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: LAKE YELLOWSTONE, WY **COOP ID: 485345**

Climate Division: WY 1 **NWS Call Sign:** **Elevation: 7,870 Feet** **Lat: 44˚34N** **Lon: 110˚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	22.8	-3.1	9.9	44+	1986	20	18.9	1981	-50	1963	12	-2.3	1979	1712	0	.0	.0	.0	27.1	31.0	17.0
Feb	28.3	-1.5	13.4	56	1982	23	20.3	1986	-50+	1985	2	2.5	1985	1446	0	.0	.0	@	19.4	28.3	14.2
Mar	35.2	4.3	19.8	58	1986	29	26.0	1986	-42	1965	18	11.2	1976	1404	0	.0	.0	.8	10.1	31.0	10.7
Apr	42.2	14.6	28.4	65+	1987	29	35.4	1987	-26	1975	2	19.9	1975	1098	0	.0	.0	6.1	2.6	29.8	3.3
May	51.0	25.1	38.1	75+	2001	25	45.4	1987	-2	1967	5	32.9	1975	835	0	.0	.0	17.6	.1	27.1	.1
Jun	61.1	32.5	46.8	83	1988	25	53.4	1988	14	1951	4	41.5	1998	545	0	.0	.0	26.6	.0	15.6	.0
Jul	70.4	37.5	54.0	89+	1956	27	58.1	1998	20	1985	15	46.6	1993	344	2	.0	.0	30.8	.0	4.8	.0
Aug	70.4	36.5	53.5	91	1969	10	57.9	1971	17	1976	27	48.1	1985	362	2	.0	.0	30.9	.0	7.1	.0
Sep	60.3	28.6	44.5	83+	1956	16	50.9	1998	-5	1985	29	37.6	1985	616	0	.0	.0	26.0	@	22.2	.1
Oct	48.2	20.9	34.6	72+	1987	3	40.1	1988	-13	1991	30	27.8	1984	944	0	.0	.0	15.3	2.2	30.2	.5
Nov	33.1	10.0	21.6	63	1949	5	30.7	1999	-30	1955	16	14.3	1994	1303	0	.0	.0	1.4	15.1	29.8	5.9
Dec	24.8	1.1	13.0	48	1981	10	22.6	1980	-43	1990	22	3.3	1990	1614	0	.0	.0	.0	26.5	31.0	14.8
Ann	45.7	17.2	31.5	91	Aug 1969	10	58.1	Jul 1998	-50+	Feb 1985	2	-2.3	Jan 1979	12223	4	.0	.0	155.5	103.1	287.9	66.6

\+ 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	1.91	1.89	1.35	1969	21	3.58	1978	.36	1992
Feb	1.49	1.39	1.20	1962	12	5.31	1986	.35	1977
Mar	1.73	1.68	.84	1967	15	4.06	1974	.49	1984
Apr	1.48	1.44	1.00	2001	21	3.05	1993	.42	1987
May	2.06	1.72	1.01	2000	17	4.70	1981	.61	1979
Jun	2.08	1.62	1.50	1988	2	5.27	1998	.83	1974
Jul	1.66	1.11	1.32	1952	11	4.13	1985	.00	2000
Aug	1.69	1.75	1.40	1961	8	3.28	1984	.25	1992
Sep	1.59	1.62	1.57	1966	15	3.54	1972	.11	1987
Oct	1.32	1.36	1.45	1975	26	5.38	1975	.06	1986
Nov	1.71	1.45	.93	1995	26	3.88	1986	.29	1993
Dec	1.68	1.57	1.42	1955	23	4.89	1996	.06	1986
Ann	20.40	20.16	1.57	Sep 1966	15	5.38	Oct 1975	.00	Jul 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.4	7.1	.3	@
Feb	13.8	5.3	.3	.0
Mar	14.0	6.0	.3	.0
Apr	10.8	5.1	.3	.0
May	12.1	6.3	.9	@
Jun	13.3	6.1	.9	.1
Jul	10.7	5.2	.7	@
Aug	10.7	4.7	.8	@
Sep	9.4	5.0	.6	.1
Oct	7.4	3.7	.5	.1
Nov	12.9	5.7	.5	.0
Dec	15.3	6.3	.2	.0
Ann	147.8	66.5	6.3	.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	.55	.73	1.00	1.24	1.47	1.71	1.98	2.29	2.70	3.34	3.93
Feb	.42	.56	.78	.96	1.14	1.33	1.54	1.79	2.11	2.62	3.09
Mar	.54	.70	.95	1.16	1.36	1.57	1.80	2.07	2.42	2.96	3.47
Apr	.50	.64	.84	1.02	1.19	1.36	1.55	1.77	2.05	2.49	2.90
May	.61	.80	1.10	1.35	1.60	1.86	2.14	2.48	2.91	3.59	4.22
Jun	.76	.96	1.24	1.47	1.70	1.93	2.18	2.47	2.84	3.41	3.93
Jul	.19	.40	.68	.92	1.16	1.41	1.70	2.04	2.50	3.23	3.93
Aug	.54	.70	.93	1.13	1.33	1.53	1.75	2.01	2.35	2.87	3.35
Sep	.27	.41	.64	.86	1.08	1.33	1.60	1.94	2.39	3.12	3.82
Oct	.14	.24	.42	.61	.81	1.03	1.29	1.62	2.06	2.79	3.51
Nov	.43	.59	.84	1.06	1.27	1.51	1.76	2.07	2.47	3.10	3.69
Dec	.34	.50	.75	.97	1.20	1.44	1.72	2.05	2.48	3.18	3.84
Ann	14.16	15.36	16.90	18.07	19.12	20.13	21.18	22.34	23.75	25.80	27.58

\+ 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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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	30.9	31.9	31	28	13.0	2000	12	50.5	1971	62+	1997	29	57	1997	15.6	12.1	3.9	1.3	.1	30.8	30.8	30.8	30.7
Feb	21.5	21.8	38	35	11.0	1986	15	39.5	2000	77	1986	23	64	1997	12.0	8.8	3.1	1.1	.1	28.2	28.2	28.2	28.2
Mar	26.7	23.7	42	40	10.0	1971	13	75.5	1974	73	1997	5	67	1997	12.3	9.5	3.7	1.3	.1	30.4	30.4	30.4	30.4
Apr	16.3	13.0	35	38	14.0	1988	5	41.0	1982	71	1989	2	59	1982	7.2	5.7	2.3	.8	.1	28.0	27.9	27.5	26.9
May	5.3	4.4	11	16	9.5	1996	19	16.9	1981	51	1982	1	29	1996	2.9	2.1	1.0	.4	.0	16.4	15.1	14.4	12.8
Jun	.8	.0	#	0	3.5	1979	19	5.5+	1984	4	1979	19	#	1999	.6	.4	.1	.0	.0	.2	@	.0	.0
Jul	.0	.0	#	0	.5	1983	3	.5	1983	0	0	0	#	1993	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	#	.0	#	0	#	1994	31	#	1994	#	1987	16	#	1987	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	1.4	.0	#	0	6.0	1978	18	8.2	1982	6+	1982	28	#	2000	1.0	.6	.1	.1	.0	.7	.1	.1	.0
Oct	5.7	4.1	1	0	7.0	1985	7	14.0	1990	24	1975	27	4	1975	4.1	2.2	.8	.1	.0	6.4	3.1	1.2	.3
Nov	24.3	20.8	7	7	16.0	1998	22	59.7	1985	36	1985	30	13	1973	12.2	8.9	3.0	1.1	.2	24.3	21.8	17.9	9.0
Dec	25.4	26.8	18	18	9.0	1976	7	41.0	1971	38	1985	3	33	1985	14.1	9.4	3.4	1.0	.0	30.5	30.5	30.4	27.5
Ann	158.3	146.5	N/A	N/A	16.0	Nov 1998	22	75.5	Mar 1974	77	Feb 1986	23	67	Mar 1997	82.0	59.7	21.4	7.2	.6	195.9	187.9	180.9	165.8

+ 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	8/03	7/31	7/29	7/28	7/26	7/24	7/22	7/20	7/17
32	8/01	7/26	7/23	7/20	7/17	7/14	7/10	7/07	7/02
28	7/21	7/14	7/10	7/06	7/02	6/28	6/24	6/20	6/13
24	7/03	6/25	6/20	6/15	6/11	6/06	6/02	5/27	5/20
20	6/14	6/06	5/31	5/26	5/21	5/17	5/12	5/06	4/28
16	5/24	5/18	5/14	5/11	5/08	5/05	5/01	4/28	4/22

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	7/29	7/31	8/02	8/04	8/05	8/07	8/09	8/11	8/13
32	7/31	8/04	8/08	8/11	8/14	8/17	8/21	8/24	8/30
28	8/08	8/14	8/18	8/22	8/26	8/29	9/02	9/06	9/12
24	8/23	8/29	9/02	9/06	9/09	9/12	9/16	9/20	9/26
20	9/04	9/10	9/14	9/18	9/21	9/25	9/28	10/02	10/08
16	9/18	9/24	9/29	10/03	10/06	10/10	10/14	10/18	10/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	24	19	16	13	10	7	4	0	0
32	54	45	39	33	28	23	17	11	2
28	82	72	66	60	54	48	42	36	26
24	121	110	103	96	90	84	77	69	58
20	153	142	135	128	122	116	110	102	92
16	176	168	161	156	151	146	140	134	125

***** 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	1712	1446	1404	1098	835	545	344	362	616	944	1303	1614	12223
60	1557	1306	1249	948	680	397	203	222	469	789	1153	1459	10432
57	1464	1222	1156	858	587	311	134	152	383	696	1063	1366	9392
55	1402	1166	1094	798	525	257	98	114	329	634	1003	1304	8724
50	1247	1026	939	648	376	142	32	44	207	480	853	1149	7143
32	689	522	392	170	34	1	0	0	7	57	334	593	2799

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	0	0	11	62	222	446	681	664	381	135	21	2	2625
55	0	0	0	0	0	12	66	65	13	0	0	0	156
57	0	0	0	0	0	6	41	40	7	0	0	0	94
60	0	0	0	0	0	1	17	17	3	0	0	0	38
65	0	0	0	0	0	0	2	2	0	0	0	0	4
70	0	0	0	0	0	0	0	0	0	0	0	0	0

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	0	0	5	62	236	452	434	188	34	0	0	0	0	0	5	67	303	755	1189	1377	1411	1411	1411
45	0	0	0	0	15	127	301	284	90	3	0	0	0	0	0	0	15	142	443	727	817	820	820	820
50	0	0	0	0	0	47	158	145	27	0	0	0	0	0	0	0	0	47	205	350	377	377	377	377
55	0	0	0	0	0	9	53	46	3	0	0	0	0	0	0	0	0	9	62	108	111	111	111	111
60	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	2	4	4	4	4	4
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	0	16	75	196	333	336	186	64	0	0	0	0	0	16	91	287	620	956	1142	1206	1206	1206

(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