

Winter 2009/2010 and January Climate

A year ago in January 2010, the coldest daily lows since December 1989 at Austin Bergstrom and Del Rio and since December 1990 at Austin Mabry and San Antonio came January 9th, 2010.

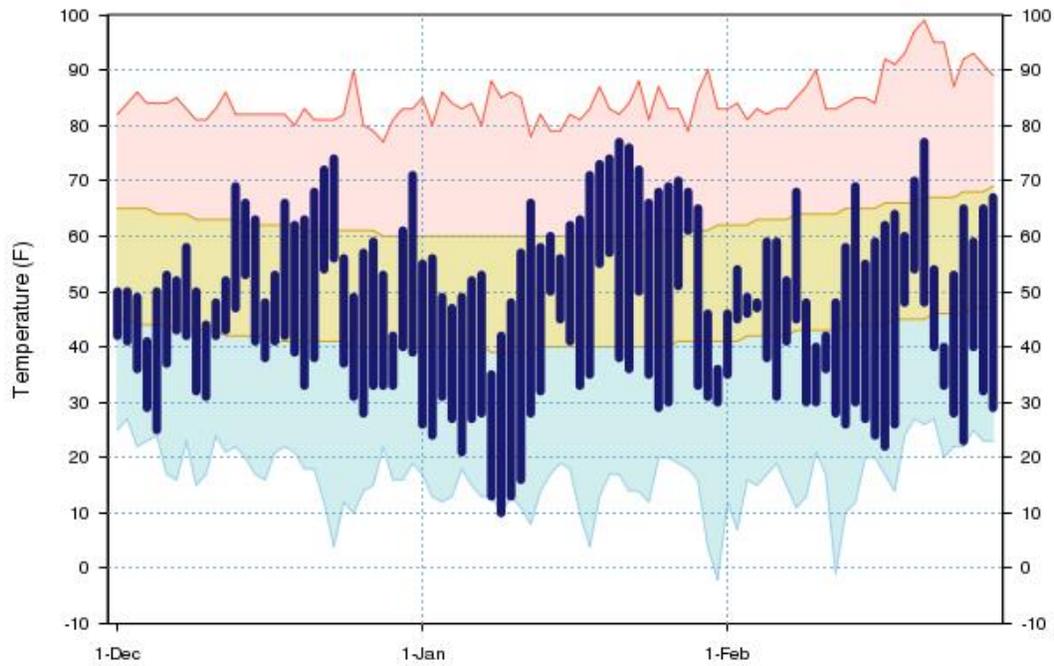
The trend of cooler than normal conditions persisted from December 2009 through February 2010. Some of the large scale synoptic features that made the Winter colder for South Central Texas last year was the strong El Nino and the negative phase of the North Atlantic Oscillation from December 2009 to February 2010. When the North Atlantic Oscillation Index is negative, cold air outbreaks are more common over the Eastern U.S. and Texas. The cold of early January 2010 was just one of a variety of weather trends that affected the region in January 2010. The trend of colder than usual cold fronts from December 2009 set the stage for colder temperatures to follow in January 2010 across South Central Texas. After a brief and quick warming trend on New Years Eve of 2009, when highs rose to the 70s, a late day cold front left colder weather for January 1st to the 3rd, 2010, that was followed by a wave of Arctic Air in the early morning hours of Monday, January 4th, leaving colder temperatures on the 4th and 5th. An additional wave of Arctic Air swept across the region the night of the 6th to early morning of Thursday the 7th of January, 2010, leaving even colder temperatures on January 7th to the 10th last year.

The coldest lows for January 2010 came on January 9th, 2010 when lows fell to 10 at Austin Bergstrom, 17 at Austin Mabry, 13 at Burnet, 18 at Del Rio, 12 at Hondo, 14 at New Braunfels, 16 at San Antonio, and 17 at San Antonio Stinson. The last time it was this cold at Austin Mabry was December 23, 1990, when the low was 15, and at Austin Bergstrom on December 23, 1989, when the low was 6. The last time it was this cold at San Antonio was December 23, 1990, when the low was 16. The last time it was this cold at Del Rio was on December 23, 1989, when the low was 10 and December 24, 1989, when the low was 18.

Frequent cold fronts followed by brief warming trends, more cloudiness than usual from active weather systems, and above normal rain made the winter season from December 2009 to February 2010 the coldest for South Central Texas since the winters of 1976/1977, 1977/1978, 1978/1979, and 1983/1984. The average temperature from December 2009 to February 2010 was a tie for the 4th coldest at Del Rio; the 7th coldest at San Antonio; and a tie for the 8th coldest at Austin Mabry. The average for the state of Texas in the Winter of 2009/2010 from December to February was the 5th coldest on record, statewide, since 1895, with the average temperature statewide at 43.6 degrees, 4.5 degrees below normal and the coldest since 1978/1979.

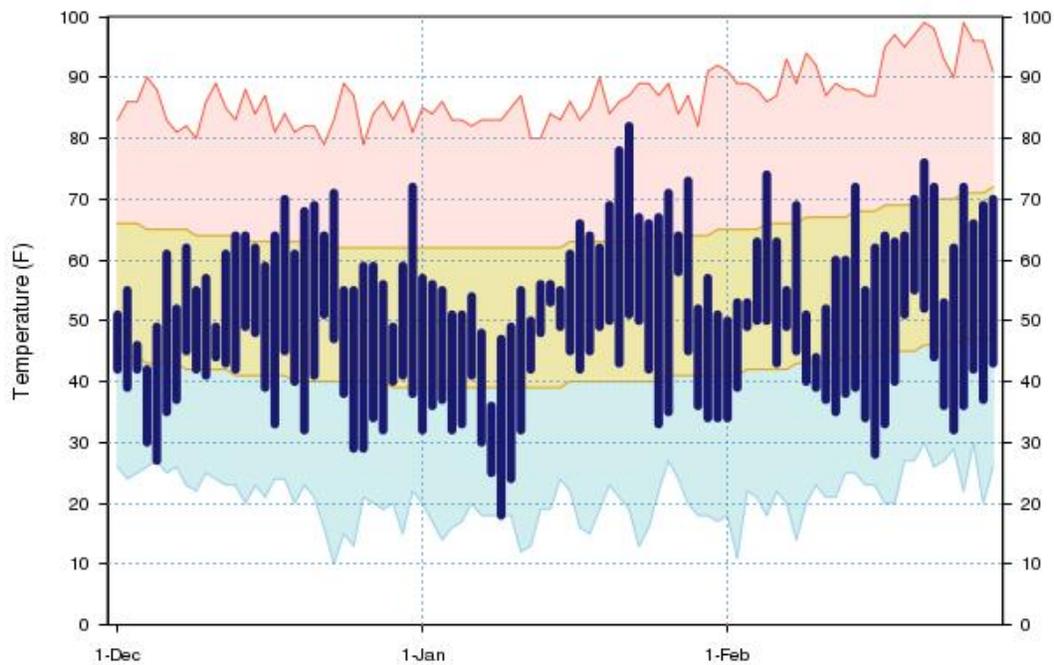
The averages did not capture the complete scope on how cool the winter was in 2009/2010. The charts below and records show that the cool weather in the winter of 2009/2010 was much more consistent than usual, with only short warming trends. Other winters when conditions were consistently cooler than usual include the winters of 1935/1936, 1966/1967, and 1967/1968. The frequent cold fronts with limited warming trends, more clouds in the day from active weather systems, and higher soil moisture contributed to more consistent cool temperatures from day to day and month to month. The rainfall from September 2009 to February 2010 was the 2nd wettest September to February at San Antonio since 1871; the 12th wettest at Austin since 1856; and the 31st wettest at Del Rio since 1906.

Temperature Summary for Austin Area Dec 1, 2009 - Feb 28, 2010



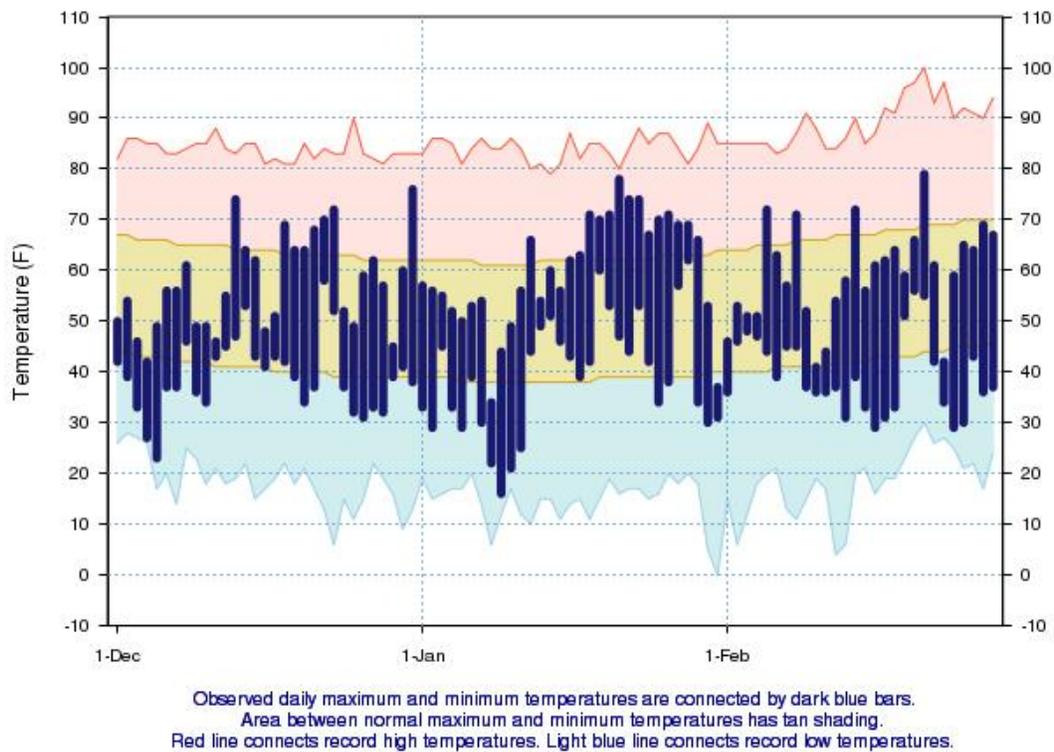
Observed daily maximum and minimum temperatures are connected by dark blue bars.
Area between normal maximum and minimum temperatures has tan shading.
Red line connects record high temperatures. Light blue line connects record low temperatures.

Temperature Summary for Del Rio Area Dec 1, 2009 - Feb 28, 2010



Observed daily maximum and minimum temperatures are connected by dark blue bars.
Area between normal maximum and minimum temperatures has tan shading.
Red line connects record high temperatures. Light blue line connects record low temperatures.

**Temperature Summary for San Antonio Area
Dec 1, 2009 - Feb 28, 2010**



The winter of 2010/2011 began at 538 pm CST on Tuesday, December 21st, 2010. Similar to December 2009, a warming trend came in late December 2010, with highs on December 30th, 2010 rising to the 70s to low 80s. December 30th, 2010 was the warmest day of December 2010 at Del Rio with 83. At San Antonio Stinson December 30, 2010 tied for the warmest day in December, with the 4th and 21st, for a high of 81. Cooler conditions Friday, December 31st, 2010 were followed by colder days on January 1st and 2nd, 2011. This Winter a La Nina event has been in place, opposite to the El Nino of a year ago. One ingredient that is similar to last year is that the North Atlantic Oscillation Index has been negative. This has helped cooler weather spill southward across South Central Texas since late November, and limited the duration and magnitude of warming trends that normally occur during La Nina Winters.

Climatologically, January marks the coldest temperatures averaged over a long period of time for South Central Texas; however, in some years the coldest in a winter season comes sometimes in December or February. The All Time Lows of Record for Austin and San Antonio came January 30, 1949, when the low was -2 at Austin Mueller Airport; -5 at Austin Bergstrom, and 0 at San Antonio. The All Time Low at Del Rio was 10 on December 23, 1989. The long term averages show January as one of the drier months of the year; however on some occasions heavy downpours have showed up. Extremes from warm to cold and cold to warm continue and are historically exceeded only by February. A record snow event for Del Rio and San Antonio showed up in January of 1985, when San Antonio

had 13.5 inches of snow and Del Rio 8.6 inches of snow. The most snow for Austin came November 22 and 23, 1937 when 9.7 inches of snow fell.

The coldest January for Austin was January 1856, when the average monthly temperature was 36.6 degrees. The coldest January for San Antonio and Del Rio was January 1930, which was the 2nd coldest January for Austin after January of 1856. The average monthly temperature at Austin in January 1930 was 39.4 degrees; at Del Rio 43.8 degrees; and at San Antonio 43.3 degrees in January 1930. For Austin Bergstrom the coldest January, from 1943 to 2010, was January 1978, when the average monthly temperature was 42.4 degrees. The 1970s had several cold Januarys in 1970, 1973, 1977, 1978, and 1979.

The warmest January at Austin and San Antonio was January of 1923, when the average monthly temperature at Austin was 59.6 and at San Antonio 62.0. The warmest January at Del Rio was January 1950, when the average monthly temperature was 59.5. The warmest January at Austin Bergstrom was January of 1952, when the average monthly temperature was 61.3 degrees. The warmest January day for the Austin City Climate Location, Austin Mabry, and San Antonio came January 30, 1971, during the drought of 1970/1971. The winter of 1970/1971 was a La Nina Winter. On January 30, 1971 the high was 90 at Austin Mueller Airport and 89 at San Antonio. The warmest January day for Austin Bergstrom was 89 January 23, 1972 and 89 January 25, 1971. The warmest January day at Del Rio was 92 on January 30, 1911. These warm days came during dry winters. Although La Nina plays a role in shaping winter, it is not the only factor that controls the magnitude and duration of warm, cold, wet, or dry periods.

On a few occasions, heavy rains have come to the area in some Januarys. Since 1930, this happened in 1931, 1968, 1991, 1992 and 2007. In January of 1968 San Antonio had 8.52 inches of rain, the wettest January at San Antonio, and Austin had 7.62 inches of rain, the 2nd wettest January for the Austin City Climate location. The wettest January in Austin was January of 1991, when Austin Bergstrom had 10.53 inches of rain and Austin Mueller Airport 9.21 inches of rain. The wettest January at Del Rio was in 1931, when 4.12 inches of rain fell.

Severe weather events have increased in frequency during some of the El Nino Years, like 1983 and 1998. January and February 1998 brought several severe weather events to South Central Texas.

A few noteworthy Arctic Outbreaks in the past during the month of January came in January of 1886, 1888, 1911, 1912, 1918, 1930, 1949, 1951, 1962, 1963, 1964, 1970, 1973 with snow, 1979, 1982 with snow, 1985 with snow, 1997 with an ice storm, and 2007 with an ice storm. A widespread winter precipitation event came January 15th to 17th, 2007.

The January 2007 event was one of the more widespread events since February 13-14, 2004; February 24-25, 2003; December 12-13, 2000; December 23-24, 1998;

January 1997; and February 1 to February 3, 1996. Water equivalent amounts on the January 2007 freezing rain event were greater than the past events dating back to 1996. The last event over such an area to equal this as a winter precipitation event would be the January 1985 heavy snow event over South Central Texas. In January of 2007 cold air poured over South Central Texas on the morning of January 13th, in the wake of a strong cold front. In advance of the cold front, showers and thunderstorms developed. Heavy rains fell from the eastern Texas Hill Country to parts of Williamson, Travis, Hays, Comal, and Bastrop Counties. One of the thunderstorms developed into a super cell and produced strong winds and a brief tornado near San Marcos on January 13, 2007. Additional strong storms later formed along the cold front and produced spotty heavy rain along the IH-35 corridor. Some areas experienced flash flooding.

In January 2007, temperatures continued to cool in wake of the cold front on the following 2 days after January 13th. On the morning of Monday, January 15th, 2007 temperatures in the northern Hill Country fell to near freezing. At the same time, a winter precipitation making weather system approached South Texas from the southwest. Light precipitation began falling through the cold air on the morning of January 15th, turning to ice over the northern Hill Country first. By mid day ice was being reported north of a line from Llano to Burnet to Georgetown. Freezing precipitation continued to spread over the west and southeast part of South Central Texas through the afternoon. By early evening, ice was reported in all of the counties along and north of a Leakey to Bandera to New Braunfels to Lockhart to La Grange line. By sunrise on January 16th, the icy conditions spread south to a Del Rio to Brackettville to Uvalde to Hondo to Poteet to Floresville to Gonzales line, plus a small part of the northern section of Atascosa County. This included the metropolitan areas of Austin and San Antonio. Spotty 1 to 2 inch snowfalls were common over the Hill Country and Edwards Plateau. The wintery event finally ended on Wednesday January 17th and temperatures rose above freezing on Thursday the 18th. Ice coatings of freezing rain and drizzle varied from one-half inch to three-quarters of an inch in thickness in the winter storm area. Many schools and businesses in the area, as well as public offices, were already closed on January 15th due to the Martin Luther King Holiday and simply did not re-open until Wednesday, January 17th or Thursday January 18th, 2007. Hundreds of accidents were reported on interstate highways, as well as city and rural roads, causing additional closures and problems. As the ice thickened on January 16th, whole sections of IH-35 and IH-10 were closed north and northwest of San Antonio. Power outages also became a problem across most of the winter storm area on January 16th and 17th, 2007. Tens of thousands were left without power for several hours.

January 2008 weather was influenced by fast moving weather systems and cold fronts that brought dry conditions to the area, more day to day fluctuations between warm and cold, and several windy days. January 2008 had less than half of the usual rain for January, continuing the trend of dry weather that started in September 2007.

January 2009 was another dry January, characterized by fast moving cold fronts and warming trends that increased the contrast between warm and cold days. Mild temperatures from the 18th to the 23rd of January 2009 were followed by colder weather on the 24th. After a brief warm up on the 26th, it turned very cold again on Tuesday January 27, 2009, as a wave of arctic air came across the region. A low pressure system aloft to the west passed near the area late in the day and overnight hours, bringing a light precipitation event to South Central Texas. A freezing rain event came from just before sunset on Tuesday, January 27th, to the predawn hours of the 28th, from parts of the Hill Country to parts of Central Texas. It dried out rapidly just before and after sunrise on the 28th. Sunny and much drier conditions came in the afternoon of the 28th; however, daytime highs in the modified arctic air stayed mostly in the 50s, with low 60s showing up along the Rio Grande, and mid 40s to near 50 over the east part of South Central Texas. Sunny and mild days returned the 30th and 31st.