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: TWIN LAKES RES, CO **COOP ID: 058501**

Climate Division: CO 1 **NWS Call Sign:** **Elevation: 9,195 Feet** **Lat: 39˚06N** **Lon: 106˚21W**

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	31.9	1.9	16.9	57	1989	31	23.1	2000	-40	1974	3	8.6	1979	1492	0	.0	.0	.4	15.5	31.0	12.7
Feb	35.4	2.4	18.9	58+	1995	21	25.3	1995	-45	1989	7	10.1	1975	1291	0	.0	.0	1.2	9.4	28.3	10.4
Mar	39.3	10.8	25.1	61	1997	21	31.8	1999	-29	1975	30	16.7	1975	1239	0	.0	.0	4.1	6.0	31.0	4.6
Apr	45.6	18.6	32.1	65+	2000	28	38.5	1981	-19	1975	8	24.4	1973	987	0	.0	.0	11.5	2.9	29.4	1.0
May	55.7	28.4	42.1	76+	2000	31	47.0	1996	0	1968	7	35.0	1975	712	0	.0	.0	24.2	.1	22.7	.0
Jun	66.8	35.9	51.4	84	2001	30	56.6	1994	13+	1976	27	45.6	1976	411	2	.0	.0	29.4	.0	7.2	.0
Jul	72.0	41.7	56.9	86+	1989	6	60.6	1980	23	1971	4	52.6	1973	256	5	.0	.0	31.0	.0	.6	.0
Aug	70.4	40.6	55.5	83+	2000	11	59.7	2000	22	1975	2	50.9	1974	298	4	.0	.0	31.0	.0	2.3	.0
Sep	63.6	33.9	48.8	82	1978	7	54.7	1998	13	1996	28	42.4	1973	489	0	.0	.0	28.7	@	11.3	.0
Oct	53.3	24.7	39.0	74	1980	1	43.3	1988	0+	1976	18	31.8	1984	806	0	.0	.0	21.4	.8	27.8	.1
Nov	39.5	13.8	26.7	67	1996	20	35.1	1999	-18	1976	27	19.1	1972	1150	0	.0	.0	6.5	6.8	29.7	2.4
Dec	32.8	5.1	19.0	56	1971	24	28.3	1980	-31	1969	29	11.8	1978	1428	0	.0	.0	1.2	13.4	31.0	8.6
Ann	50.5	21.5	36.0	86+	Jul 1989	6	60.6	Jul 1980	-45	Feb 1989	7	8.6	Jan 1979	10559	11	.0	.0	190.6	54.9	252.3	39.8

\+ 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: 1949-2001

(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	.44	.26	1.00	1956	27	1.65	1996	.00	1977
Feb	.51	.32	1.32	1955	18	1.91	1996	.03	1973
Mar	.79	.74	.73	2001	13	2.21	1995	.10	1978
Apr	.81	.69	1.00	1999	30	2.46	1990	.09	1979
May	.96	.86	1.50	1957	9	2.99	1995	.01	1974
Jun	.83	.72	1.48	1988	29	3.20	1988	.03	1980
Jul	1.47	1.40	1.22	2000	17	3.13	1998	.09	1994
Aug	1.49	1.40	1.21	1995	21	3.27	1984	.18	1985
Sep	.90	.83	1.10	1970	22	2.46	1976	.22+	1978
Oct	.67	.63	.70	1963	21	1.91	1984	.02	1976
Nov	.55	.48	1.20	1979	20	1.79	1979	.12	1973
Dec	.45	.37	1.32	1951	30	1.74	1977	.00	1976
Ann	9.87	9.61	1.50	May 1957	9	3.27	Aug 1984	.00+	Jan 1977

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.1	1.4	@	.0
Feb	4.9	1.5	@	.0
Mar	7.4	2.9	.2	.0
Apr	7.2	2.5	.2	@
May	7.7	2.8	.2	.0
Jun	7.7	2.5	.2	.1
Jul	10.5	4.0	.3	.1
Aug	11.5	4.9	.3	@
Sep	7.6	2.3	.2	.0
Oct	4.9	2.2	.2	.0
Nov	5.4	1.6	.1	@
Dec	4.4	1.1	.1	.0
Ann	84.3	29.7	2.0	.2

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	.01	.03	.09	.15	.22	.30	.40	.53	.71	1.01	1.31
Feb	.04	.07	.14	.21	.29	.38	.49	.62	.81	1.13	1.44
Mar	.20	.27	.39	.49	.59	.69	.81	.95	1.14	1.42	1.69
Apr	.15	.23	.35	.46	.57	.69	.83	.99	1.21	1.56	1.90
May	.09	.16	.29	.43	.57	.74	.93	1.17	1.50	2.06	2.60
Jun	.14	.21	.33	.44	.56	.69	.83	1.01	1.24	1.63	1.99
Jul	.29	.43	.64	.84	1.04	1.26	1.50	1.79	2.18	2.80	3.38
Aug	.47	.61	.82	1.00	1.17	1.35	1.55	1.78	2.08	2.55	2.98
Sep	.19	.27	.40	.52	.64	.77	.92	1.10	1.33	1.70	2.05
Oct	.13	.19	.29	.38	.47	.57	.69	.82	1.00	1.28	1.55
Nov	.13	.18	.26	.33	.41	.48	.57	.67	.80	1.01	1.21
Dec	.03	.08	.15	.22	.28	.36	.45	.55	.69	.93	1.15
Ann	6.65	7.26	8.05	8.65	9.19	9.71	10.26	10.86	11.60	12.67	13.60

\+ 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: 1949-2001
(3) Derived from 1971-2000 serially complete daily data

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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	6.7	3.1	4	3
Feb	6.2	3.8	6	4
Mar	11.4	12.0	5	3
Apr	10.5	11.0	2	1
May	4.1	1.8	#	#
Jun	.8	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.6	.0	#	0
Oct	2.4	1.0	#	#
Nov	7.5	7.5	1	1
Dec	5.3	3.0	2	2
Ann	55.5	43.2	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	10.5	1982	4	32.0	1980	27	1984	18	22	1984
Feb	8.0	1980	19	18.0	1980	25	1984	16	23	1984
Mar	10.0	1985	28	23.5	1985	26	1984	15	23	1984
Apr	8.0	1978	10	18.0	1980	23	1984	4	12	1984
May	10.0	1983	20	23.0	1979	9	1995	17	3	1973
Jun	8.0	1984	7	10.0+	1984	3	1984	7	#+	1999
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	5.0	1985	30	11.0	1985	1+	1996	27	#+	1996
Oct	4.6	1996	17	8.1	1996	4	1972	31	1	1984
Nov	12.0	1979	20	13.0	1986	10	1979	20	3	1992
Dec	8.0	1981	28	16.5	1981	24	1983	29	14	1983
Ann	12.0	Nov 1979	20	32.0	Jan 1980	27	Jan 1984	18	23+	Mar 1984

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	2.1	.6	.3	.1
Feb	3.7	2.0	.6	.2	.0
Mar	4.8	3.0	.9	.2	.1
Apr	4.1	2.8	.7	.2	.0
May	1.6	1.4	.6	.2	@
Jun	.2	.2	.1	.1	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.3	.2	.1	@	.0
Oct	1.4	.9	.2	.0	.0
Nov	3.8	2.6	.6	.2	.1
Dec	3.2	1.8	.3	.1	.0
Ann	26.9	17.0	4.7	1.5	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	3.9	2.3	1.5	1.0
May	.7	.1	.1	.0
Jun	.1	@	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	.0	.0	.0
Oct	1.0	.1	.0	.0
Nov	10.1	2.9	.7	.1
Dec	16.3	6.2	1.1	.0
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	7/28	7/22	7/17	7/13	7/10	7/06	7/02	6/27	6/21
32	7/14	7/06	7/01	6/26	6/22	6/18	6/13	6/07	5/31
28	6/27	6/19	6/13	6/08	6/04	5/30	5/25	5/19	5/11
24	6/19	6/09	6/03	5/28	5/23	5/17	5/12	5/05	4/26
20	6/06	5/28	5/22	5/17	5/12	5/07	5/02	4/26	4/18
16	5/27	5/18	5/12	5/07	5/02	4/28	4/23	4/17	4/08

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	7/27	8/02	8/07	8/11	8/15	8/19	8/23	8/28	9/04
32	8/03	8/11	8/18	8/23	8/28	9/02	9/08	9/14	9/23
28	8/20	8/28	9/03	9/08	9/12	9/17	9/22	9/28	10/06
24	9/04	9/11	9/17	9/21	9/25	9/29	10/04	10/09	10/16
20	9/19	9/26	10/01	10/05	10/09	10/13	10/17	10/22	10/29
16	9/30	10/07	10/11	10/15	10/19	10/23	10/27	11/01	11/07

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	66	55	48	42	36	30	23	16	6
32	110	95	84	75	67	58	49	38	23
28	136	124	115	107	100	93	85	76	64
24	166	152	142	133	125	117	108	98	83
20	187	174	165	157	149	142	134	125	112
16	204	192	184	176	169	162	155	146	134

***** 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	1492	1291	1239	987	712	411	256	298	489	806	1150	1428	10559
60	1337	1151	1084	837	557	273	125	163	344	651	1000	1273	8795
57	1244	1067	991	747	466	199	72	102	263	558	910	1180	7799
55	1182	1011	929	687	406	157	43	70	213	497	850	1118	7163
50	1027	871	774	539	269	75	8	19	112	347	700	963	5704
32	476	374	258	118	14	0	0	0	0	24	214	415	1893

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	8	8	42	120	325	580	771	730	501	241	53	11	3390
55	0	0	0	0	5	47	101	87	25	0	0	0	265
57	0	0	0	0	2	29	68	57	14	0	0	0	170
60	0	0	0	0	0	13	29	25	5	0	0	0	72
65	0	0	0	0	0	2	5	4	0	0	0	0	11
70	0	0	0	0	0	0	0	0	0	0	0	0	0

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	0	0	0	14	127	358	537	490	286	77	1	0	0	0	0	14	141	499	1036	1526	1812	1889	1890	1890
45	0	0	0	0	47	216	382	335	155	19	0	0	0	0	0	0	47	263	645	980	1135	1154	1154	1154
50	0	0	0	0	6	100	228	186	56	0	0	0	0	0	0	0	6	106	334	520	576	576	576	576
55	0	0	0	0	0	28	90	64	8	0	0	0	0	0	0	0	0	28	118	182	190	190	190	190
60	0	0	0	0	0	0	16	4	0	0	0	0	0	0	0	0	0	0	16	20	20	20	20	20
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	2	34	125	269	360	332	224	97	18	0	0	0	2	36	161	430	790	1122	1346	1443	1461	1461

(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