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: GRAND LAKE 1 NW, CO **COOP ID: 053496**

Climate Division: CO 2 **NWS Call Sign:** **Elevation: 8,720 Feet** **Lat: 40˚16N** **Lon: 105˚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	31.5	3.8	17.7	53	1986	30	22.6	1986	-43	1963	13	10.3	1979	1468	0	.0	.0	.3	16.5	31.0	11.9
Feb	36.2	5.8	21.0	56+	1986	25	28.1	1995	-40	1951	1	12.4	1974	1231	0	.0	.0	1.4	8.7	28.3	9.9
Mar	42.5	13.0	27.8	67	1987	6	33.5	1999	-30	1965	3	21.3	1977	1155	0	.0	.0	6.8	4.1	30.9	4.0
Apr	49.5	19.6	34.6	74	1975	22	39.5	1992	-19+	1973	9	25.7	1973	912	0	.0	.0	16.4	1.3	29.6	1.0
May	59.6	27.9	43.8	81	1989	24	48.9	2000	4	1973	5	39.7	1975	659	0	.0	.0	26.7	.0	26.4	.0
Jun	70.9	34.0	52.5	89	1988	24	56.4	1994	16	1978	26	48.7	1973	377	0	.0	.0	29.6	.0	11.6	.0
Jul	75.9	39.0	57.5	92	1978	15	61.0	1998	21	1959	2	54.2	1973	238	3	.0	.1	31.0	.0	2.4	.0
Aug	74.1	37.7	55.9	92	1995	8	59.7	1995	18	1978	29	51.2	1974	286	3	.0	@	31.0	.0	4.5	.0
Sep	67.7	31.1	49.4	89	1978	6	55.6	1998	7+	1961	25	44.7	1971	468	0	.0	.0	29.1	.0	17.6	.0
Oct	56.6	22.9	39.8	75+	1992	2	44.2	1988	-8	1993	30	34.4	1984	783	0	.0	.0	24.2	.7	29.0	.1
Nov	40.0	12.8	26.4	68	1999	14	33.9	1999	-28+	1976	28	18.3	1979	1158	0	.0	.0	5.7	7.0	29.9	3.7
Dec	32.0	4.6	18.3	54+	1998	3	27.3	1980	-35	1990	23	13.2	1978	1447	0	.0	.0	.4	15.2	31.0	11.9
Ann	53.0	21.0	37.1	92+	Aug 1995	8	61.0	Jul 1998	-43	Jan 1963	13	10.3	Jan 1979	10182	6	.0	.1	202.6	53.5	272.2	42.5

\+ 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	1.83	1.52	.79	2000	10	4.83	1980	.33	1981
Feb	1.51	1.26	1.91	1986	20	5.93	1986	.33	1981
Mar	1.52	1.51	.82+	1983	6	4.50	1983	.40	1976
Apr	1.96	1.88	1.79	1986	3	3.43	1986	.78+	1987
May	2.05	1.80	1.97	1969	7	4.81	1995	.18	1974
Jun	1.49	1.34	1.50	1984	9	5.44	1984	.10	1980
Jul	2.11	2.13	1.91	1985	19	4.42	1973	.35	1994
Aug	2.15	1.96	1.77	1984	28	6.12	1984	.33	1985
Sep	1.68	1.37	3.20	1985	28	4.68	1985	.11	1979
Oct	1.50	1.39	1.59	1969	3	3.58	1986	.14	1999
Nov	1.37	1.34	1.00	1985	9	3.44	1985	.61	1998
Dec	1.58	1.42	1.00	1966	6	4.39	1983	.17	1986
Ann	20.75	19.70	3.20	Sep 1985	28	6.12	Aug 1984	.10	Jun 1980

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	14.2	6.2	.5	.0
Feb	11.4	5.0	.5	@
Mar	11.5	5.3	.3	.0
Apr	10.8	5.9	.6	.1
May	13.0	6.4	1.0	.1
Jun	11.2	4.6	.5	.1
Jul	14.4	6.5	.7	.1
Aug	14.8	6.3	.8	.1
Sep	12.3	4.9	.6	.1
Oct	9.2	4.8	.7	.1
Nov	11.7	5.0	.1	@
Dec	12.3	5.8	.3	.0
Ann	146.8	66.7	6.6	.7

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	.42	.59	.85	1.10	1.34	1.59	1.88	2.22	2.67	3.39	4.07
Feb	.32	.46	.68	.88	1.08	1.30	1.54	1.83	2.21	2.83	3.40
Mar	.53	.67	.88	1.06	1.23	1.40	1.59	1.81	2.09	2.52	2.92
Apr	.79	.97	1.23	1.44	1.64	1.84	2.06	2.31	2.63	3.11	3.55
May	.53	.72	1.02	1.28	1.54	1.81	2.11	2.47	2.94	3.68	4.37
Jun	.29	.43	.65	.85	1.05	1.27	1.52	1.81	2.21	2.84	3.44
Jul	.64	.84	1.14	1.40	1.65	1.91	2.19	2.53	2.96	3.64	4.27
Aug	.53	.73	1.05	1.33	1.60	1.89	2.22	2.60	3.11	3.91	4.66
Sep	.37	.52	.77	.99	1.22	1.45	1.72	2.04	2.46	3.14	3.77
Oct	.29	.42	.64	.84	1.05	1.27	1.52	1.83	2.23	2.88	3.49
Nov	.57	.70	.87	1.02	1.15	1.29	1.43	1.60	1.82	2.15	2.44
Dec	.32	.46	.69	.90	1.12	1.35	1.61	1.93	2.34	3.01	3.64
Ann	14.70	15.87	17.37	18.51	19.52	20.50	21.51	22.63	23.98	25.95	27.65

\+ 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	29.4	26.0	19	19	14.8	2000	10	62.6	1980	45	1996	31	34	1997	13.1	9.4	3.7	1.7	.2	27.4	26.7	26.6	24.9
Feb	22.4	19.6	24	24	16.0	1986	20	59.7	1986	53	1986	20	38	1980	9.8	7.4	2.4	1.2	.2	-9.9	-9.9	-9.9	-9.9
Mar	15.0	15.8	23	22	12.0	1973	14	32.0	1990	49	1980	7	40	1980	7.8	5.5	1.9	.7	.1	-9.9	-9.9	-9.9	-9.9
Apr	17.0	16.9	11	9	17.0	1986	3	33.5	1973	39	1983	3	32	1983	6.4	5.1	2.3	.6	.1	15.8	14.3	12.5	8.3
May	4.7	3.0	1	#	8.5	1983	17	22.0	1973	26	1983	1	13	1983	1.7	1.4	.7	.3	.0	1.8	1.2	.7	.1
Jun	.8	.0	#	0	15.0	1974	8	17.0	1974	15	1974	8	1	1974	.2	.2	@	@	@	@	.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	#	1976	8	#	1976	1	1995	27	#	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.4	.0	#	0	5.0	1971	17	5.0	1971	5	1971	17	3	2000	.2	.2	@	@	.0	.2	.1	@	.0
Oct	5.7	5.1	#	#	7.5	1996	29	18.0	1996	11	1975	24	2	1996	2.7	2.1	.9	.1	.0	3.5	1.9	.4	@
Nov	18.4	17.2	4	3	12.0	1975	27	34.5	1977	20	1985	30	11	1985	9.4	6.3	2.5	.7	.1	15.8	12.4	8.1	2.1
Dec	19.9	17.2	11	10	18.0	1973	28	44.3	2000	38	1983	27	25	1983	11.3	7.8	3.0	1.5	.1	27.7	26.9	22.7	11.9
Ann	133.7	120.8	N/A	N/A	18.0	Dec 1973	28	62.6	Jan 1980	53	Feb 1986	20	40	Mar 1980	62.6	45.4	17.4	6.8	.8	-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	8/04	7/31	7/29	7/26	7/24	7/22	7/20	7/18	7/14
32	7/31	7/25	7/21	7/17	7/13	7/10	7/06	7/02	6/25
28	7/11	7/05	6/30	6/26	6/23	6/19	6/15	6/10	6/04
24	6/16	6/09	6/04	5/31	5/27	5/23	5/18	5/13	5/06
20	6/03	5/26	5/21	5/17	5/13	5/09	5/04	4/29	4/22
16	5/20	5/13	5/08	5/04	4/30	4/27	4/22	4/18	4/11

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	7/30	7/31	8/02	8/03	8/05	8/06	8/08	8/09	8/12
32	7/31	8/06	8/11	8/15	8/18	8/22	8/26	8/31	9/06
28	8/13	8/20	8/25	8/29	9/02	9/06	9/10	9/15	9/22
24	8/27	9/03	9/07	9/12	9/16	9/20	9/24	9/29	10/06
20	9/11	9/17	9/21	9/24	9/27	10/01	10/04	10/08	10/14
16	9/22	9/29	10/04	10/09	10/13	10/17	10/21	10/26	11/02

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	25	20	17	14	11	8	5	1	0
32	67	56	48	42	35	29	22	14	3
28	100	90	83	77	71	65	59	52	42
24	145	133	125	118	111	105	98	89	78
20	169	158	150	143	137	131	124	116	105
16	197	186	178	171	165	158	151	143	132

***** 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	1468	1231	1155	912	659	377	238	286	468	783	1158	1447	10182
60	1313	1091	1000	762	504	234	108	150	321	628	1008	1292	8411
57	1220	1007	907	672	411	158	56	90	238	535	918	1199	7411
55	1158	951	845	612	350	115	30	58	188	473	858	1137	6775
50	1003	811	690	465	209	40	4	13	87	321	708	982	5333
32	449	318	189	75	3	0	0	0	0	15	216	426	1691

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	4	10	57	152	367	613	788	740	522	255	47	2	3557
55	0	0	0	0	1	38	105	85	20	0	0	0	249
57	0	0	0	0	0	21	69	55	10	0	0	0	155
60	0	0	0	0	0	7	28	22	3	0	0	0	60
65	0	0	0	0	0	0	3	3	0	0	0	0	6
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	27	152	379	547	498	293	83	0	0	0	0	0	27	179	558	1105	1603	1896	1979	1979	1979
45	0	0	0	1	57	236	392	343	165	20	0	0	0	0	0	1	58	294	686	1029	1194	1214	1214	1214
50	0	0	0	0	8	111	240	195	62	2	0	0	0	0	0	0	8	119	359	554	616	618	618	618
55	0	0	0	0	0	31	93	66	11	0	0	0	0	0	0	0	0	31	124	190	201	201	201	201
60	0	0	0	0	0	3	21	7	0	0	0	0	0	0	0	0	0	3	24	31	31	31	31	31
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	16	60	167	323	409	381	279	138	15	0	0	0	16	76	243	566	975	1356	1635	1773	1788	1788

(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