

SAN ANTONIO CLIMATE SUMMARY

The city of San Antonio is located in the south-central portion of Texas on the Balcones escarpment. Northwest of the city, the terrain slopes upward to the Edwards Plateau, and to the southeast it slopes downward to the Gulf Coastal Plains. Soils are blackland clay and silty loam on the Plains and thin limestone soils on the Edwards Plateau. With its location on the northwest edge of the Gulf Coastal Plain, San Antonio experiences a modified subtropical climate. The average monthly temperatures range from the **50s** in winter to **80s** in summer. Elevation varies from near 550 feet to near and above 1000 feet above sea level.

During winter the area is alternately influenced by a continental climate, when winds blow from the north and west and by a modified maritime climate, when south and southeast winds blow from the Gulf of Mexico. Mild weather prevails during most of the winter. Below freezing temperatures occur on average about 20 days each year. When strong cold fronts do occur, they block any moderating effects from the Gulf of Mexico. The coldest winters overall have come from those winters of frequent cold fronts, accompanied by mostly cloudy weather regimes. The **coldest low of record was 0 on January 31, 1949**. Although daytime highs are restrained in cloudy winters, overnight lows can be potentially higher, sometimes preventing the area from having much colder minimums that come under clear skies. During sunny winters, the South Texas sun warms daytime temperatures to pleasant levels, while nights are cooler. Daily temperature variations can be as much as 40 to 50 degrees. Very warm days occur when dry west winds in a mild airmass allow winter temperatures to climb to spring or summerlike levels, such as **90 December 25, 1955; 89 January 30, 1971; 100 February 21, 1996 and 100 March 6, 1991**.

During the summer the climate becomes more tropical like with prevailing south and southeast winds. The moderating effects of the Gulf of Mexico prevent extremely high temperatures; however, summers are usually long and hot with daily maximum temperatures above 90 over 80 percent of the time. In many years summer conditions continue into September and sometimes even to October. The **highest of record was 111 September 5, 2000.**, when dry conditions occurred and the area was blocked off from the moderating south and southeast Gulf winds. Occasionally, cool fronts may move through the area, dropping overnight lows into the 50s and 60s; however, the cooling is brief, and in a day or two the minimum temperatures are back to the 70s. If the drier air with these fronts has lost all of its cool properties, daytime highs have risen above normal, as the moderating affects of the Gulf of Mexico are blocked. Although July and August can have limiting rain, sometimes rather heavy rain events can come in July and August, especially with the remnants of tropical storms or stalled out cool fronts.

San Antonio is situated between a semi-arid area to the west and a much wetter and more humid area to the east. Such a location allows for large variations in monthly and annual precipitation amounts. The average long term annual precipitation for San Antonio is around 29 inches, although it may range from near 10 to near 50 inches from one year to another. The extremes vary from **10.11 inches** in 1917 to **52.28 inches** in 1973. Heavy rain may occur with or without thunder in any season. During some of these events, rain has exceeded 5 inches in several hours and caused flash flooding. A year of normal precipitation is sufficient for the

production of most crops, although during the drier years irrigation is essential. On average the heaviest rains fall in May, September, and October while the driest months, on average, are December through March, and July. Since rainfall is sporadic, the wettest and driest month in any one year may occur in any season and vary widely from year to year. Precipitation from April through September usually occurs as a result of thunderstorms; however, thunderstorms may occur in any month.

Hail of damaging intensity has occurred, although it is not as frequent as it is compared to North Texas or other places in the Great Plains or Rocky Mountain regions. Small hail is frequent with the springtime thunderstorms and has been observed during other seasons. Measurable snow usually occurs only once in three or four years. Snowfall of 2 to 4 inches occurs about every ten years

Since San Antonio is located only 140 miles from the Gulf of Mexico, tropical storms occasionally affect the city with strong winds and heavy rains. One of the fastest winds recorded, 74 mph, occurred as a tropical storm moved inland east of the City in August 1942.

Strong winds also come as a result of microbursts from thunderstorms. A microburst during the afternoon of July 10, 1979, caused a wind gust of 77 mph. Strong winds also come from squall lines, and strong cold fronts. On March 27, 1994, a squall line blasted through the city during the early morning hours, causing a wind gust of 104 mph at Randolph AFB, on the northeast side of the city. On May 27, 1997 a squall line swept through the city from the north and northeast, and caused a wind gust of 122 mph at Kelly AFB in a thunderstorm. Although tornadoes are rare, they have occurred, and they have most often been associated with the dissipating tropical storms.

Relative humidity is above 80 percent during the early morning hours most of the year, dropping to near 50 percent in late afternoon

San Antonio receives about 50 percent of possible sunshine during the winter months and more than 70 percent during the summer. Stratus clouds frequently develop at night during all seasons with south and southeast winds, as Gulf moisture is lifted from the coastal plains to the higher terrain over the Balcones escarpment. When these clouds dissipate, partly cloudy to sunny conditions follow by late morning to sometime as late as late afternoon. On some days, these clouds do not dissipate much, persisting all day, with few or no late afternoon or early evening breaks. In the winter these stratus clouds may be accompanied by fog and drizzle, as south and southeast wind brings Gulf moisture over the top of a cool air dome at the surface. In some years, when very cloudy conditions prevailed, even if these low clouds break up, mostly cloudy skies continued, with considerable high cloudiness from a high deck of cirrus, that sometime accompanies an active subtropical jet stream.

Normally the first freezing temperatures occur around December 1st, while the average last freeze occurs in late February. Extreme freeze dates have varied from 32 on October 30, 1917 to 31 on April 3, 1987.

In summary, the climate of San Antonio is a moderated sub-tropical climate. Although variations in temperature can be extreme mainly in winter and fall, most of the time they are

moderated, mainly by the Gulf breeze and morning clouds. Rainfall variations can be extreme, with some years coming in near 10 to 20 inches of rain, and other years producing near 50 inches of rain. Average yearly long term rainfall is near 29 inches. The extremes vary from **10.11 inches** in 1917 to **52.28 inches** in 1973.

History of San Antonio Climate Station Locations

1885 to July 1891

**U.S. Army Signal Corps
Administrative Bldg.
Ft. Sam Houston, Texas**

July 1891 to February 1892

**Weather Bureau Office
Dulling Bldg.
Commerce and Alamo Streets**

February 1892 to July 1895

**Weather Bureau Office
Alamo Insurance Bldg.
Navarro Street**

July 1895 to May 1900

**Weather Bureau Office
Maverick Building
Alamo Plaza and Houston Streets**

May 1900 to June 1914

**Weather Bureau Office
Hicks Building
Ave. C and East Houston Street**

June 1914 to July 1930

**Weather Bureau Office
State Trust and Bank Bldg.
313 East Houston Street**

July 1930 to October 1937

**Weather Bureau Office
Alamo Nat'l Bank Bldg.
306 West Commerce Street**

October 1937 to January 1941

**Weather Bureau Office
Federal Bldg.
Alamo Plaza and Houston Street**

January 1941 to July 1942

**Weather Bureau Office
Administrative Bldg.
Stinson Field**

July 1942 to August 1953

**Weather Bureau Office
East Lean-To, Hanger #2
San Antonio International Airport**

August 1953 to May 1972

**Weather Bureau Office
Federal Lines Terminal Bldg.
San Antonio International Airport**

May 1972 to Present

**National Weather Service
San Antonio International Airport**