Winter 2013

NATIONAL WEATHER SERVICE

The Dryline

December Tornadoes

While thunderstorms are fairly uncommon in December in the Panhandles, severe weather is almost unheard of during this month. In fact, less than 1% of all severe weather in the Panhandles occurs in December. However, meteorological anomalies do happen, and that is certainly what transpired during the afternoon hours of December 14. As a potent upper-level storm system approached the region, it helped transport moisture from the Gulf of Mexico northward. At the surface, a cold front advanced eastward during the day. As the front encountered the relatively moist air in the Texas Panhandle, showers and thunderstorms developed by the early afternoon hours across eastern New Mexico. Initially, this activity remained below severe levels as it moved into the far western Texas Panhandle. However as the afternoon progressed, the atmosphere became slightly more unstable, which led to the development of severe thunderstorms.

There were several reports of damaging winds, including a 77-mph wind gust near Lake Tanglewood in Randall County, TX. Despite very cold temperatures aloft, most of the hail that occurred was smaller than the size of a nickel. Additionally, a storm survey determined that three EF-0 tornadoes occurred across the southern Texas Panhandle. The first tornado occurred about 3 miles northeast of Washburn, the second tornado occurred 5 miles south southeast of Clarendon, and the third tornado occurred 1 mile north northwest of Lelia Lake. *These were the first known tornadoes to occur in December in the Amarillo forecast area since 1950*! Despite the severe weather it was also one of the wettest days since late September. Find more information on these storms at weather.gov/ama?n=dec14storms

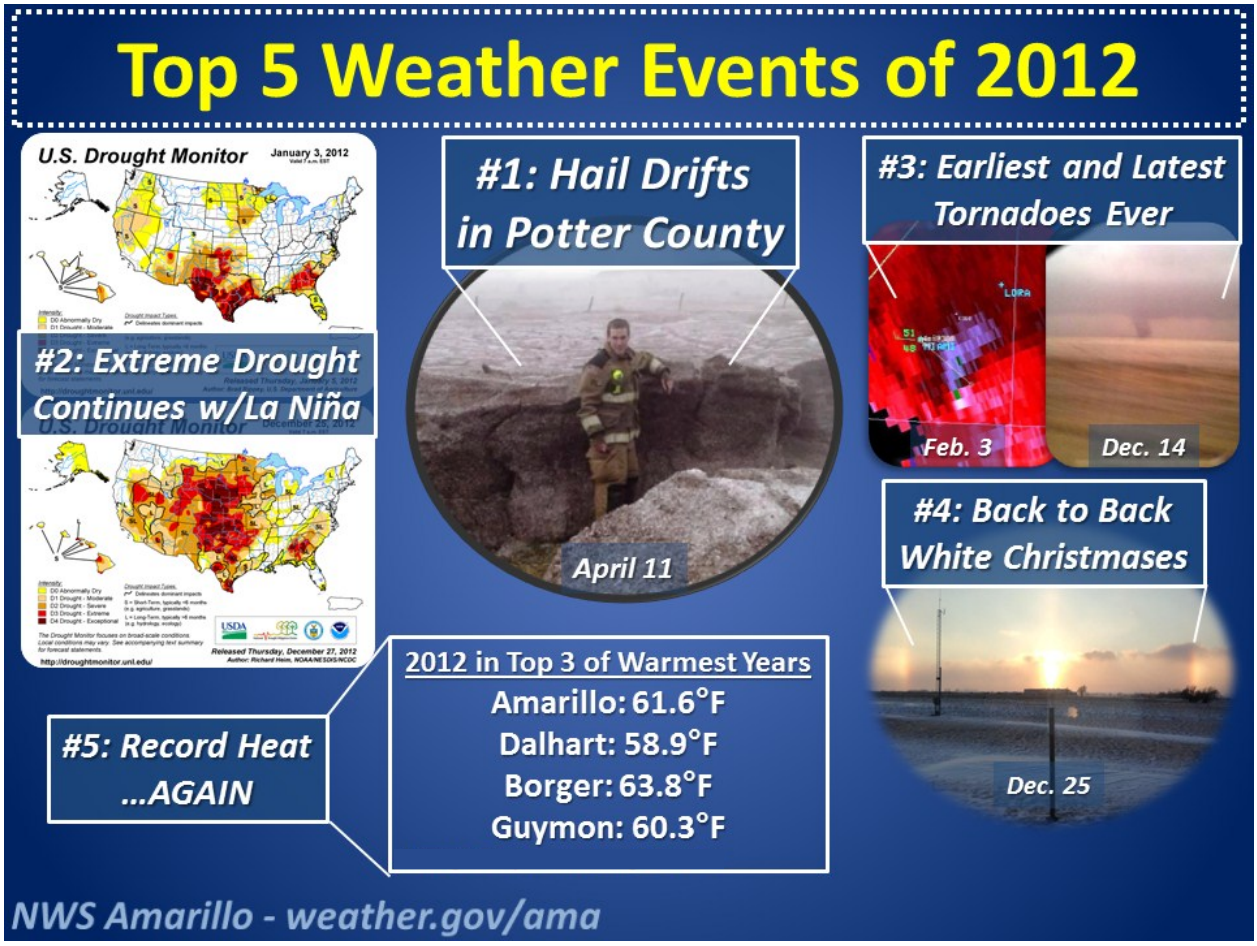
Tornado northeast of Washburn, TX (Courtesy BJ Shipp)

Inside this issue

2012 Weather Year in Review

Known for its often extreme and quickly changing weather, the Panhandles did not disappoint in 2012. Though the quick pace of broken temperature records from last year wasn't matched this year, the Panhandles experienced the second warmest year on record. Following last year's extreme heat, this December also concludes the warmest two- and three-year stretches on record. Precipitation in most locations across the area was nearly double 2011's record low amounts, though these figures were still only roughly half of the normal amounts. Beneficial late-winter and early-spring rains helped most of the area see short term recovery from the ongoing drought, though a dry summer and autumn have left mostly extreme to exceptional drought across the Panhandles.

This was a relatively quiet year for severe weather events, as the ongoing drought limited the needed moisture for storms to develop on many occasions. Rare cool-season severe weather events did lead, to both the earliest and latest confirmed tornadoes on record in the NWS Amarillo forecast area. The earliest tornado on record, rated EF-1, occurred a few miles south of Miami, TX shortly after midnight on February 3rd. This is only the 4th known February tornado for this area. The rest of the spring and summer saw several severe thunderstorms, with wind gusts between 80 to 90 mph and hail as big as softballs. In addition, a massive hail storm on April 11th shut down U.S. Highway 287, 20 miles north of Amarillo, due to hail drifts 3 to 4 feet high. Finally, the year wrapped up with the area's first ever confirmed December tornadoes. Three brief EF-0 tornadoes were produced on December 14th as a cold front swept rapidly across the Panhandles. Once again, Panhandle residents were lucky enough to see another White Christmas which was the first back to back White Christmases since 1894 and 1895.

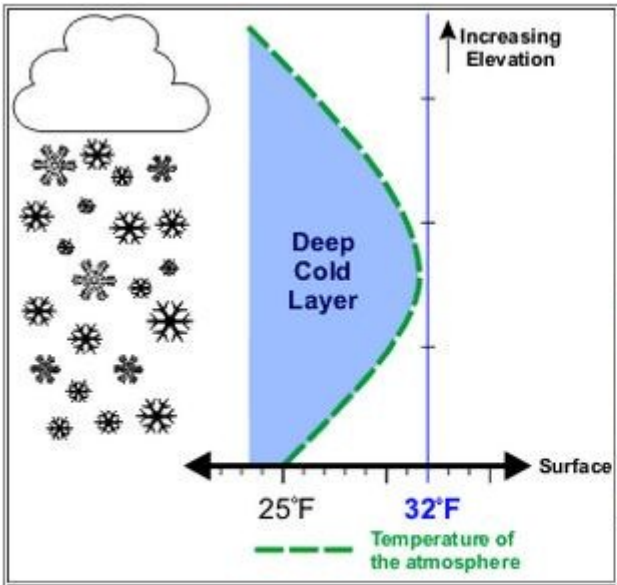


Winter Precipitation Types

Winter weather is certainly not a stranger to the Texas and Oklahoma Panhandles from late fall through early spring. More often than not, the main precipitation type that is observed is snow. However, sleet and occasionally freezing rain also affect the Panhandles. What causes these different types of precipitation? The vertical temperature profile is the most important aspect in controlling whether snow, sleet, or freezing rain occurs. The vertical temperature profile is the temperature of the atmosphere at various heights above the surface. Just as important, in order for ice crystals (snow) to form, there needs to be sufficient saturation (relative humidity values of 70% higher) present within a layer known as the dendritic growth zone, or snow growth zone. This is a layer in the atmosphere with temperatures approximately between 10 and 0° F (-12° and -18°C) where snow forms. If there is not enough saturation present, snow and sleet will not form.

Snow

Let's start with one most people from the Texas and Oklahoma Panhandles are very familiar with, snow. In order for the surface precipitation type to be snow, the atmospheric temperature (dashed green line in image below) must be at or below 32°F (0°C) to ensure that no melting occurs. However, there are other special circumstances when snow can occur at the surface despite the entire atmosphere not being below freezing. The first situation occurs when there is a very shallow melting layer aloft with a maximum temperature in the melting layer less than 34°F (1°C). The melting layer is defined as the area of the atmosphere that is above freezing (32°F or 0°C) where frozen precipitation (snow or ice) starts to melt. The second situation occurs when the wet bulb zero height (the height where the evaporatively cooled temperature, goes below 32°F) is less than 1,500 feet. Wet snow is most likely to occur in both circumstances since the snow flake has only been partially melted.



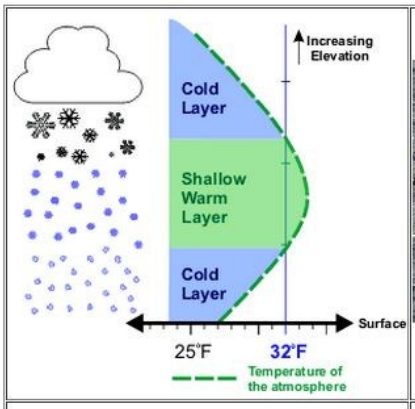
Vertical Temperature profile which will produce snow

Snow as it is falling and on the ground

Winter Precipitation Types (continued)

Sleet

In the vertical temperature profile of the atmosphere (pictured below) notice that the entire atmosphere is not below freezing. In fact, there is a thin layer above the surface that is above freezing. In this example, sleet would be the dominant precipitation type. Sleet occurs when a snow flake partially melts and then refreezes giving it a different shape and composition compared to snow. For partial melting to occur, the maximum temperature in the melting layer is typically between 34 and 38°F (1 and 3°C) and for a relatively thin layer (less than 2,000 feet thick). Sleet can be identified as it hits the ground since it bounces because it's made of hard ice, unlike snow or freezing rain which stick to the ground once they hit.

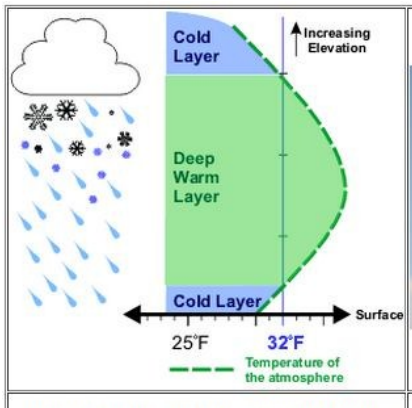


Vertical Temperature profile which will produce sleet

Sleet accumulating on the ground

Freezing Rain

When the snow flake completely melts and the surface temperature is below freezing, freezing rain will be the dominant precipitation type. In the profile below, notice that there is a deep melting layer above the surface and a shallow freezing layer just above the surface. When the maximum temperature in the melting layer exceeds 38°F (3°C), the snow flake completely melts and becomes a rain drop. Since the freezing layer just above the surface is shallow, there is not enough time for the rain drops to freeze into sleet. As a result, the rain drops freeze on contact with the surface and can create very hazardous conditions. Not only can freezing rain lead to ice on roads, it can weigh down tree branches and power lines and cause power outages.



Vertical Temperature profile which will produce freezing rain

Rain freezing and accumulating on a tree branch

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

Pantex Declared StormReady

By Pantex blog (www.pantex.com)

On the plains of the Texas Panhandle, it pays to be ready for unpredictable and severe weather. The Pantex Plant has risen to that challenge, once again earning recognition from the National Weather Service in Amarillo as a StormReady site. "Pantex was one of the first entities of its kind to become StormReady," said Jose Garcia, Meteorologist-in-Charge of the NWS's Amarillo office. "Pantex is a special facility, and it is important the public knows it is prepared for severe weather." Garcia and other NWS officials were at the plant on December 12, 2012 to present Pantex officials with the recertification. He said StormReady status indicates Pantex has the weather sirens, shelters, notification technology and emergency response infrastructure to respond effectively to severe weather. Alonza Campbell, manager of the Emergency Management Department at Pantex, said the Plant has a long history of working hand-in-hand with the community. Pantex maintains contact with the NWS to anticipate storms and other inclement weather conditions. Pantex even uses National Oceanic and Atmospheric Administration (NOAA) All-Hazards Weather Radios to alert residents living near the plant of emergency conditions.

"We recognize that we have a responsibility to our neighbors to be prepared for all types of emergency situations," Campbell said. "In this part of the country, severe weather is a fact of life and it is one of the potential risks we have to be ready for at all times."

The Dryline**.....** 1900 English Road, Amarillo, TX 79108

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