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: BUFFALO, WY **COOP ID: 481165**

Climate Division: WY 5 **NWS Call Sign:** **Elevation: 4,670 Feet** **Lat: 44˚21N** **Lon: 106˚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	33.0	7.3	20.2	65	1966	8	28.4	1986	-36	1963	19	2.3	1979	1390	0	.0	.0	4.1	11.1	30.6	7.9
Feb	38.0	13.0	25.5	74	1982	21	34.2	1992	-32+	1996	2	11.5	1989	1107	0	.0	.0	7.3	7.4	27.4	4.3
Mar	46.7	22.4	34.6	78	1986	27	43.3	1986	-22	1978	3	28.1	1996	944	0	.0	.0	15.1	3.6	27.8	1.1
Apr	55.5	32.0	43.8	88	1987	28	50.8	1987	5	1966	20	37.3	1997	638	0	.0	.0	21.5	.9	17.1	.0
May	64.9	41.0	53.0	93+	1969	27	58.4	1994	13	1970	1	47.7	1995	379	5	.0	.1	28.3	.1	4.7	.0
Jun	76.4	50.3	63.4	102	1970	27	74.2	1988	27	1969	14	55.3	1998	142	93	.1	3.6	29.8	.0	.2	.0
Jul	84.0	56.2	70.1	105+	1983	14	74.7	1980	32	1968	1	61.9	1993	41	199	1.0	10.7	31.0	.0	.0	.0
Aug	83.3	54.6	69.0	106	1979	5	77.1	1983	33+	1962	31	63.7	1977	53	177	.2	8.9	31.0	.0	.0	.0
Sep	71.6	43.4	57.5	101	1983	1	64.4	1998	13	1984	25	52.3	1984	250	25	@	1.7	28.7	.1	3.2	.0
Oct	59.7	32.3	46.0	89+	1976	1	50.8	1973	-8	1991	30	41.2	1981	589	0	.0	.0	25.1	.8	15.0	.1
Nov	43.2	18.9	31.1	80	1999	7	43.3	1999	-24	1959	16	16.9	1985	1019	0	.0	.0	10.7	5.5	26.9	1.5
Dec	34.8	9.6	22.2	70	1965	4	28.6	1999	-35	1983	24	7.3	1983	1327	0	.0	.0	5.1	9.7	30.3	5.5
Ann	57.6	31.8	44.7	106	Aug 1979	5	77.1	Aug 1983	-36	Jan 1963	19	2.3	Jan 1979	7879	499	1.3	25.0	237.7	39.2	183.2	20.4

\+ 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

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	.45	.34	.93	1972	2	2.00	1972	.00	1983
Feb	.39	.30	.40+	1988	22	1.11	1988	.00+	1999
Mar	.73	.59	1.02	1977	25	2.07	1977	.06	1997
Apr	1.60	1.35	3.40	1963	28	3.89	1976	.16	1981
May	2.44	2.08	2.18	1978	17	7.86	1978	.17	1998
Jun	2.13	1.74	3.72	1992	15	5.64	1992	.58	1974
Jul	1.48	1.54	1.50+	1997	20	4.88	1997	.00	1999
Aug	.89	.76	1.15	1976	2	2.90	1972	.22	1991
Sep	1.37	1.14	2.10	1982	14	4.90	1986	.07	1975
Oct	1.04	.75	1.55	1993	8	3.58	1971	.04	1984
Nov	.49	.45	.86	1973	1	1.27	1986	.00+	1999
Dec	.48	.35	.91	1982	2	1.87	1989	.00+	1999
Ann	13.49	13.51	3.72	Jun 1992	15	7.86	May 1978	.00+	Dec 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.6	1.6	@	.0
Feb	4.1	1.5	.0	.0
Mar	5.6	2.3	.2	@
Apr	7.5	4.2	.7	.2
May	9.9	5.5	1.6	.4
Jun	8.3	4.5	1.2	.4
Jul	6.7	3.5	1.0	.2
Aug	5.3	2.9	.3	@
Sep	5.5	3.7	.6	.1
Oct	5.0	3.2	.5	.1
Nov	3.7	1.6	.3	.0
Dec	4.4	1.8	.2	.0
Ann	70.6	36.3	6.6	1.4

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	.04	.09	.16	.22	.29	.37	.45	.56	.69	.92	1.14
Feb	.00	.06	.13	.20	.26	.32	.40	.49	.61	.80	.98
Mar	.10	.16	.26	.37	.47	.59	.72	.89	1.11	1.48	1.83
Apr	.27	.41	.64	.86	1.08	1.33	1.61	1.95	2.41	3.14	3.85
May	.51	.74	1.10	1.42	1.75	2.10	2.49	2.97	3.59	4.59	5.54
Jun	.52	.72	1.03	1.30	1.58	1.87	2.19	2.57	3.08	3.88	4.63
Jul	.13	.30	.54	.76	.98	1.22	1.49	1.82	2.27	2.99	3.67
Aug	.18	.26	.39	.51	.63	.76	.90	1.08	1.31	1.68	2.02
Sep	.18	.29	.49	.68	.88	1.10	1.36	1.68	2.11	2.81	3.49
Oct	.11	.19	.33	.48	.63	.81	1.01	1.27	1.62	2.21	2.77
Nov	.00	.00	.18	.28	.37	.45	.54	.64	.78	.97	1.16
Dec	.00	.01	.07	.14	.21	.31	.42	.57	.79	1.16	1.53
Ann	9.62	10.37	11.33	12.05	12.70	13.32	13.97	14.68	15.54	16.79	17.87

\+ 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	6.1	4.8	3	2	12.0	1972	2	19.0	1972	14+	1979	2	14	1979	3.6	2.7	.7	.2	.1	12.3	8.0	5.0	1.3
Feb	4.6	4.5	1	1	5.0	1971	7	12.1	1971	6	1990	13	4	1980	3.0	2.0	.3	.1	.0	7.4	3.1	1.1	.0
Mar	4.8	4.0	#	#	7.2	1999	5	12.0	1972	7	1999	5	1	1999	2.9	2.2	.6	.1	.0	1.6	.2	.0	.0
Apr	2.6	.8	#	0	15.0	1976	27	15.0	1976	20	1998	15	3	1998	1.1	.9	.3	.1	.1	.4	.1	.1	.1
May	.7	.0	#	0	9.0	1979	9	9.0	1979	#+	1998	20	#+	1998	.2	.2	.1	@	.0	.0	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#+	1998	5	#+	1998	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	#	0	.0	0	0	.0	0	#	1998	4	#	1998	.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	.2	.0	#	0	2.0	1995	20	4.0	1995	2	2000	23	#+	2000	.1	.1	.0	.0	.0	.0	.0	.0	.0
Oct	2.5	1.5	#	#	8.0	1996	26	9.0	1996	8	1996	26	1	1996	1.1	.9	.4	.1	.0	1.3	.6	.1	.0
Nov	5.6	5.9	#	#	12.0	1973	1	15.0	1978	8	1973	1	1+	2000	2.6	2.2	.4	.1	.1	4.4	.9	.2	.0
Dec	9.9	4.3	3	#	11.0	1989	15	33.5	1989	27	1989	16	12	1980	3.1	2.6	.8	.4	.1	9.0	6.2	4.2	2.2
Ann	37.0	25.8	N/A	N/A	15.0	Apr 1976	27	33.5	Dec 1989	27	Dec 1989	16	14	Jan 1979	17.7	13.8	3.6	1.1	.4	36.4	19.1	10.7	3.6

+ 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	6/24	6/17	6/12	6/07	6/03	5/29	5/25	5/19	5/12
32	6/01	5/27	5/23	5/20	5/17	5/15	5/11	5/08	5/03
28	5/16	5/11	5/08	5/05	5/02	4/29	4/26	4/23	4/18
24	5/07	5/03	4/30	4/27	4/25	4/22	4/19	4/16	4/12
20	4/25	4/20	4/17	4/14	4/11	4/08	4/05	4/01	3/27
16	4/19	4/11	4/06	4/02	3/29	3/25	3/21	3/16	3/09

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	8/31	9/05	9/08	9/11	9/13	9/16	9/18	9/22	9/26
32	9/10	9/13	9/16	9/18	9/20	9/23	9/25	9/27	10/01
28	9/15	9/20	9/24	9/27	9/30	10/03	10/06	10/10	10/15
24	9/22	9/28	10/02	10/05	10/09	10/12	10/16	10/20	10/25
20	10/03	10/09	10/13	10/16	10/19	10/22	10/26	10/30	11/04
16	10/13	10/18	10/23	10/26	10/29	11/01	11/05	11/09	11/14

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	129	119	113	107	102	96	91	84	75
32	146	139	134	129	125	121	117	112	105
28	174	166	160	155	150	146	141	135	127
24	190	182	176	171	166	162	157	151	143
20	213	206	200	195	191	186	182	176	168
16	244	234	226	220	213	207	201	193	182

***** 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	1390	1107	944	638	379	142	41	53	250	589	1019	1327	7879
60	1235	967	789	490	242	71	13	18	142	434	869	1172	6442
57	1142	883	696	404	171	41	5	8	91	343	779	1079	5642
55	1080	827	634	349	131	27	2	4	64	286	719	1017	5140
50	926	691	481	225	56	8	0	0	20	162	579	862	4010
32	425	267	79	10	0	0	0	0	0	5	174	361	1321

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	57	85	158	362	649	941	1181	1147	765	439	145	57	5986
55	0	0	0	11	67	278	470	437	139	7	0	0	1409
57	0	0	0	6	45	232	411	379	106	3	0	0	1182
60	0	0	0	2	23	171	326	296	66	1	0	0	885
65	0	0	0	0	5	93	199	177	25	0	0	0	499
70	0	0	0	0	1	40	107	91	7	0	0	0	246

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	4	12	66	195	431	707	948	913	563	257	51	7	4	16	82	277	708	1415	2363	3276	3839	4096	4147	4154
45	0	0	24	107	293	560	793	758	419	150	18	2	0	0	24	131	424	984	1777	2535	2954	3104	3122	3124
50	0	0	4	48	171	417	638	603	288	69	0	0	0	0	4	52	223	640	1278	1881	2169	2238	2238	2238
55	0	0	0	16	86	277	484	452	176	23	0	0	0	0	0	16	102	379	863	1315	1491	1514	1514	1514
60	0	0	0	4	32	158	334	301	85	5	0	0	0	0	0	4	36	194	528	829	914	919	919	919
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	4	21	73	151	274	440	604	581	372	200	54	14	4	25	98	249	523	963	1567	2148	2520	2720	2774	2788

(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