

# Climatology of the United States

## No. 20

### 1971-2000

**Station: GREELEY UNC, CO**

**COOP ID: 053553**

**Climate Division: CO 4**

**NWS Call Sign:**

**Elevation: 4,715 Feet Lat: 40° 24N**

**Lon: 104° 42W**

### 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	40.0	15.6	27.8	74	1982	26	35.2	1999	-25	1984	18	16.0	1979	1153	0	.0	.0	7.7	7.9	30.3	3.6
Feb	46.2	20.9	33.6	76	1986	25	40.9	1999	-20+	1996	3	22.0	1989	881	0	.0	.0	12.3	4.2	26.7	1.4
Mar	55.0	28.0	41.5	82	1997	20	47.7	1986	-4	1976	6	35.8	1980	728	0	.0	.0	21.5	1.6	24.2	.2
Apr	63.0	35.8	49.4	91	1992	30	55.6	1981	-3	1975	2	43.1	1983	470	2	.0	.1	25.6	.2	11.2	@
May	72.3	45.4	58.9	96	2000	29	63.5	1994	25	1983	12	51.7	1995	220	29	.0	.7	30.2	.0	1.0	.0
Jun	83.1	54.2	68.7	103+	2001	30	73.6	1994	35	1975	11	64.0	1995	45	154	.3	8.7	29.9	.0	.0	.0
Jul	88.7	59.3	74.0	106	1998	20	76.8	1980	42	1971	30	70.6	1992	1	279	1.1	15.7	31.0	.0	.0	.0
Aug	86.6	57.5	72.1	102	1975	6	75.9	1983	41+	1992	27	68.5	1992	8	227	.3	12.2	31.0	.0	.0	.0
Sep	78.2	48.2	63.2	99+	1998	6	69.1	1998	17	1985	30	58.3	1971	122	68	.0	3.6	29.5	@	1.4	.0
Oct	66.0	36.9	51.5	91	1991	16	55.3	1973	5+	1997	26	46.5	1984	420	0	.0	@	28.0	.3	10.2	.0
Nov	49.7	25.4	37.6	80	1999	13	45.1	1999	-7+	1993	24	28.0	1985	824	0	.0	.0	15.8	2.9	25.3	.4
Dec	41.3	17.2	29.3	75	1980	17	39.1	1980	-24	1989	22	16.8	1983	1108	0	.0	.0	9.0	6.5	30.2	2.6
Ann	64.2	37.0	50.6	106	1998	20	76.8	1980	-25	1984	18	16.0	1979	5980	759	1.7	41.0	271.5	23.6	160.5	8.2

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1967-2001

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

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Lon: 104°42W

### Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1)											
														Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
Means/Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels												
													These values were determined from the incomplete gamma distribution												
Month	Mean	Median	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	.53	.43	.88	1992	7	1.44	1980	.02	1975	4.1	1.8	.2	.0	.05	.09	.17	.24	.32	.41	.52	.65	.83	1.13	1.42	
Feb	.38	.23	.79	1987	26	1.52	1987	.00+	1991	3.5	1.3	.1	.0	.00	.01	.06	.12	.18	.25	.34	.46	.62	.90	1.18	
Mar	1.16	.64	1.91	1990	5	4.13	1990	.09	1978	5.8	3.1	.6	.2	.10	.18	.33	.49	.67	.87	1.11	1.41	1.83	2.52	3.21	
Apr	1.81	1.61	2.56	1999	30	7.41	1999	.18	1982	7.2	4.1	1.1	.2	.35	.52	.78	1.03	1.28	1.54	1.84	2.21	2.69	3.47	4.21	
May	2.55	2.09	2.94	1975	29	5.36	1981	.10	1974	10.1	5.5	1.6	.5	.53	.76	1.14	1.48	1.82	2.19	2.61	3.10	3.76	4.82	5.82	
Jun	1.80	1.64	3.20	1974	8	4.00	1995	.21	1990	7.7	4.3	1.0	.3	.35	.52	.78	1.02	1.27	1.54	1.84	2.20	2.67	3.44	4.17	
Jul	1.42	1.25	3.48	2001	13	3.41	1989	.02	2000	6.7	3.1	.7	.3	.17	.28	.48	.68	.89	1.13	1.40	1.74	2.20	2.95	3.69	
Aug	1.18	.87	1.65	1979	10	3.89	1979	.12	1973	6.2	2.8	.7	.1	.19	.29	.47	.63	.79	.98	1.18	1.44	1.78	2.33	2.85	
Sep	1.19	.97	1.68	1971	17	3.36	1971	.00+	1992	6.0	3.4	.7	.1	.00	.17	.40	.59	.78	.99	1.22	1.49	1.86	2.46	3.03	
Oct	.89	.69	1.93	1978	22	2.92	1984	.03	1988	4.8	2.5	.4	.1	.08	.14	.26	.38	.52	.67	.85	1.08	1.40	1.93	2.44	
Nov	.84	.48	1.22	1979	20	2.29	1983	.02+	1989	4.5	2.4	.4	.1	.04	.09	.18	.30	.42	.58	.77	1.01	1.35	1.94	2.52	
Dec	.47	.39	.75	1979	27	1.11	1979	.00+	1996	3.9	1.8	.1	.0	.00	.06	.15	.22	.30	.38	.48	.59	.75	1.00	1.24	
Ann	14.22	14.17	3.48	Jul 2001	13	7.41	Apr 1999	.00+	Dec 1996	70.5	36.1	7.6	1.9	9.74	10.59	11.70	12.54	13.30	14.03	14.78	15.62	16.65	18.13	19.43	

+ 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: 1967-2001

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

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Climate Division: CO 4

NWS Call Sign:

Elevation: 4,715 Feet

Lat: 40° 24N

Lon: 104° 42W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	6.5	5.4	2	2	10.0	1989	28	16.3	1980	12	1971	3	6	1988	4.1	2.1	.8	.4	@	14.9	8.3	5.2	.3
Feb	4.4	2.6	1	1	6.5	1987	26	13.2	1987	9	1980	11	6	1980	3.5	1.8	.3	.1	.0	7.6	4.4	1.7	.0
Mar	7.8	6.0	#	#	9.5	1988	31	17.0	1988	30	1974	23	1	1998	4.6	2.7	.9	.4	.0	3.0	.9	.3	.0
Apr	6.3	6.0	1	#	9.5	1984	20	16.5	1984	9	1984	20	5	1974	2.6	1.8	.8	.3	.0	1.5	.8	.4	.0
May	.8	.0	#	0	6.0	1973	1	6.0+	1983	6	1978	6	#+	1983	.2	.2	.1	.1	.0	.2	.1	@	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#	1982	3	#	1982	.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	.9	.0	#	0	5.0	1971	17	9.0	1971	5	1985	29	#+	2000	.5	.4	.1	@	.0	.2	.1	@	.0
Oct	2.6	2.0	#	#	10.0	1997	24	20.2	1997	20	1997	25	3	1997	1.1	.8	.2	.1	.1	.7	.2	@	.0
Nov	8.5	5.5	1	#	13.0	1983	26	23.5	1983	16	1983	27	4	1979	3.9	2.3	1.1	.4	.1	5.5	3.0	1.5	.4
Dec	5.8	4.9	2	1	8.0	1975	31	13.8	1975	13	1985	11	6	1992	3.9	2.0	.5	.2	.0	11.4	5.8	2.8	.5
Ann	43.6	32.4	N/A	N/A	13.0	Nov 1983	26	23.5	Nov 1983	30	Mar 1974	23	6+	Dec 1992	24.4	14.1	4.8	2.0	.2	45.0	23.6	11.9	1.2

+ 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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<b>Freeze Data</b>									
<b>Spring Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of later date in spring (thru Jul 31) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	5/26	5/21	5/18	5/15	5/12	5/09	5/06	5/03	4/28
<b>32</b>	5/13	5/09	5/06	5/04	5/02	4/30	4/28	4/25	4/21
<b>28</b>	5/03	4/28	4/24	4/21	4/18	4/16	4/13	4/09	4/04
<b>24</b>	4/20	4/16	4/13	4/10	4/08	4/05	4/02	3/30	3/26
<b>20</b>	4/12	4/06	4/02	3/29	3/26	3/22	3/19	3/14	3/08
<b>16</b>	4/08	3/31	3/26	3/21	3/16	3/12	3/07	3/02	2/22
<b>Fall Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of earlier date in fall (beginning Aug 1) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	9/15	9/18	9/21	9/23	9/25	9/27	9/29	10/01	10/04
<b>32</b>	9/17	9/22	9/25	9/28	10/01	10/03	10/06	10/10	10/14
<b>28</b>	9/25	9/30	10/04	10/07	10/10	10/13	10/16	10/20	10/25
<b>24</b>	10/07	10/13	10/16	10/20	10/23	10/26	10/29	11/02	11/07
<b>20</b>	10/20	10/25	10/29	11/01	11/03	11/06	11/09	11/12	11/17
<b>16</b>	10/28	11/02	11/05	11/08	11/10	11/13	11/16	11/19	11/24
<b>Freeze Free Period</b>									
<b>Temp (F)</b>	<b>Probability of longer than indicated freeze free period (Days)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	153	147	142	138	135	131	128	123	117
<b>32</b>	169	162	158	154	151	147	144	139	133
<b>28</b>	195	188	182	178	174	170	166	161	153
<b>24</b>	219	212	206	202	197	193	188	183	175
<b>20</b>	245	237	231	226	222	217	212	206	198
<b>16</b>	264	255	249	243	238	233	228	221	212

\* 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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**Lon: 104° 42W**

### 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	1153	881	728	470	220	45	1	8	122	420	824	1108	5980
60	998	741	573	329	117	13	0	1	50	269	674	953	4718
57	905	657	481	252	73	5	0	0	24	187	584	860	4028
55	843	601	420	206	50	2	0	0	13	140	527	798	3600
50	690	470	277	112	15	0	0	0	2	54	389	650	2659
32	233	113	13	0	0	0	0	0	0	0	66	209	634

### Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	103	156	308	522	832	1099	1302	1241	936	604	232	124	7459
55	0	0	2	38	169	411	589	528	260	31	3	0	2031
57	0	0	0	24	130	354	527	466	210	16	0	0	1727
60	0	0	0	11	81	271	434	374	146	5	0	0	1322
65	0	0	0	2	29	154	279	227	68	0	0	0	759
70	0	0	0	0	7	69	134	103	23	0	0	0	336

### 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	11	45	138	302	581	855	1047	984	692	368	86	16	11	56	194	496	1077	1932	2979	3963	4655	5023	5109	5125
45	0	12	59	181	430	705	892	829	545	236	33	0	0	12	71	252	682	1387	2279	3108	3653	3889	3922	3922
50	0	0	21	93	287	555	737	674	402	123	7	0	0	0	21	114	401	956	1693	2367	2769	2892	2899	2899
55	0	0	0	39	167	409	583	519	267	46	0	0	0	0	0	39	206	615	1198	1717	1984	2030	2030	2030
60	0	0	0	9	75	267	428	364	147	11	0	0	0	0	0	9	84	351	779	1143	1290	1301	1301	1301
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	25	60	135	224	365	537	667	632	446	274	86	33	25	85	220	444	809	1346	2013	2645	3091	3365	3451	3484

(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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)