

# Climatology of the United States No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

Station: SAN ANTONIO INTL AP, TX

1971-2000

COOP ID: 417945

Climate Division: TX 7

NWS Call Sign: SAT

Elevation: 809 Feet Lat: 29° 32N Lon: 98° 28W

Temperature (°F)																					
Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	62.1	38.6	50.3	89	1971	30	56.4	1998	0	1949	31	42.9	1978	455	7	.0	.0	25.6	.2	7.8	.0
Feb	67.1	42.4	54.7	100	1996	21	62.6	2000	6	1951	2	45.8	1978	303	19	@	.3	25.7	.3	4.6	.0
Mar	74.3	49.9	62.1	100+	1991	6	67.3	1974	19	1980	2	57.2	1987	149	68	.1	.9	30.6	.0	1.5	.0
Apr	80.4	56.9	68.6	101	1996	19	73.1	1972	31	1987	3	63.9	1997	42	161	.1	2.2	30.0	.0	@	.0
May	86.0	65.5	75.8	103	1989	25	81.9	1996	43	1984	9	70.8	1976	1	344	.2	8.3	31.0	.0	.0	.0
Jun	91.4	71.6	81.5	107	1998	15	87.0	1990	53	1964	2	78.7	1973	0	505	1.5	20.6	30.0	.0	.0	.0
Jul	94.6	74.0	84.3	106+	1989	19	88.1	1998	62	1967	16	79.4	1976	0	607	3.7	27.7	31.0	.0	.0	.0
Aug	94.7	73.6	84.2	108	1986	19	86.9	1993	61+	1992	29	80.8	1971	0	601	2.8	28.0	31.0	.0	.0	.0
Sep	90.0	68.8	79.4	111	2000	5	83.4	1986	46+	1983	22	72.0	1974	2	439	.7	18.4	30.0	.0	.0	.0
Oct	82.0	59.4	70.7	99	1991	12	74.5	1979	27	1993	31	60.8	1976	33	215	.0	4.9	30.9	.0	@	.0
Nov	71.4	48.6	60.0	94	1988	4	65.5	1973	21	1976	29	51.8	1976	197	57	.0	.1	29.3	.0	1.9	.0
Dec	64.0	40.8	52.4	90	1955	25	59.2	1984	6	1989	23	42.7	1983	391	15	.0	.0	27.6	.2	6.2	.0
Ann	79.8	57.5	68.7	111	Sep 2000	5	88.1	Jul 1998	0	Jan 1949	31	42.7	Dec 1983	1573	3038	9.1	111.4	352.7	.7	22.0	.0

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: [www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1946-2001

(3) Derived from 1971-2000 serially complete daily data

# Climatography of the United States

## No. 20 1971-2000

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

**Station: SAN ANTONIO INTL AP, TX**

**COOP ID: 417945**

**Climate Division: TX 7**

**NWS Call Sign: SAT**

**Elevation: 809 Feet Lat: 29°32N**

**Lon: 98°28W**

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	1.66	1.33	2.72	1968	18	5.64	1992	.00	1996	7.6	3.7	.8	.3	.04	.16	.38	.62	.88	1.19	1.56	2.03	2.68	3.79	4.88
Feb	1.75	1.33	2.44	1986	3	6.37	1992	.01	1999	6.8	3.4	.9	.4	.09	.18	.38	.62	.89	1.21	1.60	2.11	2.83	4.06	5.29
Mar	1.89	1.40	2.50	1992	3	6.12	1992	.04	1971	7.9	4.0	1.1	.5	.15	.28	.53	.79	1.08	1.41	1.80	2.30	2.99	4.14	5.27
Apr	2.60	2.06	3.60	1990	26	8.80	1977	.05	1998	7.3	3.8	1.6	.8	.19	.36	.69	1.05	1.45	1.91	2.46	3.15	4.12	5.75	7.35
May	4.72	4.10	6.26	1993	5	12.85	1987	.33	1989	9.2	5.4	3.2	1.5	.56	.93	1.59	2.25	2.95	3.73	4.64	5.77	7.30	9.83	12.28
Jun	4.30	3.67	6.18	1951	3	11.95	1986	.52	1980	7.7	5.4	2.6	1.5	.60	.96	1.57	2.17	2.79	3.48	4.27	5.25	6.56	8.71	10.78
Jul	2.03	1.14	4.45+	1985	3	8.29	1990	.00+	1997	4.6	2.7	1.2	.6	.00	.00	.14	.38	.69	1.10	1.63	2.35	3.41	5.29	7.23
Aug	2.57	2.06	5.57	1950	13	11.14	1974	.01	1993	5.2	3.6	1.7	.9	.08	.20	.46	.79	1.18	1.66	2.26	3.05	4.19	6.16	8.16
Sep	3.00	2.18	6.54	1973	26	13.09	1973	.05	1999	6.5	4.1	1.8	.7	.25	.46	.86	1.27	1.73	2.25	2.87	3.65	4.73	6.54	8.31
Oct	3.86	3.27	11.26	1998	17	18.07	1998	.11	1979	6.9	4.7	2.2	1.2	.18	.38	.82	1.33	1.93	2.64	3.51	4.64	6.23	8.97	11.72
Nov	2.58	2.50	4.87	1977	1	8.58	2000	.02	1988	7.3	3.8	1.5	.8	.10	.22	.50	.83	1.23	1.71	2.30	3.08	4.19	6.12	8.06
Dec	1.96	1.26	5.97	1991	19	13.96	1991	.09	1985	7.8	3.4	.9	.3	.06	.15	.35	.60	.90	1.26	1.72	2.32	3.18	4.68	6.20
Ann	32.92	34.89	11.26	Oct 1998	17	18.07	Oct 1998	.00+	Jul 1997	84.8	48.0	19.5	9.5	18.73	21.25	24.60	27.23	29.62	31.97	34.46	37.25	40.70	45.83	50.36

+ Also occurred on an earlier date(s)

# Denotes amounts of a trace

@ Denotes mean number of days greater than 0 but less than .05

\*\* Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1946-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

# Climatography of the United States

## No. 20 1971-2000

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
[www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

**Station: SAN ANTONIO INTL AP, TX**

**COOP ID: 417945**

**Climate Division: TX 7**

**NWS Call Sign: SAT**

**Elevation: 809 Feet**

**Lat: 29°32N**

**Lon: 98°28W**

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	.7	.0	#	0	13.2	1985	12	15.9	1985	9	1985	13	1	1985	.2	.1	@	@	@	.3	.1	.1	.0
Feb	.1	.0	0	0	2.0	1973	8	2.1	1973	2	1973	9	0	0	.1	.0	.0	.0	.0	@	.0	.0	.0
Mar	#	.0	0	0	#	1989	22	#+	1989	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1977	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	#	.0	0	0	#	1993	30	#	1993	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	#	.0	0	0	#	1980	26	#+	1980	#	1976	28	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	#	.0	0	0	#	1990	23	#+	1990	#	1972	11	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.8	.0	N/A	N/A	13.2	Jan 1985	12	15.9	Jan 1985	9	Jan 1985	13	1	Jan 1985	.3	.1	@	@	@	.3	.1	.1	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

Complete documentation available from:

[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

# Climatography of the United States

## No. 20 1971-2000

**Station: SAN ANTONIO INTL AP, TX**

**COOP ID: 417945**

**Climate Division: TX 7**

**NWS Call Sign: SAT**

**Elevation: 809 Feet**

**Lat: 29°32N**

**Lon: 98°28W**

Freeze Data									
Spring Freeze Dates (Month/Day)									
Temp (F)	Probability of later date in spring (thru Jul 31) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	4/07	3/30	3/25	3/20	3/16	3/11	3/07	3/01	2/22
32	3/21	3/14	3/09	3/04	2/28	2/23	2/19	2/13	2/06
28	3/13	3/01	2/20	2/13	2/06	1/30	1/23	1/14	1/02
24	2/21	2/10	2/02	1/26	1/20	1/13	1/05	12/25	0/00
20	2/07	1/27	1/18	1/08	12/28	0/00	0/00	0/00	0/00
16	1/09	12/22	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Fall Freeze Dates (Month/Day)									
Temp (F)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	10/26	11/02	11/06	11/10	11/14	11/17	11/21	11/26	12/02
32	11/08	11/14	11/18	11/22	11/25	11/29	12/02	12/07	12/13
28	11/15	11/24	11/30	12/05	12/10	12/16	12/21	12/27	1/05
24	12/02	12/12	12/20	12/27	1/03	1/10	1/18	1/31	0/00
20	12/14	12/26	1/05	1/15	1/27	0/00	0/00	0/00	0/00
16	1/01	1/16	0/00	0/00	0/00	0/00	0/00	0/00	0/00
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	270	261	254	248	242	237	231	224	214
32	297	288	281	275	270	264	259	252	242
28	348	332	322	313	306	298	290	281	268
24	>365	>365	>365	361	347	337	329	320	308
20	>365	>365	>365	>365	>365	>365	358	343	328
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

\* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

**0/00** Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

Complete documentation available from:

[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

**Climatography  
of the United States  
No. 20  
1971-2000**

**Station: SAN ANTONIO INTL AP, TX**

**COOP ID: 417945**

**Climate Division: TX 7      NWS Call Sign: SAT      Elevation: 809 Feet      Lat: 29°32N      Lon: 98°28W**

Degree Days to Selected Base Temperatures (°F)													
Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	455	303	149	42	1	0	0	0	2	33	197	391	1573
60	325	193	56	5	0	0	0	0	0	5	108	270	962
57	252	141	28	1	0	0	0	0	0	2	69	204	697
55	210	111	16	0	0	0	0	0	0	1	49	167	554
50	124	52	3	0	0	0	0	0	0	0	17	89	285
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	583	652	947	1111	1368	1495	1632	1626	1429	1206	846	645	13540
55	64	113	266	424	655	805	919	913	739	497	212	86	5693
57	45	87	218	367	593	745	857	851	679	437	172	64	5115
60	25	55	153	285	500	655	764	758	589	350	120	40	4294
65	7	19	68	161	344	505	607	601	439	215	57	15	3038
70	1	4	22	70	202	355	454	448	298	112	18	3	1987

Growing Degree Units (2)																								
Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	362	466	708	877	1131	1264	1393	1386	1198	965	616	415	362	828	1536	2413	3544	4808	6201	7587	8785	9750	10366	10781
45	237	335	555	727	976	1114	1238	1231	1048	810	469	283	237	572	1127	1854	2830	3944	5182	6413	7461	8271	8740	9023
50	137	219	410	577	821	964	1083	1076	898	657	333	169	137	356	766	1343	2164	3128	4211	5287	6185	6842	7175	7344
55	66	128	274	434	666	814	928	921	748	505	217	92	66	194	468	902	1568	2382	3310	4231	4979	5484	5701	5793
60	29	66	160	293	511	664	773	766	598	357	126	42	29	95	255	548	1059	1723	2496	3262	3860	4217	4343	4385
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	225	291	454	584	785	877	948	944	822	652	392	262	225	516	970	1554	2339	3216	4164	5108	5930	6582	6974	7236

(1) Derived from the 1971-2000 Monthly Normals

(2) Derived from 1971-2000 serially complete daily data

**Note:** For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normals/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normals/usnormals.html)

## Notes

- a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.
- b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.
- c. Only observed validated values were used to select the extreme daily values.
- d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.  
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.
- e. Degree Days were derived using the same techniques as the 1971-2000 normals.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)
- f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set.  
Documentation of the serially complete data set is available from the link below:
- g. Snowfall and snow depth statistics were derived from the Snow Climatology.  
Documentation for the Snow Climatology project is available from the link under references.

## Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html)  
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,  
[www1.ncdc.noaa.gov/pub/data/special/serialcomplete\\_jam\\_0900.pdf](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)