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: WILLCOX, AZ **COOP ID: 029334**

Climate Division: AZ 7 **NWS Call Sign:** **Elevation: 4,175 Feet** **Lat: 32˚15N** **Lon: 109˚50W**

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	60.5	27.7	44.1	81	1950	21	47.8	1993	-1	1962	15	40.2	1971	648	0	.0	.0	28.1	.1	23.2	.0
Feb	65.3	30.0	47.7	88	1957	14	53.5	1996	2	1971	21	42.6	1971	486	0	.0	.0	27.0	.3	18.5	.0
Mar	71.0	34.0	52.5	92	1907	12	56.9	1972	6	1964	9	47.0	1973	388	1	.0	.1	30.8	.0	13.2	.0
Apr	78.7	38.8	58.8	97	1989	20	63.9	1989	9	1971	17	53.2	1975	208	19	.0	1.4	29.9	.0	6.0	.0
May	86.6	46.8	66.7	105	1951	27	71.8	2000	11	1971	8	62.8	1971	55	107	.4	9.6	31.0	.0	.6	.0
Jun	95.5	55.4	75.5	110+	1994	28	80.3	1994	27	1971	5	71.7	1991	3	315	7.2	25.7	30.0	.0	.1	.0
Jul	95.2	63.8	79.5	110	1905	6	82.5	1980	42+	1913	28	76.6	1987	0	449	6.9	26.5	31.0	.0	.0	.0
Aug	92.7	62.8	77.8	105+	1972	1	81.1	1994	41	1938	18	74.8	1990	0	395	1.5	24.2	31.0	.0	.0	.0
Sep	89.0	55.7	72.4	105	1929	4	76.9	1997	30	1965	21	69.3	1985	7	227	.2	15.4	30.0	.0	.0	.0
Oct	79.5	43.8	61.7	99	1915	1	65.6	1987	15	1970	27	58.0	1976	136	31	.0	2.7	31.0	.0	2.1	.0
Nov	68.3	32.3	50.3	91+	1916	4	54.7	1995	8	1921	19	46.0	2000	441	0	.0	.0	29.5	.0	16.2	.0
Dec	60.3	27.2	43.8	81+	1916	5	48.2+	1980	-7	1978	8	40.4	1978	658	0	.0	.0	28.0	.1	23.9	.1
Ann	78.6	43.2	60.9	110+	Jun 1994	28	82.5	Jul 1980	-7	Dec 1978	8	40.2	Jan 1971	3030	1544	16.2	105.6	357.3	.5	103.8	.1

\+ 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: 1898-2001

(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	1.11	.86	1.86	1905	9	6.12	1993	.03	1999
Feb	.95	.89	1.51	1980	14	2.74	1998	.00+	1984
Mar	.68	.46	1.50	1905	16	2.54	1992	.00+	1984
Apr	.25	.07	1.07	1931	28	1.41	1987	.00+	1993
May	.35	.10	1.40	1997	20	2.44	1992	.00+	2000
Jun	.40	.30	1.73	1952	2	1.45	2000	.00+	1995
Jul	2.36	2.30	2.28	1954	21	5.61	1999	.49	2000
Aug	2.59	2.71	3.65	1980	14	6.60	1999	.10	1975
Sep	1.27	.98	2.11	1941	28	4.50	1975	.00+	1993
Oct	1.36	.75	2.50	1989	5	6.69	2000	.00+	1999
Nov	.73	.57	1.55	1913	17	2.80	1994	.00	1999
Dec	1.30	.51	1.42	1965	22	4.08	1994	.00+	1999
Ann	13.35	13.14	3.65	Aug 1980	14	6.69	Oct 2000	.00+	May 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.9	2.7	.6	.1
Feb	4.6	2.4	.6	.1
Mar	4.5	2.3	.2	@
Apr	2.1	.7	@	.0
May	2.5	.9	.1	@
Jun	2.8	1.0	.2	@
Jul	10.7	5.6	1.5	.4
Aug	9.8	5.4	1.7	.4
Sep	6.0	3.1	.7	.2
Oct	4.5	2.8	.9	.3
Nov	3.7	2.0	.3	.1
Dec	5.2	2.9	1.0	.2
Ann	62.3	31.8	7.8	1.8

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	.03	.07	.18	.32	.49	.70	.96	1.31	1.82	2.70	3.61
Feb	.00	.00	.08	.26	.45	.65	.90	1.20	1.62	2.31	3.02
Mar	.00	.03	.12	.22	.33	.46	.62	.82	1.11	1.59	2.08
Apr	.00	.00	.00	.02	.05	.10	.17	.27	.42	.70	.99
May	.00	.00	.00	.01	.06	.13	.24	.38	.60	1.00	1.40
Jun	.00	.00	.00	.08	.15	.25	.35	.49	.69	1.02	1.35
Jul	.67	.89	1.23	1.53	1.81	2.11	2.45	2.84	3.35	4.15	4.89
Aug	.49	.72	1.10	1.45	1.81	2.19	2.63	3.16	3.86	4.98	6.05
Sep	.00	.07	.24	.43	.65	.89	1.19	1.56	2.08	2.97	3.85
Oct	.00	.00	.13	.30	.53	.80	1.15	1.62	2.29	3.46	4.65
Nov	.02	.07	.17	.27	.39	.52	.69	.89	1.19	1.68	2.16
Dec	.00	.00	.10	.29	.52	.80	1.13	1.58	2.21	3.29	4.38
Ann	7.80	8.79	10.11	11.14	12.08	13.00	13.97	15.06	16.40	18.38	20.13

\+ 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: 1898-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	.8	.0	#	0
Feb	.8	.0	#	0
Mar	.5	.0	#	0
Apr	.1	.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
Nov	.2	.0	#	0
Dec	.8	.0	#	0
Ann	3.2	.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	3.5	1973	20	3.5+	1985	2	1997	7	#+	2000
Feb	3.8	1990	2	8.5	1985	2	1980	9	#+	1996
Mar	2.8	1975	26	6.2	1975	3	1975	26	#+	1975
Apr	1.3	1975	7	1.3+	1976	#+	1999	2	#+	1999
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	#	1972	31	#	1972	0	0	0	0	0
Nov	2.0	1976	13	2.0+	2000	1	1975	29	#+	2000
Dec	4.5	1990	21	5.0	1990	3+	1990	22	#+	1990
Ann	4.5	Dec 1990	21	8.5	Feb 1985	3+	Dec 1990	22	#+	Nov 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.7	.4	.1	.0	.0
Feb	.5	.3	.1	.0	.0
Mar	.6	.2	.0	.0	.0
Apr	.1	.1	.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	.1	.1	.0	.0	.0
Dec	.7	.3	.1	.0	.0
Ann	2.7	1.4	.3	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.1	.0	.0	.0
Feb	@	.0	.0	.0
Mar	.1	@	.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
Dec	.4	.1	.0	.0
Ann	.6	.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	5/24	5/18	5/13	5/09	5/05	5/01	4/27	4/22	4/16
32	5/11	5/05	4/30	4/26	4/22	4/18	4/14	4/09	4/02
28	5/02	4/24	4/18	4/13	4/08	4/03	3/29	3/23	3/14
24	4/12	4/02	3/25	3/19	3/13	3/06	2/28	2/20	2/10
20	3/23	3/08	2/25	2/16	2/07	1/29	1/20	1/09	12/25
16	3/08	2/19	2/07	1/26	1/15	1/03	12/17	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	10/09	10/13	10/16	10/19	10/21	10/24	10/26	10/29	11/02
32	10/14	10/19	10/22	10/25	10/28	10/31	11/02	11/06	11/10
28	10/26	10/30	11/01	11/03	11/05	11/07	11/10	11/12	11/16
24	11/05	11/10	11/14	11/17	11/20	11/23	11/26	11/30	12/05
20	11/14	11/20	11/25	11/29	12/03	12/07	12/11	12/16	12/23
16	11/26	12/07	12/16	12/23	12/31	1/09	1/23	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	189	182	177	172	169	165	160	155	148
32	212	204	198	193	188	184	179	173	164
28	238	229	222	216	211	206	200	193	184
24	289	276	267	259	252	245	237	228	215
20	352	332	318	307	297	287	277	265	248
16	>365	>365	>365	>365	>365	340	322	306	287

***** 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	648	486	388	208	55	3	0	0	7	136	441	658	3030
60	493	347	243	105	14	0	0	0	0	50	294	503	2049
57	400	266	166	61	4	0	0	0	0	22	212	410	1541
55	338	215	123	39	2	0	0	0	0	11	163	348	1239
50	191	108	46	9	0	0	0	0	0	1	69	203	627
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	375	438	636	802	1075	1302	1472	1418	1211	918	549	365	10561
55	0	9	46	151	364	612	759	705	521	216	22	0	3405
57	0	4	27	113	305	552	697	643	461	164	11	0	2977
60	0	0	10	67	221	462	604	550	371	99	3	0	2387
65	0	0	1	19	107	315	449	395	227	31	0	0	1544
70	0	0	0	3	37	182	294	240	109	5	0	0	870

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	158	239	393	565	827	1069	1231	1180	978	678	318	151	158	397	790	1355	2182	3251	4482	5662	6640	7318	7636	7787
45	52	121	243	420	672	919	1076	1025	828	525	185	54	52	173	416	836	1508	2427	3503	4528	5356	5881	6066	6120
50	6	38	125	276	517	769	921	870	678	372	80	7	6	44	169	445	962	1731	2652	3522	4200	4572	4652	4659
55	0	1	44	150	365	619	766	715	528	227	19	0	0	1	45	195	560	1179	1945	2660	3188	3415	3434	3434
60	0	0	3	58	220	469	611	560	378	110	1	0	0	0	3	61	281	750	1361	1921	2299	2409	2410	2410
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	177	231	331	432	548	639	777	760	625	468	282	173	177	408	739	1171	1719	2358	3135	3895	4520	4988	5270	5443

(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