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 25 WNW, WY **COOP ID: 488888**

Climate Division: WY 4 **NWS Call Sign:** **Elevation: 5,695 Feet** **Lat: 43˚43N** **Lon: 108˚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	36.2	6.8	21.5	63	1981	22	32.2	1981	-40	1963	12	9.4	1979	1349	0	.0	.0	3.5	10.1	30.7	8.9
Feb	40.3	12.2	26.3	66	1986	24	33.4	1991	-40	1989	3	12.0	1989	1085	0	.0	.0	5.9	5.8	27.8	4.6
Mar	47.7	19.6	33.7	73+	1986	29	42.1	1986	-26	1960	2	26.7	1996	971	0	.0	.0	13.8	2.5	29.0	1.5
Apr	56.1	27.2	41.7	78+	1989	22	47.6	1987	-2	1975	8	33.1	1975	700	0	.0	.0	21.5	.6	21.9	@
May	64.6	36.3	50.5	86	2001	13	55.7	1994	14	1972	1	46.3	1975	451	0	.0	.0	28.9	.0	9.7	.0
Jun	74.9	43.4	59.2	93+	2001	28	66.3	1988	22	2000	1	53.5+	1998	208	32	.0	.7	29.8	.0	1.4	.0
Jul	81.8	48.5	65.2	97+	1998	18	69.5	2000	26	1993	19	55.5	1993	102	106	.0	3.2	31.0	.0	.1	.0
Aug	80.6	47.3	64.0	98	2001	6	69.4	1971	20	1968	22	58.1	1993	117	84	.0	1.3	31.0	.0	.5	.0
Sep	71.0	38.0	54.5	92+	2001	2	60.7	1998	2	1984	25	49.4	1985	328	12	.0	.3	28.6	.1	7.8	.0
Oct	59.4	28.7	44.1	87	1993	5	47.6	1979	-5+	1991	31	39.2	1984	651	0	.0	.0	26.0	.5	21.0	.1
Nov	44.0	16.2	30.1	70+	2001	5	40.2	1999	-26	1959	13	18.9	1985	1047	0	.0	.0	10.0	4.9	28.8	2.4
Dec	37.1	8.1	22.6	69	1980	27	33.8	1980	-40	1990	22	11.3	1983	1314	0	.0	.0	4.7	9.3	30.6	6.3
Ann	57.8	27.7	42.8	98	Aug 2001	6	69.5	Jul 2000	-40+	Dec 1990	22	9.4	Jan 1979	8323	234	.0	5.5	234.7	33.8	209.3	23.8

\+ 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: 1951-2001

(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	.38	.36	.60	1972	12	1.21	1973	.00	1988
Feb	.31	.24	.50	1981	20	1.08	1981	.00	1991
Mar	.76	.59	.95	1992	18	2.21	1992	.19	1974
Apr	1.26	1.05	2.07	1963	27	4.51	1999	.06	1987
May	2.52	1.87	2.10	1993	6	6.88	1978	.05	1984
Jun	1.88	1.53	2.60	1997	9	6.44	1997	.31	1973
Jul	1.46	1.28	2.18	1983	23	3.27	1987	.28	1988
Aug	1.13	1.11	1.81	1971	30	2.41	1980	.16+	2000
Sep	1.30	1.23	1.55	1973	2	4.09	1973	.03	1979
Oct	.97	.76	1.39	1971	18	3.87	1971	.00+	1988
Nov	.52	.47	.80	2001	18	1.25	1987	.00+	1997
Dec	.37	.22	.70	1978	5	1.60	1978	.00	1971
Ann	12.86	12.39	2.60	Jun 1997	9	6.88	May 1978	.00+	Nov 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.6	1.4	@	.0
Feb	3.0	1.3	@	.0
Mar	4.6	2.7	.2	.0
Apr	6.3	3.7	.6	.1
May	8.6	5.8	1.7	.4
Jun	8.0	4.5	1.0	.3
Jul	7.6	3.6	.8	.1
Aug	5.7	2.8	.5	@
Sep	4.7	2.6	.8	.3
Oct	4.1	2.3	.5	.1
Nov	3.8	2.0	@	.0
Dec	3.0	1.2	.1	.0
Ann	63.0	33.9	6.2	1.3

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	.05	.11	.17	.23	.29	.37	.47	.60	.83	1.04
Feb	.02	.04	.09	.14	.18	.24	.30	.38	.49	.66	.83
Mar	.16	.23	.34	.44	.54	.65	.77	.92	1.11	1.42	1.71
Apr	.22	.33	.51	.68	.86	1.05	1.27	1.53	1.88	2.46	3.00
May	.39	.61	.98	1.32	1.68	2.08	2.53	3.08	3.82	5.02	6.18
Jun	.28	.44	.71	.97	1.24	1.54	1.88	2.30	2.86	3.77	4.64
Jul	.30	.44	.65	.85	1.04	1.25	1.49	1.77	2.15	2.75	3.32
Aug	.26	.37	.53	.68	.83	.98	1.16	1.37	1.64	2.08	2.49
Sep	.16	.26	.44	.62	.81	1.03	1.28	1.59	2.01	2.70	3.37
Oct	.00	.08	.24	.40	.56	.74	.95	1.20	1.56	2.15	2.72
Nov	.00	.00	.15	.25	.33	.43	.53	.66	.83	1.10	1.36
Dec	.01	.04	.09	.14	.20	.27	.35	.45	.60	.84	1.08
Ann	7.79	8.71	9.92	10.86	11.72	12.55	13.43	14.40	15.61	17.39	18.95

\+ 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: 1951-2001
(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	7.6	7.1	2	1	7.5	1983	28	15.0	1973	12	1986	20	11	1986	3.1	2.4	1.0	.2	.0	13.0	6.5	.9	.0
Feb	5.6	4.8	1	1	10.0	1978	20	14.5+	1987	9+	1993	22	4	1978	2.7	2.1	.8	.2	@	7.0	3.0	1.3	.0
Mar	10.2	7.2	1	1	12.3	1992	18	27.5	1998	12	1992	18	3	1998	3.3	2.8	1.4	.5	@	5.0	2.6	1.3	.1
Apr	8.0	5.8	#	#	15.0	1973	20	20.1	1976	10+	1991	18	3	1991	2.8	2.4	1.4	.6	.1	2.1	1.2	.3	@
May	3.0	.5	#	0	10.0	1978	6	17.5	1978	10	1979	8	1	1979	.8	.7	.4	.2	.1	.4	.3	.2	@
Jun	.1	.0	#	0	4.0	1976	14	4.0	1976	1	1976	14	#	1976	@	@	@	.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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	1.5	.0	#	0	12.0	1984	23	12.0	1984	12	1984	25	2	1971	.6	.6	.3	.1	@	.3	.1	@	.0
Oct	5.7	3.5	#	#	12.0	1989	28	21.0	1989	12	1989	31	3	1998	1.7	1.5	.8	.4	@	1.8	1.2	.6	.1
Nov	7.9	7.0	1	1	10.0	1973	1	23.0	1973	12	1989	1	4	1978	2.7	2.2	1.0	.3	.1	7.9	4.5	1.8	.2
Dec	5.5	4.1	1	1	8.0	1992	12	14.0	1982	12	1985	12	7	1985	3.0	2.4	.9	.2	.0	9.6	4.4	.3	.0
Ann	55.1	40.0	N/A	N/A	15.0	Apr 1973	20	27.5	Mar 1998	12+	Mar 1992	18	11	Jan 1986	20.7	17.1	8.0	2.7	.3	47.1	23.8	6.7	.4

+ 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	7/11	7/06	7/02	6/29	6/26	6/22	6/19	6/15	6/10
32	6/27	6/20	6/15	6/10	6/06	6/02	5/29	5/24	5/16
28	6/11	6/03	5/29	5/24	5/19	5/15	5/10	5/04	4/27
24	5/30	5/23	5/18	5/14	5/10	5/06	5/02	4/27	4/20
20	5/14	5/08	5/04	4/30	4/27	4/23	4/20	4/15	4/10
16	4/24	4/20	4/18	4/15	4/13	4/11	4/08	4/06	4/02

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	8/16	8/21	8/25	8/29	9/01	9/04	9/07	9/11	9/16
32	8/26	8/31	9/03	9/06	9/09	9/12	9/15	9/18	9/23
28	9/05	9/09	9/12	9/15	9/17	9/20	9/22	9/26	9/30
24	9/11	9/17	9/21	9/24	9/28	10/01	10/04	10/09	10/14
20	9/23	9/29	10/03	10/06	10/10	10/13	10/17	10/21	10/27
16	9/30	10/06	10/10	10/13	10/16	10/20	10/23	10/27	11/01

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	91	83	76	71	66	61	56	50	42
32	119	110	104	99	94	89	84	78	69
28	146	137	131	125	120	115	109	103	94
24	168	158	151	145	140	134	128	121	111
20	192	183	176	171	165	160	154	148	138
16	206	199	194	190	186	182	177	172	165

***** 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	1349	1085	971	700	451	208	102	117	328	651	1047	1314	8323
60	1194	945	816	550	301	110	39	48	205	496	897	1159	6760
57	1101	861	723	463	219	67	19	24	144	404	807	1066	5898
55	1039	805	661	406	170	44	12	15	109	343	747	1004	5355
50	884	665	508	273	76	12	1	3	45	202	597	849	4115
32	356	226	90	18	0	0	0	0	0	4	169	351	1214

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	31	65	142	309	572	815	1027	990	674	376	112	61	5174
55	0	0	0	6	29	169	325	292	94	2	0	0	917
57	0	0	0	3	16	131	271	239	68	1	0	0	729
60	0	0	0	0	5	85	198	170	40	0	0	0	498
65	0	0	0	0	0	32	106	84	12	0	0	0	234
70	0	0	0	0	0	9	41	29	3	0	0	0	82

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	7	41	135	342	583	789	753	445	195	28	4	2	9	50	185	527	1110	1899	2652	3097	3292	3320	3324
45	0	0	7	62	209	434	634	598	309	101	7	0	0	0	7	69	278	712	1346	1944	2253	2354	2361	2361
50	0	0	0	22	103	294	481	443	189	39	0	0	0	0	0	22	125	419	900	1343	1532	1571	1571	1571
55	0	0	0	5	41	169	329	293	91	8	0	0	0	0	0	5	46	215	544	837	928	936	936	936
60	0	0	0	0	5	75	184	154	33	0	0	0	0	0	0	0	5	80	264	418	451	451	451	451
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	14	54	126	240	387	514	496	326	180	40	12	2	16	70	196	436	823	1337	1833	2159	2339	2379	2391

(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