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: BOULDER, UT **COOP ID: 420849**

Climate Division: UT 4 **NWS Call Sign:** **Elevation: 6,680 Feet** **Lat: 37˚54N** **Lon: 111˚25W**

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	40.7	18.1	29.4	63	1975	25	36.5	1986	-16	1963	12	20.1	1979	1103	0	.0	.0	4.0	5.5	30.4	1.2
Feb	45.3	22.3	33.8	69	1996	15	42.4	1995	-17	1989	6	27.9	1979	874	0	.0	.0	7.5	1.9	26.6	.4
Mar	52.7	28.5	40.6	73	1966	31	48.4	1972	0	1966	4	34.6	1973	755	0	.0	.0	17.7	.2	23.3	.0
Apr	60.7	34.5	47.6	82	1981	30	54.0	1992	8+	1965	11	39.8	1975	523	0	.0	.0	25.5	.0	13.7	.0
May	69.1	42.5	55.8	89	2000	23	61.5	1984	20	1977	18	51.1	1977	297	12	.0	.0	30.4	.0	3.6	.0
Jun	79.5	52.4	66.0	96	1961	23	72.0	1974	28	1955	2	61.0	1998	77	106	.0	1.9	30.0	.0	.1	.0
Jul	84.8	59.0	71.9	96+	1989	6	75.3	1996	39+	1982	6	67.7	1987	6	219	.0	5.1	31.0	.0	.0	.0
Aug	82.2	57.4	69.8	95	1962	14	73.2	1994	34	1960	17	67.4	1993	7	156	.0	2.3	31.0	.0	.0	.0
Sep	74.8	49.9	62.4	90+	1958	1	67.9	1979	24+	1959	28	55.9	1986	120	40	.0	@	29.9	.0	.7	.0
Oct	63.9	39.6	51.8	83+	1963	1	58.6	1988	4	1971	30	46.1	1984	417	6	.0	.0	28.1	@	7.0	.0
Nov	49.9	27.2	38.6	70	1988	3	45.7	1995	-1	1976	28	31.6	2000	795	0	.0	.0	14.5	.8	23.1	@
Dec	42.2	19.7	31.0	65	1958	12	39.8	1980	-11+	1978	8	23.3	1978	1056	0	.0	.0	4.3	4.5	30.4	.5
Ann	62.2	37.6	49.9	96+	Jul 1989	6	75.3	Jul 1996	-17	Feb 1989	6	20.1	Jan 1979	6030	539	.0	9.3	253.9	12.9	158.9	2.1

\+ 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: 1954-2001

(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	.96	.62	1.51	1997	13	4.35	1993	.00	1972
Feb	.91	.75	1.21	1980	14	3.18	1993	.00+	1977
Mar	1.02	.78	1.31	1969	4	2.84	1979	.00+	1999
Apr	.49	.34	1.50	1964	3	1.51	1985	.00+	1996
May	.77	.55	.80	1978	1	2.85	1992	.00+	1984
Jun	.33	.27	1.65	1956	29	1.41	1972	.00+	1980
Jul	1.06	.88	2.33	1969	20	3.84	1999	.06	1993
Aug	1.50	1.41	1.49	1962	22	3.43	1999	.05	1985
Sep	1.20	.82	1.92	1962	21	4.43	1997	.04	1989
Oct	1.21	.84	2.00	1960	9	5.62	1972	.00+	1999
Nov	.79	.45	1.85	1978	11	4.76	1978	.00+	1999
Dec	.58	.29	1.01	1959	25	1.98	1984	.00+	1989
Ann	10.82	10.51	2.33	Jul 1969	20	5.62	Oct 1972	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	2.8	.4	.1
Feb	4.6	2.7	.6	.1
Mar	4.8	3.1	.7	.1
Apr	3.5	1.3	.3	.0
May	4.7	2.3	.4	.0
Jun	2.8	1.0	.1	@
Jul	6.4	3.2	.4	.1
Aug	7.6	4.3	.8	@
Sep	6.0	3.5	.6	.2
Oct	4.6	3.3	.8	@
Nov	3.2	2.0	.4	.1
Dec	3.6	1.8	.2	.0
Ann	56.3	31.3	5.7	.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	.02	.07	.19	.32	.47	.65	.88	1.16	1.56	2.25	2.94
Feb	.00	.07	.22	.36	.51	.68	.89	1.13	1.47	2.04	2.60
Mar	.00	.00	.09	.24	.42	.64	.90	1.24	1.73	2.56	3.39
Apr	.00	.00	.02	.10	.19	.30	.43	.60	.84	1.24	1.65
May	.00	.00	.14	.27	.40	.55	.73	.96	1.26	1.78	2.29
Jun	.00	.00	.05	.10	.17	.24	.32	.42	.56	.79	1.02
Jul	.09	.17	.31	.46	.62	.80	1.02	1.29	1.66	2.29	2.91
Aug	.21	.33	.55	.75	.97	1.21	1.49	1.83	2.29	3.04	3.76
Sep	.06	.13	.27	.43	.62	.83	1.10	1.45	1.93	2.76	3.59
Oct	.00	.00	.23	.43	.64	.88	1.16	1.51	1.98	2.77	3.55
Nov	.00	.00	.06	.18	.32	.48	.69	.95	1.34	1.99	2.64
Dec	.00	.00	.07	.16	.27	.39	.54	.73	.99	1.42	1.85
Ann	6.57	7.35	8.36	9.15	9.87	10.57	11.30	12.12	13.13	14.62	15.92

\+ 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: 1954-2001
(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	12.8	12.0	4	3
Feb	5.3	4.0	3	1
Mar	2.5	1.0	#	#
Apr	1.4	.0	#	0
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	#	0
Oct	.5	.0	#	0
Nov	3.3	.0	#	#
Dec	5.7	3.5	1	#
Ann	31.5	20.5	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	18.0	1997	13	29.4	1997	27	1993	19	16	1993
Feb	10.0	1993	8	18.0+	1992	34	1993	21	28	1993
Mar	8.0	1983	4	11.0	1992	18	1979	2	5	1979
Apr	8.0	1999	4	15.0	1999	7	1975	1	#+	1999
May	#	1996	27	#+	1996	3	1987	26	#+	1995
Jun	.5	1999	4	.5	1999	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	#	1996	18	#	1996	#	1996	18	#	1996
Oct	3.5	1994	15	3.5	1994	3	1972	24	#+	2000
Nov	14.0	1982	30	14.0	1982	8+	1985	13	1	1994
Dec	8.0	1984	27	21.0	1988	16	1988	28	5	1994
Ann	18.0	Jan 1997	13	29.4	Jan 1997	34	Feb 1993	21	28	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.3	3.0	1.8	1.1	.2
Feb	2.5	2.2	1.2	.6	.1
Mar	1.2	1.0	.4	.2	.0
Apr	.6	.3	.2	.1	.0
May	.0	.0	.0	.0	.0
Jun	@	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.3	.2	.1	.0	.0
Nov	.7	.6	.5	.2	@
Dec	2.1	1.8	.7	.3	.0
Ann	10.7	9.1	4.9	2.5	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	10.2	9.3	6.3	3.0
Feb	6.9	5.1	3.6	.4
Mar	1.1	.4	.1	.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
Nov	.8	.5	.3	.0
Dec	3.4	2.0	1.1	.4
Ann	22.5	17.3	11.4	3.8

+ 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	6/19	6/14	6/10	6/06	6/03	5/31	5/27	5/24	5/18
32	6/02	5/28	5/24	5/21	5/18	5/15	5/12	5/08	5/03
28	5/23	5/17	5/12	5/08	5/05	5/01	4/27	4/22	4/16
24	5/09	5/02	4/27	4/22	4/18	4/14	4/09	4/04	3/27
20	4/24	4/17	4/12	4/07	4/03	3/30	3/25	3/20	3/13
16	4/06	3/28	3/22	3/17	3/12	3/07	3/02	2/23	2/15

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	139	131	125	120	115	110	105	99	91
32	163	155	149	144	140	135	130	124	116
28	196	185	178	171	165	159	152	145	134
24	222	213	206	200	194	188	182	175	166
20	243	234	228	222	217	212	207	200	192
16	284	273	265	258	251	245	238	230	218

***** 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	1103	874	755	523	297	77	6	7	120	417	795	1056	6030
60	948	734	601	382	174	27	0	0	47	281	645	901	4740
57	855	650	511	303	116	12	0	0	22	211	555	808	4043
55	793	594	452	254	85	6	0	0	13	169	497	746	3609
50	638	455	313	153	32	1	0	0	2	88	355	591	2628
32	182	81	26	5	0	0	0	0	0	1	35	144	474

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	102	132	294	473	738	1019	1236	1172	911	613	231	111	7032
55	0	0	7	32	110	335	523	459	233	68	2	0	1769
57	0	0	3	20	79	280	461	397	183	47	1	0	1471
60	0	0	1	10	44	206	369	304	118	25	0	0	1077
65	0	0	0	0	12	106	219	156	40	6	0	0	539
70	0	0	0	0	2	41	96	48	7	0	0	0	194

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	3	24	92	237	480	770	980	919	664	364	71	4	3	27	119	356	836	1606	2586	3505	4169	4533	4604	4608
45	0	1	34	129	329	620	825	764	514	232	23	0	0	1	35	164	493	1113	1938	2702	3216	3448	3471	3471
50	0	0	4	54	201	471	670	609	368	127	1	0	0	0	4	58	259	730	1400	2009	2377	2504	2505	2505
55	0	0	0	17	100	328	515	454	232	52	0	0	0	0	0	17	117	445	960	1414	1646	1698	1698	1698
60	0	0	0	0	33	195	361	299	116	15	0	0	0	0	0	0	33	228	589	888	1004	1019	1019	1019
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	20	74	165	302	495	655	602	411	225	53	5	2	22	96	261	563	1058	1713	2315	2726	2951	3004	3009

(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