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: RAPID CITY RGNL AP, SD **COOP ID: 396937**

Climate Division: SD 5 **NWS Call Sign: RAP** **Elevation: 3,160 Feet** **Lat: 44˚03N** **Lon: 103˚03W**

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	33.6	11.3	22.4	76	1987	12	33.0	1992	-27	1950	4	7.3	1979	1314	0	.0	.0	5.7	12.9	30.0	7.5
Feb	38.6	15.9	27.3	75+	1995	24	36.6	1999	-31	1996	2	13.7	1989	1061	0	.0	.0	8.3	9.1	26.6	4.2
Mar	46.6	23.2	34.9	82	1993	26	42.3	1986	-21	1996	8	26.2	1996	925	0	.0	.0	14.2	5.1	26.4	1.2
Apr	57.1	32.3	44.7	93	1989	22	51.3	1985	1	1975	2	38.7	1997	595	2	.0	.1	22.1	.8	15.6	.0
May	67.2	42.7	55.0	98	1969	27	61.1	1985	18	1950	1	50.6	1996	313	13	.0	.3	29.5	.0	2.7	.0
Jun	77.4	51.8	64.6	106+	1988	24	75.0	1988	32+	1998	3	58.7	1998	88	86	.4	3.1	29.9	.0	@	.0
Jul	85.5	57.9	71.7	110+	1989	8	77.4	1974	39+	1987	13	63.8	1992	16	227	1.8	10.7	31.0	.0	.0	.0
Aug	85.5	56.6	71.1	106	1988	15	77.6	1983	38+	1992	30	65.5	1992	21	208	1.1	11.0	31.0	.0	.0	.0
Sep	75.2	46.0	60.6	104+	1978	6	67.1	1998	18	1985	24	54.6	1986	190	59	.4	3.9	29.2	.0	2.0	.0
Oct	61.7	34.7	48.2	94+	1993	6	51.6	1974	-2	1991	31	43.8	1972	521	3	.0	.2	25.5	.4	11.1	@
Nov	44.8	22.1	33.4	83+	1999	8	44.4	1999	-19	1959	14	15.5	1985	934	0	.0	.0	12.3	6.3	25.7	1.2
Dec	36.1	13.3	24.7	75	1965	4	33.3	1999	-30	1990	30	7.5	1983	1233	0	.0	.0	6.2	10.7	30.0	4.6
Ann	59.1	34.0	46.6	110+	Jul 1989	8	77.6	Aug 1983	-31	Feb 1996	2	7.3	Jan 1979	7211	598	3.7	29.3	244.9	45.3	170.1	18.7

\+ 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	.37	.26	.65	1971	30	1.18	1971	.02	1989
Feb	.46	.35	.87	1953	9	1.71	1987	.02	1999
Mar	1.03	.87	1.39	1963	16	2.71	1973	.12	1981
Apr	1.86	1.56	3.19	1997	5	4.80	1997	.02	1987
May	2.96	2.48	3.21	1965	14	8.18	1996	1.17	1979
Jun	2.83	2.53	3.78	1963	15	5.63	1975	.64	1973
Jul	2.03	1.73	2.00	1999	31	4.47	1981	.38	1988
Aug	1.61	1.42	2.60	1982	4	4.83	1982	.46	1995
Sep	1.10	.76	2.13	1966	13	3.14	1986	.03	1975
Oct	1.37	1.03	2.49	1982	9	5.60	1998	.11	1999
Nov	.61	.54	.68	1977	19	2.22	1985	.07	1996
Dec	.41	.35	1.04	1975	31	1.65	1975	.01	1986
Ann	16.64	16.01	3.78	Jun 1963	15	8.18	May 1996	.01	Dec 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	.9	@	.0
Feb	6.4	1.6	.1	.0
Mar	8.2	2.8	.5	.1
Apr	9.7	4.4	1.0	.2
May	12.0	6.4	1.9	.5
Jun	12.1	6.0	1.4	.6
Jul	9.8	4.4	1.2	.3
Aug	7.8	4.1	.8	.2
Sep	6.5	2.5	.6	.1
Oct	6.4	3.0	.9	.2
Nov	5.8	2.2	.1	.0
Dec	5.5	1.2	.1	@
Ann	96.6	39.5	8.6	2.2

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	.04	.07	.12	.17	.23	.29	.36	.45	.57	.77	.97
Feb	.05	.09	.15	.22	.28	.36	.45	.57	.72	.97	1.22
Mar	.19	.29	.44	.58	.72	.87	1.05	1.26	1.53	1.98	2.41
Apr	.17	.30	.54	.80	1.09	1.41	1.79	2.27	2.92	4.02	5.10
May	.91	1.19	1.61	1.97	2.32	2.68	3.08	3.55	4.16	5.10	5.97
Jun	.69	.96	1.37	1.74	2.10	2.49	2.92	3.43	4.10	5.16	6.16
Jul	.45	.63	.93	1.20	1.47	1.75	2.07	2.46	2.97	3.77	4.54
Aug	.39	.55	.78	.99	1.20	1.41	1.66	1.95	2.33	2.93	3.49
Sep	.07	.13	.27	.42	.59	.78	1.02	1.33	1.75	2.48	3.20
Oct	.17	.28	.48	.67	.87	1.09	1.36	1.68	2.11	2.83	3.52
Nov	.12	.17	.26	.34	.43	.52	.62	.74	.90	1.17	1.42
Dec	.03	.06	.11	.17	.23	.30	.38	.49	.64	.89	1.14
Ann	10.60	11.72	13.18	14.30	15.32	16.31	17.34	18.49	19.90	21.97	23.78

\+ 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: SD 5 **NWS Call Sign: RAP** **Elevation: 3,160 Feet** **Lat: 44°03N** **Lon: 103°03W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	5.2	3.1	1	1
Feb	6.5	5.6	1	1
Mar	9.1	8.2	1	1
Apr	6.2	4.7	#	1
May	.5	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	0	0
Oct	1.8	.9	#	0
Nov	6.3	5.0	1	0
Dec	5.3	4.8	1	1
Ann	41.1	32.3	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	1996	17	19.4	1996	16	1993	13	8	1993
Feb	7.1	1987	26	21.5	1987	14	1987	28	5	1971
Mar	12.5	1999	5	27.4	1975	16	1977	30	2+	1999
Apr	14.0	2000	19	22.1	1984	12	2000	19	1+	2000
May	4.0	1983	11	4.9	1991	5	1991	3	#	2000
Jun	.0	0	0	.0	0	0	0	0	#	1991
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	1.1	1984	27	1.4+	2000	#+	1985	30	0	0
Oct	7.3	1995	22	10.2+	1995	5	1995	23	#	1997
Nov	9.3	1977	19	33.6	1985	15	1985	11	6	1985
Dec	9.8	1975	31	17.9	1975	11+	1985	2	6	1985
Ann	14.0	Apr 2000	19	33.6	Nov 1985	16+	Jan 1993	13	8	Jan 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	6.5	1.5	.3	.1	.0
Feb	6.2	2.4	.4	.1	.0
Mar	6.3	2.5	.8	.4	.1
Apr	3.9	1.9	.7	.3	@
May	.3	.1	.1	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.3	.0	.0	.0	.0
Oct	1.5	.5	.1	.1	.0
Nov	4.8	2.2	.6	.2	.0
Dec	5.5	1.6	.4	.1	.0
Ann	35.3	12.7	3.4	1.3	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	14.1	4.1	1.6	.4
Feb	12.0	5.1	1.4	.2
Mar	8.2	3.9	1.9	.5
Apr	3.0	1.2	.6	@
May	.1	.1	@	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.9	.3	@	.0
Nov	6.7	3.2	1.6	.1
Dec	12.0	5.8	1.9	.1
Ann	57.0	23.7	9.0	1.3

+ 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

Complete documentation available from:
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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	6/11	6/05	6/01	5/28	5/24	5/21	5/17	5/13	5/07
32	5/25	5/20	5/16	5/12	5/09	5/06	5/02	4/28	4/23
28	5/12	5/07	5/04	5/01	4/28	4/25	4/22	4/19	4/14
24	5/01	4/27	4/24	4/21	4/19	4/16	4/13	4/10	4/06
20	4/21	4/15	4/11	4/08	4/05	4/02	3/30	3/26	3/20
16	4/11	4/06	4/02	3/29	3/26	3/23	3/20	3/16	3/10

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	138	130	125	121	116	112	108	102	95
32	164	156	150	145	140	136	131	125	117
28	181	174	169	165	162	158	154	149	142
24	201	193	187	183	178	173	168	163	155
20	225	217	211	207	202	198	193	187	179
16	243	236	231	226	222	218	214	209	202

***** 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	1314	1061	925	595	313	88	16	21	190	521	934	1233	7211
60	1164	917	779	461	190	47	8	7	105	367	797	1095	5937
57	1072	840	686	376	128	24	3	3	66	277	712	1002	5189
55	1013	788	624	322	94	15	1	1	46	221	657	940	4722
50	869	658	476	201	35	2	0	0	15	104	518	796	3674
32	399	276	89	7	0	0	0	0	0	1	154	332	1258

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	63	101	203	408	724	985	1235	1214	861	516	172	69	6551
55	0	0	3	25	105	304	523	502	224	41	2	0	1729
57	0	0	1	17	75	251	461	440	183	27	1	0	1456
60	0	0	0	9	43	179	370	350	129	13	0	0	1093
65	0	0	0	2	13	86	227	208	59	3	0	0	598
70	0	0	0	0	2	30	113	98	23	0	0	0	266

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	15	32	80	211	485	754	996	973	632	302	65	17	15	47	127	338	823	1577	2573	3546	4178	4480	4545	4562
45	2	5	35	124	341	604	841	818	490	191	29	1	2	7	42	166	507	1111	1952	2770	3260	3451	3480	3481
50	0	1	9	62	209	456	686	663	349	99	11	0	0	1	10	72	281	737	1423	2086	2435	2534	2545	2545
55	0	0	1	25	109	311	531	508	229	44	0	0	0	0	1	26	135	446	977	1485	1714	1758	1758	1758
60	0	0	0	9	48	187	380	356	134	13	0	0	0	0	0	9	57	244	624	980	1114	1127	1127	1127
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	20	40	82	162	300	465	636	622	400	216	66	24	20	60	142	304	604	1069	1705	2327	2727	2943	3009	3033

(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