Winter 2012

NATIONAL WEATHER SERVICE

The Dryline

2011 Weather Year in Review

By Justyn Jackson & Nicholas Fenner

Panhandle weather is often described as extreme and 2011 certainly fit the bill. A strong La Niña episode in the Central Pacific Ocean significantly influenced the weather pattern across the Panhandles for most of the year. Due to this, 2011 will be remembered as the driest and one of the hottest years on record.

Amazingly, only one month in 2011 ended up with above normal precipitation— December! Precipitation totals over four of the first five months out of the year (January, March, April, and May) combined were only 0.25 inches of precipitation! Well below normal precipitation continued into the middle of August before the weather pattern became more favorable for precipitation. This pattern shift was evident as precipitation totals over the final three months of the year combined was nearly half of the annual precipitation at Amarillo during 2011. For the year, Amarillo only received 7 inches of precipitation, easily placing it at as the driest year on record.

Amarillo typically averages about 18 inches of snow per year, and we measured just over 19 inches of snow, despite the historic drought. This was mainly due to three storm systems that, when combined, brought almost 14 inches of snow – one in early February, the second in late October, and the last on Christmas Day.

...2011 Weather Year in Review continued on page 2...

Feast and Famine: A Comparison of December 2010 and December 2011 Weather Patterns

By Justyn Jackson, General Forecaster

The beginning of the historic drought of 2011 began to intensify rather quietly in December 2010. With the exception of one winter storm across the western Texas Panhandle in the middle of December of 2010, the remainder of the month and area was warm and dry. In fact, monthly average temperatures around the area were over 3.5° F above normal while monthly precipitation amounts were generally 75% of normal or less (Figure 1).

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The heat was also another major story, particularly between June and August when numerous daily temperature records were tied and/or broken. Some notable temperature records that were broken at Amarillo in 2011 included the all-time record high (111° F, set on June 26), the most number of 100-degree days (50 days), the most consecutive days of 90-degree temperatures (50 days), and the hottest average monthly temperature on record (July at 85.2° F). Only February and December had the distinction as being the only months this year with below normal temperatures. Overall, 2011 will go down as the 7th warmest year on record at Amarillo.

2011 will also be remembered as a quiet year for severe weather. The severe weather season started slowly but did increase slightly in June when all 4 tornadoes that were reported in the Panhandles this year occurred on June 11. However, since 1950, this was the 6th latest start to a year without a tornado in the Panhandles. The Texas and Oklahoma Panhandles typically see about 21 tornadoes per year, and this year, all 4 tornadoes that were reported were weak (EF-1 or less). Most of the thunderstorms this year were responsible for producing straight line wind damage, including a 120-mph wind gust that occurred with a thunderstorm in Beaver County, OK on August 9th.

YEAR 2011 SUMMARY FOR AMARILLO

High for the year: 111° F, June 26th* ***All-time record*** *

Low for the year: -6° F, February 9th and 10th

Average High Temperature: 74.6° F (3.7° F above normal)

Average Low Temperature: 44.8° F (1.1° F above normal)

Average Annual Temperature: 59.7° F (2.4° F above normal)

Annual precipitation: 7.00 inches (13.36 inches below normal) * ***Driest year on record*** *

Annual snowfall: 19.3 inches (1.5 inches above normal)

Days with temperature ≥ 100° F: 50 * ***Most in a year*** *

Panhandle Tornadoes: 4 total – 3 EF-0 and 1 EF-1

Aviation Weather Notes

By Sarah Johnson, General Forecaster

On January 9, Categorical Amendment Criteria (CAC) was implemented at all three Terminal Aerodrome Forecast (TAF) sites in the Texas and Oklahoma Panhandles: Rick Husband Amarillo International Airport (KAMA), Guymon Municipal Airport (KGUY), and Dalhart Municipal Airport (KDHT). CAC is already being used at several other NWS TAF locations and will be implemented at all NWS TAF locations across the country through this year.

So what exactly is CAC? CAC is a shift to impact-driven TAF amendments from the more traditional threshold-driven TAF amendments. Amendment criteria will be tailored to specific airport requirements of ceiling and visibility with TEMPO groups actively monitored to notify forecasters of impacts to customers. **There will not be any change in the format of the TAFs or the timing of scheduled issuances**. However, since amendments will be more impact driven we hope to eliminate unnecessary and operationally insignificant amendments. If you would like more information, or have comments regarding CAC you may call or email us at (806) 335-1121 or sarah.johnson@noaa.gov

Feast or Famine (continued)

Fast forwarding to December of 2011, the Panhandles experienced a colder and wetter than normal month. Monthly average temperatures were just over 2.5° F below normal while monthly precipitation amounts ranged between 125% of normal to almost 600% of normal (Figure 1). What caused such stark contrasts in the observed weather conditions?

La Niña conditions were present during both months, but La Niña was much stronger in December 2010 as compared to December 2011. Sea surface temperature anomalies in the equatorial Pacific Ocean were around -2° C in December 2010 (Figure 2). Meanwhile, a weak La Niña was ongoing in December 2011 with sea surface temperature anomalies around -1° C (Figure 2).

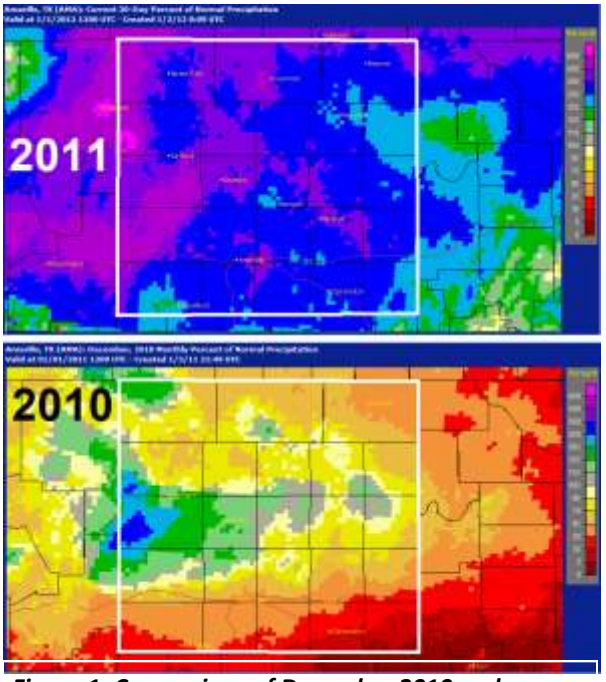


Figure 1. Comparison of December 2010 and December 2011 percent of normal precipitation. Above (below) normal precipitation is denoted by values greater (less) than 100%.

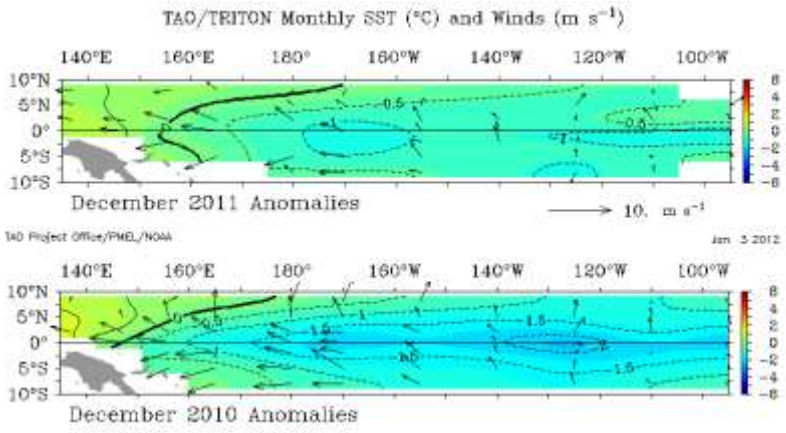


Figure 2. Comparison of December 2010 & December 2011 sea surface temperature anomalies across the equatorial Pacific Ocean.

Due to a much stronger La Niña episode in December 2010, an upper-level ridge was anchored over the Four Corners region (Figure 3) with the polar jet stream extending from the Pacific Northwest through the northern Plains and into the Eastern Seaboard (Figure 4). This was a classic pattern that is typical of strong La Niña episodes. As a result of the upper-level ridge across the Four Corners, warm and dry conditions prevailed across much of the southern High Plains.

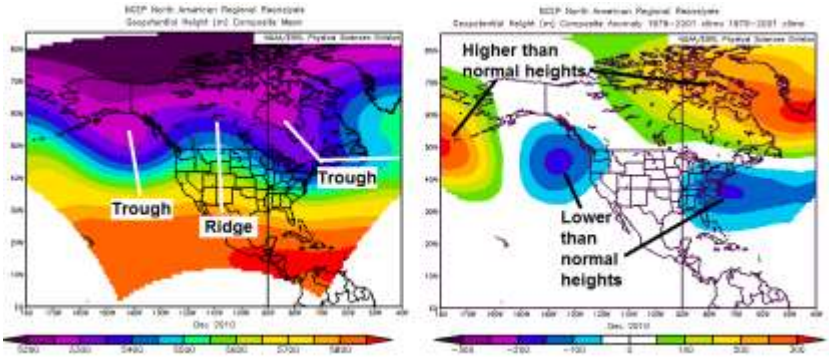


Figure 3. December 2010 500 mb geopotential height (m) composite mean (left) and composite anomaly (right).

...Feast or Famine continued on page 4...

Feast or Famine (continued)

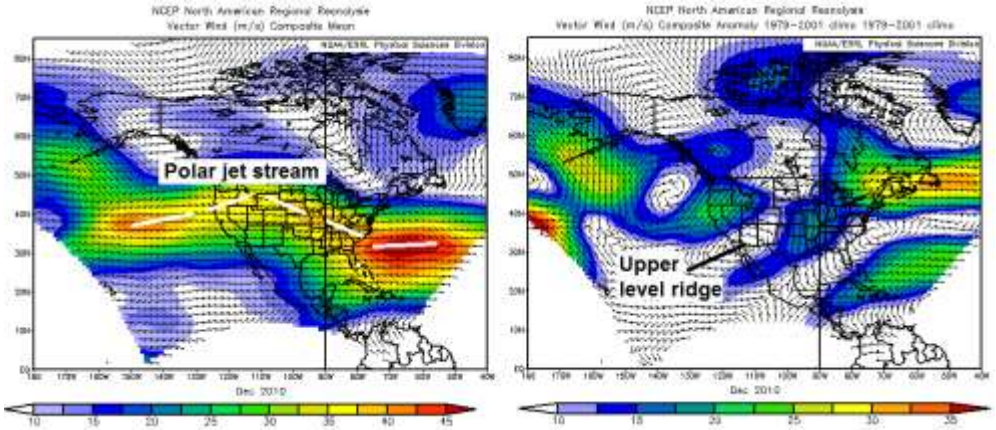


Figure 4. December 2010 250 mb vector wind (m/s) composite mean (left) and composite anomaly (right).

With a weaker La Niña signal present in December 2011, the upper-level pattern can exhibit a large degree of variability from the classic La Niña model. A mean upper-level trough was positioned over the Four Corners with upper-level ridging present north and east of the Panhandles (Figure 5). The polar jet stream was located well to the north, extending from British Columbia and into the Great Lakes. However, the primary difference between both years is that a stronger than normal subtropical jet stream extended from the equatorial Pacific Ocean into the Southern Plains (Figure 6). This typically brings an unsettled weather pattern to the Panhandles, and indeed, cooler and wetter than normal conditions resulted across the Panhandles.

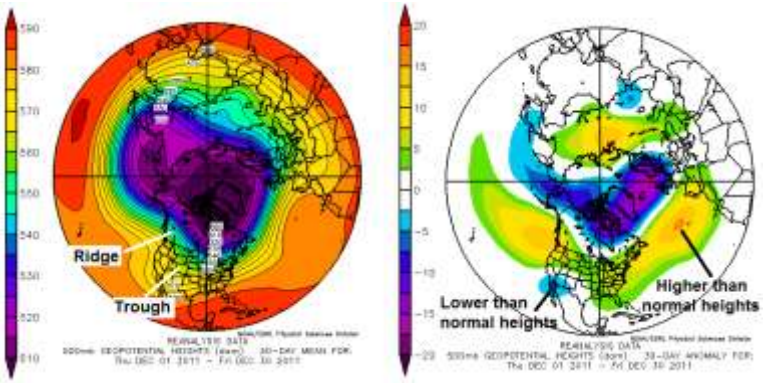


Figure 5. December 2011 500 mb geopotential height (dam) 30-day mean (left) and 30-day anomaly (right).

The big question remains whether or not the pattern that was observed in December 2011 will continue through the winter of 2012. If it does continue, there will likely be consistent opportunities for additional precipitation. On the other hand, if the weather pattern from December 2010 develops, an abrupt change to warmer and drier than normal conditions will return to the Panhandles.

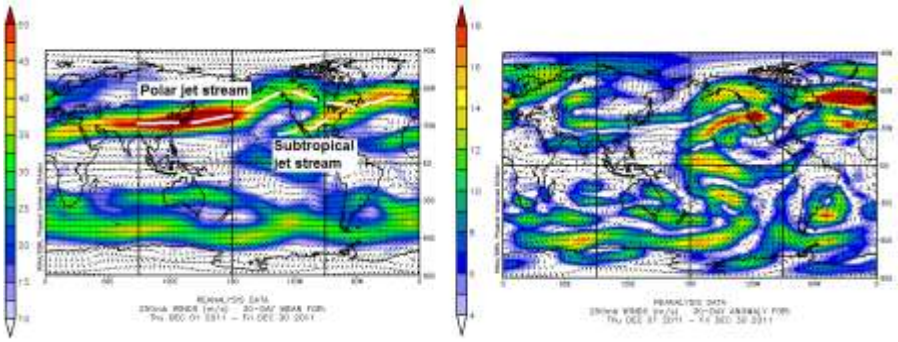


Figure 6. December 2010 250 mb vector wind (m/s) 30-day mean (left) and 30-day anomaly (right).

NWS in the Community

Combined Federal Campaign

Employees of the National Weather Service in Amarillo participated in several charitable activities this holiday season. During the fall, the Combined Federal Campaign (CFC) kicked off across the nation. This program allows Federal employees to donate charitable contributions to non-profit organizations across the world. NWS Amarillo employees raised $12,516.04, surpassing the office goal of $12,000. In addition, NWS Amarillo received the "2011 Exceptional Achievement Award" from the CFC. NWS Amarillo also raised money to purchase turkeys to donate to the High Plains Food Bank. With the money raised, ten turkeys were donated prior to the Thanksgiving holiday.

Lastly, around the Christmas holiday, several staff members participated in the Eveline Rivers Christmas project. The goal of the project is to provide disadvantaged children in the Amarillo area with basic necessities such as clothes, winter coats and school supplies. In early December, meteorologists from the NWS helped label Christmas presents with other volunteers from around the Amarillo area. For more information about the Eveline Rivers Christmas project, please visit www.evelineriversproject.org.

NWS Employee Retires After Dedicated Service

On December 31, 2011, Richard Wynne, Science and Operations Officer at the National Weather Service (NWS) office in Amarillo retired, after 35 years of federal service.

He began his career in 1976 with an appointment as meteorologist at the Environmental Science Service Center in College Station, Texas. There he served the NWS offices of the western sections of the Southern Region and agricultural customers and partners of that area for nearly 18 years. In 1994, he was promoted to the Science and Operations Officer position at Amarillo. Rich was a key member of the team that was responsible for implementing science and technology in the modernized National Weather Service. He oversaw training for the WSR-88D Doppler Radar and was highly instrumental in preparing the staff for the installation of the AWIPS computer forecasting systems. Most recently, he oversaw training for the Amarillo Dual Polarization radar upgrade. During his time in Amarillo, Rich trained dozens of Meteorologist Interns and Forecasters, many who have gone on to become Senior Forecasters, Information Technology Officers, Science and Operations Officers, and even Meteorologists-In-Charge.

Rich plans to keep up with atmospheric and earth sciences after his retirement, but he is also looking forward to reviving his hobby of creating stained glass art. Rich will remain in Amarillo for a few months, but he is planning for a move closer to family in Illinois.

Major Radar Advancement for Amarillo NWS

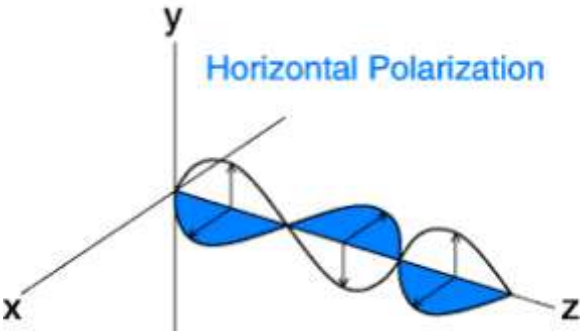
During the first two weeks of November 2011, the National Weather Service Doppler radar in Amarillo was upgraded to allow it to transmit, receive, and display dual-polarmetric data. This upgrade to "dual-pol" radar marks a significant advancement in radar meteorology, by which vertically oriented radio waves, in addition to horizontally oriented waves, are emitted, with some of their energy being scattered back to the radar after reaching a meteorological target. The addition of the vertically polarized signal means that vertical, as well as horizontal, measurements can be made within clouds and areas of precipitation. All of this means that the meteorologists at the National Weather Service in Amarillo are getting a better picture of the atmospheric processes and the accompanying associated weather that impacts the Texas and Oklahoma Panhandles.

Amarillo Radar

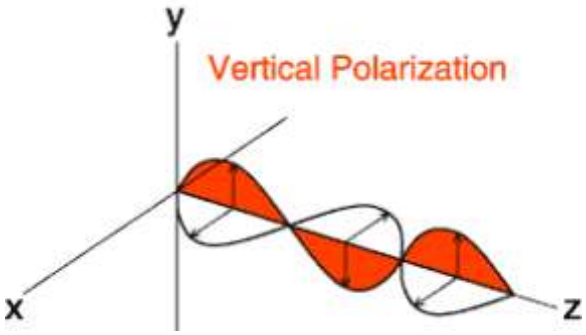
The upgrade was completed on schedule on November 13, 2011, with Amarillo being one of the first NWS offices in the nation to make the transition. Of the 121 National Weather Service radars across the country, ours was number eight on the list. The upgrade deployment teams will continue to visit all of the National Weather Service radars until the final radar has been upgraded, with the work scheduled to be done in early May 2013.

Although we have been in a drought since our radar made the transition to dual-pol, the few precipitation events that have occurred have offered the meteorologists a sampling of the new radar's detection capabilities. The dual-pol radar has been utilized to make determinations of precipitation type, differentiating rain and hail from snow. Refined estimates of rainfall amounts, as determined by the radar's new precipitation algorithm, have been obtained.

The meteorologists at the National Weather Service in Amarillo are very enthused to have the dual-pol enhancements in readiness for the remainder of this winter season and for the upcoming severe thunderstorm season. We are confident that the radar's new capabilities will allow us to more readily identify severe versus non-severe signatures, and to better determine rainfall rates and flooding potential.



Example of the structure of a horizontally polarized radio wave



Example of the structure of a vertically polarized radio wave

SKYWARN Spotter Talk Information

What is SKYWARN?

The National Weather Service in Amarillo utilizes various spotter networks for severe and other inclement weather verification and reporting. The various spotter networks are comprised of emergency management officials, law enforcement, fire fighters, EMS personnel, road crews, the general public, and amateur radio operators.

Formed in the early 1970s, SKYWARN is the National Weather Service program of volunteer severe weather spotters. SKYWARN volunteers support their local community and government by providing the NWS with timely and accurate severe weather reports. These reports are used to inform communities of approaching severe weather. Like the NWS, the focus of SKYWARN is simple -- to save lives and property.

Since the early 1990s, the WSR-88D Doppler radar has provided valuable information to forecasters with better detection of severe storm phenomena and more accurate and timely warnings. However, even with the advance in technology, "ground truth" is still a very important part of the warning process. "Ground truth" is what is actually occurring. More specifically, is a storm tornadic? Is it producing large hail? How about damaging winds? Most of the "ground truth" is provided by trained storm spotters who are the eyes of the NWS.

Who can be a spotter?

SKYWARN is an open volunteer organization, meaning that we accept reports from anyone in the public whether they have an amateur radio license or not, whether they are out in their cars observing a tornado, or whether they are home on their cell phone or on their ham radio.
To be a good storm spotter, we are looking for people who:

- give concise, meaningful weather ground truth information
- are safe and defensive drivers
- refrain from giving unnecessary weather reports
- continue to improve their weather education through spotter training sessions

How can I become a spotter?

1. Attend a live spotter training session
2. Complete FREE online training modules* (modules online at www.srh.noaa.gov/ama/?n=skywarn)
3. Register with eSpotter (registration & more information available at http://espotter.weather.gov)

*After you have completed both courses, you must e-mail/forward a copy of your electronic certificate of completion to Krissy Scotten at Kristin.Scotten@noaa.gov. In your e-mail, please include your name, address, and phone number so that we can register you as an official spotter. **Your contact information will *never* be distributed outside of NWS Amarillo.**

Link to spotter talk schedule: www.srh.noaa.gov/ama/?n=spottertalks

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