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: TUCSON, AZ **COOP ID: 028815**

Climate Division: AZ 7 **NWS Call Sign:** **Elevation: 2,478 Feet** **Lat: 32˚14N** **Lon: 110˚57W**

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	66.0	41.9	54.0	90+	1971	20	61.0	1986	6	1913	7	48.4	1979	345	1	.0	.1	30.3	.0	2.4	.0
Feb	70.0	44.8	57.4	93	1957	14	63.4	1995	17	1899	7	50.7	1998	223	11	.0	@	27.8	.0	.6	.0
Mar	74.7	48.7	61.7	98	1988	26	67.8	1997	22+	1965	4	54.4	1973	164	61	.0	1.1	30.9	.0	.1	.0
Apr	82.4	54.4	68.4	104+	1989	20	75.9	1989	28+	1922	10	62.1	1999	68	170	.3	6.7	30.0	.0	.0	.0
May	90.9	62.8	76.9	111	1910	29	84.0	1997	32	1899	3	71.3	1971	8	375	3.4	19.5	31.0	.0	.0	.0
Jun	100.3	71.9	86.1	115+	1990	26	92.5	1994	43	1908	4	82.4	1998	0	634	18.2	28.8	30.0	.0	.0	.0
Jul	100.5	76.5	88.5	115	1995	28	93.4	1994	49	1911	3	85.1+	1990	0	728	18.9	29.8	31.0	.0	.0	.0
Aug	98.6	75.3	87.0	112+	1997	5	92.8	1994	55	1917	20	81.9	1971	0	681	14.6	29.5	31.0	.0	.0	.0
Sep	95.1	70.9	83.0	112	1950	1	87.3	1994	42	1965	30	79.0	1996	0	540	6.3	25.6	30.0	.0	.0	.0
Oct	85.3	59.8	72.6	104	1950	11	77.0	1988	29+	1908	22	65.9	1971	21	255	.5	10.7	31.0	.0	@	.0
Nov	73.8	47.9	60.9	94	1924	1	65.9	1999	19	1921	19	53.3	2000	164	40	.0	.3	30.0	.0	.3	.0
Dec	66.2	42.1	54.2	88+	1970	7	61.7	1980	10	1901	14	49.4	1971	340	5	.0	.0	30.1	.0	2.6	.0
Ann	83.7	58.1	70.9	115+	Jul 1995	28	93.4	Jul 1994	6	Jan 1913	7	48.4	Jan 1979	1333	3501	62.2	152.1	363.1	.0	6.0	.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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1894-2001

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

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COOP ID: 028815

Climate Division: AZ 7 **NWS Call Sign:** **Elevation: 2,478 Feet** **Lat: 32˚14N** **Lon: 110˚57W**

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	1.04	.78	2.63	1916	19	5.58	1993	.00+	1999
Feb	.96	.73	1.25	1987	25	3.81	1998	.00+	1999
Mar	.88	.87	1.42	1903	25	2.38	1973	.00+	1984
Apr	.33	.27	1.27	1988	15	1.57	1988	.00+	2000
May	.20	.07	1.34	1931	15	.84	1978	.00+	2000
Jun	.28	.06	1.56	1938	28	1.97	2000	.00+	1999
Jul	1.93	1.50	2.36	1950	30	7.56	1984	.05	1995
Aug	2.23	2.27	2.88	1935	1	4.89	1971	.52	1976
Sep	1.24	.99	2.84	1962	26	4.41	1996	.00+	1979
Oct	1.21	.54	4.16	1983	1	5.78	1983	.00+	1999
Nov	.68	.58	2.09	1931	22	1.78+	1994	.00+	1999
Dec	1.02	.53	2.15	1906	3	3.60	1992	.00+	2000
Ann	12.00	11.14	4.16	Oct 1983	1	7.56	Jul 1984	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.2	2.4	.6	.2
Feb	4.1	2.6	.5	.1
Mar	3.9	2.4	.5	.0
Apr	1.7	.9	.1	@
May	1.8	.7	.1	.0
Jun	1.7	.5	.2	.0
Jul	8.2	4.4	1.1	.3
Aug	8.5	5.0	1.3	.4
Sep	4.7	2.7	.8	.2
Oct	3.7	2.0	.8	.3
Nov	2.9	1.8	.4	@
Dec	4.3	2.6	.7	.1
Ann	49.7	28.0	7.1	1.6

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	.13	.28	.46	.67	.93	1.26	1.73	2.54	3.35
Feb	.00	.00	.08	.22	.39	.60	.84	1.17	1.63	2.42	3.21
Mar	.00	.00	.18	.33	.48	.65	.85	1.10	1.43	2.00	2.55
Apr	.00	.00	.00	.03	.10	.18	.28	.41	.58	.87	1.16
May	.00	.00	.00	.00	.00	.08	.15	.24	.37	.57	.77
Jun	.00	.00	.00	.00	.01	.05	.13	.26	.46	.86	1.29
Jul	.20	.35	.61	.88	1.17	1.50	1.88	2.36	3.01	4.09	5.14
Aug	.51	.72	1.04	1.34	1.63	1.94	2.29	2.70	3.25	4.11	4.93
Sep	.00	.10	.30	.49	.70	.93	1.20	1.54	2.00	2.78	3.53
Oct	.00	.00	.05	.19	.38	.63	.96	1.40	2.05	3.20	4.39
Nov	.00	.00	.20	.32	.43	.56	.70	.87	1.08	1.44	1.78
Dec	.00	.00	.04	.15	.31	.52	.80	1.17	1.72	2.71	3.72
Ann	6.67	7.60	8.85	9.83	10.73	11.61	12.54	13.60	14.90	16.84	18.56

\+ 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: 1894-2001
(3) Derived from 1971-2000 serially complete daily data

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Climate Division: AZ 7 **NWS Call Sign:** **Elevation: 2,478 Feet** **Lat: 32°14N** **Lon: 110°57W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	.2	.0	0	0
Feb	.0	.0	0	0
Mar	.2	.0	#	0
Apr	#	.0	0	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.0	.0	0	0
Nov	.0	.0	0	0
Dec	.1	.0	#	0
Ann	.5	.0	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	3.0	1987	16	3.5	1987	0	0	0	0	0
Feb	.5	1985	3	.5	1985	0	0	0	0	0
Mar	5.0	1976	3	5.0	1976	1	1976	3	#	1976
Apr	#	1999	4	#	1999	0	0	0	0	0
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	.0	0	0	.0	0	0	0	0	0	0
Nov	.0	0	0	.0	0	0	0	0	0	0
Dec	2.0	1987	24	3.7	1987	#	1998	6	#	1998
Ann	5.0	Mar 1976	3	5.0	Mar 1976	1	Mar 1976	3	#+	Dec 1998

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.1	.1	@	.0	.0
Feb	@	.0	.0	.0	.0
Mar	.1	@	@	@	.0
Apr	.0	.0	.0	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.0	.0	.0	.0	.0
Dec	.1	.1	.0	.0	.0
Ann	.3	.2	@	@	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.0	.0	.0	.0
Feb	.0	.0	.0	.0
Mar	@	.0	.0	.0
Apr	.0	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.0	.0	.0	.0
Dec	.0	.0	.0	.0
Ann	@	.0	.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	3/29	3/16	3/06	2/26	2/18	2/11	2/02	1/24	1/10
32	2/24	2/12	2/03	1/27	1/19	1/12	1/02	12/19	0/00
28	2/02	1/17	1/03	12/16	0/00	0/00	0/00	0/00	0/00
24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	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	11/07	11/16	11/22	11/28	12/03	12/08	12/14	12/20	12/29
32	11/18	11/28	12/05	12/11	12/18	12/24	1/02	1/17	0/00
28	12/15	12/29	1/11	1/31	0/00	0/00	0/00	0/00	0/00
24	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
20	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00	0/00
16	0/00	0/00	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	338	318	305	295	285	276	266	254	238
32	>365	>365	355	335	324	314	305	296	283
28	>365	>365	>365	>365	>365	>365	>365	>365	335
24	>365	>365	>365	>365	>365	>365	>365	>365	>365
20	>365	>365	>365	>365	>365	>365	>365	>365	>365
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

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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	345	223	164	68	8	0	0	0	0	21	164	340	1333
60	204	117	81	26	1	0	0	0	0	5	77	203	714
57	134	71	45	13	0	0	0	0	0	1	42	137	443
55	97	46	29	8	0	0	0	0	0	0	26	102	308
50	30	11	8	1	0	0	0	0	0	0	6	35	91
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	680	712	921	1093	1390	1624	1751	1704	1530	1257	866	687	14215
55	64	113	236	410	677	934	1038	991	840	545	202	76	6126
57	38	82	191	356	615	874	976	929	780	484	158	49	5532
60	15	44	134	278	524	784	883	836	690	394	103	23	4708
65	1	11	61	170	375	634	728	681	540	255	40	5	3501
70	0	1	21	91	240	484	573	526	391	142	10	0	2479

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	446	519	682	855	1154	1397	1512	1462	1294	1019	630	447	446	965	1647	2502	3656	5053	6565	8027	9321	10340	10970	11417
45	296	376	527	705	999	1247	1357	1307	1144	864	481	300	296	672	1199	1904	2903	4150	5507	6814	7958	8822	9303	9603
50	159	238	374	555	844	1097	1202	1152	994	709	335	166	159	397	771	1326	2170	3267	4469	5621	6615	7324	7659	7825
55	63	123	239	412	689	947	1047	997	844	556	208	69	63	186	425	837	1526	2473	3520	4517	5361	5917	6125	6194
60	15	44	124	277	535	797	892	842	694	404	104	14	15	59	183	460	995	1792	2684	3526	4220	4624	4728	4742
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	265	314	421	546	747	876	974	958	855	667	386	265	265	579	1000	1546	2293	3169	4143	5101	5956	6623	7009	7274

(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:
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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