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: BOYSEN DAM, WY **COOP ID: 481000**

Climate Division: WY 9 **NWS Call Sign:** **Elevation: 4,810 Feet** **Lat: 43˚24N** **Lon: 108˚10W**

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	27.0	3.8	15.4	70	1953	11	27.1	1999	-39	1979	31	-7.6	1979	1537	0	.0	.0	1.7	17.3	30.8	9.3
Feb	35.1	10.2	22.7	69	1951	10	32.2	1991	-32+	1979	3	5.6	1989	1186	0	.0	.0	5.0	9.0	27.9	5.5
Mar	48.3	23.4	35.9	75	1986	28	42.4	1972	-10+	1993	2	27.2	1973	905	0	.0	.0	16.6	2.1	26.4	.4
Apr	57.8	33.0	45.4	84+	1992	30	51.8	1987	2	1975	2	37.9	1973	587	0	.0	.0	25.0	.2	13.4	.0
May	68.4	43.5	56.0	93+	1984	31	62.9	1994	20	1954	1	51.1	1978	300	18	.0	.1	30.0	.0	2.2	.0
Jun	80.4	52.6	66.5	103	1988	25	74.9	1988	30	1951	3	59.4	1998	89	134	.3	6.8	29.9	.0	.1	.0
Jul	88.8	59.2	74.0	108	1954	4	78.4	1988	40	1978	9	68.1	1993	7	285	1.1	17.9	31.0	.0	.0	.0
Aug	87.0	57.8	72.4	104	1979	6	77.2	1983	39	1968	9	68.6+	1978	18	246	.3	15.0	31.0	.0	.0	.0
Sep	74.1	46.7	60.4	99	1998	5	66.7	1990	16	1965	17	55.6	1985	184	47	.0	2.4	29.2	.1	1.1	.0
Oct	60.3	35.1	47.7	89	1971	10	52.9	1988	8	1991	31	42.8	1971	536	0	.0	.0	27.0	.4	8.6	.0
Nov	41.1	20.9	31.0	70+	1999	9	40.6	1999	-15+	1985	24	16.2	1985	1019	0	.0	.0	10.3	5.7	26.6	1.3
Dec	29.2	8.1	18.7	65	1995	4	29.7	1980	-36	1978	31	5.4	1983	1436	0	.0	.0	2.2	16.0	30.8	6.1
Ann	58.1	32.9	45.5	108	Jul 1954	4	78.4	Jul 1988	-39	Jan 1979	31	-7.6	Jan 1979	7804	730	1.7	42.2	238.9	50.8	167.9	22.6

\+ 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: 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	.28	.27	.50	1964	23	.71	1973	.00+	1999
Feb	.30	.28	.59	1978	20	.81+	1986	.02+	1990
Mar	.62	.51	1.05	1973	23	2.28	1998	.04	1994
Apr	1.22	1.03	2.25	1957	23	3.64	1973	.04	1987
May	1.93	1.76	2.00	1978	18	5.14	1978	.19	1984
Jun	1.15	.89	2.51	1964	22	3.35	1993	.12	1978
Jul	.78	.63	1.53	1997	29	2.36	1977	.00	1976
Aug	.54	.46	1.14	1963	31	1.34+	1976	.02	1996
Sep	.92	.73	1.32	1999	4	2.84	1982	.04	1992
Oct	.95	.85	1.25	1971	18	3.53	1971	.02	1988
Nov	.39	.29	.55	1968	25	2.36	1983	.00	1997
Dec	.30	.20	1.25	1982	2	1.89	1982	.00	1971
Ann	9.38	9.11	2.51	Jun 1964	22	5.14	May 1978	.00+	Jan 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.7	1.0	@	.0
Feb	3.6	1.0	@	.0
Mar	4.8	1.9	.3	@
Apr	6.7	3.3	.5	.1
May	8.5	4.5	1.2	.1
Jun	6.5	2.9	.5	.1
Jul	5.1	2.3	.3	.1
Aug	4.5	1.8	.1	@
Sep	5.0	2.5	.5	.1
Oct	4.6	2.4	.4	.1
Nov	4.1	1.1	.0	.0
Dec	3.4	1.0	.1	@
Ann	60.5	25.7	3.9	.6

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	.00	.00	.08	.13	.18	.23	.29	.36	.44	.59	.73
Feb	.04	.06	.11	.15	.19	.24	.30	.37	.46	.61	.76
Mar	.06	.10	.19	.27	.37	.48	.60	.76	.98	1.34	1.69
Apr	.14	.23	.40	.57	.76	.96	1.19	1.49	1.88	2.54	3.18
May	.34	.51	.79	1.05	1.32	1.62	1.95	2.35	2.89	3.77	4.60
Jun	.13	.21	.37	.53	.71	.90	1.13	1.41	1.79	2.42	3.04
Jul	.01	.06	.15	.25	.38	.52	.70	.94	1.26	1.83	2.39
Aug	.04	.08	.15	.22	.30	.40	.51	.65	.85	1.18	1.51
Sep	.06	.12	.24	.36	.51	.67	.86	1.11	1.46	2.04	2.62
Oct	.08	.14	.27	.40	.54	.71	.91	1.16	1.50	2.07	2.64
Nov	.02	.05	.11	.17	.23	.30	.38	.48	.62	.85	1.08
Dec	.01	.03	.07	.11	.16	.21	.28	.37	.49	.69	.89
Ann	5.39	6.10	7.04	7.78	8.45	9.11	9.81	10.59	11.55	12.99	14.25

\+ 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

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	2.1	1.0	1	#
Feb	2.9	2.0	1	#
Mar	1.3	.5	#	0
Apr	.1	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	#	0
Oct	.4	.0	#	0
Nov	.8	.0	#	0
Dec	2.2	1.0	1	#
Ann	9.8	4.5	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	4.0	1993	12	6.5	1993	14	1973	4	9	1973
Feb	3.0	1971	8	6.5	1971	5+	1998	10	3	1998
Mar	4.0	1971	17	4.0	1971	10	1973	25	2	1973
Apr	1.5	1994	28	1.5	1994	18	1973	21	3	1973
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	2	1997	2	#	1997
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.1	2000	23	.1	2000	#	2000	22	#	2000
Oct	2.4	1999	16	2.5	1997	14	1996	28	4	1996
Nov	4.0	2000	7	4.0	2000	4	2000	17	2	2000
Dec	8.0	1972	29	10.0	1972	9	1982	2	9	1982
Ann	8.0	Dec 1972	29	10.0	Dec 1972	18	Apr 1973	21	9+	Dec 1982

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.2	.7	.2	.0	.0
Feb	1.8	.9	.2	.0	.0
Mar	.9	.6	.2	.0	.0
Apr	.1	.1	.0	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.2	.2	.0	.0	.0
Nov	.9	.8	.1	.0	.0
Dec	1.2	.8	.1	.1	.0
Ann	6.3	4.1	.8	.1	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	2.1	.2	.1	.0
Feb	1.8	.4	.0	.0
Mar	.6	.2	.0	.0
Apr	.0	.0	.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	.0	.0
Nov	.9	.0	.0	.0
Dec	6.5	1.0	.3	.0
Ann	11.9	1.8	.4	.0

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	6/05	5/30	5/26	5/23	5/20	5/16	5/13	5/09	5/03
32	5/24	5/18	5/14	5/11	5/08	5/05	5/01	4/27	4/22
28	5/13	5/07	5/02	4/28	4/24	4/21	4/17	4/12	4/05
24	5/03	4/27	4/22	4/18	4/14	4/11	4/07	4/02	3/27
20	4/19	4/13	4/09	4/06	4/03	3/30	3/27	3/23	3/17
16	4/17	4/09	4/02	3/28	3/23	3/18	3/13	3/06	2/26

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	9/14	9/18	9/20	9/23	9/25	9/27	9/30	10/03	10/06
32	9/19	9/25	9/28	10/02	10/05	10/08	10/11	10/15	10/20
28	9/28	10/04	10/09	10/12	10/16	10/19	10/23	10/27	11/02
24	10/06	10/12	10/16	10/20	10/24	10/27	10/31	11/05	11/11
20	10/18	10/24	10/28	10/31	11/03	11/06	11/09	11/13	11/18
16	10/28	11/01	11/04	11/07	11/10	11/12	11/15	11/18	11/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	150	142	137	132	128	123	119	113	106
32	175	166	160	154	149	144	139	132	123
28	201	192	185	179	174	168	162	155	146
24	217	208	202	197	192	187	181	175	166
20	239	230	224	218	213	208	203	197	188
16	259	249	242	236	231	225	219	213	203

***** 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	1537	1186	905	587	300	89	7	18	184	536	1019	1436	7804
60	1382	1046	750	442	180	37	1	4	93	382	869	1281	6467
57	1289	962	657	359	123	19	0	1	55	293	779	1188	5725
55	1227	906	595	307	92	12	0	0	36	237	723	1126	5261
50	1075	777	449	192	37	3	0	0	9	122	583	972	4219
32	572	352	79	7	0	0	0	0	0	3	189	472	1674

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	58	91	197	410	741	1035	1302	1252	853	490	159	59	6647
55	0	0	0	20	120	357	589	539	198	11	3	0	1837
57	0	0	0	12	89	304	527	478	157	5	0	0	1572
60	0	0	0	5	53	232	435	388	106	1	0	0	1220
65	0	0	0	0	18	134	285	246	47	0	0	0	730
70	0	0	0	0	4	65	156	130	16	0	0	0	371

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	6	72	248	530	827	1082	1036	658	304	40	1	0	6	78	326	856	1683	2765	3801	4459	4763	4803	4804
45	0	0	24	140	380	678	927	881	514	186	9	0	0	0	24	164	544	1222	2149	3030	3544	3730	3739	3739
50	0	0	0	64	246	529	772	726	373	90	0	0	0	0	0	64	310	839	1611	2337	2710	2800	2800	2800
55	0	0	0	20	135	383	617	571	249	33	0	0	0	0	0	20	155	538	1155	1726	1975	2008	2008	2008
60	0	0	0	5	61	249	463	416	140	8	0	0	0	0	0	5	66	315	778	1194	1334	1342	1342	1342
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	11	72	180	328	523	697	672	419	206	36	2	0	11	83	263	591	1114	1811	2483	2902	3108	3144	3146

(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