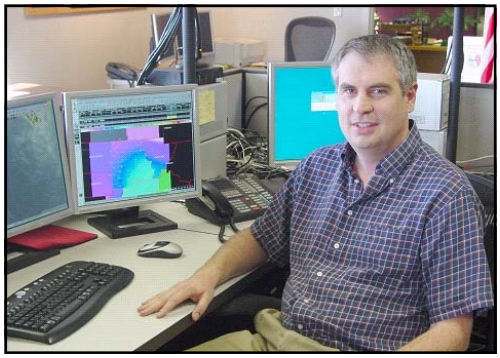
The Southern Plains Cyclone

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 4 | Winter 2006 | Issue 1

Meet Your Weatherman David Andra



Hi! I am David Andra, the Science and Operations Officer (SOO) for the National Weather Service's Norman Weather Forecast Office.

I was born and raised in Kansas where, like Oklahoma and North Texas, the weather was characterized by dramatic and sometimes violent changes. Tornadoes, floods, blizzards, and droughts were all part of growing up on the Plains. These experiences provided my inspiration to study meteorology and pursue a career in the National Weather Service.

I moved to Norman, Oklahoma in the summer of 1983 and enrolled as a meteorology major at the University of Oklahoma. The professional meteorological community in Norman provided not only academic opportunities, but also opportunities to participate in research and operational weather warning and forecast activities. I was fortunate to participate in projects leading up to the deployment of the nationwide network of Doppler radars and development of a flash flood warning system. My first paying job in meteorology was that of NOAA Weather Radio broadcaster at the Oklahoma City

See **Weatherman** on Page 3

Weather Data and GIS

By Matt Foster, Information Technology Officer

"What's the forecast for Oklahoma City?"

That's a question that we get many times a day at the National Weather Service, and typically the answer is pretty straight-forward: "Mostly cloudy today and a high around 52. There's a 30 percent chance of rain tonight, and the low will be near 42."

Sometimes, however, the request for a forecast is not so simple. For example, an emergency manager or official from the Forestry Service might call and say, "We have a fire near latitude 36.40N, longitude 97.86W, and we need to know the temperature, relative humidity and transport wind at every hour for the next 6 hours." This type of request would be very difficult to answer over the phone, and prone to errors in relaying the message. However, this type of data request can be filled quite nicely by using a Geographic Information System, or GIS.

GIS provides a means by which data, almost *any* type of data, can be very accurately mapped to earth coordinates. This type of data is commonly referred to as *geo-referenced data*. The coordinates can be either *geographic* (i.e. latitude and longitude) or *projected* (e.g. Mercator, Polar Stereographic, etc.). The National Weather Service Forecast Office in

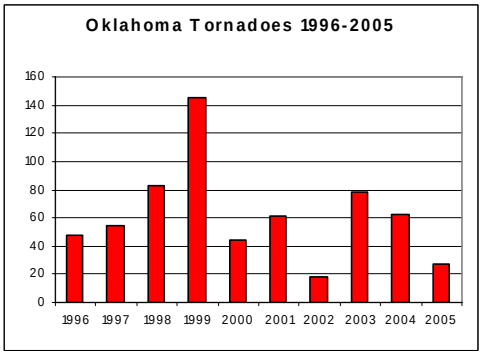
See **GIS** on Page 5

Severe Weather 2005 in Review

By Rick Smith, Warning Coordination Meteorologist

Although there were a few significant severe weather events in 2005, the year will go down as one for the record books in terms of tornadoes in Oklahoma.

Preliminary statistics show 27 tornadoes were reported in the state of Oklahoma in 2005. This is half of the 50 year average of 54 tornadoes. There have been years that have seen fewer tornadoes, but 2005 stands out for a couple of reasons. For the first time since complete tornado records have been kept, Oklahoma had no tornadoes in May. Also, there were no significant (F2-F5) tornadoes in the state for the entire year. This was the first time that had happened since 1988. Only five tornadoes were reported in the eight north Texas counties served by NWS Norman.



Oklahoma Tornadoes for the past 10 years.

The National Weather Service Forecast Office in Norman issued 53 tornado warnings during 2005. Most of these were during March, April, May and June, but there were several issued during September and October. There were 984 severe thunderstorm warnings, and 63 flash flood warnings.

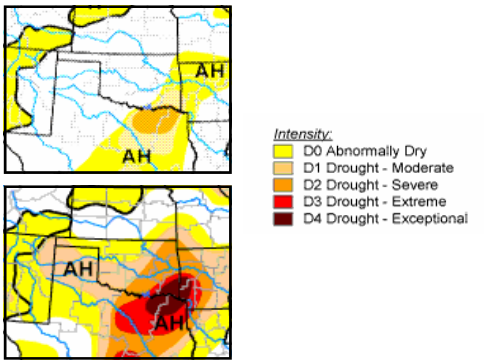
Climate Commentary

By Jennifer Palucki, Meteorologist Intern

Warm and Dry Autumn. Oklahoma City was warm and dry through the months of September through November in 2005. Oklahoma City finished in the top ten for warmest and driest autumns since records began in 1891. It was the 7th driest Autumn on record with only 3.06 inches of precipitation falling. Normal rainfall for the months of September through November is 9.73 inches. The driest autumn on record occurred in 1952 when 2.22 inches of precipitation fell.

This autumn tied for the 9th warmest on record with an average temperature of 64.8 degrees. The warmest autumn on record occurred in 1931 with an average temperature of 68.0 degrees.

Drought. The persistent warm and dry conditions have left much of Oklahoma and western north Texas in a moderate to severe drought.



Figures adapted from the Drought Monitor website at *http://www.drought.unl.edu/dm/index.html*

The top figure shows the drought status for Oklahoma and surrounding area on October 11, 2005. At this time only extreme southeast Oklahoma was in a moderate drought. The bottom figure shows the drought conditions on December 20, 2005, only 10 weeks later. Conditions areawide have drastically deteriorated as southeast Oklahoma has worsened to exceptional drought and much of the rest of the state has amplified to moderate to severe drought conditions.

It is feared that the drought will persist and/or worsen further. The Climate Prediction Center's forecast for January through March calls for continued above normal temperatures and below normal precipitation for Oklahoma and western north Texas.

Record January Warmth. January has not even ended yet, but several high temperature records have already been set. At Oklahoma City, January 1st, 7th and 8th set high temperature records with temperatures of 77, 76 and 72 degrees, respectively. These record temperatures, combined with the fact that most other high temperatures were at or above normal, and with no significant cool down in sight, January in Oklahoma City could become the warmest January on record. Similarly at Wichita Falls, high temperature records were broken on the 1st, 3rd, 7th and 11th, with temperatures of 81, 85, 83 and 80 degrees, respectively.

Tales, Legends, and Other Sayings

By Mike Branick, Lead 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 meteorological 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 *Jennifer.Palucki@noaa.gov*.

This Issue's Topic – "Ten inches of snow equals one inch of rain."

The "ten to one" (10:1) ratio is commonly used to estimate how much actual water exists in a given amount of snow. But this rule is only a rough estimation, and actual snow:water ratios vary a lot - more than most people realize from one snow event to the next. Ten-to-one is actually an approximate average; observed ratios can range as low as four to one (4:1) or less in a wet, "slushy" snowfall to as much as 50 to one (50:1) in a dry, "fluffy" snow that falls when winds are light and the air is exceptionally cold.

Differences in snow-to-water ratios are based not only on the amount of liquid water present in the snow, but the size and type of ice crystals that make up the individual snowflakes. Air temperature and humidity (both at surface and aloft), and to some extent wind speed, are determining factors in whether snowfall is dry and powdery (high ratio) or wet and slushy (low ratio).

For those interested in more specific snow-to-water ratios for the Oklahoma and north Texas area, a study conducted at Saint Louis University (see reference) found an average ratio of 11.6:1 over the Norman forecast area, based on data from 1971-2000. Regionally, the average ranged from just over 10:1 in southeast Oklahoma (Durant area) to just over 12:1 in far northwest Oklahoma (Harper County). The median value was 10.2:1 - half of all snow events had a higher snow:water ratio than this, and half were lower. Half of all events had ratios between 7.7:1 and 14.3:1. Extreme values ranged from less than 4:1 in a few events to more than 30:1 in a handful of others.

For most cases of snowfall in the Oklahoma and north Texas area, 10:1 is a reasonably good estimate. But one should use a lower ratio, as low as 5:1 or so, in snow events dominated by exceptionally wet, "sloppy" snow. Surface temperatures during these events typically are close to or just above freezing (low to mid 30s F or higher). Likewise, the ratio should be adjusted upward, to as much as 20:1 or so, when surface air temperatures are unusually low (teens to single digits F) and the snow is dry and powdery.

Reference: http://www.eas.slu.edu/CIPS/Research/snowliquidrat.html

Climate (continued)

Christmas Weather for Oklahoma City and Wichita Falls

By Ty Judd, Meteorologist Intern

Everybody loves Christmas time. You know, the time of year where lights are appearing on many homes and presents are exchanged. Christmas break is beginning, bags are packed, and families set off to visit friends and loved ones. Weather plays a tremendous part in planning for the most wonderful time of year. Even though the holidays have already passed, we wanted to let you know what kind of weather is "normal" for that time of year. Most years the weather is pleasant. High temperatures average in the middle to upper 40s across central Oklahoma and in the lower 50s across western north Texas. By the time Santa arrives, temperatures are in the middle 20s near Oklahoma City and close to 30 degrees at Wichita Falls. Precipitation is usually not a problem. There have been 26 days since 1891 in Oklahoma City with precipitation on Christmas Day, 10 days of which had snow. At Wichita Falls, there have been 17 days with precipitation, seven of which had snow. So, all in all, the weather during the Christmas holiday is relatively pleasant.

However, just like any other day of the year, there are a few years that just don't follow the rules. On Christmas Eve in 1955, the temperature at Oklahoma City rose to a balmy 86 degrees, with a low temperature of 50 degrees. That same day at Wichita Falls, the temperature reached 87 degrees, with a low temperature of 53 degrees. Needless to say, both of these temperatures set records for that day. The temperature on Christmas day of that year fell to a more "normal" value of 54 degrees at Oklahoma City, and 57 degrees at Wichita Falls. The highest temperature recorded on Christmas Day was 73 degrees at Oklahoma City, set in 1922, and 75 degrees at Wichita Falls, set in 1942 and 1971.

Of course, just like there are warm temperatures on Christmas Day, there are very cold temperatures. Santa Clause brought the North Pole temperatures with him in 1983. On December 24th in Oklahoma City, the temperature warmed to only 3 degrees. The low temperature was 0 degrees. The next day, temperatures warmed to only 13 degrees, with a low temperature of -1 degrees. On Christmas Eve in Wichita Falls, the temperature was 11 degrees, with a low temperature of 6 degrees. The next day, the temperature was 14 degrees, with a low temperature of 5 degrees.

For those of us who prefer a white Christmas, Oklahoma City and Wichita Falls are probably not the places to be. Precipitation is not necessarily uncommon on Christmas day, but snow seems to be the exception, rather than the rule. Snow has fallen in Oklahoma City on Christmas Eve 18 times, while only falling 10 times on Christmas Day. At Oklahoma City, more than an inch of snow has fallen on Christmas Eve four times, with two of those being over two inches. On Christmas Day, there has been only one day that snow has totaled over an inch. Way back in 1914, 2.5 inches of snow fell on Christmas Eve in Oklahoma City, and 6.5 inches fell on Christmas day. When the snow finally settled, six inches of snow was on the ground! This was the most snow recorded and the most snow on the ground during this time period. There have only been a handful of times when there has been snow on the ground on Christmas morning. The last time that there was more than an inch of snow on the ground was in 2002, when two inches had fallen a couple of days earlier. In Wichita Falls, Christmas Eve has seen only four days with snowfall, and only seven days on Christmas Day since 1924. Santa was smiling in 1975 after two inches of snow fell on Christmas Eve. On Christmas Day, snowfall totaled one inch. These two instances were the only time that snow eclipsed one inch for either day.

With all of the above information, you can see that the weather during the Christmas holiday is normally pleasant at both Oklahoma City and Wichita Falls. Temperatures are normally pleasant, and precipitation is usually not a problem. However, just like any other day of the year, the weather doesn't always behave as planned.

National Severe Weather Workshop

The National Severe Weather Workshop is set for March 2-4, 2006. It will be held at the Reed Center in Midwest City, Oklahoma, and will once again feature some of the nation's experts on hazardous weather. For the first time this year, the workshop will give participants a chance to become severe weather forecasters, emergency managers or television meteorologists, as we participate in a severe weather exercise. Saturday, March 4th, will feature a new course on ways to more effectively observe storms, both on radar and visually.

For more information and registration details, visit the NSWW 2006 website at *www.norman.noaa.gov/nsww2006.*

Weatherman: From Page 1

NWS Forecast Office at Will Rogers World Airport. At the time, the University of Oklahoma was under contract with the government to provide around-the-clock coverage of student broadcasters.

In May 1987, I was selected to fill a position in the National Weather Service as a meteorologist intern in Oklahoma City; then in 1989, I transferred to the Norman office as a journeyman forecaster. I completed my Master's degree in Meteorology in 1990 and over the next few years played a role in many activities and projects supporting the modernization of the National Weather Service in the 1990s.

My present position as Science and Operations Officer ensures that I remain close to new research findings and technological developments in meteorology. I am excited by the prospect of our office moving into the new National Weather Center facility (www.nwc.ou.edu) later this year. This move will bring many new opportunities to collaborate with other weather organizations and improve our life-saving services to the citizens of Oklahoma and North Texas – our ultimate responsibility at the Norman Weather Forecast Office.

Hurricane Season 2005 Wrap-Up

By Jennifer Palucki, Meteorologist Intern

The 2005 Atlantic Basin hurricane season will be remembered as the most active hurricane season in history. A total of 30 systems developed across the Atlantic Basin. Of these 30, there were 14 hurricanes and 13 tropical storms. Since storms are not named until they reach tropical storm strength, this means only three systems remained unnamed as tropical depressions.

In a typical hurricane season, which extends from June 1 to November 30, there are 10 named storms, which means of tropical storm strength or greater, and six of those become hurricanes. Of those six, between two and three become major hurricanes (category 3 or greater). This year was anything but normal.

The 30 tropical systems this year set records in many different categories. To start, the 27 named systems this year broke the record for most named systems in a season. The previous record was 21 named storms which was set in 1933. This was the first time in history that the Greek alphabet was used to name storms because the standard list of names was exhausted.

The 14 hurricanes that occurred this season not only more than doubled the average amount in a given year, but also set the record for most number of hurricanes in a given season since records began in 1851. The previous record for most hurricanes in a season was set in 1969 with 12 hurricanes. Of the 14 hurricanes that occurred this year, there were 7 major hurricanes. This ties the record for the second most number of major hurricanes to occur in a season. The last time this occurred was in 1961. Eight major hurricanes occurred in 1950, which holds the record for most major hurricanes in a season.

Numerous other records were broken for strongest hurricane, in terms of lowest pressure recorded, this year as well. Hurricane Wilma bottomed out at a record low pressure of 882 mb. Hurricane Wilma now has the record for strongest hurricane ever in the Atlantic Basin. Other hurricanes this year also made it onto the top ten strongest hurricane list. Hurricane Rita dropped to 897 mb, which makes Rita the 4th strongest hurricane in the Atlantic Basin. In addition, Hurricane Katrina fell to 902 mb, which is the 6th strongest hurricane on record.

The 2005 hurricane season will also be remembered for the substantial damage sustained across southeast United States. We will always remember the pictures of New Orleans after Hurricane Katrina hit. The damage from Hurricane Katrina alone have cost nearly 80 billion dollars. This supersedes Hurricane Andrew of 1992 as the costliest hurricane ever. This entire hurricane season has cost the United States nearly 110 billion dollars.

Hurricane Katrina was also one of the deadliest hurricanes in history. At an estimated 1200 deaths, Katrina will be ranked among the top 5 deadliest that hit mainland United States. Katrina was the deadliest storm to hit the United States since an unnamed southeast Florida hurricane in 1928 where between 2500 and 3000 people died. The 1900 Galveston, Texas hurricane is the deadliest hurricane ever with over 8000 deaths estimated.

It seemed as though the 2005 hurricane season would not end as Tropical Storm Zeta chugged away until January 6, 2006. Zeta surpassed Hurricane Alice of 1954 for the longest lived tropical system into January.

We will remember the 2005 hurricane season not only for the records it set, but also for the lives it touched, and the lives it took. As scientists remained astonished by the numbers, we prepare for next year in hopes that it's not of the magnitude of this year. However, meteorologists predict that the 2006 season will be another active season.

Reference: www.nhc.noaa.gov

2005 Atlantic Basin Tropical Systems

Name	Month	Max Wind (mph)
Tropical Storm ARLENE	June	70
Tropical Storm BRET	June	40
Tropical Storm CINDY	July	70
Hurricane DENNIS**	July	150
Hurricane EMILY**	July	155
Tropical Storm FRANKLIN	July	70
Tropical Storm GERT	July	45
Tropical Storm HARVEY	August	65
Hurricane IRENE	August	105
Tropical Depression TEN	August	35
Tropical Storm JOSE	August	50
Hurricane KATRINA**	August	175
Tropical Storm LEE	Aug/Sept	40
Hurricane MARIA**	September	115
Hurricane NATE	September	90
Hurricane OPHELIA	September	85
Hurricane PHILIPPE	September	80
Hurricane RITA**	September	175
Tropical Depression NINETEEN	Sept/Oct	30
Hurricane STAN	October	80
Tropical Storm TAMMY	October	50
Subtropical Depression TWENTY-TWO	October	35
Hurricane VINCE	October	75
Hurricane WILMA**	October	175
Tropical Storm ALPHA	October	50
Hurricane BETA**	October	115
Tropical Storm GAMMA	November	55
Tropical Storm DELTA	November	70
Hurricane EPSILON	Nov/Dec	85
Tropical Storm ZETA	Dec/Jan	65

** indicates major hurricane

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

By Rick Smith, Warning Coordination Meteorologist

Severe Weather Awareness Week. Oklahoma and Texas Severe Weather Awareness Week will be observed March 6-12. During this week, the National Weather Service will work with emergency management officials and the media to make people aware of the upcoming severe weather season, and ways they can get ready and stay safe. Stay tuned for more details.

McReady. NWS is partnering with Oklahoma Emergency Management and other agencies to participate in McReady Oklahoma 2006. This awareness campaign is designed to educate people about the hazards springtime weather can bring and ways to stay safe. McDonald's restaurants across the state of Oklahoma participate in the campaign, along with a variety of state agencies.

Spotter Training Begins. NWS Norman began its 2006 storm spotter training season in mid January, and classes will continue through the end of March. NWS meteorologists will travel to cities across Oklahoma and Texas to conduct the training sessions, which typically last around two hours. More than 40 classes will be held across the area by the end of March. If you are interested in attending a spotter class, check the schedule at our website *weather.gov/norman*.

Fire Support. Since November 2005, Oklahoma and Texas have experienced numerous wildfires that have claimed tens of thousands of acres of land, homes, businesses and other buildings. The National Weather Service routinely works with state and local officials during wildfire situations to provide weather information and support. In early January, meteorologists from the Norman Forecast Office began working in the Fire Incident Command Post in Shawnee, Oklahoma to assist emergency management and fire response agencies with critical weather information. NWS will continue to provide onsite support as needed through the ongoing fire situation.

NWS Norman Forecaster Scott Curl explains to Lieutenant Governor Mary Fallin how fires can be seen on satellite images. These images are shown on the NWS Norman Enhanced webpage.

GIS: From Page 1

Norman has the ability to provide georeferenced data in the form of point-based "Shapefiles" which were developed many years ago as a way of storing GIS data. This file format has become a widely-accepted GIS standard.

Illustration 1 shows an example of NWS forecast data, as displayed in *ArcMap*, which is part of ESRI's *ArcGIS* package.

This screen capture shows how one can simply click on any point in the data, and obtain a list of all of the available parameters at that point.

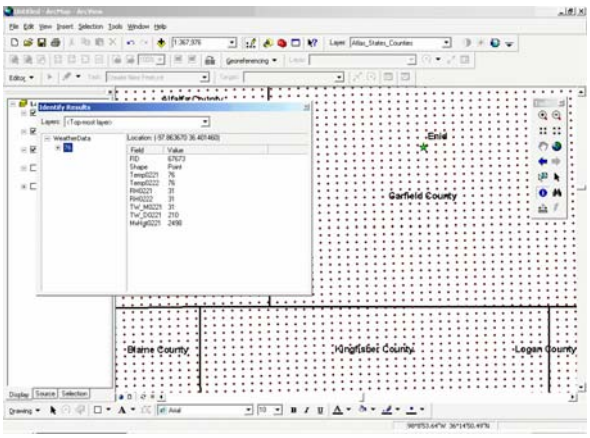


Illustration 1: Sampled point forecast data.

In this example, temperature and relative humidity are available for two hours, and transport wind (with separate magnitude and direction) and mixing height are available at one hour. We have the ability to supply data for many hours if we limit the domain the data covers. Otherwise, the files become prohibitively large.

In Illustration 2 we show another capability of GIS. In this example we have instructed the software to highlight the data points where specific weather conditions are met. In this case we asked, "Where is the mixing height greater than 2495 feet and less than 2520 feet?". This is only a simple example. The number and type of queries you can do are only limited by what data fields are available. A more complex example might involve intersecting a particular set of meteorological data with data from a smoke plume model. You could then even mix in census, or other population data to see where certain conditions will affect population centers.

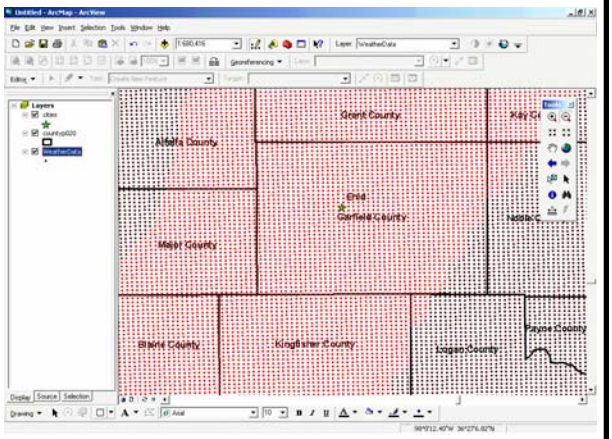


Illustration 2: Data points selected by specific attributes.

The potential uses of meteorological data in GIS are great, and we have only begun to scratch the surface of its capabilities. In the near term, we will provide this data on an as-needed basis at the request of emergency managers and other government agencies, however, it is conceivable that this type of data will be available to all users routinely in the future.

Cooperative Observer Notes

December Record Lows and January Snow!

By Jennifer Palucki, Meteorologist Intern

During the morning hours of December 8th and 9th, our cooperative observers had to brave the coldest weather that some have seen in over 50 years. Temperatures plummeted into the single or negative numbers as an arctic airmass parked itself over the southern plains.

The record low temperatures came in conjunction with the first snowfall of the season. During the morning of December 8th, many of our cooperative observers across Oklahoma woke up to snow on the ground. Morrison and Loco received the most snow with 2.0 inches.

With the cold air in place and snow on the ground, there was no doubt it was going to be a cold morning. Clear skies and calm winds allowed for temperatures to cool even further. Here are some of the record lows that morning.

...Oklahoma...			
Location	**New Record**	**Old Record**	**Period of Record**
Blackwell	-2	11 in 1989	1954-2005
Hollis	-2	2 in 1927	1922-2005
Billings	1	11 in 1989*	1959-2005
Helena	1	10 in 1978	1906-2005
Watonga	1	12 in 1978	1902-2005
Cushing	3	12 in 1976	1940-2005
Altus Dam	7	12 in 1976	1945-2005
Marietta	10	16 in 1950	1940-2005
...Western North Texas...			
Seymour	8	12 in 1950	1905-2005
Vernon	8	17 in 1950	1919-2005
Archer City	9	17 in 1976	1964-2005

During the day on December 8th, high temperatures remained below freezing for much of the area. This allowed the snow to remain on the ground and thus, another chilly morning was in store. So, for the second morning in a row, single digit temperatures plagued the region. Below are the record low temperatures observed the morning of December 9th.

...Oklahoma...			
Location	**New Record**	**Old Record**	**Period of Record**
Marietta	1	14 in 1995*	1940-2005
Great Salt Plains Dam	2	6 in 1977	1946-2005
Perry	2	3 in 1919	1898-2005
Billings	3	6 in 1995*	1959-2005
Healdton	4	8 in 1919*	1894-2005
Durant	6	10 in 1978	1901-2005
Madill	7	14 in 1978*	1936-2005
...Western North Texas...			
Archer City	11	13 in 1978	1964-2005

Will these be the coldest temperatures that we see this season? It is quite possible. Temperatures didn't even drop that significantly in January when some locations received significant snowfall! Six to 10 inches of snow fell across portions of north central Oklahoma during the late night hours of January 9th and the early morning hours of the 10th. Some of the heavier amounts are listed below.

- Lamont - 11.0 inches
- Braman - 9.5 inches
- Marshall - 7.5 inches
- Crescent - 6.5 inches
- Blackwell - 5 inches
- Morrison - 4 inches.

Thanks to all of our cooperative observers for their hard work!

Award Recipients

The following observer has recently received a Length of Service award:

James Rozell - 15 years

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

Cox City Observer Retires

The NWS Staff would like to thank Mazie Parker of Cox City for her dedicated work. Mrs. Parker took precipitation measurements for NWS Norman for 14 years. Thanks and best wishes in the years to come!

New Observers

The NWS Staff would like to welcome Cody Wright and Barbara Frizzell to the NWS Norman cooperative observer program. We look forward to working with these new observers for many years to come.

In Memoriam

This winter several of our dedicated cooperative weather observers passed away. Mr. Oscar Garret, Jr. of Tussy and Mr. J. W. Hastings of Amber took precipitation measurements for the Norman Forecast Office for several years. Mr. Elmer Linville of Hammon and Mr. Leeman Story, Jr. of Meeker took temperature and precipitation measurements for the Norman Office for numerous years as well. These observers will truly be missed.

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** **Jennifer Palucki** **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 Jennifer.Palucki@noaa.gov.