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: GRANT, CO **COOP ID: 053530**

Climate Division: CO 4 **NWS Call Sign:** **Elevation: 8,675 Feet** **Lat: 39˚28N** **Lon: 105˚41W**

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	33.1	7.5	20.3	58	1997	3	26.8	1986	-23	1971	6	12.4	1979	1385	0	.0	.0	.5	13.1	30.9	6.6
Feb	37.3	9.6	23.5	58	1979	14	29.0	1995	-30+	1989	5	18.0	1989	1163	0	.0	.0	2.2	7.4	28.2	4.6
Mar	43.2	15.1	29.2	65+	1997	21	34.4	1999	-22	1965	19	24.8	1988	1112	0	.0	.0	9.0	4.2	30.8	1.5
Apr	50.0	21.7	35.9	76	1981	27	41.8	1981	-10+	1983	6	28.7	1983	875	0	.0	.0	17.2	1.8	29.0	.6
May	60.3	29.8	45.1	82	2000	31	49.8	1996	3	1978	7	40.8	1983	618	0	.0	.0	26.8	.2	21.1	.0
Jun	70.8	36.7	53.8	90	1994	26	58.4	1994	20	1970	1	50.1	1975	338	1	.0	@	29.6	.0	5.2	.0
Jul	75.3	42.0	58.7	89	1998	19	61.6	2000	27	1968	1	55.6	1973	201	3	.0	.0	31.0	.0	.2	.0
Aug	72.8	41.1	57.0	85+	2000	9	60.9	2000	25	1964	28	54.3	1974	250	0	.0	.0	31.0	.0	.5	.0
Sep	65.8	33.1	49.5	84	2001	6	55.4	1998	7+	1995	22	45.9	1971	466	0	.0	.0	28.6	.1	10.9	.0
Oct	55.6	24.8	40.2	77	1980	1	43.8	1988	-5	1991	29	34.8	1984	770	0	.0	.0	23.5	1.0	27.6	.2
Nov	40.4	14.8	27.6	67+	1999	14	38.0	1999	-18	1976	28	20.4	1979	1122	0	.0	.0	6.6	6.6	29.7	2.3
Dec	33.1	8.8	21.0	58	1965	4	30.4	1980	-27+	1990	22	15.3	1990	1365	0	.0	.0	.6	13.7	30.9	5.8
Ann	53.1	23.8	38.5	90	Jun 1994	26	61.6	Jul 2000	-30+	Feb 1989	5	12.4	Jan 1979	9665	4	.0	@	206.6	48.1	245.0	21.6

\+ 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: 1963-2001

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

Issue Date: February 2004

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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	.49	.36	.73	1996	1	2.10	1996	.10	1983
Feb	.58	.48	.59	1995	12	1.70	1995	.10	1973
Mar	1.15	1.14	.82	1995	28	2.41	1995	.36	1999
Apr	1.55	1.41	1.60	1980	24	4.02	1995	.29	1972
May	1.70	1.41	2.47	1969	7	4.67	1995	.02	1974
Jun	1.54	1.64	2.23	1979	8	3.32	1997	.00	1980
Jul	2.43	2.24	1.85	1985	19	6.09	1998	.41	1994
Aug	2.45	2.47	1.84	1987	24	4.82	1984	.83	1985
Sep	1.31	1.14	1.37	1970	22	2.46	1990	.24	1983
Oct	1.11	1.11	1.25	1969	3	2.87	1974	.09	1988
Nov	.89	.77	1.19	1966	9	2.18	1983	.19+	1989
Dec	.67	.61	1.01	1972	5	1.69	1978	.11	2000
Ann	15.87	15.59	2.47	May 1969	7	6.09	Jul 1998	.00	Jun 1980

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.8	1.8	@	.0
Feb	5.8	2.2	.1	.0
Mar	8.0	4.1	.3	.0
Apr	8.9	4.7	.7	.2
May	9.3	5.0	.9	.2
Jun	8.9	4.6	.7	.1
Jul	13.3	6.8	1.1	.3
Aug	15.6	7.6	.8	.1
Sep	8.8	3.9	.6	.0
Oct	6.0	3.4	.6	.1
Nov	6.4	3.0	.4	@
Dec	6.5	2.1	.2	@
Ann	103.3	49.2	6.4	1.0

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	.07	.11	.18	.25	.32	.40	.49	.60	.76	1.00	1.24
Feb	.12	.17	.26	.33	.41	.50	.59	.70	.85	1.09	1.32
Mar	.37	.48	.64	.78	.91	1.05	1.20	1.37	1.60	1.95	2.27
Apr	.45	.60	.82	1.01	1.20	1.39	1.61	1.86	2.18	2.69	3.17
May	.18	.31	.54	.78	1.03	1.32	1.66	2.08	2.65	3.60	4.52
Jun	.21	.41	.67	.89	1.11	1.34	1.59	1.90	2.30	2.94	3.54
Jul	.55	.78	1.13	1.45	1.77	2.11	2.49	2.95	3.55	4.50	5.39
Aug	.91	1.14	1.47	1.75	2.01	2.27	2.56	2.90	3.32	3.98	4.58
Sep	.41	.54	.72	.88	1.03	1.19	1.36	1.56	1.83	2.23	2.61
Oct	.20	.30	.46	.61	.76	.93	1.12	1.35	1.66	2.15	2.62
Nov	.21	.29	.42	.54	.65	.78	.92	1.08	1.29	1.64	1.96
Dec	.16	.22	.32	.41	.49	.59	.69	.81	.97	1.22	1.45
Ann	12.11	12.86	13.80	14.51	15.14	15.74	16.36	17.03	17.85	19.02	20.03

\+ 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: 1963-2001
(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	8.4	7.0	10	10
Feb	11.0	8.8	11	11
Mar	18.0	18.0	10	11
Apr	16.3	17.0	6	3
May	6.3	2.0	#	#
Jun	1.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	2.0	.0	#	0
Oct	8.5	8.0	1	1
Nov	14.5	13.0	4	4
Dec	13.2	13.0	8	8
Ann	99.2	86.8	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	10.0	1989	12	22.6	1987	28	1980	30	23	1980
Feb	12.0	1987	27	33.5	1987	32	1987	27	25+	1980
Mar	12.0	1983	15	39.0	1983	36	1984	31	27	1984
Apr	17.0	1986	3	37.0	1973	34	1987	2	20	1984
May	16.0	1973	7	36.0	1973	16	1978	7	4	1973
Jun	12.0	1975	10	13.0	1979	10	1979	9	1	1979
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	8.0	1985	29	16.0	1971	8	1985	29	1	1985
Oct	17.0	1975	23	23.0	1975	17	1975	23	2	1990
Nov	13.0	1979	20	39.0	1983	23	1983	22	11	1994
Dec	24.0	1978	2	41.0	1978	31	1978	2	21	1978
Ann	24.0	Dec 1978	2	41.0	Dec 1978	36	Mar 1984	31	27	Mar 1984

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.6	4.0	.9	.3	@
Feb	4.3	3.7	1.4	.7	.1
Mar	6.5	6.0	2.7	1.1	.1
Apr	5.4	4.9	2.2	1.1	.2
May	2.0	1.8	.7	.4	.1
Jun	.2	.1	.1	.1	@
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.6	.6	.3	.2	.0
Oct	2.1	2.1	1.1	.6	.1
Nov	4.7	4.2	1.7	.9	.2
Dec	5.2	4.5	1.3	.5	.2
Ann	35.6	31.9	12.4	5.9	1.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	28.5	26.5	23.5	16.1
Feb	25.0	22.1	20.4	16.9
Mar	25.4	21.9	19.1	14.7
Apr	12.9	10.8	9.4	7.0
May	2.2	1.3	.8	.2
Jun	.2	.1	.1	@
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.5	.3	.2	.0
Oct	4.1	2.8	1.7	.3
Nov	19.1	14.6	11.5	3.2
Dec	28.2	25.4	22.8	11.0
Ann	146.1	125.8	109.5	69.4

+ 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	7/22	7/16	7/13	7/09	7/06	7/03	6/30	6/26	6/21
32	7/05	6/29	6/25	6/22	6/19	6/16	6/13	6/09	6/04
28	6/19	6/13	6/09	6/05	6/01	5/29	5/25	5/21	5/15
24	5/26	5/21	5/18	5/15	5/12	5/09	5/06	5/03	4/28
20	5/14	5/10	5/07	5/04	5/02	4/30	4/27	4/25	4/21
16	5/04	4/29	4/26	4/23	4/20	4/17	4/14	4/11	4/06

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	8/05	8/09	8/13	8/17	8/21	8/25	8/29	9/05
32	8/22	8/27	8/31	9/04	9/07	9/10	9/13	9/17	9/23
28	9/03	9/08	9/12	9/15	9/17	9/20	9/23	9/26	10/01
24	9/15	9/19	9/21	9/24	9/26	9/28	9/30	10/02	10/06
20	9/20	9/26	9/30	10/04	10/07	10/11	10/14	10/19	10/25
16	9/25	10/03	10/08	10/12	10/16	10/21	10/25	10/30	11/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	68	59	52	47	41	36	30	24	14
32	103	95	89	84	79	74	69	63	54
28	129	121	116	111	107	103	98	93	86
24	154	148	143	139	136	132	128	124	118
20	179	172	166	162	157	153	149	143	136
16	205	196	189	184	179	174	168	162	153

***** 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	1385	1163	1112	875	618	338	201	250	466	770	1122	1365	9665
60	1230	1023	957	725	463	200	74	111	319	615	972	1210	7899
57	1137	939	864	635	371	131	29	54	235	522	882	1117	6916
55	1075	883	802	575	312	93	12	29	184	460	822	1055	6302
50	920	743	647	428	179	30	1	4	84	308	672	900	4916
32	369	249	145	55	2	0	0	0	0	12	198	353	1383

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	7	9	56	171	407	653	825	773	524	265	66	11	3767
55	0	0	0	0	4	56	124	89	18	0	0	0	291
57	0	0	0	0	1	34	79	52	9	0	0	0	175
60	0	0	0	0	0	13	31	16	3	0	0	0	63
65	0	0	0	0	0	1	3	0	0	0	0	0	4
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	7	53	203	437	596	543	321	109	9	0	0	0	7	60	263	700	1296	1839	2160	2269	2278	2278
45	0	0	0	10	91	291	441	388	186	33	0	0	0	0	0	10	101	392	833	1221	1407	1440	1440	1440
50	0	0	0	0	23	161	286	234	80	3	0	0	0	0	0	0	23	184	470	704	784	787	787	787
55	0	0	0	0	1	56	136	95	18	0	0	0	0	0	0	0	1	57	193	288	306	306	306	306
60	0	0	0	0	0	7	33	16	0	0	0	0	0	0	0	0	0	7	40	56	56	56	56	56
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	22	73	183	328	405	362	256	129	17	0	0	0	22	95	278	606	1011	1373	1629	1758	1775	1775

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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