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: CASA GRANDE NATL MONUMNT, AZ **COOP ID: 021314**

Climate Division: AZ 6 **NWS Call Sign:** **Elevation: 1,419 Feet** **Lat: 33˚00N** **Lon: 111˚32W**

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	67.3	34.0	50.7	89	1935	29	55.0	1986	8	1913	7	46.8	1979	445	0	.0	.0	30.8	.0	12.7	.0
Feb	72.0	37.2	54.6	93+	1951	10	59.5	1996	11	1975	22	50.6	1990	293	2	.0	.1	27.9	.1	6.5	.0
Mar	77.2	42.0	59.6	100	1988	26	65.9	1972	21	1971	2	53.2	1973	208	40	@	3.1	31.0	.0	2.4	.0
Apr	86.2	47.6	66.9	106+	2000	28	74.0	1989	25	1945	4	60.4	1975	82	139	1.9	13.5	30.0	.0	.2	.0
May	95.7	56.3	76.0	116+	1996	13	82.7	1997	32+	1975	6	71.8	1977	9	350	11.0	25.8	31.0	.0	@	.0
Jun	105.5	64.7	85.1	123	1994	30	90.0	1994	44+	1993	7	79.6	1991	0	604	25.9	29.5	30.0	.0	.0	.0
Jul	107.1	73.6	90.4	123+	1995	30	93.3	1980	51	1956	3	87.6	1992	0	786	28.7	30.9	31.0	.0	.0	.0
Aug	105.0	72.3	88.7	120+	1995	7	92.9	1994	49	1990	15	83.9	1990	0	733	27.9	30.7	31.0	.0	.0	.0
Sep	100.4	65.3	82.9	115+	1995	1	86.8	1995	37	1993	20	77.6	1985	0	536	19.1	29.1	30.0	.0	.0	.0
Oct	89.6	52.5	71.1	111	1980	1	76.3	1988	25	1971	30	66.2	1971	30	218	4.6	17.6	31.0	.0	.3	.0
Nov	76.2	39.0	57.6	97	1965	1	63.4	1999	17	1956	20	52.7	2000	240	18	.0	1.4	30.0	.0	4.2	.0
Dec	67.1	33.7	50.4	89	1939	9	56.3	1980	14	1953	27	46.0	1974	452	0	.0	.0	30.8	.0	13.0	.0
Ann	87.4	51.5	69.5	123+	Jul 1995	30	93.3	Jul 1980	8	Jan 1913	7	46.0	Dec 1974	1759	3426	119.1	181.7	364.5	.1	39.3	.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: 1906-2001

(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	.91	.79	2.12	1995	5	3.92	1993	.00+	1996
Feb	.95	.73	1.75	1915	3	3.99	1998	.00+	1984
Mar	1.20	1.02	1.74	1993	27	3.34	1983	.00+	1984
Apr	.34	.20	1.02+	1988	16	1.78	1988	.00+	2000
May	.21	.09	.88	1944	10	1.52	1992	.00+	2000
Jun	.11	.00	.73	1938	28	1.08	1972	.00+	1999
Jul	.98	.80	2.00	1936	26	3.70	1996	.10	1987
Aug	1.35	1.10	5.40	1906	1	4.68	1971	.01	1980
Sep	.79	.41	2.92	1946	18	2.87	1999	.00	1973
Oct	.92	.51	3.20	1972	19	5.32	1972	.00+	1999
Nov	.76	.71	1.76	1993	15	2.79	1993	.00+	1999
Dec	1.09	.74	1.95	1978	18	3.79	1984	.00+	2000
Ann	9.61	8.16	5.40	Aug 1906	1	5.32	Oct 1972	.00+	Dec 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	2.3	.4	.1
Feb	4.5	2.4	.5	.1
Mar	4.7	3.1	.7	.1
Apr	1.9	1.0	.2	@
May	1.6	.8	.1	.0
Jun	.8	.3	.1	.0
Jul	4.7	2.6	.6	.1
Aug	5.3	2.4	.7	.4
Sep	3.4	1.6	.4	.2
Oct	3.1	2.0	.6	.1
Nov	2.7	1.5	.6	.1
Dec	4.0	2.3	.7	.1
Ann	41.5	22.3	5.6	1.3

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	.09	.21	.35	.54	.77	1.08	1.53	2.30	3.09
Feb	.00	.00	.14	.30	.48	.68	.90	1.19	1.59	2.23	2.87
Mar	.00	.07	.25	.43	.63	.86	1.14	1.48	1.96	2.78	3.58
Apr	.00	.00	.00	.02	.09	.18	.28	.41	.59	.91	1.22
May	.00	.00	.00	.00	.03	.08	.15	.24	.37	.61	.84
Jun	.00	.00	.00	.00	.00	.00	.01	.07	.17	.36	.57
Jul	.14	.22	.36	.50	.64	.80	.98	1.20	1.50	1.99	2.46
Aug	.04	.10	.24	.41	.61	.87	1.18	1.60	2.20	3.25	4.30
Sep	.01	.03	.10	.20	.32	.47	.67	.92	1.30	1.96	2.63
Oct	.00	.00	.00	.21	.40	.61	.86	1.17	1.60	2.32	3.01
Nov	.00	.00	.06	.18	.31	.47	.67	.93	1.29	1.91	2.53
Dec	.00	.00	.04	.19	.38	.62	.91	1.30	1.87	2.83	3.83
Ann	4.77	5.58	6.69	7.57	8.39	9.20	10.07	11.06	12.29	14.14	15.79

\+ 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: 1906-2001
(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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Feb	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Mar	.0	.0	0	0	.0	0	0	.0	0	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	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	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Dec	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Ann	.0	.0	N/A	N/A	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.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	4/29	4/20	4/13	4/07	4/02	3/27	3/22	3/15	3/05
32	4/10	4/01	3/26	3/20	3/15	3/10	3/05	2/26	2/17
28	3/13	3/02	2/22	2/15	2/09	2/02	1/26	1/18	1/07
24	2/24	2/09	1/30	1/20	1/10	12/30	12/13	0/00	0/00
20	1/14	12/15	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	10/23	10/28	11/01	11/04	11/08	11/11	11/14	11/18	11/24
32	11/03	11/08	11/12	11/15	11/18	11/21	11/25	11/28	12/04
28	11/11	11/18	11/23	11/28	12/02	12/06	12/11	12/16	12/23
24	11/27	12/07	12/15	12/22	12/29	1/07	1/23	0/00	0/00
20	12/21	1/20	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	252	241	232	226	219	213	206	198	186
32	282	270	262	254	247	240	233	224	212
28	331	317	308	301	294	288	281	273	261
24	>365	>365	>365	>365	>365	342	322	308	294
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	445	293	208	82	9	0	0	0	0	30	240	452	1759
60	291	166	112	32	1	0	0	0	0	8	129	300	1039
57	206	104	69	16	0	0	0	0	0	3	80	216	694
55	153	72	46	10	0	0	0	0	0	1	55	164	501
50	59	18	14	2	0	0	0	0	0	0	15	69	177
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	578	633	855	1047	1364	1594	1809	1756	1526	1211	768	571	13712
55	18	61	187	367	651	904	1096	1043	836	499	133	22	5817
57	9	37	148	313	589	844	1034	981	776	439	98	11	5279
60	2	15	99	239	498	754	941	888	686	351	57	3	4533
65	0	2	40	139	350	604	786	733	536	218	18	0	3426
70	0	0	12	66	219	454	631	578	387	114	3	0	2464

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	451	631	822	1129	1370	1576	1530	1307	992	560	361	362	813	1444	2266	3395	4765	6341	7871	9178	10170	10730	11091
45	222	310	476	672	974	1220	1421	1375	1157	837	413	217	222	532	1008	1680	2654	3874	5295	6670	7827	8664	9077	9294
50	99	179	323	523	819	1070	1266	1220	1007	682	271	99	99	278	601	1124	1943	3013	4279	5499	6506	7188	7459	7558
55	30	76	191	377	664	920	1111	1065	857	528	152	31	30	106	297	674	1338	2258	3369	4434	5291	5819	5971	6002
60	2	24	89	243	510	770	956	910	707	379	64	1	2	26	115	358	868	1638	2594	3504	4211	4590	4654	4655
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	289	341	436	527	660	767	930	918	782	615	405	285	289	630	1066	1593	2253	3020	3950	4868	5650	6265	6670	6955

(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