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: REDBIRD, WY **COOP ID: 487555**

Climate Division: WY 7 **NWS Call Sign:** **Elevation: 3,890 Feet** **Lat: 43˚15N** **Lon: 104˚17W**

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	34.9	7.9	21.4	69	1992	31	32.4	1990	-47	1963	19	2.0	1979	1352	0	.0	.0	4.5	11.6	30.2	9.4
Feb	41.0	13.9	27.5	72	1950	26	37.2	1999	-38+	1996	2	10.4	1993	1051	0	.0	.0	8.4	7.2	26.7	4.9
Mar	50.8	22.0	36.4	81	1967	29	44.6	1986	-30	1956	12	29.5	1996	887	0	.0	.0	17.1	3.2	27.0	1.3
Apr	60.6	31.1	45.9	90+	1980	21	51.8	1981	-8	1966	20	39.9	1997	574	0	.0	@	23.9	.5	16.5	.0
May	70.6	41.3	56.0	100	1969	27	61.7	1998	12	1954	3	51.1	1983	293	12	.0	.6	30.1	.0	4.2	.0
Jun	81.5	50.2	65.9	109	1954	23	73.9	1988	24	1951	3	59.6	1982	85	110	.6	6.3	29.9	.0	.2	.0
Jul	89.6	56.3	73.0	112	1954	12	79.1	2000	36	1972	3	67.2	1992	16	263	3.3	16.4	31.0	.0	.0	.0
Aug	88.5	54.0	71.3	106+	1975	6	77.3	1983	30	1964	30	66.6	1977	29	221	1.2	14.6	31.0	.0	@	.0
Sep	77.8	42.3	60.1	103	1960	4	68.7	1998	9	1961	30	53.5	1973	200	51	.2	4.5	29.4	.0	4.7	.0
Oct	64.6	30.3	47.5	92	1953	1	51.1	1974	-16	1991	31	42.6	1976	544	0	.0	.1	27.5	.3	18.1	.2
Nov	46.2	18.3	32.3	80	1999	7	42.1	1999	-27	1959	14	16.0	1985	983	0	.0	.0	12.6	5.2	27.6	2.3
Dec	37.2	8.8	23.0	77	1998	1	31.6	1999	-47	1989	22	3.3	1983	1302	0	.0	.0	5.8	9.8	30.4	7.6
Ann	61.9	31.4	46.7	112	Jul 1954	12	79.1	Jul 2000	-47+	Dec 1989	22	2.0	Jan 1979	7316	657	5.3	42.5	251.2	37.8	185.6	25.7

\+ 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	.33	.30	.70	1974	21	.82	1974	.00	1989
Feb	.40	.36	1.12	1953	9	1.67	1971	.00	1977
Mar	.77	.73	1.12	1985	3	1.92	1998	.00	1974
Apr	2.00	2.15	2.83	2000	19	3.96	2000	.47	1992
May	2.62	2.31	2.80	1971	23	5.31	1991	.11	1974
Jun	2.35	2.41	3.55	1952	27	4.70	1986	.35	1974
Jul	2.00	1.80	1.76	1973	21	5.68	1973	.21	1989
Aug	1.54	1.19	4.02	1976	1	4.79	1976	.11	1995
Sep	1.41	.95	1.66	1973	9	4.67	1989	.03	1983
Oct	1.05	.88	1.25	1948	29	4.24	1998	.07	1999
Nov	.68	.55	.97	2000	1	2.24	1983	.03	1981
Dec	.33	.28	.52	1992	13	1.26	1992	.00+	1986
Ann	15.48	15.53	4.02	Aug 1976	1	5.68	Jul 1973	.00+	Jan 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	.7	@	.0
Feb	3.7	1.3	.1	.0
Mar	5.8	2.5	.2	@
Apr	8.2	4.7	1.3	.2
May	10.4	6.2	1.6	.3
Jun	9.2	5.2	1.6	.4
Jul	8.3	4.5	1.4	.3
Aug	6.0	3.4	1.0	.3
Sep	5.3	3.4	.9	.2
Oct	5.4	2.8	.6	@
Nov	4.7	2.0	.3	.0
Dec	4.4	1.2	@	.0
Ann	76.2	37.9	9.0	1.7

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	.03	.07	.12	.17	.22	.27	.33	.40	.50	.66	.81
Feb	.01	.03	.08	.14	.20	.28	.37	.49	.66	.94	1.22
Mar	.15	.26	.38	.49	.59	.69	.81	.94	1.11	1.38	1.63
Apr	.44	.62	.92	1.18	1.45	1.73	2.05	2.43	2.93	3.72	4.48
May	.64	.89	1.27	1.61	1.94	2.30	2.69	3.17	3.78	4.76	5.67
Jun	.59	.81	1.15	1.46	1.76	2.07	2.43	2.85	3.40	4.26	5.07
Jul	.36	.54	.83	1.11	1.38	1.69	2.03	2.44	3.00	3.89	4.74
Aug	.25	.38	.61	.82	1.04	1.28	1.55	1.88	2.33	3.05	3.74
Sep	.07	.15	.32	.51	.72	.98	1.29	1.69	2.26	3.23	4.19
Oct	.16	.25	.40	.55	.70	.86	1.05	1.28	1.59	2.10	2.58
Nov	.06	.11	.20	.30	.40	.51	.65	.82	1.06	1.46	1.84
Dec	.00	.04	.10	.15	.20	.26	.33	.41	.52	.70	.88
Ann	10.31	11.29	12.55	13.52	14.38	15.22	16.10	17.07	18.25	19.98	21.49

\+ 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	7.1	6.0	3	2
Feb	5.5	4.0	2	1
Mar	10.3	9.3	1	1
Apr	6.9	5.6	#	#
May	.5	.0	#	0
Jun	#	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.5	.0	#	0
Oct	2.7	1.0	#	0
Nov	7.3	5.1	1	1
Dec	6.8	7.8	2	1
Ann	47.6	38.8	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	2000	28	18.0	2000	19	1993	14	13	1993
Feb	9.0	1995	14	18.0	1987	21	1993	21	15	1993
Mar	15.0	1985	3	28.0	1998	14	1993	1	5	1993
Apr	12.0	1986	4	19.0	1997	10	1997	10	2	1997
May	8.0	1983	12	8.0	1983	1	1983	12	#+	1993
Jun	#	1998	4	#+	1998	#	1993	21	#	1993
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	7.0	1995	20	8.0	1995	4	2000	22	#+	2000
Oct	12.0	1993	8	15.0+	1995	9	1993	8	1	1993
Nov	10.0	1977	19	31.0	1983	20	1985	30	7	1985
Dec	16.0	1992	13	16.0	1992	25	1992	15	12	1992
Ann	16.0	Dec 1992	13	31.0	Nov 1983	25	Dec 1992	15	15	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.0	3.6	.8	.2	.0
Feb	3.0	2.6	1.0	.3	.0
Mar	3.7	3.6	1.5	.5	.1
Apr	2.3	2.2	1.0	.4	.1
May	.1	.1	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.1	@	.0
Oct	.9	.8	.5	.2	@
Nov	2.8	2.6	1.1	.5	.1
Dec	3.9	3.6	1.0	.3	@
Ann	20.8	19.2	7.1	2.5	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	13.2	7.0	3.9	.6
Feb	9.0	4.6	2.6	1.2
Mar	5.6	3.2	1.8	.4
Apr	1.8	.8	.6	.1
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	.1	.0	.0
Oct	1.0	.4	.2	.0
Nov	6.9	3.5	1.9	.4
Dec	11.7	7.6	3.9	1.0
Ann	49.3	27.2	14.9	3.7

+ 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	6/21	6/14	6/10	6/06	6/03	5/30	5/26	5/22	5/16
32	6/05	5/31	5/27	5/24	5/21	5/18	5/15	5/11	5/06
28	5/15	5/11	5/08	5/06	5/03	5/01	4/28	4/25	4/21
24	5/07	5/02	4/29	4/26	4/23	4/21	4/18	4/15	4/10
20	5/03	4/27	4/22	4/19	4/15	4/12	4/08	4/04	3/29
16	4/21	4/16	4/12	4/09	4/06	4/03	3/30	3/26	3/21

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	8/25	8/30	9/03	9/06	9/09	9/12	9/16	9/19	9/25
32	9/08	9/11	9/13	9/16	9/17	9/19	9/21	9/24	9/27
28	9/11	9/16	9/20	9/23	9/25	9/28	10/01	10/05	10/09
24	9/16	9/21	9/25	9/28	10/01	10/04	10/07	10/11	10/16
20	9/21	9/27	10/02	10/06	10/10	10/14	10/18	10/23	10/30
16	10/04	10/10	10/15	10/18	10/22	10/25	10/29	11/02	11/08

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	121	113	107	102	98	93	88	82	74
32	138	131	126	122	119	115	111	106	100
28	164	158	153	148	145	141	136	131	125
24	180	173	168	164	160	156	152	147	141
20	203	194	188	182	177	172	167	161	152
16	222	214	208	203	198	193	188	182	174

***** 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	1352	1051	887	574	293	85	16	29	200	544	983	1302	7316
60	1197	911	732	427	170	31	3	7	108	391	833	1147	5957
57	1104	827	639	341	112	15	0	3	68	301	743	1054	5207
55	1043	779	577	287	81	8	0	1	47	245	689	992	4749
50	897	647	428	169	29	1	0	0	14	128	550	844	3707
32	419	259	61	2	0	0	0	0	0	3	171	369	1284

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	90	131	197	418	742	1015	1270	1216	841	482	178	90	6670
55	1	8	0	13	110	333	557	504	198	11	7	0	1742
57	0	0	0	7	79	280	495	443	159	5	0	0	1468
60	0	0	0	2	44	207	404	355	110	1	0	0	1123
65	0	0	0	0	12	110	263	221	51	0	0	0	657
70	0	0	0	0	2	46	147	117	19	0	0	0	331

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	5	19	81	224	504	782	1031	975	614	275	47	9	5	24	105	329	833	1615	2646	3621	4235	4510	4557	4566
45	0	1	32	128	356	632	876	820	471	159	14	2	0	1	33	161	517	1149	2025	2845	3316	3475	3489	3491
50	0	0	7	55	221	484	721	665	332	71	2	0	0	0	7	62	283	767	1488	2153	2485	2556	2558	2558
55	0	0	0	21	115	341	566	510	214	25	0	0	0	0	0	21	136	477	1043	1553	1767	1792	1792	1792
60	0	0	0	5	46	211	414	360	113	5	0	0	0	0	0	5	51	262	676	1036	1149	1154	1154	1154
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	10	35	98	191	336	494	645	617	422	249	64	21	10	45	143	334	670	1164	1809	2426	2848	3097	3161	3182

(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