U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

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: TUMACACORI NATL MONUMENT, AZ **COOP ID: 028865**

Climate Division: AZ 7 **NWS Call Sign:** **Elevation: 3,267 Feet** **Lat: 31˚34N** **Lon: 111˚03W**

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	65.0	31.8	48.4	89	1971	19	53.9	1986	8	1971	8	45.1	1979	514	0	.0	.0	29.9	.0	17.4	.0
Feb	68.6	33.7	51.2	92	1957	13	55.1	1980	11	1955	22	46.5	1998	388	0	.0	.0	27.6	.2	11.8	.0
Mar	72.4	37.0	54.7	95+	1989	10	60.5	1972	15	1965	4	47.8	1973	329	10	.0	.6	30.9	.0	6.4	.0
Apr	79.8	41.6	60.7	100+	1989	20	66.7	1989	25	1953	12	55.1	1983	172	43	@	3.6	29.9	.0	2.3	.0
May	87.8	48.4	68.1	109	1958	28	73.8	1984	28	1950	5	64.5	1995	44	140	1.6	14.2	31.0	.0	.1	.0
Jun	97.8	58.0	77.9	113+	1970	25	82.1	1990	38	1995	9	73.8	1995	1	387	13.3	27.5	30.0	.0	.0	.0
Jul	96.2	65.9	81.1	113	1983	5	85.1	1980	42	1995	4	77.7	1984	0	496	10.7	26.9	31.0	.0	.0	.0
Aug	93.4	64.6	79.0	108+	1969	4	81.8	1994	47+	1958	30	75.2	1990	0	434	3.7	25.5	31.0	.0	.0	.0
Sep	90.9	58.6	74.8	108	1950	1	78.6	1979	36	1965	30	71.3	1985	1	294	1.8	20.2	30.0	.0	.0	.0
Oct	82.7	47.8	65.3	104	1980	2	69.1	1979	21	1971	30	61.6	1971	74	82	.3	6.6	31.0	.0	.6	.0
Nov	72.1	36.6	54.4	93+	1980	5	59.6	1999	16+	1979	22	48.6	2000	323	3	.0	.2	29.9	.0	7.6	.0
Dec	65.4	31.9	48.7	88+	1970	6	55.6	1980	5	1978	8	42.3	1997	507	0	.0	.0	29.8	.0	16.0	.0
Ann	81.0	46.3	63.7	113+	Jul 1983	5	85.1	Jul 1980	5	Dec 1978	8	42.3	Dec 1997	2353	1889	31.4	125.3	362.0	.2	62.2	.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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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

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Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	1.24	1.02	2.25	1993	19	7.09	1993	.00+	1999
Feb	1.12	.99	1.90	1991	11	4.22	1998	.00+	1999
Mar	1.01	.64	1.95	1992	28	4.04	1992	.00+	1984
Apr	.35	.12	1.29	2001	6	1.32	1987	.00+	2000
May	.22	.04	1.03	1992	21	1.10	1997	.00+	2000
Jun	.46	.23	1.31	1961	28	3.20	2000	.00+	1997
Jul	3.79	3.33	2.91	1979	30	10.56	1984	.41	1994
Aug	3.97	3.80	3.47	1958	5	8.74	1994	.67	1975
Sep	1.72	1.31	2.80	1994	3	6.36	1983	.08	1973
Oct	1.43	.77	3.63	1983	1	7.33	2000	.00+	1999
Nov	.74	.50	3.25	1994	12	3.65	1994	.00+	1999
Dec	1.35	.57	3.20	1994	6	5.47	1992	.00+	1999
Ann	17.40	17.63	3.63	Oct 1983	1	10.56	Jul 1984	.00+	May 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.7	2.9	.7	.2
Feb	3.8	2.5	.7	.2
Mar	3.8	2.4	.6	.1
Apr	1.6	.8	.2	.0
May	1.4	.6	.1	@
Jun	2.3	1.2	.2	@
Jul	11.8	7.8	2.6	.7
Aug	12.0	7.9	2.7	.9
Sep	6.6	4.1	.7	.3
Oct	3.8	2.2	.9	.3
Nov	2.5	1.6	.3	.1
Dec	4.3	2.6	.9	.2
Ann	58.6	36.6	10.6	3.0

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.00	.00	.10	.28	.49	.75	1.08	1.50	2.10	3.12	4.15
Feb	.00	.00	.12	.27	.45	.68	.96	1.34	1.87	2.80	3.73
Mar	.00	.05	.20	.35	.52	.71	.95	1.24	1.65	2.35	3.04
Apr	.00	.00	.00	.00	.02	.10	.22	.39	.63	1.06	1.50
May	.00	.00	.00	.00	.00	.03	.13	.24	.41	.68	.95
Jun	.00	.00	.00	.04	.10	.19	.32	.50	.77	1.28	1.81
Jul	.83	1.18	1.73	2.23	2.74	3.27	3.87	4.60	5.55	7.07	8.50
Aug	1.28	1.65	2.21	2.68	3.14	3.61	4.13	4.74	5.52	6.74	7.86
Sep	.19	.32	.56	.79	1.05	1.34	1.68	2.10	2.67	3.62	4.54
Oct	.00	.00	.02	.17	.39	.69	1.09	1.63	2.44	3.87	5.38
Nov	.00	.00	.17	.30	.43	.57	.74	.94	1.20	1.65	2.08
Dec	.00	.00	.05	.19	.39	.67	1.04	1.54	2.29	3.63	5.02
Ann	9.22	10.63	12.52	14.03	15.40	16.77	18.21	19.85	21.88	24.92	27.62

\+ 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: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	.1	.0	#	0	2.0	1979	29	2.0	1979	#	1987	20	#	1987	.1	.1	.0	.0	.0	.0	.0	.0	.0
Feb	.2	.0	0	0	2.5	1985	5	3.5	1985	0	0	0	0	0	.1	.1	.0	.0	.0	.0	.0	.0	.0
Mar	.0	.0	0	0	1.0	1976	4	1.0	1976	0	0	0	0	0	@	@	.0	.0	.0	.0	.0	.0	.0
Apr	#	.0	0	0	#	1977	3	#+	1977	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	0	0	0	.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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.0	.0	0	0	1.0	1971	16	1.0	1971	0	0	0	0	0	@	@	.0	.0	.0	.0	.0	.0	.0
Dec	.2	.0	#	0	4.5	1987	24	5.0	1987	4	1987	24	1	1971	.1	.1	.1	.0	.0	.1	.1	.0	.0
Ann	.5	.0	N/A	N/A	4.5	Dec 1987	24	5.0	Dec 1987	4	Dec 1987	24	1	Dec 1971	.3	.3	.1	.0	.0	.1	.1	.0	.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

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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	5/16	5/09	5/04	4/30	4/26	4/23	4/18	4/14	4/07
32	5/03	4/24	4/18	4/13	4/08	4/03	3/28	3/22	3/13
28	4/06	3/28	3/22	3/16	3/11	3/06	2/28	2/22	2/13
24	3/12	3/01	2/21	2/15	2/09	2/03	1/27	1/20	1/09
20	2/21	2/05	1/25	1/14	1/03	12/22	12/04	0/00	0/00
16	1/17	12/31	12/15	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	10/13	10/18	10/22	10/25	10/28	10/31	11/03	11/07	11/12
32	10/24	10/30	11/02	11/06	11/09	11/12	11/15	11/19	11/24
28	11/01	11/08	11/12	11/16	11/19	11/23	11/26	12/01	12/07
24	11/09	11/16	11/21	11/26	11/30	12/04	12/09	12/14	12/21
20	11/28	12/07	12/14	12/21	12/28	1/05	1/20	0/00	0/00
16	12/08	12/23	1/09	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	210	201	195	189	184	179	173	167	158
32	241	232	225	220	214	209	203	197	187
28	284	273	265	259	252	246	240	232	221
24	325	312	304	297	291	285	279	271	261
20	>365	>365	>365	>365	>365	337	319	307	295
16	>365	>365	>365	>365	>365	>365	>365	>365	336

***** 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

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Degree Days to Selected Base Temperatures (˚F)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	514	388	329	172	44	1	0	0	1	74	323	507	2353
60	359	253	199	87	11	0	0	0	0	22	191	355	1477
57	270	178	138	50	4	0	0	0	0	8	127	269	1044
55	212	134	104	32	2	0	0	0	0	4	92	216	796
50	96	54	39	9	0	0	0	0	0	0	33	110	341
32	0	0	0	0	0	0	0	0	0	0	0	0	0

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	509	536	703	861	1118	1376	1519	1457	1283	1031	670	516	11579
55	9	26	94	203	407	686	806	744	593	322	72	19	3981
57	4	14	66	161	347	626	744	682	533	264	47	11	3499
60	0	5	35	108	261	536	651	589	443	185	22	3	2838
65	0	0	10	43	140	387	496	434	294	82	3	0	1889
70	0	0	1	12	56	246	341	279	157	24	0	0	1116

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	291	351	492	646	889	1156	1288	1228	1059	799	453	301	291	642	1134	1780	2669	3825	5113	6341	7400	8199	8652	8953
45	161	213	340	497	734	1006	1133	1073	909	644	311	172	161	374	714	1211	1945	2951	4084	5157	6066	6710	7021	7193
50	68	105	202	350	579	856	978	918	759	491	185	73	68	173	375	725	1304	2160	3138	4056	4815	5306	5491	5564
55	16	36	99	215	425	706	823	763	609	340	86	21	16	52	151	366	791	1497	2320	3083	3692	4032	4118	4139
60	0	2	32	105	278	556	668	608	459	203	23	0	0	2	34	139	417	973	1641	2249	2708	2911	2934	2934
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	251	290	368	458	567	674	809	791	676	524	348	253	251	541	909	1367	1934	2608	3417	4208	4884	5408	5756	6009

(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

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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.
Compete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/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 are 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.

a. Temperature/ Precipitation Tables
   1. 1971-2000 Monthly Normals
   2. Cooperative Summary of the Day
   3. National Weather Service station records
   4. 1971-2000 serially complete daily data

b. Degree Day Table
   1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
   2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data

c. Snow Tables
   1. Snow Climatology
   2. Cooperative Summary of the Day

d. Freeze Data Table
   1971-2000 serially complete daily data

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html
Snow Climatology Project Description, 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