



The Dryline

The Official Newsletter of the National Weather Service in Amarillo
Fall 2008

August Rains Lead To Flooding

By Chris Kimble, Meteorologist Intern

When most people think of August in the Panhandles, they think of the typical hot weather that normally occurs here. However, this August an unusual weather pattern affected the region and brought extreme rainfall amounts and abnormally cool conditions (some might say downright cold weather for August!).

On August 10, an upper level low pressure system moved onshore in the Pacific Northwest, while a ridge of high pressure dominated the Southwest United States. Over the next few days, the upper level low moved eastward across southern Canada. As the upper level ridge began to drift westward and build across the Pacific Northwest, the upper level low moved south through the Northern Plains and the Central Rocky Mountains.

By the 16th of the month, the low pressure system had moved as far south as Colorado (Fig. 2). Because the upper level ridge had built across Washington, Oregon, and Montana, the upper level low to the south became trapped over the Central Rockies and Southern Plains states over the next few days before slowly moving eastward through the Panhandles on the 18th. With the upper level low nearby, the Panhandles received multiple rounds of thunderstorms and heavy rainfall. This kept temperatures very cool, as some areas did not get out of the 60s for high temperatures. Meanwhile, areas in the Pacific Northwest which were influenced by the upper level ridge experienced unusually hot temperatures for that region. Portland, Oregon, reached 102 degrees and Spokane, Washington, reached 103, while Amarillo had two days in a row with high temperatures in the 60s.



Fig. 1. Yards became lakes after heavy rains in eastern Amarillo on August 18, 2008. Photo by Steve Drillette.

During the week of August 11th through 18th, thunderstorms and heavy rain brought widespread flooding problems to the Panhandles. At first, thunderstorms were isolated although hail and heavy rain did fall in a few locations. When the low pressure system moved closer, the heavy thunderstorm rains became more widespread. The worst period of flooding occurred over the weekend of August 15th through 18th. During this week, many areas received in excess of 4 to 5 inches of rain, with some locations recording nearly 8 inches of rainfall. This is about 40% to 50% of the rainfall these areas would typically receive in an entire year!

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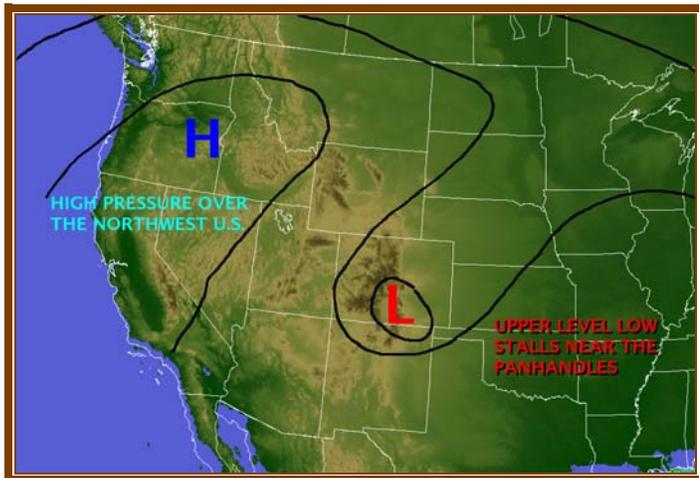


Fig. 2. The upper level atmospheric pressure fields for August 17, 2008. High pressure was over the Pacific Northwest while low pressure slowly drifted east.



Fig. 3. An August day looks more like February after a hailstorm in Beaver County, OK on August 14, 2008. Photo courtesy of Emergency Manager Keith Shaddon.

Heavy rains are not uncommon for the Panhandles in August. In fact, August is one of the wettest months of the year on average, with two to three inches of rainfall during the month. In a typical year, summer heat often gives way to afternoon thunderstorms, especially in late summer when moisture from the Southwest United States monsoon is available. However, to have this much rain and cold temperatures from a low pressure system from Canada in mid August is a rare event.

You may be wondering how these upper level high and low pressure systems cause such different weather for us at the surface. High pressure ridges are associated with areas of warmer air above the ground. Low pressure troughs have relatively colder air. On a typical summer day, the sun heats the ground until the air near the ground gets so warm that it is forced to rise into the cooler air above it. This often leads to puffy cumulus clouds in the afternoon and helps to keep temperatures at the surface from getting too hot. During a heat wave with an upper level ridge and warm air above the ground, the air near the surface is able to heat up much more before being forced to rise. But when cold air is above the surface, only a little bit of heat from the sun will cause the air to rise and form clouds and thunderstorms. This helps to keep temperatures from warming much at all, and is what led to the unusual spell of cool temperatures and heavy rains for the Panhandles this August.

NWS Amarillo Welcomes New Forecasters

By José Garcia, Meteorologist In Charge

We are pleased to announce the arrival of two new forecasters at the National Weather Service in Amarillo. Both forecasters arrived at the office in August and are eager to tackle Panhandle weather forecasting. Sarah Johnson was an Intern at WFO Goodland, Kansas. She earned a Bachelor's Degree in Family and Consumer Sciences at Meredith College in Raleigh, North Carolina, and went on to earn a Master's Degree in Meteorology at the University of North Dakota. She has done some work with programming, web and research and served on the WFO Goodland science team. She was recognized with a local Isaac Cline Award for her work on the WFO Goodland Graphicast program.

Our other new forecaster, Todd Beal, was an Intern at WFO Memphis, Tennessee. He earned a Bachelor's Degree in Geosciences at Mississippi State University and went on to earn a Master's Degree in Geosciences. He served as a SCEP student employee at Memphis as well. Mr. Beal worked on the WFO Memphis post storm evaluation team and served as team lead. He was the WFO Memphis Winter Weather and Non-Precipitation warning focal point. He has an excellent operational background and also earned a local Isaac Cline Award for Hydrometeorology.

A Day in the Life of the NWS: A Forecaster's Daily Routine

By Roland Nuñez, Senior Forecaster and Christine Krause, General Forecaster

Have you ever wondered what goes on at the NWS Amarillo? Many people rely on quality and accurate forecasts on a daily basis but are uncertain where this information comes from, or even how meteorologists compose the accurate forecasts they depend on. For this reason, the Dryline Team will begin a series of stories that describe the operations of the NWS Amarillo. The topic for this issue is our forecasters' daily routine.

NWS Amarillo is open 24 hours a day, every day, and is ready to service the weather needs of the Oklahoma and Texas Panhandles. Two forecasters are scheduled on duty at all times, and split the entire 24 hour period with three eight hour shifts. Each shift starts with the outgoing forecast team who provides an operational briefing to the incoming forecaster team, which includes an equipment status report, staffing availability, weather-related requests and projects, and the reasoning and confidence behind the current forecasts. The forecaster duties are generally divided based on short and long term periods.

The short term forecaster is focused on the forecast for the first 24 hours. Four times a day, this forecaster generates and maintains aviation forecasts for three local airports: Rick Husband International Airport in Amarillo, Dalhart Municipal Airport, and Guymon Municipal Airport in Oklahoma. Also, this forecaster creates a Hazardous Weather Outlook text and graphical product which indicates any expected hazardous weather that may impact The Texas and Oklahoma Panhandles. When weather becomes active, the short term forecaster produces short term forecasts and any necessary warnings or advisories.

The long term forecaster looks at the big picture and concentrates on the seven day forecast. After diagnosing the existing conditions, this forecaster determines what the expected conditions will be through the use of weather models, prognostic tools and local experience. Both public and specialized fire weather forecasts are produced through an array of gridded forecasts, painting a picture of common weather elements such as temperatures, cloud cover, wind speed and direction, probability of precipitation, and fire weather parameters. These gridded forecasts are then used to create the internet forecasts and text products that are used by our customers.

As part of the forecasting process, meteorologists coordinate decisions with each other and collaborate with neighboring NWS offices and the local media. We also service many phone calls from the public, law enforcement, emergency managers and other customers. On occasion, we host tours of our office and operations. Since NWS Amarillo operations depend on a complex network of computer, radar, and observation systems, there are also several electronic technicians and information technology specialists on staff who maintain the computers and equipment and diagnose and correct any performance issues and outages. Data Acquisition staff members are available 16 hours per day. Their primary duties include releasing weather balloons, monitoring NOAA Weather Radio, and assisting with gathering observations and climate information.

The next topic in the series "A Day in the Life of the NWS" will be on Winter Weather Operations. Look for it in our Winter 2009 Dryline issue.



Fig. 4. Forecasters Edward Andrade (right) and Mike Johnson busy assembling the forecast for the Panhandles.

Weather Review and Outlook

By Chris Kimble, Meteorologist Intern, and Richard Wynne, Science and Operations Officer

REVIEW OF SUMMER 2008

Although Spring was warm and dry, with very hot weather in the month of June, the weather pattern began to change in July. Thunderstorms forming over the Rocky Mountains drifted into the Panhandles during the evening hours, keeping temperatures cooler and alleviating the dry conditions. Remnants from Hurricane Dolly also brought rain to the area at the end of July. By the middle of August, a large upper level low pressure system brought cool weather and widespread rain to the Panhandles. Temperatures stayed below 80 degrees for a full week and did not even reach 70 degrees for two straight days during the middle of the month. Heavy rains fell, causing widespread flooding problems across the region before finally coming to an end on the 19th. Cold fronts began pushing into the Panhandles again in early September, providing surges of cooler air every few days. This kept temperatures cool for most of the month, with mainly tranquil weather conditions.

Overall, most of the summer was generally cool and wet, with the added rainfall helping to reduce extreme drought conditions which had developed over some parts of the panhandles.

	AVG HIGH	AVG LOW	AVG TEMP	PRECIP	90° +
JUL	89.8 (-1.2)	65.1 (-0.2)	77.4 (-0.8)	4.96 (+2.28)	19 (-0.9)
AUG	85.7 (-3.0)	63.5 (-0.3)	74.6 (-1.7)	4.43 (+1.49)	11 (-5.5)
SEP	79.3 (-2.5)	54.5 (-1.8)	66.9 (-2.2)	1.32 (-0.56)	0 (-7.0)

Table 1. Summer 2008 statistics for Amarillo, TX

OUTLOOK FOR FALL 2008

The three-month outlooks for October, November, and December have been issued by the Climate Prediction Center (CPC). The temperature outlook indicates a slightly higher probability of above normal temperatures for the Panhandles over the three month period. Normally the first freezing temperatures occur in mid-October. The precipitation outlook indicates equal chances for above and below normal precipitation for the Panhandles. Normally, precipitation in this region decreases significantly towards the winter months, which is generally the driest time of the year.

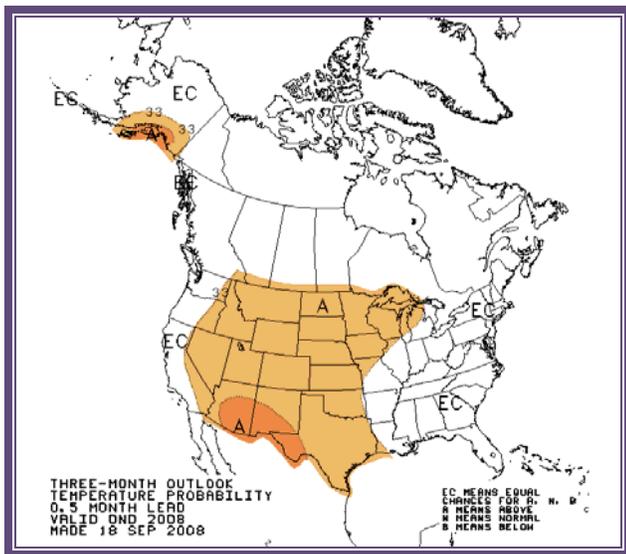


Fig. 5. OCT-NOV-DEC 2008 Temperature Outlook

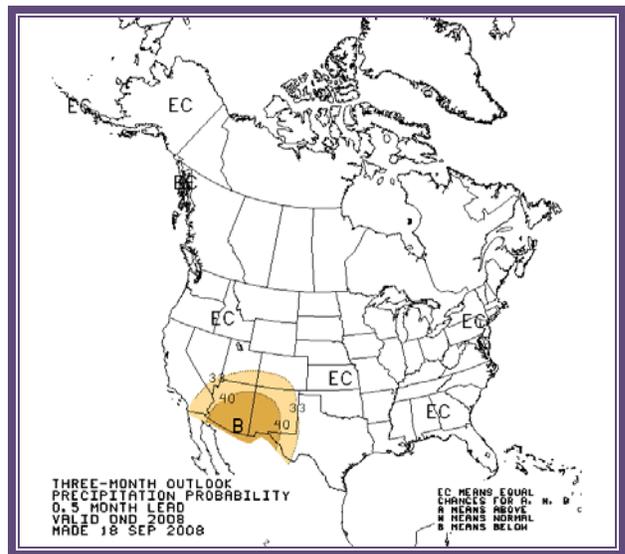


Fig. 6. OCT-NOV-DEC 2008 Precipitation Outlook

Oklahoma Panhandle Endures Extreme Drought

By Chris Kimble, Climate Focal Point



The Oklahoma Panhandle was once considered “No Man’s Land” by frontier settlers. This dry and dusty plain was one of the last places to be settled in the Great Plains and at one time was referred to as the “Cimarron Desert.” The people of this area have maintained farms and ranches through periods of drought and plenty for 100 years. In the 1930s, this region was the hardest hit region during the infamous “Dust Bowl.”

The first half of 2008 proved to be yet another tough year for farmers and ranchers in the western Oklahoma Panhandle. Dry, windy weather brought extreme drought conditions to the area, prompting many locals to make comparisons to the drought of the 1930s. Although some comparison can be made, extremely dry weather has not been as persistent as the 1930s and farming practices have improved to drastically limit soil erosion and dust storms.

Since the year 2000, the region has been abnormally dry, allowing a long term drought to develop in the Oklahoma Panhandle. Boise City normally receives 18.68 inches of precipitation each year, but this much rain has not fallen since 1999. Most years this decade would not be considered extremely dry, with all years receiving at least 70% of the normal rainfall. But the constant dryness adds up. This year, spring and summer rains were slow to arrive. As of June 30, Boise

City received only 2.49 inches of rain. This is only 27% of the normal precipitation for the first half of the year and the second driest start to the year on record. When summer thunderstorms finally arrived in mid-June, they were hit and miss. Some areas got much needed rain while others remained parched.

July and August finally saw more widespread rainfall. A large upper level low pressure system brought heavy rain to the Panhandles for a full week in August, allowing Boise City to record the wettest August on record with 7.69 inches of rain. This more than doubled the rainfall for the year and brought the area to within one inch of normal.

The very dry first half of 2008 had devastating impacts on local agriculture. Many farmers and ranchers were unable to grow crops and were forced to sell off their entire herds of cattle when grasses became sparse. Though the area remains in a long term drought since the beginning of this decade, the current dry period is not nearly as dry as the devastating Dust Bowl of the 1930s. During the 1930s, Boise City recorded three consecutive years with less than 10 inches of rain (1934-36) and 10 consecutive years of below normal rainfall.

COOPERATIVE OBSERVER ANNIVERSARIES

We want to thank our volunteer Cooperative observers for their service in helping the NWS maintain quality climatology data for their cities and towns. The following observers were recently recognized for their many years of service:

30 years

Riverside, OK – Roy Bridwell

Wheeler, TX – Louis Stas

25 years

Boise City, OK – Zena Lee Walker

20 years

Eva, OK – Ruth Sipes

10 years

Booker, TX – Jerry and Kayla Parvin

Higgins, TX – F.J. Bougham

Hooker, OK – Sheila Blankenship

21S of Perryton, TX – Barbara Phillips

5 years

Vega, TX – Kim Montgomery

Follett, TX – Tommy Schilling

22SE of Canadian, TX – Bret and Haley Begert

6NW of Canadian, TX – John Wheeler

15SW of Canadian, TX – Frank and Fern Young

In YOUR Community

The National Weather Service in Amarillo continues to participate in numerous outreach events. In addition to the events shown below, we have many more photos from outreach to many communities in the Texas and Oklahoma Panhandles. They are located on our website at:

http://www.srh.noaa.gov/ama/outreach_events/outreach_event_front.htm



Fig. 7. MIC José Garcia and ET Dave Wilburn met the challenge at the Amarillo Chamber BBQ.



Fig. 8. ET Dave Wilburn keeps an eye on the tasty cuisine.

We would love to participate at your next event! To schedule the NWS Amarillo in your next community event, please e-mail Steve Drillette at steve.drillette@noaa.gov, or call 806-335-1121.

Partners and Volunteers Recognized at NWS Appreciation Day

By Steve Drillette, Warning Coordination Meteorologist

The National Weather Service in Amarillo held its 8th Annual Spotter & Cooperative Observer Appreciation Day and public Open House on Saturday, September 13th. More than 100 local storm spotters, residents, and NWS staff were in attendance and were treated to a complimentary meal consisting of hotdogs and sausages, chips, cookies, and refreshing lemonade and iced tea. Tours of the NWS Forecast Office were also provided. Each hour, several door prizes including rain gauges, weather alert radios or six-pack coolers with built-in radios, along with items for kids were given away. “The purpose of the Appreciation Day is to thank our volunteers and partners for all the fine work they do for us”, said Meteorologist-In-Charge Jose Garcia. “The open house provides us the opportunity to showcase our office and demonstrate to the public how *their* NWS works to fulfill its mission of protecting life and property.”

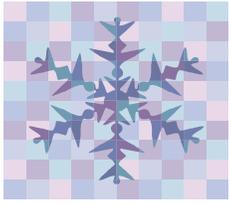


Fig. 9. Senior Forecaster Roland Nuñez serves food at the Volunteer Appreciation Day at the NWS on September 13, 2008.

To add to the celebration, Coffee Memorial Blood Center conducted a blood drive. Each donor received a t-shirt from Coffee Memorial, a coupon for a free entrée from Chick-Fil-A, and a rain gauge from the NWS. We’d like to express our thanks to Wal-Mart and Chick-Fil-A of Amarillo who partnered with us this year. Nearly all of the food was donated by Wal-Mart. The success of the event would not be possible without their generous support.

NWS Winter Warnings are Changing

By Chris Kimble, Winter Weather Focal Point



As an institution of the federal government, the National Weather Service strives to fulfill its mission and serve the public in the best ways possible. Over the course of the spring and summer, the NWS solicited feedback from the media, emergency management officials, and the general public on its winter weather products. As a result of this feedback, the National Weather Service has changed many of the winter weather advisories and warnings in order to provide the most accurate and most specific warnings possible while minimizing confusion.

As part of its mission, the NWS is charged with preparing forecasts and issuing statements, advisories, and warnings regarding potentially hazardous winter weather events. In general, winter weather advisories are issued when winter weather conditions are expected to cause significant inconveniences, and if caution is not exercised, these conditions could lead to life threatening situations. Winter storm warnings are issued when life threatening hazardous winter weather conditions are expected or are occurring and may cause a major impact on travel conditions or local infrastructure. Winter storm watches may also be issued a few days in advance of the expected conditions to alert the public that a hazardous winter event is possible.

These guidelines are the same nationwide for every National Weather Service Office. However, each area of the country has a different climatology, and winter weather conditions may cause vastly different impacts from one region to the next. For this reason, each local National Weather Service Forecast Office is charged with issuing advisories and warnings based on the impacts for each specific area. During the spring and summer of 2008, the National Weather Service in Amarillo surveyed local media and emergency personnel in an attempt to better understand and define what the criteria should be for issuing advisories and warnings for the Texas and Oklahoma Panhandles. Due to all the changes in product types and criteria, a review of several types of advisories and warnings is explained below:



Winter Weather Advisory – Any combination of one or more of the following conditions are expected: one to five inches of snow, significant blowing snow, sleet accumulating to less than one half inch, or light accumulations of ice on exposed surfaces.



Freezing Rain Advisory – Freezing rain or drizzle is expected to form light accumulations of ice on exposed surfaces, with no other winter precipitation type expected.



Winter Storm Warning – A hazardous winter event is expected with any combination of one or more of the following precipitation types expected: six inches or more of snow, sleet accumulations of one half inch or more, or freezing rain producing ice accumulations of one quarter of an inch or greater.



Ice Storm Warning – Freezing rain is expected to cause damaging ice accumulations of one quarter of an inch or greater, and no other winter precipitation type is expected.



Blizzard Warning – Heavy snow and/or blowing snow is expected with wind speeds of 35 mph or more, frequently reducing visibilities to less than one quarter of a mile for three hours or more.

As always, for the latest updates on any watches, warnings or advisories for your area tune in to your NOAA Weather Radio or local media outlet. You may also visit our website at www.srh.noaa.gov/ama.

Aviation Forecast Format Change

By Mike Johnson, General Forecaster



One of our most visible aviation products will soon be getting a facelift. On, November 5, 2008, there will be a slight change to the format of the Terminal Aerodrome Forecasts, or TAFs. In response to international requests, the National Weather Service will begin issuing 30-hour aviation forecasts for select airports, rather than the 24-hour forecast currently produced. The 30-hour TAFs will be issued at 32 high-impact airports across the United States, but this does not include any in the Texas or Oklahoma Panhandles. However, all TAFs will conform to the new format.

Existing Format	New Format Effective November 5, 2008
TAF KAMA 061125Z 061212 17012KT P6SM SCT020 TEMPO 1214 BKN015 FM 1800 19017G25KT P6SM SCT070 FM 0200 17012KT P6SM BKN100	TAF KACV 061125Z 0612/0712 17012KT P6SM SCT020 TEMPO 0612/0614 BKN015 FM 061800 19017G25KT P6SM SCT070 FM 070200 17012KT P6SM BKN100

As you can see, the only differences are found in the portions of the TAF that contain the time and date. Using Universal Coordinate Time (CDT+5 or CST+6), the ‘day of the month’ will precede each hour group. The actual weather portion of the TAF will not be changed. If you have any questions about these changes, please contact our Aviation Program Leader, John Brost, at john.brost@noaa.gov.

The Dryline

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