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: THERMOPOLIS, WY **COOP ID: 488875**

Climate Division: WY 4 **NWS Call Sign:** **Elevation: 4,313 Feet** **Lat: 43˚39N** **Lon: 108˚12W**

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	35.5	8.6	22.1	67	1953	9	31.0	1983	-39	1949	24	4.7	1979	1332	0	.0	.0	2.3	11.0	30.6	6.5
Feb	43.3	15.7	29.5	70+	1958	22	37.9	1991	-36	1949	13	16.4	1989	993	0	.0	.0	8.6	4.7	27.5	3.3
Mar	52.6	24.6	38.6	77	1960	27	47.2	1986	-17	1955	25	31.2	1996	818	0	.0	.0	17.8	1.5	26.2	.7
Apr	61.7	32.9	47.3	90	1952	13	54.5	1987	10+	1997	12	38.6	1975	532	1	.0	.0	28.4	.1	15.9	.0
May	71.9	41.9	56.9	93	1954	19	62.8	1994	12	1954	2	52.6	1983	265	14	.0	.1	30.8	.0	.6	.0
Jun	83.4	50.0	66.7	105	1954	23	73.6	1988	24	1951	3	61.0	1998	65	115	.1	3.4	29.9	.0	.0	.0
Jul	90.5	55.4	73.0	105	1954	11	76.8	2000	34	1955	8	66.5	1993	9	255	.7	13.8	31.0	.0	.0	.0
Aug	89.7	54.3	72.0	103	1957	11	77.6	1983	34	1962	31	68.3	1993	14	232	.2	18.0	31.0	.0	.0	.0
Sep	78.4	43.9	61.2	99+	1950	4	67.4	1990	22	1951	27	56.2	1985	167	50	.0	2.8	29.5	.0	.6	.0
Oct	65.8	33.2	49.5	89+	1992	2	53.8	1988	4+	1954	28	45.0	1984	482	0	.0	.0	27.9	.2	15.4	.0
Nov	46.9	20.4	33.7	74+	2001	5	45.4	1999	-28	1955	16	20.7	1985	941	0	.0	.0	13.1	2.3	28.8	.5
Dec	37.0	11.8	24.4	67	1995	1	32.8	1980	-35+	1990	22	14.0	1978	1259	0	.0	.0	2.0	2.8	30.4	1.7
Ann	63.1	32.7	47.9	105+	Jul 1954	11	77.6	Aug 1983	-39	Jan 1949	24	4.7	Jan 1979	6877	667	1.0	38.1	252.3	22.6	176.0	12.7

\+ 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	.36	.26	1.43	1995	16	2.00	1995	.00	1992
Feb	.28	.24	.75	1961	3	.79	1997	.07	1991
Mar	.92	.82	1.10	1958	9	3.06	1998	.00	1997
Apr	1.44	1.26	1.17	1991	26	4.23	1999	.47	1987
May	2.05	1.76	1.45	1952	21	4.27	1981	.62	1994
Jun	1.57	1.48	2.00	1963	14	3.18	1992	.51+	1996
Jul	1.11	1.16	.97	1992	21	2.26	1987	.08	1996
Aug	.49	.44	.80	1999	4	1.71	1999	.14	1996
Sep	1.41	1.42	.93	1950	20	3.12	1973	.22	1979
Oct	1.20	1.00	1.55	1994	16	3.44	1994	.13	1992
Nov	.79	.72	.94	1994	13	2.03	1983	.05	1997
Dec	.34	.32	.63	1997	9	1.65	1997	.02	1994
Ann	11.96	11.70	2.00	Jun 1963	14	4.27	May 1981	.00+	Mar 1997

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.3	.8	@	@
Feb	1.3	.4	.0	.0
Mar	6.8	2.1	.3	@
Apr	7.7	3.6	.6	.1
May	11.4	5.2	1.1	.1
Jun	10.0	3.6	.6	.1
Jul	7.8	2.1	.3	.0
Aug	1.9	.7	.1	.0
Sep	6.6	2.8	.5	@
Oct	1.9	1.1	.5	.1
Nov	5.5	2.3	.2	.0
Dec	4.9	.9	.1	.0
Ann	71.1	25.6	4.3	.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	.08	.14	.19	.24	.30	.37	.45	.55	.72	.88
Feb	.07	.10	.14	.18	.21	.25	.29	.34	.41	.51	.60
Mar	.16	.28	.44	.57	.69	.82	.96	1.12	1.34	1.68	2.00
Apr	.43	.57	.77	.95	1.12	1.30	1.49	1.72	2.02	2.49	2.92
May	.73	.92	1.20	1.44	1.66	1.89	2.15	2.44	2.81	3.39	3.92
Jun	.58	.73	.94	1.12	1.28	1.45	1.64	1.85	2.13	2.55	2.93
Jul	.20	.30	.46	.62	.77	.94	1.13	1.36	1.66	2.16	2.63
Aug	.13	.18	.25	.31	.37	.43	.50	.58	.69	.86	1.02
Sep	.34	.47	.68	.86	1.04	1.23	1.45	1.70	2.03	2.56	3.05
Oct	.20	.31	.48	.65	.82	1.00	1.21	1.47	1.81	2.37	2.90
Nov	.21	.28	.40	.50	.60	.70	.81	.95	1.13	1.41	1.67
Dec	.06	.09	.14	.18	.23	.29	.35	.42	.52	.68	.83
Ann	8.44	9.12	9.99	10.65	11.24	11.81	12.40	13.05	13.84	14.99	15.98

\+ 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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Climate Division: WY 4 **NWS Call Sign:** **Elevation: 4,313 Feet** **Lat: 43°39N** **Lon: 108°12W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.8	7.3	3	2
Feb	4.5	3.5	2	1
Mar	2.3	2.0	1	#
Apr	3.3	4.0	#	#
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.4	.0	#	0
Oct	2.7	.0	#	0
Nov	4.2	3.9	1	1
Dec	3.3	3.0	2	1
Ann	27.5	23.7	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	8.0	1998	20	12.0	1993	14	1993	20	10	1993
Feb	5.0	1997	28	11.0	1997	15	1993	26	10	1993
Mar	14.0	1998	18	14.0	1998	15	1998	18	5	1998
Apr	6.0	1999	1	8.0	1999	8	1999	2	1	1999
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	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	4.5	2000	22	4.5	2000	5	2000	22	#	2000
Oct	12.0	1991	28	14.0	1991	12	1991	28	1	1996
Nov	10.0	1992	23	12.0	1992	10	1992	24	2	1992
Dec	6.0	1997	9	7.5	1990	13	1997	29	9	1997
Ann	14.0	Mar 1998	18	14.0+	Mar 1998	15+	Mar 1998	18	10+	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.3	2.1	1.0	.5	.0
Feb	1.8	1.6	.7	.1	.0
Mar	1.4	1.3	.5	.5	.1
Apr	1.0	1.0	.3	.2	.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	.1	.1	.1	.0	.0
Oct	.6	.6	.2	.2	.1
Nov	2.3	1.9	.4	.3	.1
Dec	2.0	1.6	.8	.3	.0
Ann	11.5	10.2	4.0	2.1	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	-9.9	-9.9	-9.9	-9.9
Apr	-9.9	-9.9	-9.9	-9.9
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	.1	.1	.0
Oct	.8	.6	.4	.2
Nov	-9.9	-9.9	-9.9	-9.9
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	5/25	5/20	5/16	5/13	5/09	5/06	5/03	4/29	4/23
32	5/08	5/03	4/30	4/27	4/24	4/21	4/18	4/15	4/10
28	4/28	4/24	4/21	4/18	4/16	4/14	4/11	4/08	4/05
24	4/15	4/09	4/06	4/02	3/30	3/27	3/24	3/20	3/15
20	4/10	4/04	3/31	3/28	3/25	3/22	3/19	3/15	3/10
16	4/04	3/29	3/25	3/21	3/18	3/15	3/11	3/07	3/01

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	9/19	9/22	9/25	9/27	9/29	10/01	10/03	10/05	10/09
32	9/25	9/29	10/02	10/04	10/06	10/08	10/10	10/13	10/16
28	10/01	10/06	10/10	10/13	10/16	10/19	10/22	10/26	10/31
24	10/21	10/24	10/27	10/28	10/30	11/01	11/03	11/05	11/08
20	10/28	10/30	10/31	11/01	11/02	11/03	11/04	11/06	11/07
16	11/02	11/06	11/09	11/11	11/13	11/15	11/18	11/21	11/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	163	156	150	146	142	137	133	128	120
32	186	178	173	168	164	160	155	150	142
28	206	198	192	187	182	178	173	167	159
24	233	226	221	217	213	209	205	200	193
20	240	233	229	225	221	218	214	209	203
16	263	255	249	244	239	235	230	224	216

***** 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	1332	993	818	532	265	65	9	14	167	482	941	1259	6877
60	1177	853	663	390	147	20	1	2	80	329	791	1104	5557
57	1084	769	570	311	94	8	0	1	45	242	702	1011	4837
55	1022	713	510	262	66	4	0	0	28	191	646	949	4391
50	869	582	368	159	22	0	0	0	6	89	508	795	3398
32	379	190	45	5	0	0	0	0	0	1	141	306	1067

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	70	121	251	465	772	1040	1269	1241	873	543	190	70	6905
55	0	0	3	31	125	353	556	528	211	19	6	0	1832
57	0	0	1	20	91	298	494	467	168	8	1	0	1548
60	0	0	0	10	51	220	402	375	113	2	0	0	1173
65	0	0	0	1	14	115	255	232	50	0	0	0	667
70	0	0	0	0	2	46	131	114	16	0	0	0	309

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	2	15	77	219	531	744	980	990	644	271	29	2	2	17	94	313	844	1588	2568	3558	4202	4473	4502	4504
45	0	0	27	94	377	594	825	835	496	147	4	2	0	0	27	121	498	1092	1917	2752	3248	3395	3399	3401
50	0	0	8	23	227	445	670	680	350	62	0	0	0	0	8	31	258	703	1373	2053	2403	2465	2465	2465
55	0	0	0	6	96	295	515	525	219	17	0	0	0	0	0	6	102	397	912	1437	1656	1673	1673	1673
60	0	0	0	0	22	166	362	370	108	4	0	0	0	0	0	0	22	188	550	920	1028	1032	1032	1032
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	3	29	80	191	353	459	612	625	429	230	48	2	3	32	112	303	656	1115	1727	2352	2781	3011	3059	3061

(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