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: PIERRE RGNL AP, SD **COOP ID: 396597**

Climate Division: SD 6 **NWS Call Sign: PIR** **Elevation: 1,734 Feet** **Lat: 44˚23N** **Lon: 100˚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	27.9	7.7	17.8	68	1981	23	30.9	1990	-33	1966	29	2.5	1978	1463	0	.0	.0	1.9	18.0	30.6	10.4
Feb	34.8	14.1	24.5	75	1992	29	36.8	1999	-35	1994	9	6.7	1979	1137	0	.0	.0	5.4	12.0	26.8	5.2
Mar	45.5	23.8	34.7	87	1988	27	41.8	2000	-19	1998	11	25.2	1996	940	0	.0	.0	12.3	5.3	25.0	1.2
Apr	59.7	34.7	47.2	98	1980	21	54.2	1981	4	1975	3	40.3	1995	536	2	.0	.3	23.0	.7	11.7	.0
May	71.4	46.3	58.9	105	1969	27	65.6+	1985	22+	1967	3	54.1	1996	225	34	@	1.1	30.4	.0	1.2	.0
Jun	81.4	55.9	68.7	112	1988	24	77.4	1988	34	1998	3	63.6	1993	46	154	.9	5.7	30.0	.0	.0	.0
Jul	89.2	61.8	75.5	113+	1989	5	81.3	1974	42+	1971	30	66.4	1992	13	340	4.1	15.5	31.0	.0	.0	.0
Aug	88.0	60.1	74.1	114	1988	15	82.1	1983	39+	1974	31	67.0	1992	22	304	2.7	14.3	31.0	.0	.0	.0
Sep	77.4	49.0	63.2	108	1983	2	71.7	1998	21+	1995	22	58.0	1993	139	85	1.1	5.4	29.8	.0	.8	.0
Oct	62.4	37.0	49.7	98+	1997	2	54.0	2000	4	1991	31	45.5	1972	474	0	.0	.4	26.0	.3	8.3	.0
Nov	43.3	23.3	33.3	87	1999	8	44.4	1999	-18	1959	14	19.9	1985	951	0	.0	.0	10.5	6.8	25.4	.9
Dec	31.7	12.1	21.9	77	1998	1	31.9	1997	-31	1990	30	5.5	1983	1336	0	.0	.0	3.2	15.1	30.5	6.0
Ann	59.4	35.5	47.5	114	Aug 1988	15	82.1	Aug 1983	-35	Feb 1994	9	2.5	Jan 1978	7282	919	8.8	42.7	234.5	58.2	160.3	23.7

\+ 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	.52	.44	.91	1985	15	2.28	1997	.01	1983
Feb	.54	.44	1.28	1952	19	2.34	1987	.02+	1985
Mar	1.19	1.10	1.80	1975	27	3.73	1977	.05	1988
Apr	2.02	1.32	2.13	1964	26	6.38	1986	.18	1987
May	3.14	2.84	2.72	1982	13	7.24	1982	.54	1992
Jun	3.49	3.20	3.33	1971	9	6.30	1991	.46	1976
Jul	2.75	1.87	4.00	1984	25	6.43	1997	.31	1983
Aug	1.86	1.62	3.52	1953	2	4.57	1995	.35	2000
Sep	1.55	1.13	2.74	1999	2	6.95	1996	.01	1972
Oct	1.64	1.34	2.39	1980	15	5.39	1982	.07	1987
Nov	.70	.45	1.77	1956	2	2.58	1985	.04+	1976
Dec	.48	.43	.89	1951	6	1.20	1996	.00	1986
Ann	19.88	20.29	4.00	Jul 1984	25	7.24	May 1982	.00	Dec 1986

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.7	1.5	.2	.0
Feb	5.2	1.6	.2	.0
Mar	6.5	2.9	.6	.2
Apr	8.4	4.5	1.3	.4
May	9.8	6.2	2.1	.7
Jun	10.2	6.1	2.4	.8
Jul	9.4	5.3	1.7	.6
Aug	7.3	4.0	1.1	.3
Sep	5.4	2.7	.8	.3
Oct	5.6	3.4	1.0	.3
Nov	6.3	2.0	.3	.0
Dec	6.5	1.6	@	.0
Ann	87.3	41.8	11.7	3.6

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	.06	.12	.19	.27	.36	.48	.63	.83	1.18	1.54
Feb	.03	.06	.13	.20	.28	.38	.50	.65	.87	1.23	1.59
Mar	.12	.21	.37	.53	.71	.92	1.15	1.45	1.86	2.54	3.20
Apr	.29	.46	.75	1.03	1.32	1.64	2.01	2.47	3.08	4.07	5.03
May	.83	1.13	1.59	1.99	2.38	2.79	3.25	3.79	4.50	5.61	6.65
Jun	.70	1.01	1.52	1.99	2.47	2.97	3.55	4.24	5.16	6.63	8.02
Jul	.44	.68	1.08	1.45	1.84	2.27	2.76	3.35	4.15	5.44	6.68
Aug	.47	.64	.91	1.15	1.39	1.64	1.92	2.25	2.68	3.37	4.01
Sep	.03	.08	.22	.41	.64	.93	1.30	1.81	2.54	3.84	5.18
Oct	.13	.23	.44	.67	.92	1.21	1.56	1.99	2.60	3.62	4.62
Nov	.05	.09	.18	.28	.38	.51	.66	.85	1.11	1.56	2.00
Dec	.03	.07	.15	.22	.29	.37	.47	.59	.75	1.01	1.26
Ann	11.26	12.78	14.81	16.40	17.85	19.28	20.79	22.49	24.58	27.70	30.46

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	4.7	4.5	2	2
Feb	5.3	4.1	2	2
Mar	6.7	4.8	1	1
Apr	3.4	1.5	#	0
May	.0	.0	#	0
Jun	#	.0	0	0
Jul	.0	.0	#	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	1.2	.0	#	0
Nov	5.1	3.5	1	0
Dec	4.7	3.7	1	1
Ann	31.1	22.1	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	10.0	1997	5	13.6	1975	22+	1997	16	15	1997
Feb	9.2	1991	17	18.7	1987	16+	1978	15	9+	1997
Mar	18.0	1975	27	31.8	1975	29+	1975	30	5	1975
Apr	13.4	1986	14	17.5	1986	26	1975	1	4	1975
May	.3	1979	9	.3	1979	#+	1991	3	#	2000
Jun	#	1998	3	#	1998	0	0	0	0	0
Jul	.0	0	0	.0	0	#	1994	19	#	1994
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1985	30	#+	1985	0	0	0	0	0
Oct	3.9	1999	1	5.6	1995	4	1971	31	#	1999
Nov	8.0	1998	9	28.9	1985	17	1985	30	7	1985
Dec	7.1	1987	27	13.2	1977	19	1985	1	10	1985
Ann	18.0	Mar 1975	27	31.8	Mar 1975	29+	Mar 1975	30	15	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.8	1.6	.3	.1	@
Feb	4.8	1.6	.4	.2	.0
Mar	4.2	1.8	.8	.2	.1
Apr	2.0	1.0	.4	.1	.1
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.8	.5	.1	.0	.0
Nov	4.5	1.6	.4	.2	.0
Dec	5.7	1.4	.4	.1	.0
Ann	27.8	9.5	2.8	.9	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	18.0	9.4	4.8	.7
Feb	12.4	7.9	3.5	1.0
Mar	8.0	4.3	2.3	.7
Apr	1.5	.8	.6	.3
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.4	.2	.0	.0
Nov	6.1	2.8	1.6	.6
Dec	12.8	5.9	2.8	1.0
Ann	59.2	31.3	15.6	4.3

+ 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

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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	5/24	5/19	5/16	5/13	5/11	5/08	5/05	5/02	4/28
32	5/16	5/11	5/08	5/05	5/02	4/30	4/27	4/23	4/19
28	5/06	5/01	4/28	4/26	4/23	4/21	4/18	4/15	4/10
24	4/28	4/23	4/19	4/16	4/13	4/10	4/07	4/03	3/29
20	4/14	4/10	4/06	4/04	4/01	3/29	3/26	3/23	3/19
16	4/08	4/02	3/29	3/26	3/23	3/19	3/16	3/12	3/06

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	9/11	9/15	9/17	9/19	9/21	9/23	9/25	9/28	10/01
32	9/19	9/24	9/28	10/01	10/03	10/06	10/09	10/12	10/17
28	9/26	10/01	10/05	10/08	10/11	10/14	10/18	10/21	10/27
24	10/03	10/09	10/14	10/17	10/21	10/24	10/28	11/01	11/07
20	10/14	10/20	10/25	10/28	11/01	11/04	11/08	11/12	11/18
16	10/26	11/01	11/05	11/08	11/12	11/15	11/19	11/23	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	151	145	140	136	132	129	125	120	114
32	172	166	161	157	153	149	145	141	134
28	189	183	178	174	171	167	163	159	152
24	210	203	198	194	190	186	181	176	169
20	236	228	222	218	213	208	203	198	190
16	258	250	244	238	234	229	223	217	209

***** 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	1463	1137	940	536	225	46	13	22	139	474	951	1336	7282
60	1308	1002	785	394	125	13	1	6	66	323	801	1181	6005
57	1216	925	693	315	81	4	0	2	36	239	711	1088	5310
55	1156	872	632	266	58	2	0	1	23	189	657	1026	4882
50	1012	743	487	162	20	0	0	0	5	90	517	883	3919
32	524	354	109	5	0	0	0	0	0	1	149	406	1548

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	84	141	191	461	832	1099	1349	1304	936	550	188	93	7228
55	3	16	2	33	177	410	636	592	268	25	6	0	2168
57	1	13	1	21	138	353	574	531	222	13	0	0	1867
60	0	6	0	10	89	271	482	442	161	4	0	0	1465
65	0	0	0	2	34	154	340	304	85	0	0	0	919
70	0	0	0	0	9	72	213	187	37	0	0	0	518

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	1	20	73	264	594	869	1110	1064	707	332	60	3	1	21	94	358	952	1821	2931	3995	4702	5034	5094	5097
45	0	3	34	159	441	719	955	909	559	212	22	0	0	3	37	196	637	1356	2311	3220	3779	3991	4013	4013
50	0	0	8	86	301	569	800	754	414	119	8	0	0	0	8	94	395	964	1764	2518	2932	3051	3059	3059
55	0	0	2	43	177	422	645	600	282	54	1	0	0	0	2	45	222	644	1289	1889	2171	2225	2226	2226
60	0	0	0	17	91	281	491	447	178	17	0	0	0	0	0	17	108	389	880	1327	1505	1522	1522	1522
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	24	63	182	360	545	718	686	441	221	51	7	2	26	89	271	631	1176	1894	2580	3021	3242	3293	3300

(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