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!

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Meet Your Weatherman Wayne Ruff

Hi! My name is Wayne Ruff, and I am a Senior Forecaster at the National Weather Service Forecast Office in Norman.

I have been a meteorologist with the NWS for 16 years, having worked in four Plains states, including Colorado. My interest in weather, however, began when I was about 6 years old. I vividly remember my family going into our neighbor's storm shelter while a funnel cloud was passing overhead. In second grade, I decided that, when I grew up, I no longer wanted to be a veterinarian, but rather, a weatherman.

During college, I did my share of storm chasing, but my real love for weather involves the changes of fall into winter. My living in Oklahoma may seem a paradox with the type of weather that I really enjoy, as the cool, crisp days of autumn set the tone for the most enjoyable days of the year.

These sunny, dry autumn days afford me the best opportunities to pursue several of my outdoor interests. Cycling, both on road and on trail, is very important to me. Although I bike year-round, autumn usually brings those dry and cool airmasses into Oklahoma and drives out

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Inside the WFO – The Situation Awareness Display System

By David Andra, Science and Operations Officer

Managing information flow during critical incidents is one of the most important jobs in a Weather Forecast Office (WFO). Whether it is a tornado outbreak, a flood, or a hazardous materials incident, it is important that the WFO be aware of not just the weather details, but also understand the situation facing our customers and the impact our information has on them. Since the situations involved are often very complex, with many different customers involved and a mixture of many critical incidents underway simultaneously, the Situation Awareness Display System (SADS) was developed for use by the WFO to help manage all facets of the situation.

The SADS consists of eight 21-inch LCD monitors suspended in one corner of the WFO operations area. Four specifically-designed Windows XP computers power the monitors and deliver a variety of information. Special software, some developed by the Norman WFO, provides television broadcasts,

The SADS was used during a severe weather event in western Oklahoma in March 2004 to view current weather information, the status of warnings, and video from local media storm chasers.

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The Advanced Hydrologic Prediction Services – A New Way To View Hydrologic Information

By Steve Kruckenberg, Service Hydrologist

The Advanced Hydrologic Prediction Services (AHPS) are a new and essential component of the Norman Forecast Office's hydrologic program. The AHPS are a web-based collection of hydrologic forecast information for the western two-thirds of Oklahoma and western north Texas.

These services display the magnitude and uncertainty of occurrence of floods or droughts, from hours to days and months in advance. These graphical displays are useful information and planning tools for financial administrators and emergency managers. The new AHPS information will allow governmental organizations, private institutions, and individuals to make more informed decisions about the hazards posed by floods and droughts.

Why were the AHPS created? Weather affects the economic and social lives of people in many ways, and severe or significant weather can have an impact on the fiscal interests of businesses. Weather can also disturb and disorganize local communities. As the region's population increases and infrastructure costs grow, natural disasters can threaten social stability.

Weather forecasting was initially developed in response to the need of

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the oppressive humidity that we have had during the last 4 months. The recent improvement in nearby mountain biking trails motivates me to ride at every opportunity, even through the relatively dry Oklahoma winters.

When I am not outside riding on those beautiful autumn or winter days or exploring some new ethnic recipe in the kitchen on those more rare rainy ones, I find that my professional interest in meteorology focuses on winter-type weather. I simply love the cleanness and purity of snow and cold. I think it is the fleeting surreal feeling and deafening quietness that a fresh snowfall brings that causes me to enjoy my job most during the winter. The possibility of an Oklahoma snowfall, especially where I live, gives me a personal view of weather forecasting that I enjoy. Admittedly, once the snow actually falls, I had rather be at home with a fire, in the mountains on skis, or behind a team of sled dogs. Involving myself in snow sports is a significant reason that I really love winter.

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topographic mapping, numerical simulations of hazardous materials release, analyses of specialized weather information, and the capability to monitor the status of critical data sets, such as stages at local river gauges and flash flood guidance values, and information flow to our customers.

SADS was designed first and foremost to support the information management needs of the WFO operations coordinator. This person is in charge of maintaining a *big picture* perspective of office operations and ensuring our services meet the needs of our customers during critical incidents. Many others on the WFO team use the SADS to help them keep track of current warnings and storm reports, assess changes in weather conditions, track the content of the office web page, and even monitor television news broadcasts.

The SADS represents a unique and innovative step by the Norman WFO to bring the best service possible to Oklahoma and western north Texas during weather or homeland security emergencies.

Tales, Legends, and Other Sayings

By Mike Branick, Senior Forecaster

Weather-related sayings and stories have been commonplace in many cultures since the beginning of time, many of which have been passed down through the years. Are they truth, or are they myth? Can they really be used to predict the weather? This column will examine a different popular weather saying in each issue, exploring its origins and whether or not there is any real meterological truth upon which it might be based.

If you have heard of a particular weather-related story or saying that you've always wondered about and would like us to look into it, please e-mail your questions and requests to *Karen.Trammell@noaa.gov*.

This Issue's Topic – "The Blue Norther". The term "blue norther" is familiar to most Oklahomans and Texans. Although the phenomenon in question is common to many mid-latitude regions of the world, the term itself seems to be particular to the southern Plains of the south central United States. It refers to a strong, fast-moving cold front that is followed by strong north winds and sharply-falling temperatures. Although the front itself may or may not be accompanied by clouds and precipitation, it typically is followed by a period of blue skies and unseasonably cold weather. Blue northers generally occur in the fall and winter.

A "norther" is simply a cold northerly wind. The specific origin of the term "blue norther" is uncertain, but we will give credit where credit is due and acknowledge that "blue norther," while used throughout the southern Plains area, originated in Texas. As for how the term was derived, and what "blue" means precisely, there are several possible interpretations based on available sources. Some say it is a reference to a norther that arrives "under a blue-black sky," referring to the appearance of clouds along its leading edge. Others will contend that it refers to the deep, cobalt-blue appearance of the clear sky that eventually accompanies the cold air. Still others claim that it describes the potential response to the cold air itself; that is, one supposedly will turn blue from the cold. Take your pick, as whatever the source, a blue norther is simply a strong, cold, north wind following a cold front.

Variations of this term include "blue whistler," "blue darter," and "blue blizzard." The latter two seem to be particular to Oklahoma, and "blue blizzard" no doubt refers to a blue norther accompanied by snow and blowing snow. References include:

1. *The Handbook of Texas* Online, *www.tsha.utexas.edu*

2. *Dictionary of American Regional English*; Harvard University Press, Cambridge, MA; 1985.

StormReady News

By Rick Smith,
Warning Coordination
Meteorologist

We are proud to announce the latest additions to the StormReady family in the Norman county warning area, the cities of **Altus**, **Cushing**, **Madill**, **Marietta**, and **Midwest City**.

The Norman StormReady Advisory Board also officially recognized **Pioneer Telephone Cooperative** in Kingfisher as the state's first StormReady Supporter. This new program is designed to recognize excellence in severe weather preparedness and planning by companies, businesses and institutions that do not formally meet the definition of a city, county, tribal nation, or university. Pioneer Telephone Cooperative has set the bar high when it comes to being ready to handle severe weather, with a comprehensive preparedness, education and response plan and by being a strong supporter of Weather Radio expansion across the region.

Congratulations to these communities! Watch for more new StormReady communities in the next edition of the newsletter!

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societies to protect themselves from storms, severe heat and cold, floods, and other extreme weather, and to minimize consequent economic losses. It is estimated that inland flooding claims 133 lives and in excess of $4 billion in property in an average year in the U.S. The NWS is the nation's agency entrusted with the mission to protect life and property against such natural disasters, and the AHPS provide the NWS with a new and more efficient way to help carry out this mission.

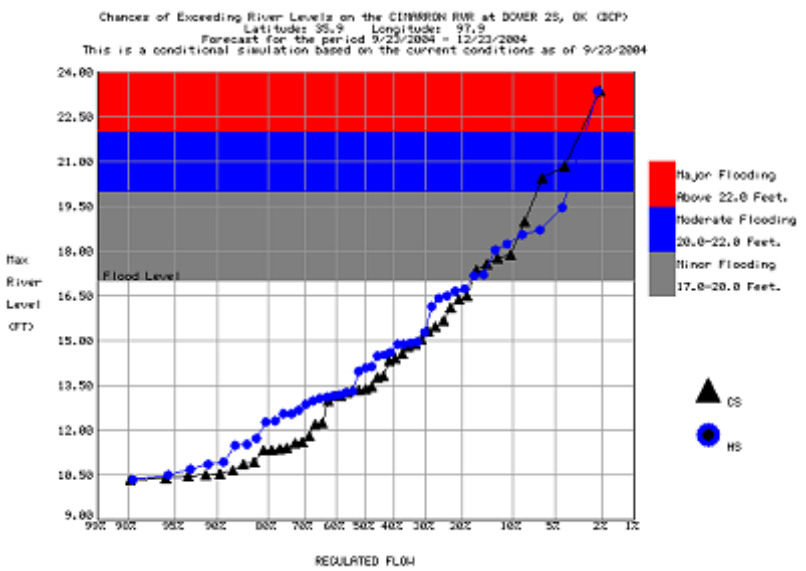
How are the AHPS displays developed? The AHPS displays are processed using sophisticated computer models and large amounts of data from a wide variety of sources, such as supercomputers, automated gages, satellites, Doppler radars, and weather observation stations.

The NWS uses the AHPS to provide hydrologic forecasts for almost 4,000 locations across the U.S., including 54 sites locally. These forecasts are developed by the River Forecast Centers (RFC) and processed and disseminated by the forecast offices. The forecast offices combine specific local information with the RFC forecasts, create graphical and text-based data, and distribute the data to a wide range of customers. At the Norman Forecast Office, the AHPS data are updated every 15 minutes.

What are the components of AHPS? The current group of AHPS information covers forecast periods ranging from hours to several days for all sites and to three months for 13 sites in the Norman county warning area. This information is presented through user-friendly graphical displays, identified by specific icons and links. The information, such as the peak forecast river level and when the peak is likely to be reached, are shown on plots of river levels versus time (hydrographs). Other probabilistic, historical, and possible impact information are also included.

An additional feature of the AHPS web site is a map of the river basins and various color-coded points along rivers for which information is available. The data are not limited to information about floods, and may also provide information about potential drought conditions. This principal collection of information may change over time to reflect the changing needs of customers.

Additional AHPS development. When the Norman Forecast Office AHPS web site went online in October 2003, the only graphical displays available included hydrographs of observed and forecast river stage data and area maps of the river forecast points. However, to increase the amount and quality of information, the Arkansas-Red Basin RFC (ABRFC) has completed development and implementation of long range probabilistic forecasts for the Arkansas River basin, including northern Oklahoma. The project area includes 13 river forecast points within the Salt Fork Arkansas River and Cimarron River basins in the Norman Forecast area.



Graphical display of a long range probabilistic forecast (weekly exceedance percentages) for the Cimarron River near Dover, Oklahoma.

To implement these probabilistic forecasts, the ABRFC calibrated and utilized the Ensemble Streamflow Prediction (ESP) model, which uses historical, current, and forecast precipitation, temperature, and streamflow data. These data are utilized to produce the probabilistic forecasts, which are used to create the graphical forecasts.

The ABRFC and West Gulf River Forecast Center (WGRFC) in Fort Worth will continue development of the long range probabilistic forecasts for the rest of the Norman forecast area. The implementation schedule for the remaining basins follows: Salt Fork Arkansas, Cimarron (2004); North Canadian, Canadian (2006); Washita, Brazos (2007); Wichita, North Fork Red, Salt Fork Red, Red mainstem (2008). Additional information can be found on the ABRFC web site at *www.srh.noaa.gov/abrfc/AHPS/ahps_abrfc_about.shtml*.

Who can use AHPS? AHPS forecast data are a basis for operation and management of flood-control structures by local, state, and federal agencies. Emergency management officials at local and state levels use these forecasts to fight floods, evacuate residents, and to take other measures to mitigate the impact of flooding.

As the population in Oklahoma and north Texas grows and more people choose to live near water, there is an increased need for the NWS to educate the public about flood hazards and to improve flood forecasts. The AHPS information can be used to meet the needs of a wide range of people, including utility companies, sandpit operators, recreational users, farmers and ranchers, households, and businesses.

Where are the AHPS information found? The home for AHPS information for the Norman county warning area is *www.srh.noaa.gov/cgi-bin/ahps.cgi?oun*.

How to give us feedback. We would appreciate your feedback on the new AHPS forecast displays. Let us know if they were helpful, and how we can make them more relevant to you. Questions and comments can be sent to us via e-mail at *sr-oun.webmaster@noaa.gov* or via the AHPS feedback link at *www.srh.noaa.gov/cgi-bin/ahps.cgi?oun&feedback*. Additional information about AHPS can be found at *www.srh.noaa.gov/oun/ahps* or on the NWS web site at *www.nws.noaa.gov/oh/ahps*.

Norman Forecast Office Notebook – A Complete Look at Events and Happenings

By Rick Smith, Warning Coordination Meteorologist
and Karen Trammell, Meteorologist Intern

Norman Forecast Office Awarded Department of Commerce Gold Medal! The U.S. Department of Commerce has awarded its prestigious Gold Medal to the Norman Forecast Office in recognition of their outstanding, life saving performance during a record tornado outbreak from May 4-10, 2003.

The Gold Medal was also awarded to the Storm Prediction Center, and to four other NWS offices (Pleasant Hill, MO; Paducah, KY; Memphis, TN; and Springfield, MO).

An unprecedented series of tornado outbreaks occurred in portions of the Great Plains, Midwest and Mid-South that week. During the seven-day period, a total of 393 tornadoes were reported in 19 states resulting in 39 deaths and approximately $600 million in damages.

The Norman Forecast Office provided exceptional information services to central and western Oklahoma and western north Texas during this period. Forecasters dealing with repeated episodes of severe storms issued over 400 severe thunderstorm and tornado warnings during the very active period from May 6 through May 16. This was in addition to a continuous stream of local weather information that flowed from the WFO.

NWS Product Changes Here! National Weather Service offices across the United States made changes to the way we transmit our text information. Effective November 9, 2004, we began transmitting ALL of our text information products using new communications identifiers. This means some of our customers and partners may need to reprogram their systems to ensure they continue to receive forecasts, watches, warnings and other information from the Norman Forecast Office.

For more information and complete details, visit the NWS service change web site at *www.nws.noaa.gov/om/notif.htm*.

Winter Weather Awareness Day in Texas and Oklahoma. Wednesday, December 1st is Winter Weather Awareness Day in Oklahoma and Texas. The National Weather Service, along with state and local emergency management officials, encourage you to take the time to think about the upcoming winter weather season and to think about ways you might prepare yourself should a dangerous winter storm affect us this season. Do you have an emergency supply kit that will sustain you and your family for at least three days? Do you have multiple ways to receive critical NWS weather information, including a tone alert weather radio? What would you do if you lost electrical power, heat, and water for several days? The NWS Norman web site, at *www.srh.noaa.gov/oun/winterwx*, provides information on how you can prepare for the upcoming winter weather season – check it out!

SKYWARN Recognition Day. The National Weather Service in Norman appreciates the hard work and dedication of amateur radio operators throughout our area. Hams assist the NWS before, during, and after significant events and provide valuable input to allow forecasters to make better warning decisions and to help protect their local communities.

Once again this year, the National Weather Service, in conjunction with the American Radio Relay league, will observe SKYWARN Recognition Day. 2004 will mark the fifth year for this event, which celebrates the contributions that volunteer SKYWARN radio operators make to the National Weather Service. During the day, amateur radio operators, located at National Weather Service offices across the United States, will contact other radio operators around the world.

This year's SKYWARN Recognition Day will begin at 6 PM Friday, December 3rd and conclude at 6 PM Saturday, December 4th. For more details, visit the web site at *hamradio.noaa.gov*.

Storm Spotter Training 2005. The arrival of winter can only mean one thing – severe weather season is right around the corner! It's this time of year when communities begin to get ready for the upcoming severe weather season by hosting storm spotter training sessions.

The Norman Forecast Office assists local communities by providing spotter training at the invitation of the local emergency management agency. An NWS meteorologist provides the training, which typically lasts 2 to 2 ½ hours, and includes information on NWS severe weather information, spotter safety, and severe storm identification techniques.

In most cases, available time and resources allow us to visit each county only once. This usually means that spotter training should be coordinated between various spotter groups in the county to pick a date that will allow the highest participation. Classes are usually offered from late January through the end of March. Spotter training is not offered beyond this to avoid conflicts with the peak of severe weather season.

The 2005 spotter training sessions will include new and improved presentations from last season.

Watch our website for more details, and a complete schedule of storm spotter training sessions coming soon!

Staffing Changes at the Norman Forecast Office. The changing of the seasons from summer to fall brought new professional opportunities for two members of the Norman Forecast Office staff, bringing their departure and the addition of two more members in their place.

In mid-August, Electronic Systems Analyst (ESA) Jeff Williams accepted a promotion at the National Weather Service's Southern Region Headquarters in Fort Worth. Jeff previously worked at the Fort Worth Forecast Office so he is no stranger to the area. More recently, in mid-October, Information Technology Officer (ITO) Steve Nelson accepted a Senior Forecaster position in the Atlanta, Georgia Forecast Office. Their contributions to the office will surely be missed.

The new opportunities for Jeff and Steve afforded new opportunities for our new ESA, Jeff Engel, and ITO, Matt Foster. Jeff comes to us from across the hall, where he worked at the NWS Radar Operations Center, while Matt arrives from the Shreveport, Louisiana Forecast Office. We would like to welcome the newcomers to our office and look forward to working with them in the months and years ahead.

Weather in Review: The Heavy Rainfall and Flood Event of July 27th-30th

By Steve Kruckenberg, Service Hydrologist

The summer of 2004 was a topsy-turvy season weather-wise, and the most significant heavy rainfall and flooding event of the period occurred between July 27th and 30th. During this period, a strong, slow-moving upper level storm system moved through Texas, producing multiple rounds of thunderstorms along a near a quasi-stationary front in north Texas and southern Oklahoma.

July 27-29 Rainfall Totals. Rainfall totals for the 48-hour period ending at 7 am on July 29 reached 2 to 4+ inches in a wide swath that included most of western north Texas and south central Oklahoma. The hardest hit areas included the Brazos River basin in Knox and Baylor counties and parts of the Wichita and Little Wichita River basins in Knox, Baylor, Archer, and Clay counties.

Storm total precipitation amounts of 4.5 to 7+ inches were observed in the southern halves of these three Texas counties, and some unofficial rainfall totals to 10 inches were reported near Archer City and Bomarton.

Flooding in western north Texas. The subsequent heavy runoff produced by these rains generated flash flooding and riverine flooding in western north Texas and flash flooding in south central Oklahoma. Minor to moderate rural flooding occurred along the Brazos River in Knox and Baylor counties on July 28-30 after the Brazos River basin received rainfall amounts of 2 to 3+ inches. The Brazos River at Seymour crested at 14.94 feet, 2.94 feet above flood stage and remained above flood stage from 1 pm on July 28 to 1 am on July 30. This crest was the eleventh highest of record, and the highest since June 4, 1990, when the Brazos River crested at 17.37 feet.

Moderate to major rural flooding occurred along the South Wichita River in Knox County near Benjamin on July 28-29. The South Wichita River crested at 16.8 feet, 4.8 feet above flood stage and remained above flood stage from 6 am on July 28 to 10 am on July 29. This flood crest was the third highest crest of record at the USGS gage site.

Further downstream, below the confluence of the South Wichita River with the Wichita River, moderate to major rural flooding occurred along the Wichita River in Baylor County near Seymour and just upstream of Lake Kemp on July 28-29. The Wichita River crested at 16.84 feet, the fifth highest crest of record. The heavy runoff from the Wichita and South Wichita Rivers was beneficial for the Wichita Falls area as the reservoir levels at Lake Kemp rose several feet.

The Little Wichita River basin in Archer and Clay counties also saw significant rises during late July. The reservoir levels increased at both Lake Kickapoo and Lake Arrowhead. Moderate to major flooding occurred along the Little Wichita River in Archer County between Lake Kickapoo and Lake Arrowhead near Archer City on July 28-30. The Wichita River crested at 25.21 feet, the tenth highest crest of record.

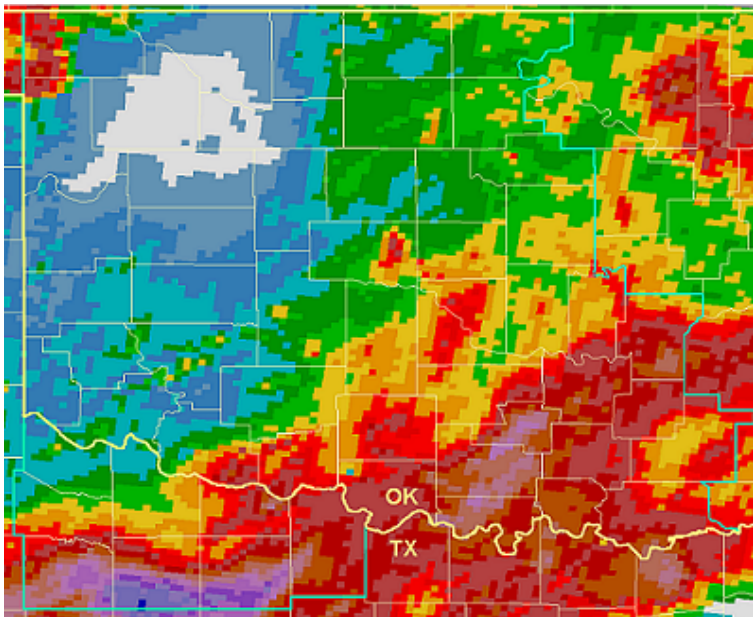
Minor rural flooding occurred along the Little Wichita River in Clay County near Henrietta on July 29. The Little Wichita River crested at 18.5 feet, 1.5 feet above flood stage and remained above flood stage from 7 pm on July 28 to 4 pm on July 29.

Numerous highways and roads in Knox, Baylor, Archer, and Clay counties were closed by floodwaters. Some of these roads include U.S. Highways 82, 183/283, 277, and 281, Texas State Highways 6, 25, 79, 114, 174, and 222, and Farm-to-Market Roads 171, 172, 210, 2070, 2178, and 2581.

Flash Flooding in South Central Oklahoma. During the late evening and early morning of July 28-29, thunderstorms produced rainfall totals of 3 to 6 inches over parts of Murray, Carter, and Love counties. The heavy rainfall produced flash flooding and nuisance flooding in several places, including Turner Falls. Up to 6 inches of rain fell in the area, closing the park for approximately 24 hours beginning at 3 am on July 29 as water levels in some streams and creeks were raised 1 to 4 feet in some places. Floodwaters covered some roads during the event, and about 120 campers were unable to use their vehicles due to the high water. Two picnic tables were washed away, and the strong currents and high waters also covered beaches and closed two swimming areas in the park.

The Chickasaw National Recreation Area near Sulphur also saw flash flooding during the early morning of July 29, as a low water bridge in the park was covered with floodwaters and debris. In addition, Shepherd Lane west of Sulphur was closed after a tinhorn along the roadside washed out and created a large hole in the road. Nuisance flooding at Lake Murray also inundated picnic areas at the lake during the morning and afternoon of July 29.

In a season that included spring and fall-like weather patterns, the late July heavy rainfall and flood event in western north Texas and southern Oklahoma was the most significant weather event during the summer of 2004.



Map of radar derived precipitation estimates during the 48-hour period ending at 7 am on July 29. The color scale ranges from the gray areas, which indicate little or no rain, to lavender and dark purple areas, which represent amounts of 4 to 8 inches.

Halloween and Thanksgiving Weather History for Oklahoma City and Wichita Falls

By Ty Judd, Meteorologist Intern

Summer has passed, and autumn is in full swing. The arrival of autumn means cooler temperatures, colorful leaves, football, and playoff baseball. It also means that two popular holidays are fast approaching - Halloween and Thanksgiving. During trick-or-treating escapades and family get-togethers, you may remember a time when the temperature seemed unusually warm or cold, and maybe there was a year that it rained or even snowed. With the approach of these two holidays, a little review of weather history on these holidays for the Oklahoma City (OKC) and Wichita Falls, (SPS) areas seemed appropriate.

While the average high and low temperatures for both cities are near average for this time of year, these averages do not tell you what kind of extremes have occurred over the years. Both cities have had temperatures that have been very warm and very cold, and both rain and snow, some of it heavy, have fallen.

	Halloween		Thanksgiving	
	Hi	Lo	Hi	Lo
OKC	66.3	45.8	56.2	34.8
SPS	72.2	48.5	60.3	36.8

Halloween. The average high temperature in Oklahoma City is 66.3 degrees and 72.2 degrees in Wichita Falls. In 1938, the high temperature for OKC rose 20 degrees higher than the average to 86 degrees, which is the highest temperature ever recorded on Halloween. That same year in Wichita Falls, the temperature topped out at 90 degrees, although this was not the highest temperature recorded. Instead, four years prior to 1938, the temperature in SPS reached 92 degrees. On one other occasion, in 1992, the temperature topped 90 degrees in SPS. The temperature has risen above 80 degrees twelve times in OKC and 26 times in SPS. On the flip side, the high temperature has fallen below 50 degrees twelve times in OKC and 6 times in SPS. On one occasion, in 1991, the high temperature at both locations fell below 40 degrees, when each recorded a high temperature of 36 degrees.

The average low temperature is 45.8 degrees for OKC and 48.5 degrees in SPS. These temperatures do not seem that bad when you consider how cold it can be. The low temperature in 1991 was 27 degrees in OKC and 30 degrees in SPS. While, at first glance, these seem like pretty cold temperatures, except that two years later, the temperature dropped to 16 degrees in OKC and 21 degrees in SPS. Each temperature was the coldest recorded for Halloween. On eight other occasions in OKC and two in SPS, the low temperature has fallen below freezing.

While low temperatures have proven to be quite cold on occasion, they also can feel like late spring. The low temperature for OKC in 1982 was 65 degrees, well above the average. Eight other times the temperature stayed above 60 degrees. In SPS, the temperature has also remained above 60 degrees eight times. The highest low temperature ever recorded at SPS was 68 degrees, in 1946.

Precipitation has fallen 38 percent of the years in OKC and SPS. The highest rainfall total for each location fell in 1971, when 1.82 inches of rain fell in OKC and 1.93 inches fell in SPS. Rainfall totals have exceeded an inch three other times in OKC and two other times in SPS. Light snow fell in 1991 at each location, marking the only time that snow was recorded in SPS. Light snow also fell in OKC back in 1941.

Thanksgiving. The average high temperature in OKC is 56.2 degrees and 60.3 degrees in SPS. In 1965, the temperature rose to 84 degrees in OKC and 89 degrees in SPS, both of which broke the daily record high temperature for the 25th of November. Temperatures above 80 degrees are few. In fact, 1965 was the only time the temperature exceeded 80 degrees in OKC on Thanksgiving Day. However, the temperature rose past 80 degrees on two other occasions, 1970 and 1988, in SPS.

Strong arctic cold fronts are not uncommon across Oklahoma and north Texas during the month of November. In 1919 and 1993, arctic air plunged south out of Canada, causing the temperature to only rise to 28 degrees in OKC. The high temperature at SPS in 1993 reached only 30 degrees, marking the only time the temperature did not reach at least the freezing mark. In OKC, the temperature did not rise above 32 degrees two other times, in 1985 and 1992.

The average low temperature in OKC is 34.8 degrees and 36.8 degrees in SPS. The coldest low temperature in OKC occurred in 1993, the same year the coldest high temperature was recorded, when the temperature fell to 15 degrees. SPS fell to 20 degrees that year. However, this is not the coldest low temperature for SPS. In 1938, the low temperature fell to 19 degrees. The temperature in OKC during that same year fell to 16 degrees.

While low temperatures have obviously been very chilly, temperatures have also been relatively warm. Temperatures above 50 degrees have occurred on seven occasions in OKC and six in SPS. In 1913, 1933, and 1966, the low temperature in OKC only fell to 60 degrees. Also in 1966, the temperature in SPS fell to only 60 degrees.

Thanksgiving has not been conducive to ample amounts of precipitation. Precipitation has fallen 27 times in OKC and 19 in SPS. The heaviest rain for OKC was in 1896, when 1.59 inches of rain fell, and in 2000, for SPS, when 1.41 inches fell. Much less rain fell over OKC in 2000, with only 0.11 inches reported. Precipitation totals over one half inch have occurred only once in OKC and twice in SPS.

It has snowed seven times in OKC and four times in SPS. Only a trace of snow was recorded each time in SPS. The highest daily total in OKC is 1.4 inches, which fell in 1968. This is the only time that snow totaled more than an inch.

While it is true that temperatures and precipitation were quite average for the majority of the years, there have been times when the values far exceeded or fell below the average. Some years an outdoors football game had to be substituted for football games on television, and sometimes candy just isn't worth walking around in the heavy rain or bundling up in the freezing temperatures.

Cooperative Observer Notes

Wintertime Precipitation – Measuring and Documenting It

By Forrest Mitchell, Hydrometeorological Technician

The leaves are changing color and dropping. The days are getting shorter and the nights longer. Soon, the first forecasts of freezing rain, sleet, and snow will debut. Once again, cooperative observers will rise to the challenge of accurately measuring ice and snow accumulations. Here are a few guidelines and tips to help you with the task.

Before the winter precipitation arrives, the funnel and measuring tube should be removed from the rain gage and left indoors. This is especially true at those sites with plastic funnels and tubes.

When freezing precipitation occurs, the outer can often stick to the gage stand. To prevent this from happening, you might want to try one of two things: spray WD-40 or a similar lubricant on the inside surface of the stand and the bottom of the outer can or place a smooth piece of wood between the bottom of the stand and the outer can. Either method makes it easier to separate the outer can from the stand.

When it is time to measure the freezing rain, sleet, or snow, the frozen precipitation must be melted to obtain the water equivalence. The easiest way to do this is by adding warm water. If the precipitation has stopped at observation time, the outer can may be brought indoors to do this. If the precipitation is ongoing, take a pre-measured amount of warm water outside, melt the ice, and pour it into a bucket or dishpan to take inside for measuring. Pour warm water into the measuring tube, taking care to measure and write down how much water is in the tube. Pour the warm water into the outer can, and swirl it around until everything has melted. Place the funnel on top of the tube, and taking great care to avoid spilling any liquid, slowly pour the melted precipitation from the outer can into the tube. Measure the amount of liquid in the tube, subtract the amount of warm water you added, and enter this number on your B-91 weather form.

Measuring snowfall on the ground will always be a challenge in this part of the country due to the wind. Using your metal snow stick, take several readings from spots where the snow is fairly uniform, away from drifts. If you are measuring on a grassy surface, clear away a spot of snow so you can see the bottom of the snow layer to keep from including the depth of the grass in the measurement. If you use a snow board, place some kind of marker next to it so that you will be able to find it when it is covered by snow.

When you are ready to enter the amounts on your B-91, enter the total meltdown, to the nearest hundredth of an inch, in the same column as you do rainfall. The next column to the immediate right is where you enter the 24-hour snowfall to the nearest tenth of an inch. The next column is the total amount of snow on the ground, to the nearest whole inch. This should be recorded until all the snow is gone. Here is an example:

	24-Hour Amounts		At Ob
	Melt	Snow-fall	Ground
Day 1	0.35	3.5	4
Day 2	0.00	0.0	3
Day 3	0.22	2.4	5
Day 4	0.00	0.0	3
Day 5	0.00	0.0	1
Day 6	0.00	0.0	T
Day 7	0.00	0.0	0

New Observers

The NWS staff would like to welcome Marjorie Oard to the NWS Norman cooperative observer program. We look forward to working with this new observer for many years to come.

Award Recipients

The following observers have recently received Length of Service awards:

Phillip Culbreath – 10 years
Harold Ebers – 15 years
Nancy Rozzell – 20 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.

Observers Needed

Are you interested in weather? Do you live in Apache, Arnett, Canton, Custer City, Munday, or Purcell? Call 405-360-5928 for more information about becoming an official NWS cooperative observer.

First Freezes

The first freezing temperatures of the season occurred on the morning of October 2nd. Fort Supply 3 SE reported a morning low of 28 degrees, while Freedom and Gage fell to 31 and 32 degrees, respectively. To date, approximately half the area has fallen to the freezing mark so far this season.

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**

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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.