month. While that area was being hammered for several days in a row with severe storms, the weather remained quiet over Oklahoma and western north Texas. The westerlies finally shifted south during the latter part of the month, and by the last week of May, the storm action picked up.

Severe storms did make a brief appearance in the middle of the month as baseball size hailstones pummeled the Mountain View area on May 12th, while tennis ball hail fell just north of Gotebo. Meanwhile, golfball hail fell in the Altus area including at the Air Force Base. The next day, golfball and ping pong sized hail fell in the Burkburnett and Sheppard Air Force Base areas, respectively. At the same time, hail to the size of nickels dinged Oklahoma City and Norman. Strong winds, gusting to 65 miles per hour, blew through Corum in southwest Oklahoma.

The next several days in May were quiet once more before severe storms ramped up again on the 24th, rumbling across the western half of Oklahoma. Two weak tornadoes touched down in southwest Oklahoma, with the first near Alfalfa and the other just east of Eakly. No damage was reported with either tornado. Gigantic softball sized hail blasted the Manitou area, while baseball hail pounded Chattanooga. Hail up to the size of tennis balls also fell near Altus and Anadarko, as well as several locations in west central Oklahoma. Later in the evening, strong winds developed in central Oklahoma in association with dissipating thunderstorms. Some of these winds gusted to near 80 miles per hour in Cushing, blowing down power lines and large tree limbs. Tree limbs were also downed in Agra.

Two days later, on the 26th, thunderstorms produced golfball size hail in Ponca City, in nearby Tonkawa, and just north of Hinton, while slightly larger hail fell north of Lamont. Strong thunderstorm winds in southwest Oklahoma, gusting to 65 miles per hour, blew down power poles near Altus.

Next came Memorial Day weekend. Rarely does that holiday weekend pass without a significant severe weather event, and 2004 remained true to form. On Saturday the 29th, towering supercell thunderstorms roamed across portions of western and central Oklahoma, producing tornadoes, huge hail, and strong winds. A long-lived supercell produced at least six tornadoes, along with high winds, in central Oklahoma. Tornadoes touched down northeast of Geary, northeast of Calumet, southwest of Okarche, and near the Deer Creek community. Seven homes were destroyed in Geary. Interestingly, residents of the small town speak of a two century-old Native American myth proclaiming that Geary would not be struck by a tornado since the town lies directly between the Canadian and North Canadian Rivers. Readers might note that there are a number of similar legends that proclaim with confidence reasons why a certain town or city is said to be protected from tornadoes, and every few years, another one of those legends is struck down when the tornado "disregards" the myth and hits the town anyway.

Still on the 29th, another weak tornado dropped down in western Oklahoma, just southwest of Thomas. Damage was mainly to power lines, trees, and outbuildings, although a few homes received roof damage. A weak tornado southeast of Meridian in Logan County uprooted or snapped off trees up to two

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feet in diameter. Several outbuildings and a trailer were also damaged by a small tornado southwest of Carney in Lincoln County. Giant hail to near the size of softballs fell just east of Custer City, while tennis to baseball size hail pounded areas around Putnam, Taloga, Thomas, and Cashion. Baseball size hail busted windshields on police cruisers in Okarche, while strong winds gusting to near 70 miles per hour swept through the Edmond area. Altogether, over 9000 Oklahoma residents lost power during the evening.

June...While the lack of widespread thunderstorms through the first 3 weeks of May resulted in below normal rainfall, things changed in June, and many areas received beneficial rains. A few locations probably got more than they wanted, as some areas experienced both flash and river flooding.

The first day of the month started out in typical spring fashion as severe thunderstorms produced large hail and strong winds over portions of western north Texas during the late afternoon and early evening hours. Hen egg sized hail belted the Windthorst area, while larger hail to the size of tennis balls fell west of Joy. Golfball hail was reported around Lake Wichita and southwest of Henrietta.

The next day, a large line of thunderstorms developed in north central Oklahoma and plowed southeast into the Red River Valley. Widespread strong winds and occasional large hail occurred with the storms. Winds of 70 to 80 miles per hour blew down power poles in Tonkawa, near Morrison and across portions of Payne County where some roof damage was also reported. In central Oklahoma, hail up to the size of half dollars was reported, along with scattered wind gusts to near 70 miles per hour. Golfball sized hail also fell in southern Oklahoma near Duncan. Another line of thunderstorms developed in west Texas and moved eastward into western north Texas. Winds gusting to 85 miles per hour destroyed several hangars and damaged a half dozen airplanes at the airport north of Vernon. Baseball sized hail pounded the area just east of Scotland, while spotty wind damage, quarter sized hail and local flooding were reported in Wichita Falls.

Severe thunderstorms in southwest Oklahoma and western north Texas on the 7th blew down power poles near Comanche and produced golfball sized hail in Wichita Falls. Thunderstorms also generated heavy rainfall that resulted in minor flooding on some roads in Garvin County.

In an environment that was almost tropical in nature, with high moisture and weak upper level winds, low-topped supercell thunderstorms produced several brief tornadoes across portions of central Oklahoma on the 9th. The very short-lived tornadoes struck west of Chandler and near Agra. Light damage, also possibly due to brief tornadoes, was noted near Stanley Draper Lake and in Ada.

On the 12th, severe thunderstorms rolled across western north Texas producing 70 miles per hour winds and golfball sized hail in the Knox City area. Winds directly produced by the thunderstorms, along with strong winds associated with a subsequent heat burst, resulted in gusts of 70 to 75 miles per hour and knocked down powerlines and large tree limbs in Seymour, Megargel, Holliday, Burkburnett, and Wichita Falls. Strong winds related to the heat burst also spread into portions of southwest Oklahoma. Heat bursts most frequently occur in association with a weakening thunderstorm complex. Large and sudden temperature rises and dew point temperature drops, in addition to high winds, can be experienced most often in the middle of the night. The strong winds can cause widespread damage over an area that spans several counties.

Early morning thunderstorms on the 17th and again later that night produced wind gusts to near 60 miles per hour in several locations in northwest Oklahoma. A few days later, thunderstorms returned to the southern Plains during the evening of the 21st and early morning of the 22nd. Wind gusts to near 70 miles per hour blew through the Crowell, Chillicothe, and Lockett areas of western north Texas. Even higher gusts, to near 80 miles per hour, struck Mooreland in northwest Oklahoma.

Even though the threat of severe weather was subsiding as the month of June closed out, ongoing thunderstorms continued to produce heavy rains and the threat of flash flooding across portions of Oklahoma and western north Texas.

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observed. This hailstone measured 4.5-by-6.5 inches. Softball-sized hail was also reported southeast of Okarche. This hail was accompained by severe wind gusts near 60 miles per hour. The thunderstorm produced a single tornado southwest of Kingfisher, rated as an F1 on the Fujita scale. The tornado damaged an automobile and an aluminum trailer along its two mile long and 40 yard wide path.

The large hail, driven by extremely severe winds, significantly damaged hundreds of permanent homes and businesses, destroyed numerous mobile homes, and damaged automobiles and vegetation in the area. The structural and vehicular damage primarily consisted of broken windows and severely dented siding and roofs. In some instances, the hail actually created holes in walls and roofs. Since the winds blew from a northerly direction, virtually all damage occurred on the northern sides of the structures.

In the Lahoma and Drummond areas, which were hardest hit, vegetation damage was extensive. Trees were stripped of leaves and bark, were snapped at the trunk, and had large branches removed. The large hail also pounded divots in lawns and fields, beating them into "brown-green mulch".

The August 17th, 1994 severe thunderstorm event, especially the Lahoma supercell, remains one of the most remarkable and memorable in the minds of many meteorologists in the area due to the tremendous damage that resulted. Fortunately, thunderstorms of this magnitude do not occur frequently.

Staffing Changes at the Norman Forecast Office

Spring graduation ceremonies brought some staffing changes to the Norman Forecast Office. Karen Trammell, who received an M.S. in Meteorology, was promoted from a Student Trainee to a Meteorologist Intern. To fill the vacated student position, Jennifer Palucki transferred to Norman from a Student Trainee position in Albuquerque. Jennifer earned her B.S. in Meteorology in May and will serve in the part-time position while pursuing her M.S.

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wanted to study meteorology in college.

Naturally, I did not do that. Instead, I obtained an Associate's Degree in Data Processing Technology from a local community college. It was cheap. It was easy. However, after a year of attempting to find a programming job, I decided to follow the advice of the several NWS employees I had pestered while I was in high school. I enlisted in the Air Force and took a Weather Specialist position, eventually winding up at Scott Air Force Base, Illinois. So, I was finally in a weather job. I was eventually transferred to Air Force Global Weather Central at Offutt Air Force Base, Nebraska, and while there, I transferred into a computer programming position. I also got to experience the Arctic deep freeze of December 1983.

After I regained civilian status in 1984, I took a job with a California poultry company as a programmer. The numbingly dull weather of central California – except for the terrifying "tule fog" - helped convince me that I needed to return to the Midwest. In 1986, I enrolled in the geography department at Augustana College in Rock Island, Illinois, which was as close to meteorology as I could get. After three years, I had a B.A. degree in geography with an emphasis on physical geography.

During my time at Augustana, I took a class that involved volunteering at the local NWS office – Moline, Illinois at the time. Less than a year later, before graduating, the NWS hired me as a part-time Meteorological Technician at Moline. Within a few months, I transferred to a full-time position at the Alpena, Michigan office. The next year, the NWS sent me to San Jose State University to acquire the remaining classes I needed to qualify as a meteorologist. My last couple of years at Alpena were spent as a Meteorologist Intern.

As much as I hated to leave the spectacularly beautiful – and safe! - northern Lower Peninsula of Michigan, I needed to try to get promoted. Since the office was going to move soon anyway, my job was not guaranteed. I applied to more than a dozen offices before a vacancy appeared in Norman. My love for the northern forests made it difficult to consider a location this far south. Ironically, though, I like warm weather, and the technology in Norman was interesting enough to get me to apply. However, I knew there was no chance that I would be selected.

Well, the seemingly impossible happened, and here I am, still working in Norman 11 years later. There are times, mostly in the spring, that I wonder what I was thinking when I applied for a forecaster job in Oklahoma. Overall, though, I am still quite happy to be here.

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have come to expect from this office.

So, what is it like at the Norman Forecast Office during a significant event? Even with only a moderate amount of severe weather in our area, you would probably find 8 to 12 people totally engaged in providing information.

This group would likely include one or more warning forecasters, a warning coordinator, people devoted to handling communications – including amateur radio, weather radio, and telephone calls – and forecasters dedicated to producing GraphiCasts, significant weather advisories, regional weather discussions, and other information services.

This is in addition to the people who are working to maintain the routine flow of 7-day forecasts, river and flood forecasts, fire weather information, weather balloon launches, and a variety of other critical information.

The many different roles played by staff at the Norman Forecast Office during a significant event are clearly displayed in the photo from the May 8, 2003 severe weather event.

It is not unusual for forecasters, technicians, meteorologist interns, and others to come in early and stay late, working extended hours for several days in a row to help handle significant events.

We are not alone in dealing with significant events! We are part of a team of dedicated people – emergency management, local government officials, television and radio broadcasters and meteorologists, spotters, and others – working long hours to help reduce the impacts of hazardous weather and other events in your local community.

Cooperative Observer Notes

Nature and Your Temperature Sensor

By Forrest Mitchell, Hydrometeorological Technician

The instruments used by our cooperative weather observers, from the standard rain gage to the soil thermometers, are usually very reliable. The standard rain gage, which is the most widely used piece of weather equipment in the cooperative observer program, is the most dependable. When we come by for an annual visit, we check the gage stand to make sure it is level and that all the nuts and bolts are secure. Often, settling of the ground around the stand or accidental bumping of the stand will cause the gage to lean slightly, which can affect the amount of rainfall collected in the funnel. Also, the bottom of the inner measuring tube can develop a small leak, especially if it is left outdoors during freezing rain events. Leaks can also develop around the bottom of the outer can. Some of you have received new outer cans, which are made of stainless steel. The stainless steel cans are slightly heavier than the older copper cans, making them more durable. The presence of leaks in either the inner cylinder or outer can leads to lower rainfall totals.

The temperature sensor is also a reliable instrument, but it can be adversely affected by several things in nature. The first of these is lightning. When lightning strikes near the sensor, some of the current can be carried through the buried cable connecting the temperature sensor located outside to the display inside your home or business. This current travels into the temperature display, affecting the circuitry or blowing the fuse. If this occurs, a new display is mailed to you as soon as we are notified of the malfunction. To help minimize this occurrence, we are installing lightning surge protectors, which direct the current back to the outdoors through your home or business's ground wire system.

Bugs, specifically wasps, can also affect the reliability of the temperature measurements. Occasionally, wasps will build nests in the sensor housing outdoors. Mud daubers are especially adept at building nests around the metal temperature rod inside the shelter. Wasp nests insulate the temperature sensor, causing both the maximum and minimum temperature measurements to be too warm. If you begin noticing unusually high maximum temperatures or the maximum and minimum temperatures staying within a few degrees of each other on sunny days, a wasp nest may be insulating the sensor. Checking for wasp nests is one reason we loosen the sensor housing during annual visits. While looking inside the sensor, if we see many pairs of eyes staring back at us, you will notice us slowly let the housing down, back away from the sensor, and return with a can of wasp killer!

A third problem that can develop is a cut or nick in the buried cable. Cables in some of the older installations are not encased in PVC as we have done for the past five years. Gophers, moles, armadillos, and other animals can chew into the cable. If the wire is exposed in the dirt, the problem is not always immediate, especially if the soil is dry. After a rain or snow, as the moisture settles into the ground, the wire becomes wet and shorts out. The result is an abnormally cold minimum temperature. As the dirt around the wire dries out, the minimum temperature becomes accurate again until the next rain or snow event. If this occurs, a new cable must be laid.

Call and notify any member of the cooperative program team if you suspect any of these problems are affecting your temperature sensor. One of us will fix the problem as soon as possible.

New Observers

The NWS staff would like to welcome David Burbank 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:

Marvin Moore – 10 years
Gorden Worden – 10 years
Peggy Howell – 10 years
Barbara Cotton – 10 years

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.

Cool July Weather

An unusually strong summer cold front affected Oklahoma and western north Texas from July 23rd to the 27th, bringing record cool temperatures and needed rainfall. The morning of Monday the 26th was the coolest for most locations. Here are some selected low temperatures measured by NWS cooperative observers on the 26th:

Fort Supply – 45 degrees
Hammon – 51 degrees
Jefferson – 54 degrees
El Reno – 57 degrees
Mangum – 57 degrees
Lindsay – 60 degrees
Quanah – 60 degrees

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

The Norman NWS Cooperative Observer Program Team:

Daryl Williams Forrest Mitchell Karen Trammell Ty Judd John Pike

In This Issue:

National Weather Service
Forecast Office
Norman, OK

Phone Number:
405-360-5928

Web Page:
www.srh.noaa.gov/oun

Meteorologist-in-Charge:
Mike Foster

Warning Coordination Meteorologist:
Rick Smith

Science and Operations Officer:
David Andra

Editor:
Karen Trammell

National Weather Service Forecast Office
1200 Westheimer Drive, Room 101
Norman, OK 73069

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.