

# Climatography of the United States

## No. 20

National Climatic Data Center  
Federal Building  
151 Patton Avenue  
Asheville, North Carolina 28801  
www.ncdc.noaa.gov

**Station: BELGRADE AP (BOZEMAN), MT**

**1971-2000**

**COOP ID: 240622**

**Climate Division: MT 2**

**NWS Call Sign: BZN**

**Elevation: 4,427 Feet Lat: 45°48N**

**Lon: 111°09W**

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	29.6	7.6	18.6	60	1953	24	29.9	1994	-46	1957	26	-2.3	1979	1439	0	.0	.0	1.4	14.5	30.0	9.8
Feb	36.1	13.5	24.8	66	1995	24	36.1	1991	-43+	1989	5	6.2	1989	1125	0	.0	.0	3.7	8.5	26.8	4.9
Mar	44.6	21.0	32.8	75	1978	30	41.7	1986	-32+	1955	25	23.2	1975	997	0	.0	.0	10.6	3.9	28.4	1.4
Apr	55.1	29.0	42.1	86	1962	19	48.5	1985	-5	1970	3	31.1	1975	687	0	.0	.0	20.3	.8	20.3	.1
May	64.4	37.1	50.8	92	1954	19	56.6	1985	15	1954	1	45.2	1975	443	1	.0	.0	27.8	.0	6.6	.0
Jun	74.2	43.8	59.0	100	1990	30	66.2	1988	26	1951	3	53.5	1998	207	25	@	1.7	29.8	.0	.8	.0
Jul	83.6	48.8	66.2	102+	1989	31	70.3	1985	30+	1971	7	57.3	1993	80	116	.1	8.3	31.0	.0	@	.0
Aug	82.9	47.6	65.3	103	1961	5	70.2	1991	27	1992	25	58.8	1993	95	103	@	7.6	31.0	.0	.2	.0
Sep	70.7	38.5	54.6	97	2000	15	61.1	1998	15+	1985	30	48.7	1985	326	14	.0	1.0	28.4	.0	5.7	.0
Oct	57.8	28.8	43.3	87+	1992	2	48.6	1988	-10	1991	30	40.0	1984	674	0	.0	.0	23.5	.6	21.3	.1
Nov	40.3	17.1	28.7	74	1999	12	39.1	1999	-36	1959	16	14.1	1985	1089	0	.0	.0	8.3	7.5	27.7	3.4
Dec	30.6	8.0	19.3	63	1980	27	30.3	1980	-46	1983	24	4.1	1983	1416	0	.0	.0	1.9	15.6	29.8	7.8
Ann	55.8	28.4	42.1	103	Aug 1961	5	70.3	Jul 1985	-46+	Dec 1983	24	-2.3	Jan 1979	8578	259	.1	18.6	217.7	51.4	197.6	27.5

+ 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/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: 1941-2001

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

007-A

# 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: BELGRADE AP (BOZEMAN), MT

COOP ID: 240622

Climate Division: MT 2

NWS Call Sign: BZN

Elevation: 4,427 Feet Lat: 45°48N

Lon: 111°09W

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	Med-ian	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	.60	.64	.56	1962	7	1.69	1989	.07	1983	7.6	1.7	@	.0	.11	.16	.25	.33	.41	.51	.61	.74	.90	1.18	1.44
Feb	.54	.46	.62	1991	16	1.52+	1980	.09	1977	6.7	1.8	.1	.0	.12	.17	.24	.32	.39	.46	.55	.65	.79	1.00	1.21
Mar	1.02	.95	3.50	1973	10	2.36	1982	.39	1978	9.6	3.3	.2	@	.38	.47	.61	.72	.83	.94	1.06	1.20	1.38	1.66	1.91
Apr	1.40	1.49	1.02	1951	30	2.69	1993	.22	1980	10.6	4.5	.4	.0	.38	.51	.71	.89	1.06	1.25	1.45	1.69	2.01	2.50	2.96
May	2.49	2.41	1.91	1980	25	6.20	1981	.73	1973	12.6	7.1	1.2	.1	.96	1.19	1.52	1.80	2.06	2.32	2.61	2.94	3.36	4.01	4.60
Jun	2.41	2.45	2.14	1969	25	4.68	1998	.27	1974	11.9	6.6	1.2	.1	.71	.94	1.28	1.58	1.87	2.17	2.50	2.89	3.40	4.19	4.93
Jul	1.19	.94	1.49	1962	13	4.62	1993	.09	1971	8.5	3.5	.4	.1	.10	.18	.34	.51	.69	.89	1.14	1.45	1.88	2.59	3.29
Aug	1.14	1.12	1.76	1948	1	2.17	1987	.17	1981	8.1	3.6	.4	.0	.34	.45	.61	.75	.89	1.03	1.18	1.37	1.61	1.98	2.33
Sep	1.43	1.40	1.21	1944	2	3.17+	1983	.04	1979	8.2	4.0	.6	.0	.23	.35	.56	.76	.96	1.19	1.44	1.75	2.16	2.84	3.48
Oct	1.11	1.05	1.29	1992	4	3.17	1975	.01	1987	7.2	3.3	.4	@	.19	.29	.45	.61	.76	.93	1.12	1.35	1.66	2.16	2.64
Nov	.81	.82	.63	1941	12	1.64	1983	.18	1976	8.0	2.6	.1	.0	.24	.31	.43	.53	.63	.73	.84	.97	1.14	1.41	1.65
Dec	.57	.49	1.04	1955	23	1.61	1996	.09	1980	7.5	2.0	@	.0	.12	.17	.25	.33	.40	.48	.58	.69	.83	1.07	1.29
Ann	14.71	14.32	3.50	Mar 1973	10	6.20	May 1981	.01	Oct 1987	106.5	44.0	5.0	.3	10.85	11.61	12.57	13.30	13.95	14.57	15.20	15.91	16.76	17.99	19.05

+ 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: 1941-2001

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

Complete documentation available from:

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

# 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](http://www.ncdc.noaa.gov)

Station: BELGRADE AP (BOZEMAN), MT

COOP ID: 240622

Climate Division: MT 2

NWS Call Sign: BZN

Elevation: 4,427 Feet

Lat: 45° 48N

Lon: 111° 09W

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	6.2	5.8	3	3	6.9	1977	15	17.1	1989	17+	1979	17	12	1979	6.2	2.4	.7	.2	.0	24.3	14.6	6.8	1.3
Feb	5.4	4.8	2	2	4.0	1975	7	13.8	1980	14+	1975	11	8	1975	5.4	2.4	.3	.0	.0	15.9	10.1	5.4	.8
Mar	8.6	8.3	1	1	7.8	1995	24	19.3	1982	12+	1979	4	5	1985	6.6	3.2	.9	.2	.0	12.8	7.0	3.3	.2
Apr	6.7	7.0	#	1	7.2	1973	20	16.8	1983	12	1983	3	2	1983	4.8	2.7	.6	.1	.0	3.3	1.1	.3	@
May	2.1	.0	#	0	6.0	1989	29	10.4	1975	3	1975	7	#	1995	1.0	.8	.2	@	.0	.5	@	.0	.0
Jun	.1	.0	#	0	1.0	1976	13	1.0+	1979	1	1979	7	#	1991	.1	.1	.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	.6	1992	24	.6	1992	#	1992	24	#	1992	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.5	.0	#	0	5.0	1977	30	5.0	1977	2	1983	19	#	1985	.3	.2	@	@	.0	.2	.0	.0	.0
Oct	2.1	.1	#	0	6.2	1973	31	9.8	1975	6+	1991	28	1+	1991	1.7	.8	.2	@	.0	1.0	.4	.3	.0
Nov	5.8	5.3	1	1	5.4	1991	27	13.1	1978	9+	1978	20	3+	1978	5.0	2.5	.5	.1	.0	10.4	3.8	1.8	.0
Dec	6.0	5.9	2	2	4.1	1994	3	11.4	1977	9+	1989	23	5+	1985	6.1	2.4	.4	.0	.0	21.0	10.4	4.0	.0
Ann	43.5	37.2	N/A	N/A	7.8	Mar 1995	24	19.3	Mar 1982	17+	Jan 1979	17	12	Jan 1979	37.2	17.5	3.8	.6	.0	89.4	47.4	21.9	2.3

+ 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

Complete documentation available from:

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

**Climatography  
of the United States  
No. 20  
1971-2000**

**Station: BELGRADE AP (BOZEMAN), MT**

**COOP ID: 240622**

**Climate Division: MT 2**

**NWS Call Sign: BZN**

**Elevation: 4,427 Feet**

**Lat: 45° 48N**

**Lon: 111° 09W**

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	7/07	6/30	6/25	6/21	6/17	6/13	6/09	6/04	5/28
32	6/23	6/17	6/12	6/08	6/04	6/01	5/28	5/23	5/17
28	5/26	5/21	5/17	5/14	5/11	5/08	5/04	4/30	4/25
24	5/16	5/11	5/07	5/03	4/30	4/27	4/23	4/19	4/13
20	5/03	4/27	4/23	4/19	4/16	4/12	4/08	4/04	3/29
16	4/20	4/14	4/10	4/06	4/03	3/31	3/27	3/23	3/17
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	8/20	8/24	8/28	8/31	9/02	9/05	9/08	9/11	9/16
32	8/31	9/04	9/07	9/09	9/12	9/14	9/16	9/19	9/23
28	9/09	9/13	9/17	9/20	9/22	9/25	9/28	10/01	10/06
24	9/18	9/23	9/27	9/30	10/03	10/07	10/10	10/14	10/19
20	9/28	10/04	10/08	10/11	10/15	10/18	10/22	10/26	11/01
16	10/12	10/18	10/22	10/26	10/29	11/01	11/05	11/09	11/15
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	104	95	88	82	77	71	65	59	49
32	122	114	108	103	98	94	89	83	74
28	155	148	143	138	134	130	125	120	112
24	182	173	167	161	156	151	145	139	130
20	209	200	193	187	182	176	170	163	154
16	234	225	219	213	208	203	198	192	183

\* 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

Complete documentation available from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

**Climatography  
of the United States  
No. 20  
1971-2000**

**Station: BELGRADE AP (BOZEMAN), MT**

**COOP ID: 240622**

**Climate Division: MT 2**

**NWS Call Sign: BZN**

**Elevation: 4,427 Feet    Lat: 45° 48N**

**Lon: 111° 09W**

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	1439	1125	997	687	443	207	80	95	326	674	1089	1416	8578
60	1284	985	842	538	298	106	26	36	204	519	939	1261	7038
57	1191	901	749	453	220	63	12	18	143	426	849	1168	6193
55	1129	845	687	397	174	41	7	11	108	365	789	1106	5659
50	976	718	543	268	85	11	0	2	44	220	651	952	4470
32	475	306	142	21	0	0	0	0	0	8	233	448	1633

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	60	104	168	324	581	809	1060	1031	679	357	135	54	5362
55	0	0	0	10	42	160	354	329	97	1	0	0	993
57	0	0	0	5	26	122	297	274	72	0	0	0	796
60	0	0	0	1	11	75	218	200	43	0	0	0	548
65	0	0	0	0	1	25	116	103	14	0	0	0	259
70	0	0	0	0	0	6	47	39	4	0	0	0	96

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	7	34	139	356	584	826	798	456	173	28	3	0	7	41	180	536	1120	1946	2744	3200	3373	3401	3404
45	0	0	5	67	221	435	671	643	316	84	8	0	0	0	5	72	293	728	1399	2042	2358	2442	2450	2450
50	0	0	0	22	114	290	516	490	192	29	0	0	0	0	0	22	136	426	942	1432	1624	1653	1653	1653
55	0	0	0	5	43	168	362	338	99	5	0	0	0	0	0	5	48	216	578	916	1015	1020	1020	1020
60	0	0	0	0	7	78	218	198	35	0	0	0	0	0	0	0	7	85	303	501	536	536	536	536
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	7	43	122	239	370	521	504	321	159	30	1	0	7	50	172	411	781	1302	1806	2127	2286	2316	2317

(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](http://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.  
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 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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
|---|---|

## 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)