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 Jeff Williams

Hello! I am Jeff Williams, the Electronics Systems Analyst (ESA).

I was raised in Clyde, Texas, a small town just east of Abilene. After complet-

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New Enhanced Weather Web Page

The Enhanced Weather Web Page provides a rich and concise source of information concerning any impending or ongoing weather threat. Graphical weather forecasts and outlooks, warnings, watches, and important safety advice may be found here.

A red motif highlights a weather situation with the highest urgency and potential to harm life or property. Yellow is used for situations that warrant attention, but where the threat is less widespread or serious.

When the weather situation warrants, any time of the day or night, the page is activated to provide the latest information and guidance. The page will automatically update every few minutes with the latest situational overview of the unfolding weather event.

The Record Events of November 11, 1911

By Mike Branick, Senior Forecaster

"If you don't like the weather, wait fifteen minutes…"

The meaning of this often-quoted statement, credited to Will Rogers, is well known to most long-time Oklahomans who have experienced the sudden, dramatic weather changes that occur all too often in the southern Plains in the spring and fall. The transition months of March and November are particularly vulnerable to powerful cold fronts – the kind that can turn a bout of spring or summer-like warmth into a wind-driven ice box in a matter of hours, or even minutes.

A notable recent example of summer-to-winter cold fronts occurred on March 3, 1989. After an unseasonably warm high temperature of 74 in Oklahoma City, the cold air arrived late in the day and promptly plunged temperatures into the 30s in less than an hour. Severe thunderstorms with nickel-size hail struck parts of central Oklahoma that evening, after the arctic air had dropped surface temperatures to 20 degrees! Two days later, much of central and southeast Oklahoma were paralyzed by over a foot of snow and near blizzard conditions.

Another recent example was the strong cold front of November 10, 1995. The daily weather records for Oklahoma City tell the story. The high temperature of 83 degrees set the record high for the date, and the daily snowfall of half an inch set the snowfall record. The cold air arrived early that afternoon, dropping temperatures into the upper 20s and turning rain to snow by midnight.

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Winter Weather Services from NWS Norman

By Rick Smith, Warning Coordination Meteorologist

Your National Weather Service forecast office in Norman is dedicated to providing information to help keep you safe and informed when winter weather threatens. As part of a nationwide network of 122 local forecast offices, the Norman Forecast Office is staffed 24-hours a day, every day of the year, with local experts on the weather in this part of the country.

If you take advantage of the information sources available from your forecast office, you can stay informed and be better prepared to deal with whatever winter brings our way. Here is a summary of the ways we at the forecast office in Norman work to keep you informed about hazardous winter weather.

Hazardous Weather Outlook...You may think of the hazardous weather outlook as merely a thunderstorm product. However, you should know that this outlook provides information on all types of hazardous weather expected over the next seven day period. The Hazardous Weather Outlook is updated at least twice every day and is available on your local Weather Radio station and on the Internet.

Winter Storm Outlook...When forecasters anticipate a significant winter storm within the next several days, they may also choose to issue a special

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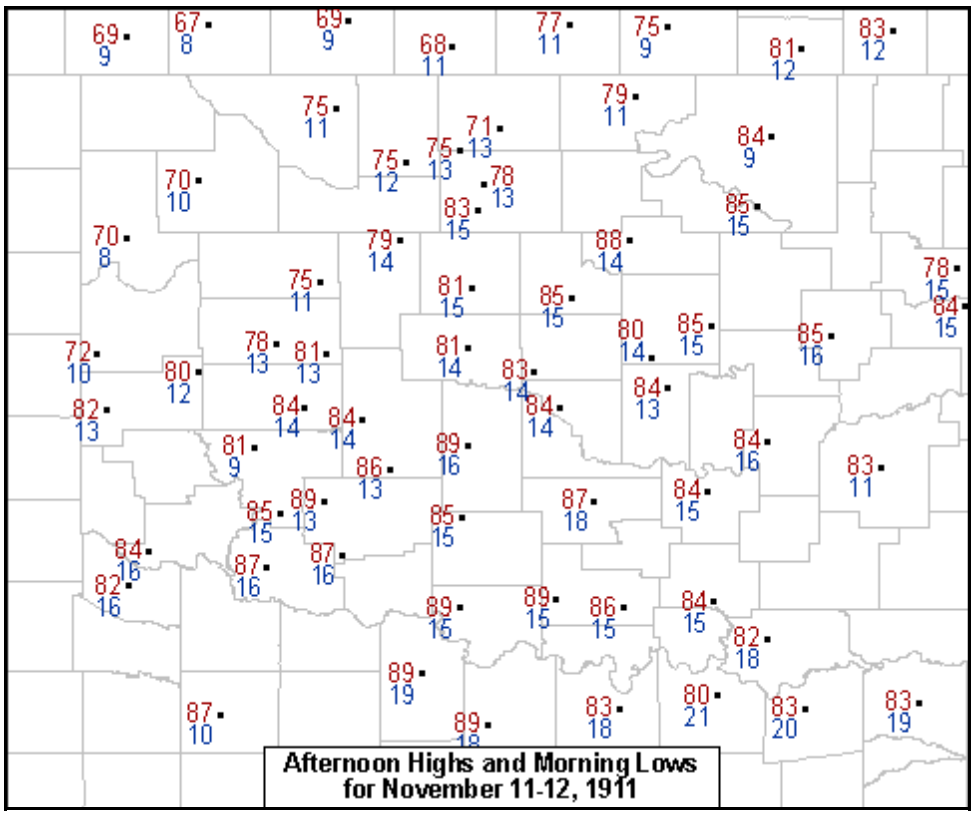

As dramatic as these weather changes were, we must go back further in time to look at one such cold front that established a set of weather records that arguably are unique in modern weather history. On November 11, 1911 (remembered easily for now as 11/11/11), the afternoon temperature in Oklahoma City reached a record high for the date of 83, before plunging 66 degrees to a record low of 17 at midnight that evening. Both daily temperature records remain unbroken and untied 92 years later.

Record high and low temperatures occurring on the same day are rare, but they do happen. A search of local records from around the United States shows no less than 18 such pairs currently on the record books at various observing stations. Most of these stations have kept daily records for 50 years or more. The hard part, though, is not setting both records but keeping them without one or the other being broken in later years. In seven of the 18 known pairs of same-day records, one or the other of the two records has been tied (either before or since the day in question). Of the sets of same-day unbroken/untied records, none are more than seven years old. In this sense, the pair of daily records at Oklahoma City on 11/11/11 is unique because of the amazing length of time over which both the record high and low have survived. By comparison, the second-longest standing unbroken/untied record for high and low temperatures on the same day occurred on May 16, 1997, in Sioux City, Iowa, with a high of 91 and a low of 33.

The accompanying map shows the observed high temperatures on November 11, 1911 and the observed lows the following morning, November 12th, across portions of Oklahoma, Texas, and Kansas. Temperature drops of 60 degrees were common, with some areas falling more than 70 degrees in roughly 12 hours.

The dramatic turn of weather events on 11/11/11 eventually affected most of the country. It began with a Canadian high pressure system that began to build over Alberta as early as November 9th. A low pressure system began to organize over the Rockies on the 10th and moved east into Iowa and Missouri on the 11th. Unseasonably warm air was drawn northward ahead of the low on the 11th, while in its wake, cold air plunged south across the entire central United States. The unseasonably cold air eventually overspread the entire eastern United States as well, routinely dropping temperatures 30 to 70 degrees in a matter of hours. In Chicago, one man was overcome by heat and two others froze to death within a 24-hour period. Severe thunderstorms erupted from the mid-Mississippi valley into the Great Lakes, spawning destructive tornadoes in parts of Wisconsin, Iowa, Illinois, Indiana, and Michigan that killed at least a dozen people. Strong winds behind the cold front reached 30 to 50 mph in many areas, with gusts over 70 mph in some locations. The high winds tore a barge from its towing ship off the New England coast. Fourteen crew members were given up as lost.

Except for the daily temperatures, there is little information on the accompanying weather changes in Oklahoma and north Texas that day. However, the following account from Springfield, Missouri, likely is representative of the sequence of events:

"By 2:30 pm...a dense greenish black bank of clouds was rising along the western horizon. By 3:30 pm dark and ominous appearing clouds extended along the northwestern horizon...and at 3:45 pm the winds shifted to northwest and immediately reached an extreme velocity of 74 mph. A tempearture of 80 was recorded, breaking the record high temperature during any previous November in the last 25 years...and falling from 80 to 13 at midnight, which likewise breaks the record for low temperature this early in November. Rain, hail, sleet, and snow fell within a period of less than 2 hours, and a moderate electric storm commenced after the temperature had fallen to below freezing and more than an hour after the wind had shifted.

"The record for varieties of weather and violent fluctuations in meteorological elements during a 24-hour period has not heretofore been equaled at this station."

Note: Many observing stations throughout the central United States still have either record highs or record lows that were recorded on 11/11/11. Springfield, Missouri is the only station other than Oklahoma City that has both records still on the books, but Springfield tied the record high of 80 in 1995.

Forecaster Forum: Forecasting Low Temperatures

By Erin Maxwell, Forecaster

With the winter months upon us, forecasting low temperatures accurately becomes an important task for forecasters. With temperatures often dipping below freezing during the nighttime hours this time of year, accurate low temperature forecasts play an important role in agriculture and other business interests, as well as in the type of precipitation an area might receive. How cold the temperatures get could mean the difference between a location receiving just rain or the more hazardous freezing rain, sleet, or snow.

At all times of the year, forecasters consider many factors in the prediction of low temperatures, including moisture, winds, and cloud cover. The amount of moisture in an area plays a pivotal role in determining the minimum temperature a location could achieve. An area containing less moisture has the potential to see lower overnight temperatures than one with more moisture present.

Wind speeds and cloud cover each have a similar effect on low temperatures. Cloudy skies and windy conditions help hold the day's heating and slow the radiational cooling process. On the other hand, clear skies and light winds allow temperatures to drop quickly after sunset.

During the winter months, two other factors are considered in the determination of overnight temperatures. Strong cold fronts often move through Oklahoma and western north Texas during the winter. Therefore, forecasters must investigate an airmass' origination, whether it be Alaska, Canada, or the Pacific, to determine how cold the air was originally.

Snow cover in the area is also important. An airmass in place or traveling over snow already on the ground can remain colder than if there were no snow cover.

These are just a few of the factors used by forecasters in the prediction of low temperatures across Oklahoma and western north Texas. The next time you are wondering how cold temperatures will get, you will know all the things that forecasters consider.

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statement highlighting that potential. A Winter Storm Outlook will provide you with more detailed information than the Hazardous Weather Outlook. The Winter Storm Outlook does not mean a winter storm is guaranteed, but it does provide you some extra time to make plans, in addition to warning you to pay close attention to later forecasts and information.

Winter Storm Watch...Just like during severe thunderstorm season, a Winter Storm Watch means to "watch out" for possible hazardous winter weather conditions. Forecasters will issue a Winter Storm Watch whenever there is a reasonable chance that dangerous winter weather will develop. Again, the watch is not a guarantee of a winter storm, but if you hear a watch for your area, it means that meteorologists are becoming increasingly concerned that a significant storm could occur. Watches are usually issued to inform you about significant winter weather expected to occur in the next 24 to 48 hours. When you hear a Winter Storm Watch for your area or an area where you may be traveling, you should pay close attention to the message for details on what is expected – whether it be snow, sleet, or ice – and when the bad weather may arrive. You may want to change travel plans or make other special arrangements to ready yourself for the storm.

Winter Storm Warning...When a dangerous winter storm is going to happen within the next 12 to 24 hours, the Norman Forecast Office will issue a Winter Storm Warning. A warning is a more urgent message, outlining areas where dangerous winter precipitation is likely to happen.

Most of the time, you will see a generic "Winter Storm Warning" issued, which means that a variety of winter weather is expected. However, the forecaster may choose to be more specific if he or she feels confident that one type of winter precipitation will be dominant. In those cases, you may see one of the following:

* A *Blizzard Warning* is issued when falling or blowing snow is accompanied by winds in excess of 35 mph and visibilities below one quarter of a mile.
* A *Heavy Snow Warning* is issued when a snowfall of 4 inches in a 12-hour period or 6 inches in a 24-hour period is expected.
* An *Ice Storm Warning* is issued when freezing rain accumulations of a quarter inch or more on exposed objects are expected.
* A *Heavy Sleet Warning* is issued when ice pellet accumulations of half an inch or more are expected.

Winter Weather Advisory...When winter precipitation is expected to primarily be an inconvenience and not generally cause a threat to life and property, NWS Norman may issue a Winter Weather Advisory. Like a warning, an advisory may cover a variety of precipitation types, from snow, to sleet, to freezing rain or drizzle, or a mixture of types.

GraphiCasts...In addition to regular watches, warnings, outlooks, and forecasts, the Norman Forecast Office routintely issues graphical forecasts that depict impending changing and hazardous weather conditions. During the winter season, these will be used to detail the location of various weather features, hazards, and precipitation types. These graphics are available only on the NWS Norman home page.

NWS forecasters in Norman will be watching for developing winter storms all season long. It is up to you to listen to your local Weather Radio station for the latest information on winter weather. You can also visit your forecast office on the Internet at *www.srh.noaa.gov/oun* for the latest forecasts, road conditions, and observations for your local area.

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Congratulations to these new StormReady Locations!

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Midwestern State University

Weather in Review: The December 12th-13th Winter Storm

By Karen Trammell, Student Meteorologist

For many residents of Oklahoma and western north Texas, the second weekend in December began with a bang as the second winter storm of the 2003-2004 season raced across the area on December 12th and into the early morning hours of the 13th. Winter storm warnings and advisories were in place for most of northern and western Oklahoma on the 12th and 13th, alerting the public to the probability of hazardous wintry precipitation. The storm brought rain and thunderstorms to much of southern Oklahoma and western north Texas and a mixture of freezing rain, sleet, and snow to the remainder of the area.

North central Oklahoma received the brunt of this latest storm, with some locations receiving more than 10 inches of snow. Ice accumulation on roadways and bridges, from freezing rain, created havoc for drivers in the Oklahoma City area and in western Oklahoma. Traffic accidents forced the periodic closure of Interstate 40 west of Oklahoma City throughout the afternoon of the 12th. The rapidly deteriorating conditions also caused many area schools to close early on the 12th and to cancel many evening extracurricular activities.

The weather conditions causing this winter storm began organizing over the Southern Plains as early as the morning hours of the 9th. After most of Oklahoma and western north Texas experienced record-setting warmth on the afternoon of the 8th, a strong cold front swept through the area, bringing much colder temperatures and modest snowfall amounts to parts of Oklahoma. A region of surface high pressure moved in behind this cold front and remained in place through the ensuing weekend, keeping temperatures well below normal.

During the afternoon hours of the 10th, a relatively weak upper level storm system moved off the Pacific onto the coast of northern California and Oregon. This system strengthened rapidly as it traversed the southwestern United States and the southern Rockies over the ensuing 36-hour period.

In the meantime, strong southeasterly winds returned to eastern and central Texas and the Gulf Coast region on the afternoon of the 11th, transporting warm and moist air northward into Oklahoma. This air rode over the cold dome in place over the area, marking the beginning of the precipitation on the morning of the 12th. Because the air above the surface remained above freezing, the precipitation fell as rain initially, but below freezing surface temperatures in many areas caused the rain to freeze upon impact with objects. As the storm system moved closer to Oklahoma and Texas during the evening hours of the 12th and early morning on the 13th, the precipitation changed entirely to snow in the northern half of Oklahoma.

Since the peak in winter storm activity typically occurs in January and February in this area, this early taste of winter for area residents is likely only the beginning of what winter has in store for Oklahoma and western north Texas this season.

Selected Snowfall Totals	
Medford	10.6 Inches
Jefferson	10.3 Inches
Billings	9.0 Inches
Enid	8.9 Inches
Braman	8.0 Inches
Helena 1 SSE	8.0 Inches
Morrison	8.0 Inches
Redrock	7.8 Inches
Lamont	7.7 Inches
Cherokee	7.0 Inches
Marshall	7.0 Inches
Mulhall 1 SE	6.0 Inches
Newkirk 1 NW	6.0 Inches
Perry	5.5 Inches
Hardy 1 SE	5.0 Inches
Hennessey 4 ESE	5.0 Inches
Orienta 1 SSW	5.0 Inches
Kingfisher	4.5 Inches

In Weather History: Winter Severe Weather Outbreaks

By Karen Trammell
Student Meteorologist

Oklahoma and western north Texas are known as hotbeds for tornadoes, hailstorms, and severe winds, and most people regard these as springtime and occasionally, autumn occurrences. Wintertime episodes, although rare, do occasionally happen. Two such events occurred on January 14, 1960, and December 29, 1972.

January 14, 1960...A very strong surface low pressure system brought widespread severe weather and very strong winds to Oklahoma and the Wichita Falls area. A severe squall line moved through the central half of Oklahoma around sunrise on the 14th. A tornado was reported in Pontotoc County near Fitzhugh, destroying several farm buildings. Other funnels were sighted in Oklahoma City and McLoud, although none touched down. Straight line winds caused tens of thousands of dollars in damage to trees, buildings, and utility poles in the Oklahoma City area.

In addition, high winds to 75 mph, not associated with the storms, swept through the rest of the area mid-day on the 14th. Plate glass windows were destroyed in Lawton, Purcell, Oklahoma City, and Yukon. A hangar and aircraft were damaged at the airport in Wichita Falls. Three people suffered various injuries from these winds.

December 19, 1972...Tornadoes, strong winds, and large hail affected parts of Oklahoma and western north Texas the evening of the 19th. A large tornado moved from southwest of Purcell to southeast of Lexington, damaging and destroying several homes, barns, and outbuildings. At one farm, a two-by-four was found embedded in a chest of drawers, after flying through a wall. A trailer home was also tossed several hundred yards.

Hail to 3 inches in diameter fell in Noble County, while 1.5 inch hail and 60 mph winds caused minor damage near Lawton. Strong winds, estimated as high as 90 mph, resulted in additional damage near Stillwater, Madill, and Lake Texoma.

National Weather Service Radio Notes

By Kevin Brown, Senior Forecaster

As always, feedback from you, our listeners, is very important! This article will deal with recent changes that have occurred with National Weather Service Radio transmitters, along with some broadcast changes that will transpire over the next several months. If you have questions or comments, or need help programming your radio, please do not hesitate to contact us. We can be reached by calling 405-360-5928, daily from 7 am to 8 pm or by visiting our website at *www.srh.noaa.gov/oun*.

Weather Radio Transmitter News. As mentioned in an earlier issue of this newsletter, the signal output from several transmitters in the area was scheduled to be upgraded. This task has been accomplished! Here is a list of these transmitters and their improvements:

- WWG-46 – Woodward – 162.500 MHz – Power increased from 100 to 1000 Watts
- WWF-42 – Ponca City – 162.450 MHz – Power increased from 500 to 1000 Watts
- WXL-48 – Enid – 162.475 MHz – Power increased from 200 to 1000 Watts
- WXK-87 – Clinton – 162.525 MHz – Power increased from 500 to 1000 Watts

This increase in output power has increased the coverage pattern of the radio signal, allowing more people in the area to receive the tremendous life-saving benefits of weather radio.

As far as new transmitters are concerned, Stillwater appears to be next on the National Weather Service's list for Oklahoma. This transmitter site is tentatively scheduled to begin operation by the Spring of 2004. Persons in and around Stillwater, who may normally set their weather radios to the Oklahoma City (162.400 MHz) or Ponca City (162.450 MHz) frequencies, will be able to tune into the Stillwater transmitter when it is brought on the air. The exact frequency for the new transmitter is still undetermined.

Weather Radio Broadcast Changes. Over the next few months, listeners will begin to hear weather segments during the mornings and evenings, highlighting daily weather history for Oklahoma and western north Texas. These segments will include record breaking, unusual, and just plain wacky weather trivia. By the Summer of 2004, additional segments will be included in the broadcast that will cover more than just regional weather, including such topics as United States and world weather records and trivia, weather word definitions and origins, astronomy, and even geology. We will also entertain the idea of having listeners phone, e-mail, or mail weather-related questions that they would like answered to us, and we will answer them during the broadcast. All of these changes are intended to make the weather radio broadcast more dynamic and informative. Of course, these new weather segments will not be included in the broadcasts when our forecast area is under hazardous weather watches or warnings.

In addition, some of you may have noticed that the typical day-by-day extended forecast has been replaced by a narrative summary of the forecast for days 4 through 7 across the entire area. This summary is intended to make the extended forecast easier to understand, as well as to let listeners know about the weather systems affecting the region.

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

We also use the test messages to advertise upcoming programming changes and to solicit feedback from YOU, our valued customers and partners. To learn more about National Weather Service Radio, we encourage you to visit the web sites at *www.srh.noaa.gov/oun/nwr* and *www.nws.noaa.gov/nwr*.

National Severe Weather Workshop

The 2004 National Severe Weather Workshop (NSWW) will be held March 4th through 6th at the Marriott Convention Center in Norman, Oklahoma. The NSWW provides an opportunity for forecasters and severe weather experts to present and discuss safety and preparedness issues, new research, and forecasting techniques. Advanced spotter training will also be available at the workshop. Additional information about the NSWW can be found online at *www.norman.noaa.gov/nsww2004*.

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ing two years of college in Architecture, I decided to join the Air Force to see what other opportunities might be out there for me. After spending six years at Tinker Air Force Base, I started my career with the NWS in San Antonio. I have also worked as an Electronics Technician in Tucson, Amarillo, and Fort Worth.

As the ESA, I have a very interesting job. I provide management and support for all the electronics equipment and computer systems that we use to provide the best services to our customers. These systems include the NEXRAD radars, Weather Radio, and the Advanced Weather Interactive Processing System.

This job is also very satisfying and rewarding. While working on my own property that was damaged in the recent tornadoes that hit Moore, I had many people stop me just to say thanks to the NWS for providing them with the advanced warnings of the storms. It is truly a privilege for me to be associated with such an outstanding organization.

Cooperative Observer Notes

Tips for Melting and Measuring Frozen Precipitation

By Forrest Mitchell, Hydrometeorological Technician

It is once again time to both enjoy and deal with winter precipitation. Snow, sleet, and freezing rain present new challenges to the weather observer since it cannot simply be measured with a measuring stick as liquid precipitation is. To make this task a little easier, here are a few tips and guidelines on melting and measuring frozen precipitation.

Before the winter precipitation arrives, the funnel and measuring tube must be removed from the rain gage and left indoors. Snow will "break" off once it clears the top of the funnel. Also, in a brisk wind, snow tends to be blown out of the funnel. In either case, the true meltdown, or water equivalence, cannot be determined. Freezing rain can break the seal on the bottom of the measuring tube, causing it to leak. In either case, removing the funnel and tube helps to correct these potential problems.

If you find it difficult to remove the outer can from the stand after a freezing rain event, here is a tip. After you remove the funnel and measuring tube, lift the outer can out of the stand, and spray WD-40 on the inside surface of the stand and on the bottom of the outer can.

When it is time to measure the freezing rain or snow, one of two procedures can be used, depending on whether the event has ended or is still ongoing. If the event has ended, lift the outer can out of the stand and bring it indoors to melt and measure the precipitation. The easiest way to melt freezing rain or snow is to melt it with warm water. To do this, first pour warm water into the measuring tube, use the measuring stick to determine how much water is in the tube, and write that amount on some scrap paper. Pour the warm water into the outer can with the frozen precipitation and swirl it around until everything has melted. If there is ice on the inside wall of the outer can, slowly rotate the can as you pour the warm water in so all the ice will melt and collect in the bottom of the can.

Next, find a dishpan or bucket and place your measuring tube in it. Place the funnel on top of the tube and slowly pour the melted precipitation from the outer can into the tube. If there is more than two inches of meltdown, the excess will spill into the dishpan or bucket. Make sure to measure this also. Once all the meltdown is measured, subtract the amount of warm water added and enter that number on your B-91 Weather Form.

If freezing or frozen precipitation is in progress at observation time, try the following. If it is snowing, empty the outer can into a bucket or dishpan and take it indoors for melting and measuring. If you are receiving freezing rain, take a pre-measured amount of warm water outside, melt down the ice, and pour it into a bucket or dishpan. Then, take it inside as you normally would.

Measuring snowfall on the ground will always be a challenge in this part of the country, as it is extremely rare to have snow without wind. Consequently, the "averaging" method must be used. Take several readings from spots where the snow is fairly uniform and away from drifts. If you are measuring on a grassy surface, clear away a spot of snow so you can see where the bottom of the snow layer is. Make sure to not include any grass in your measurement. If you have a snowboard, place a marker beside it so you will be able to find it the next morning after a snow.

As always, do not hesitate to call with any questions about snow, freezing precipitation, or anything else regarding the cooperative observer program.

New Observers

The NWS staff would like to welcome Joe Bailey, Jason Bernhardt, Tim Coffey, Margie Fondren, Glenda Harris, Stacy Henry, John Miller, Rick Mitchell, Dee Ann Ray, Ewell Rudd, Larry Thomas, and Marvin Wilson 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:

Lillian Kidwell – 20 years
Harry Thomas – 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.

First Snow

The first area snow of the 2003-2004 winter season occurred on December 9th and 10th. A strong storm system moved through the Southern Plains, affecting primarily southern Kansas and far northern portions of Oklahoma. Here are some of the largest snowfall totals from the event:

* Buffalo 2 SSW – 4.0 inches
* Cedardale 1 ESE – 4.0 inches
* Waynoka – 4.0 inches
* Morrison – 3.5 inches

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

South Central and Southeast Oklahoma
Daryl Williams

Northern Oklahoma
Forrest Mitchell

Southwest Oklahoma and Western North Texas
Steve Smart

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

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