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: LOVELL, WY **COOP ID: 485770**

Climate Division: WY 4 **NWS Call Sign:** **Elevation: 3,837 Feet** **Lat: 44˚50N** **Lon: 108˚24W**

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	29.1	4.7	16.9	63	1953	13	28.9	1981	-39	1979	7	-5.2	1979	1492	0	.0	.0	1.3	16.3	30.9	10.6
Feb	37.7	11.9	24.8	71	1982	22	35.0	1991	-35	1989	5	8.1	1989	1127	0	.0	.0	5.2	8.3	27.8	5.1
Mar	48.9	22.4	35.7	78+	1986	29	44.2	1986	-20	1978	3	25.5	1996	909	0	.0	.0	16.3	3.0	28.1	1.0
Apr	59.0	31.2	45.1	88	1980	22	51.8	1987	7+	1997	13	38.1	1975	597	0	.0	.0	23.2	.5	16.3	.0
May	68.3	41.5	54.9	97	1969	28	59.7	1987	18	1954	1	50.7	1995	321	7	.0	.3	29.5	.0	3.1	.0
Jun	78.7	49.7	64.2	103	1984	30	73.0	1988	30+	1984	2	56.7	1998	117	93	.1	4.7	29.8	.0	.1	.0
Jul	86.6	54.3	70.5	106	1954	12	74.9	1974	38+	1986	8	62.2	1993	37	206	1.0	12.4	31.0	.0	.0	.0
Aug	85.5	51.8	68.7	105	1979	6	74.1	1983	32	1956	31	63.5	1993	48	161	.3	10.1	31.0	.0	.0	.0
Sep	73.6	40.6	57.1	99+	1983	2	63.7	1998	17+	1985	30	52.0	1985	262	25	.0	1.8	28.9	.0	4.0	.0
Oct	60.5	30.6	45.6	89	1963	5	49.7	1988	-8	1991	30	41.6	1984	602	0	.0	.0	25.8	.5	18.2	.1
Nov	43.4	18.6	31.0	72+	1999	9	40.3	1999	-27	1959	16	15.8	1985	1021	0	.0	.0	9.9	5.6	27.9	2.2
Dec	31.9	7.8	19.9	66	1995	2	27.5	1980	-38+	1990	22	4.1	1983	1399	0	.0	.0	1.9	14.2	30.6	7.3
Ann	58.6	30.4	44.5	106	Jul 1954	12	74.9	Jul 1974	-39	Jan 1979	7	-5.2	Jan 1979	7932	492	1.4	29.3	233.8	48.4	187.0	26.3

\+ 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	.24	.14	.43	1962	8	.76	1972	.00+	1992
Feb	.16	.11	.34	1958	6	.87	1978	.00+	1997
Mar	.33	.26	.49	1967	30	1.14	1995	.00+	1999
Apr	.59	.57	1.30	1978	28	1.70	1978	.00	1983
May	1.21	.95	1.53	1988	7	3.60	1981	.03	1973
Jun	.99	.88	1.75	1969	25	2.64+	1997	.11	1989
Jul	.75	.65	1.35	1951	10	2.37	1993	.00+	1996
Aug	.60	.40	1.75	1976	2	2.08	1972	.00	1975
Sep	.75	.54	.99	1950	30	2.56	1973	.00	1979
Oct	.65	.49	1.40	1997	8	1.78	1997	.00+	1996
Nov	.24	.22	.43	1962	21	.68	1974	.01	1981
Dec	.23	.19	.64	1971	4	.71	1989	.00+	1994
Ann	6.74+	6.81+	1.75+	Aug 1976	2	3.60	May 1981	.00+	Mar 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.7	1.0	.0	.0
Feb	2.5	.9	.0	.0
Mar	3.5	1.2	.0	.0
Apr	4.5	2.1	.1	@
May	6.7	3.8	.4	.1
Jun	6.9	3.3	.3	.0
Jul	5.0	2.6	.2	@
Aug	4.1	1.9	.2	@
Sep	4.5	2.0	.5	.0
Oct	3.6	2.0	.3	.1
Nov	2.3	1.0	.0	.0
Dec	1.9	.9	@	.0
Ann	48.2	22.7	2.0	.2

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	.06	.10	.14	.19	.24	.30	.38	.51	.64
Feb	.00	.00	.00	.00	.05	.09	.14	.20	.29	.42	.55
Mar	.00	.00	.05	.11	.17	.23	.31	.41	.54	.76	.98
Apr	.03	.09	.18	.27	.36	.46	.58	.73	.93	1.26	1.59
May	.17	.27	.44	.61	.78	.98	1.20	1.48	1.85	2.45	3.04
Jun	.15	.23	.37	.51	.65	.81	.99	1.20	1.50	1.98	2.44
Jul	.00	.06	.19	.31	.43	.57	.74	.94	1.21	1.66	2.11
Aug	.01	.04	.12	.20	.30	.41	.55	.73	.98	1.41	1.84
Sep	.02	.06	.15	.26	.38	.52	.69	.91	1.21	1.74	2.26
Oct	.00	.00	.20	.32	.43	.54	.67	.83	1.02	1.35	1.66
Nov	.04	.06	.09	.13	.16	.20	.24	.29	.36	.47	.58
Dec	.00	.00	.00	.08	.13	.19	.24	.31	.39	.52	.64
Ann	4.62	5.02	5.54	5.93	6.28	6.63	6.98	7.37	7.85	8.55	9.15

+ 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	5.2	4.6	3	#
Feb	3.3	1.0	#	#
Mar	2.7	1.0	#	#
Apr	.7	.0	#	0
May	.1	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.5	.0	#	0
Oct	.5	.0	#	0
Nov	1.9	.2	#	0
Dec	4.0	2.8	1	#
Ann	18.9	9.6	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	6.0	1972	1	13.0	1979	29	1979	31	25	1979
Feb	6.0	1978	20	23.0	1978	8	1971	8	2	1996
Mar	8.5	1994	23	8.5	1994	8	1996	9	3	1996
Apr	3.0	1975	8	9.0	1975	9	1975	9	1	1975
May	2.0	1991	3	2.0	1991	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	5.0	1984	24	9.5	1984	6	1984	24	#	1984
Oct	4.0	1991	28	5.8	1991	5+	1995	29	#+	1995
Nov	7.0	1978	13	11.0	1978	11	1978	25	2	1978
Dec	9.0	1996	19	17.0	1996	16+	1996	29	16	1978
Ann	9.0	Dec 1996	19	23.0	Feb 1978	29	Jan 1979	31	25	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.4	1.9	.7	.2	.0
Feb	1.7	1.2	.3	.2	.0
Mar	1.7	1.2	.4	.1	.0
Apr	.4	.3	.1	.0	.0
May	@	@	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.2	.1	@	.0
Oct	.2	.2	.1	.0	.0
Nov	1.0	.6	.2	.1	.0
Dec	1.9	1.5	.5	.1	.0
Ann	9.5	7.1	2.4	.7	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.4	5.1	2.6	.0
Feb	3.1	1.9	.4	.0
Mar	2.1	1.0	.6	.0
Apr	@	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.1	@	.0
Oct	.3	.1	.0	.0
Nov	1.4	.6	.1	.0
Dec	3.4	1.7	.8	.2
Ann	18.8	10.5	4.5	.2

+ 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	6/14	6/08	6/03	5/30	5/26	5/23	5/19	5/14	5/08
32	6/01	5/26	5/22	5/18	5/15	5/11	5/08	5/03	4/27
28	5/09	5/05	5/02	4/29	4/27	4/24	4/22	4/19	4/15
24	5/02	4/28	4/24	4/21	4/19	4/16	4/13	4/10	4/06
20	4/23	4/18	4/15	4/12	4/09	4/06	4/03	3/30	3/25
16	4/16	4/10	4/06	4/02	3/29	3/26	3/22	3/17	3/11

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	8/29	9/03	9/06	9/09	9/12	9/15	9/18	9/22	9/27
32	9/07	9/12	9/15	9/18	9/20	9/23	9/26	9/29	10/04
28	9/14	9/20	9/24	9/28	10/01	10/04	10/08	10/12	10/18
24	9/25	10/01	10/05	10/09	10/13	10/16	10/20	10/24	10/30
20	10/03	10/09	10/13	10/16	10/20	10/23	10/26	10/30	11/05
16	10/21	10/26	10/30	11/03	11/06	11/09	11/13	11/17	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	133	125	118	113	108	103	98	91	83
32	152	143	138	133	128	123	118	112	104
28	180	172	166	161	156	152	147	141	133
24	200	192	186	181	176	171	166	160	152
20	217	208	203	198	193	188	183	178	170
16	247	238	232	226	221	216	211	204	195

***** 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	1492	1127	909	597	321	117	37	48	262	602	1021	1399	7932
60	1337	987	754	450	191	51	11	15	152	447	871	1244	6510
57	1244	903	661	365	128	27	4	5	99	355	784	1151	5726
55	1182	847	599	311	94	16	1	3	71	294	729	1089	5236
50	1029	719	454	192	35	3	0	0	23	157	589	936	4137
32	525	305	82	6	0	0	0	0	0	4	202	437	1561

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	57	103	196	400	710	966	1192	1136	753	424	171	61	6169
55	0	0	0	14	90	292	481	425	134	2	8	0	1446
57	0	0	0	8	63	242	421	366	102	1	3	0	1206
60	0	0	0	3	33	177	336	282	65	0	0	0	896
65	0	0	0	0	7	93	206	161	25	0	0	0	492
70	0	0	0	0	1	38	112	75	7	0	0	0	233

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	64	211	477	734	955	898	525	222	34	3	0	6	70	281	758	1492	2447	3345	3870	4092	4126	4129
45	0	1	20	115	333	584	800	743	383	116	6	0	0	1	21	136	469	1053	1853	2596	2979	3095	3101	3101
50	0	0	3	52	206	438	645	588	254	46	0	0	0	0	3	55	261	699	1344	1932	2186	2232	2232	2232
55	0	0	0	18	109	296	491	435	147	12	0	0	0	0	0	18	127	423	914	1349	1496	1508	1508	1508
60	0	0	0	4	46	178	342	283	71	0	0	0	0	0	0	4	50	228	570	853	924	924	924	924
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	15	73	164	300	454	595	564	362	192	36	3	0	15	88	252	552	1006	1601	2165	2527	2719	2755	2758

(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

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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