

The Dryline

The Official Newsletter of the National Weather Service in Amarillo

Spring 2010

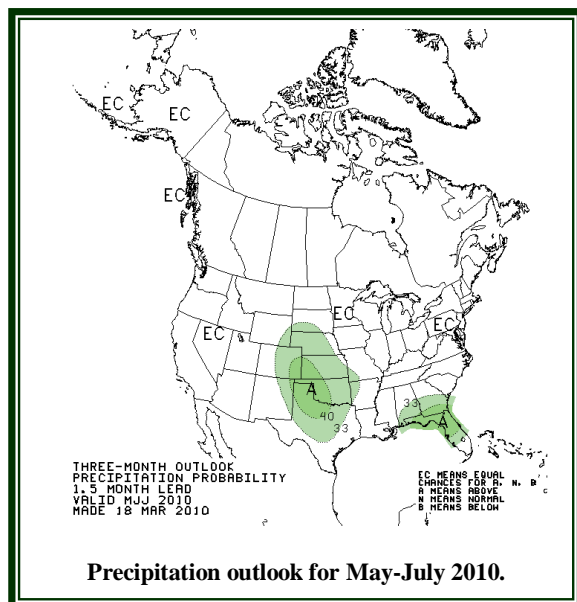


The Effects of El Niño and the Upcoming Severe Weather Season

By Christine Krause, General Forecaster

El Niño has been a buzz word lately in the news, especially in how it may affect the upcoming severe weather season. Many people who live in the Plains are concerned that there will be an increase in severe weather, specifically in the number of tornadoes. This comes especially on the heels of the last El Niño episode of 2006-2007 where the Texas and Oklahoma Panhandles had a record of 58 tornadoes during 2007!

El Niño is a periodic warming of surface ocean waters in the eastern tropical Pacific which results in a shift in convection in the western Pacific Ocean farther east than the climatological normal. These conditions affect weather patterns around the world. El Niño episodes occur roughly every three to five years and can last up to 12 to 18 months. So just how does El Niño, which occurs so far away from the Panhandles, affect the weather across our area? During this warm phase, the jet stream (which is a narrow belt of strong winds in the upper levels of the atmosphere that drive weather systems around the globe) gets displaced farther to the south. This pattern usually results in more opportunities for thunderstorms across the area, and therefore a greater likelihood to experience more severe weather than normal. It is important to note that El Niño does not necessarily increase the number of tornadoes. El Niño occurs on a large scale and does not take into account the amount of instability and moisture available at any given location, which are essential for thunderstorm development. As a result, storm systems may move too fast or too far north or south of the Panhandles, resulting in dry and windy conditions as they track across the area.



Precipitation outlook for May-July 2010.

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The latest outlook provided by the Climate Prediction Center states that El Niño conditions will persist through spring but are continuing to weaken and are expected to be neutral by summer. This correlates into enhanced probabilities of precipitation, as shown in the precipitation outlook from May through July.

The best way to be prepared for this severe weather season is to keep abreast of the latest forecasts from the National Weather Service.

Severe Weather Safety

By Christine Krause, General Forecaster

Spring is a season characterized by warmer temperatures. In turn, people get rejuvenated and ready for all the delights that warm weather affords us, especially after a long and cold winter. Springtime is also earmarked by wild swings in weather from warm and windy days, to cool evenings, to several rounds of thunderstorms. Thunderstorms are part of life in the Texas and Oklahoma Panhandles. In Amarillo, 87% of the annual rainfall is received from March through October, and almost all of this can be attributed to thunderstorms. Without this beneficial rain, the Panhandles would be a virtual desert. However, when thunderstorms do occur there are many hazards that can damage property or threaten lives. It is important that everyone be aware of these hazards and know how to protect themselves and their property.



Lightning is a part of EVERY thunderstorm and often strikes without warning. Lightning kills dozens of people and injures hundreds more each year in the United States. Most deaths occur when people are caught outside with no shelter. It is important to remember that lightning can strike several miles away from the thunderstorm, so the best place to be is indoors. If you hear thunder, you are close enough to be struck by lightning and should seek shelter immediately!



Flooding causes more than 100 deaths each year in the United States and can occur almost anywhere. Most flood related deaths occur in automobiles. Even if you don't live near a river or stream, you can still be affected by flood waters. Flash flooding is an increased concern in the Texas and Oklahoma Panhandles during the summer months when thunderstorms produce very heavy rainfall in a short amount of time. Drainage systems may not be able to handle all the water at once and roads and underpasses can quickly flood. If you run across water covering the road, you should turn around and find an alternate route. It only takes a foot or two of water to cause your vehicle to stall or float.



Severe thunderstorms can produce large hail and damaging straight line winds. In the past, a severe thunderstorm was defined as having hail $\frac{3}{4}$ inch in diameter (the size of a penny) or larger or straight line winds of 58 mph or higher. Starting this year, a severe thunderstorm is defined as having hail **one inch** in diameter (the size of a quarter) or larger. (The straight line wind criterion of 58 mph or higher still defines a severe thunderstorm.) When severe thunderstorms approach, seek shelter in a sturdy building to avoid injury. Large hail can damage property and can cause injury to those caught outside. Strong straight line winds can occasionally exceed 100 mph and cause widespread damage equivalent to that of a tornado. These winds can destroy mobile homes and damage sturdy buildings.



Tornadoes are a very rare natural phenomenon associated with thunderstorms, but occur in the United States Great Plains more than anywhere else in the world. In the Texas and Oklahoma Panhandles, tornadoes are most common in late spring and early summer. The strongest tornadoes can produce some of the strongest winds ever recorded at the Earth's

surface and completely destroy well-built structures. The best place to be during a tornado is in a basement or inside a small room inside a sturdy building, and away from outside walls and windows. If caught outside with no shelter available, lie face down in a ditch or other low spot and cover your head.

The first step in protecting yourself and your property is to know when a severe thunderstorm or tornado is approaching. Understand the statements and warnings issued by the National Weather Service and have a reliable means of being alerted when these statements are issued. One of the best ways to make sure you know when a warning is issued is to have a NOAA All Hazards Weather Radio. These devices are inexpensive and can be specially programmed to alert you when threatening weather is approaching and are available at local electronic stores.

Watches: The National Weather Service issues a watch when conditions are favorable for a hazardous weather event to develop within the watch area. Some watches include Severe Thunderstorm Watch, Tornado Watch, or Flash Flood Watch. When a watch is issued, you should be alert for changing weather conditions, make initial preparations for the potential for hazardous weather, and listen for possible warnings.

Warnings: When the National Weather Service issues a warning for your area, it is intended to alert you that hazardous weather is occurring now or is imminent. Some warnings include Severe Thunderstorm Warnings, Tornado Warnings, and Flash Flood Warnings. When a warning is issued, you should take immediate action to protect life and property from the impending hazardous weather event.

National Weather Service Welcomes New Employee

By Jose Garcia, Meteorologist-In-Charge

We are pleased to welcome a new Meteorologist Intern to your National Weather Service Office in Amarillo. At the end of March, Justyn Jackson arrived at the office. Justyn was most recently an Instructor of Meteorology at Mississippi State University. He holds Bachelor's and Master's Degrees in Geosciences with an emphasis on Broadcast and Operational Meteorology. His thesis work was in "An investigation of low-level thermodynamic characteristics associated with significant and non significant tornadoes in the Southeast United States". We are excited to have Justyn as a member of our staff and are looking forward to his great new career, which begins with serving the citizens of the Texas and Oklahoma Panhandles.



VORTEX2 Resumes

By Chris Nuttall, Meteorologist Intern

Last spring, an armada of over forty vehicles and eighty scientists set out onto the Plains for the first phase of the Verification of the Origins of Rotation in Tornadoes Experiment 2 (VORTEX2). VORTEX2, a follow-up to the first VORTEX field project during 1994-1995, is the largest field project ever undertaken to study tornadoes. The study area of VORTEX2 covers most of the Central Plains. Last year, the armada travelled over 10,000 miles in nine states.

Meteorologists hope to improve forecasts and warnings by determining how, when, and why tornadoes form, their structure, and why some are stronger and last longer than others. The VORTEX2 armada consists of ten mobile radars, twelve mobile mesonet vehicles, weather balloon launching vans, and photogrammetry teams among others. Researchers participating in VORTEX2 are from several universities, government and private organizations. Several international participants are also involved.

The VORTEX2 team experienced success last year, and they are hoping for more this year. On June 5, 2009, the armada successfully sampled a tornado near LaGrange, Wyoming. This tornado became the most documented tornado to date. Data from this storm will be analyzed by scientists for many years.

Meteorologists hope to have more successful intercepts this season. The final field phase of VORTEX2 will be from May 1st-June 15th, 2010. More information on VORTEX2 can be found by visiting their website: <http://www.vortex2.org/>

Amarillo Staffer Receives Photography Awards!

Dave Wilburn, Electronic Technician at the NWS in Amarillo entered a photography contest for the publication "NEXRAD Now". Participants were asked to submit scenic photos of the station's radar, incorporating unique factors such as weather, lighting, sky cover, setting, etc. Dave won in three separate categories: Weather Effects, Seasonal, and Color Effects. Shown below are his winning pictures shown in the order mentioned above.



Late January Winter Storm

By Mike Johnson, General Forecaster

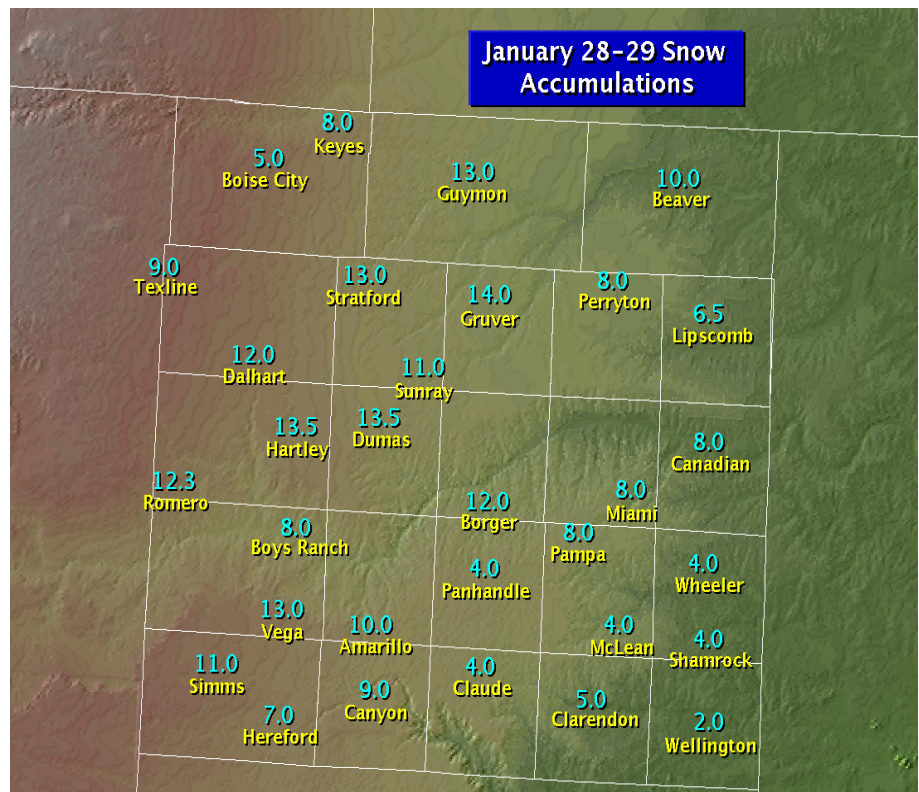
The winter of 2009-2010 has left many Panhandle residents weary of snow. Snow accumulations in November and December were actually slightly below climatological normals. Snow amounts began to increase by late January, continuing through March. The most impressive winter storm of the season occurred on January 28th-29th, bringing more than a foot of snow to portions of the Texas and Oklahoma Panhandles in addition to 1 inch or more of ice to the southeast Texas Panhandle.

The precipitation began early on the morning of the 28th, as a mixture of freezing rain, sleet, and snow as a powerful upper level low pressure system moved across the Four Corners region. At the surface, gusty northeast winds in the wake of a cold front ushered cold air into the Texas and Oklahoma Panhandles, allowing this precipitation to change over to all snow late in the day for most of the Panhandles. With wind speeds falling in the 20 to 30 mph range, with higher gusts, near blizzard conditions were reported across many areas, meaning visibilities were frequently reduced to near ¼ of a mile.

Crippling results were felt across much of the region. Interstate 40 was closed throughout the Texas Panhandle (except inside Amarillo city limits), all commercial flights were cancelled at Rick Husband International Airport, most schools and businesses were closed, and numerous other highways were shut down. By the time the snow ended on the 29th, most Panhandle residents were forced to dig

out from beneath 8 inches of wind-blown snow. Snow amounts in excess of 10 inches were reported from the southwest Texas Panhandle (including west Amarillo), to Dumas, to Guymon. The highest snowfall amount was 14 inches reported in Gruver. Many locations across the south central and central Texas Panhandle also received nearly 1 inch of sleet before the snow began.

The exception to the very heavy snowfall was in the southeast Texas Panhandle, where most locations saw accumulations of less than 6 inches. This was due to the slower changeover to all snow. However, this part of the Panhandle did not escape the brunt of the storm. More than 1 inch of ice accumulation from freezing rain was reported in Clarendon and Wellington. This resulted in widespread power outages and tree damage. Above is a map showing many of the snow reports received by the National Weather Service.



This was indeed a powerful storm. Piles of snow created during the clean-up efforts were visible for weeks, but the long lasting effects were mainly positive, including adding near 1 inch of liquid precipitation to the soil.

The snow did not stop in January. Throughout the months of February and March, we experienced several additional snow storms, although these were not on the same scale as the late January system. Through the end of March, the official snowfall for the observing stations in the Texas and Oklahoma Panhandles are as follows:

| <u>Station</u> | <u>Observed</u> | <u>Normal</u> | <u>Departure</u> |
|----------------|-----------------|---------------|------------------|
| Amarillo | 28.9" | 17.1" | +11.8" |
| Borger | 16.6" | N/A | N/A |
| Dalhart | 39.7" | 16.4" | +23.3" |
| Guymon | 29.6" | N/A | N/A |

In YOUR Community

On Wednesday, March 10, WFO Amarillo took part in "Kids Day at the Gorillas." On "Kids Day", the semi-pro Amarillo hockey team played at 11 AM with all Amarillo ISD 4th and 5th grade students in attendance. WFO Amarillo provided entertainment during the first intermission between periods. Warning Coordinator Meteorologist Steve Drillette, General Forecaster John Brost, and Hydrometeorological Technician Steve Bilodeau conducted a presentation on the dangers of severe weather, which included a demonstration on how a severe thunderstorm produces large hail. John Brost used a leaf blower to illustrate a storm's updraft which suspended various light weight balls serving as hailstones. Steve Bilodeau played the victim who was eventually struck by the hailstones. The demonstration was a big hit with the more than 2000 students and 200 adults in attendance. Unfortunately, the Amarillo Gorillas were defeated by the Tulsa Oilers by a score of 4-3.



WCM Steve Drillette (microphone) describes the demonstration as Forecaster John Brost imitates a thunderstorm updraft with the leaf blower, while Steve Bilodeau observes the suspended hail.

WFO Amarillo will participate in many events across the Panhandles this spring. One of the more popular venues that we participate in is the annual Business Connection that will be held at the Amarillo Civic Center on Tuesday May 4th. For more information on this event as well as information on any upcoming events, including spotter talks, visit our web page at:

<http://www.srh.noaa.gov/ama/>

NWS Amarillo completes modifications to ASOS Laser Beam Ceilometer Systems

By Paul Schaafsma

On January 5, 2010 the electronics team from NWS WFO Amarillo completed the final modification to remove the existing CT 12K ceilometers from the Automated Surface Observing Systems and Install the Vaisala Model CL31ASOS ceilometers in its place. The final site to receive the newer "State of the Art" CL31 ceilometer was KDHT located in Dalhart TX. This office was also responsible for performing the modification to sites KGUY at Guymon, OK, KBGD at Borger, TX, and KAMA at Amarillo International Airport. The WFO Amarillo electronics team was also part of the ASOS CL31 Operational Testing and Evaluation program (OT&E). The site at KGUY (Guymon, OK) was used to install a CL31 alongside a CT 12K for an extended period of testing for operational integrity. The OT&E process required many extra hours of travel and onsite maintenance from the AMA electronics team staff.

The CL31 measures cloud height and vertical visibility. The CL31 employs pulsed diode laser light detection and ranging (LIDAR) technology where short, laser pulses are sent out in a vertical or near-vertical direction. The reflection of light (backscatter) caused by haze, fog, mist, virga, precipitation, and clouds is measured as the laser pulses traverse the sky. The resulting backscatter profile, that is, the signal strength versus the height, is stored and processed and the cloud bases are detected. Knowing the speed of light, the time delay between the launch of the laser pulse and the detection of the backscatter signal indicates the cloud base height.

The CL31 is able to detect three cloud layers simultaneously. If the cloud base is obscured due to precipitation or ground-based fog, the CL31 reports vertical visibility. No adjustments in the field are needed.

The Laser Beam Ceilometer is part of the Automated Surface Observing System. Used by the National Weather Service (NWS), Federal Aviation Administration (FAA), and the Department of Defense (DOD) to provide automated surface observations for civilian and military airports around the country, the Laser Beam Ceilometer is one of several sensors that make up an ASOS Data Collection Platform (DCP). Located on airport property the DCP measures meteorological data and sends this data via radio link to the Acquisition Control Unit (ACU) which processes the data and disseminates the data products. These products can be heard via radio or telephone, or can be viewed via the internet -

http://www.faa.gov/air_traffic/weather/asos/

For more information about the ASOS system you can visit this NWS website -

<http://www.weather.gov/asos/>

KUDO's to Electronics Technicians Oferal Wise and David Wilburn for their part in making the transition from the CT 12K to the CL31 a success at these four sites.

Weather Review and Outlook

By Rich Wynne, Science and Operations Officer

REVIEW OF Winter 2009/2010

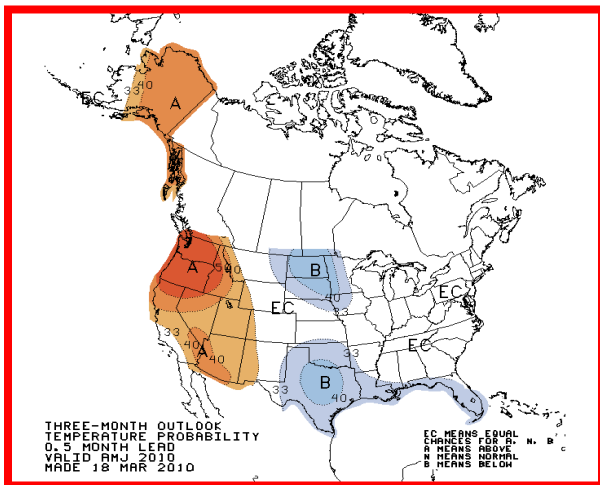
A steady stream of weather systems marched across the Southern Plains during the mid and late winter season as the El Niño pattern reached marginally strong levels. This resulted in several periods of cool and wet conditions for the Texas and Oklahoma Panhandles. Snowfall amounts for the season rose to well above the normal amounts in many locations. At the end of March, Dalhart reported 39.7 inches for the season which was 23.3 inches more than normal. The big story of the winter season, however, was the February chill. Temperatures during February across the Panhandles were well below normal. Amarillo, Borger, Dalhart, and Guymon all reported average daily maximum temperatures for the month of between 12 to 14 degrees below normal. This resulted in extended periods of snow cover in several locations.

| | AVG HIGH | AVG LOW | AVG TEMP | PRECIP | SNOW |
|-----|--------------|-------------|-------------|--------------|-------------|
| JAN | 50.0 (+1.1) | 22.2 (-0.4) | 35.8 (+0.3) | 0.94 (+0.31) | 7.1 (+2.3) |
| FEB | 42.0 (-12.1) | 23.6 (-3.4) | 32.8 (-7.8) | 1.29 (+0.74) | 22.2 (+6.8) |
| MAR | 61.6 (-0.6) | 33.6 (0.0) | 47.6 (-0.3) | 1.61 (+0.48) | 6.7 (+5.0) |

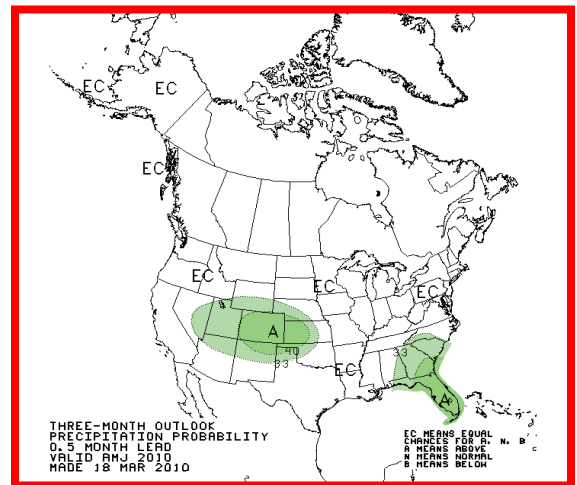
Late Winter 2010 statistics for Amarillo, TX

OUTLOOK FOR SPRING 2010

The Climate Prediction Center has issued the three-month outlook for April, May, and June (AMJ). The temperature outlook indicates a slightly better chance for below normal temperatures through the rest of spring. The precipitation AMJ outlook indicates enhanced chances for above normal precipitation across most of the Panhandles, especially in the Oklahoma Panhandle. Climate experts predict the El Niño influence to continue the rest of the spring, although the influences will be lessening through 2010.



APR-MAY-JUN 2010 Temperature Outlook



APR-MAY-JUN 2010 Precipitation Outlook

Amarillo Prepares Future Meteorologists

By Roland Nuñez, Senior Forecaster

Over 40 Scouts, leaders, and family members braved the chilly and blustery conditions on March 27, 2010, to participate in the first “Scouting for Meteorologists” program hosted by the Weather Forecast Office in Amarillo. “Scouting for Meteorologists” provided an experience for Girl Scouts and Boy Scouts from across the Texas and Oklahoma Panhandles who are interested in weather as a career or hobby. Scouts became “Meteorologists for a Day” and worked side by side with weather experts and enthusiasts from different segments of the field such as television, emergency management, storm spotters and the National Weather Service.

During the three hour event, Scouts served as meteorologists at six different stations scattered around the WFO Amarillo office and provided essential decision support, such as:

Incident Support – Scouts joined Dr. Maribel Martinez, Assistant Emergency Operations Coordinator, of the Amarillo/Potter/Randall Emergency Management and JJ Brost, NWS General Forecaster, and learned the role of an incident support meteorologist during an emergency and practiced being incident commanders at a simulated chemical spill incident.

Television Station – Shelly Sites of KVII-TV in Amarillo partnered with Scott Plischke, NWS Information Technology Officer, and shared the role of a meteorologist in broadcast media. In addition, Scouts had an opportunity to record simulated broadcasts and to gain immediate feedback from a TV weather expert. Through this experience, participants learned the importance of communicating effectively with the public.

Severe Weather Forecasting – With Senior Forecaster Ed Andrade and General Forecaster Christine Krause, Scouts diagnosed the weather pattern of a previous severe weather event as they learned the key ingredients necessary for severe weather and the role of a severe weather forecaster, through an introduction to hand analysis of surface weather data.

Severe Weather Warning Simulator – Meteorologist Intern Chris Nuttall hosted the Weather Event Simulator in which Scouts learned the role of a warning coordinator and the criteria for issuing severe weather warnings. Through the simulator experience, boys and girls experienced the responsibility of warning issuances during a severe weather event.



Dr. Maribel Martínez (in red) illustrates to some of the Girl Scouts how an incident support meteorologist would respond to an emergency.

Ham Radio Station – Bob Sanders, Chris Seright, Manuel Duke and Carl Jeans of the Panhandle Amateur Radio Club and General Forecaster Sarah Johnson, explained the roles of ham radio operators and storm spotters, especially the SKYWARN program. Scouts learned about the different types of radio communications equipment available and how this wireless network supports our community during emergency and disaster communications.

Storm Spotter support – Terra Seright, also with the Panhandle Amateur Radio Club, sat the Scouts in a fully equipped storm spotter vehicle, taught them how to use a ham radio and how to communicate properly with the ham network station. In addition, these prospective storm spotters learned about the tools and techniques necessary to stay informed and to maintain safety when observing severe weather.

Unlike typical career talks, Scouts were able to get hands-on experience in a wide variety of weather related fields and a taste of weather support to decision makers.

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