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: PETERSBURG 2 N, ND **COOP ID: 327027**

Climate Division: ND 3 **NWS Call Sign:** **Elevation: 1,530 Feet** **Lat: 48˚02N** **Lon: 98˚00W**

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	12.6	-7.7	2.5	50	1990	11	17.7	1990	-42	1982	17	-12.7	1982	1941	0	.0	.0	@	27.8	31.0	21.3
Feb	19.9	-.5	9.7	62	2000	23	24.3	1998	-44	1996	1	-6.4	1979	1551	0	.0	.0	.2	22.6	28.2	14.7
Mar	31.5	12.9	22.2	73	1963	31	33.3	2000	-30	1980	1	13.1	1996	1327	0	.0	.0	2.1	14.9	30.4	6.6
Apr	50.3	28.3	39.3	98	1980	22	48.1	1987	-12	1979	5	28.8	1979	772	1	.0	.1	15.7	2.8	20.5	.3
May	66.5	41.3	53.9	96	1964	21	63.0	1977	5	1967	3	45.5	1979	365	22	.0	.4	28.2	.0	5.5	.0
Jun	74.7	50.8	62.8	98	1961	27	70.2	1988	28	1969	20	55.6	1982	136	68	.0	1.1	29.9	.0	@	.0
Jul	79.1	54.6	66.9	100	1988	6	70.9	1983	30	1983	5	60.5	1992	57	113	@	2.1	31.0	.0	@	.0
Aug	78.6	52.1	65.4	101	1983	8	71.4	1983	25	1982	27	58.8	1977	105	116	.1	2.8	31.0	.0	.1	.0
Sep	67.7	41.6	54.7	102	1978	6	61.8	1998	15	1965	26	49.6	1984	324	14	@	.6	28.4	.0	4.0	.0
Oct	53.5	29.8	41.7	92	1963	4	47.4	1973	-1	1991	31	36.6	1976	723	0	.0	.1	18.9	1.3	18.8	@
Nov	32.3	14.5	23.4	75	1999	1	35.1	1999	-25+	1985	29	11.7	1996	1249	0	.0	.0	3.2	16.0	28.8	4.0
Dec	17.9	-.9	8.5	57	1969	2	22.6	1997	-39	1983	23	-5.0	1983	1754	0	.0	.0	.1	26.3	31.0	16.1
Ann	48.7	26.4	37.6	102	Sep 1978	6	71.4	Aug 1983	-44	Feb 1996	1	-12.7	Jan 1982	10304	334	.1	7.2	188.7	111.7	198.3	63.0

\+ 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	.66	.63	1.28	1982	23	2.48	1982	.00	1973
Feb	.43	.28	.72	2000	26	2.05	1987	.00+	1989
Mar	.94	.78	1.70	1971	14	2.33	1971	.05	1986
Apr	1.17	.89	1.45	1997	6	4.82	1979	.00+	1988
May	2.27	2.03	2.20	1985	31	5.62	1974	.55	1984
Jun	3.62	3.19	3.50	2000	13	6.91+	2000	1.16	1988
Jul	3.25	3.11	3.03	1987	22	8.02	1997	.45	1985
Aug	2.71	2.64	2.33	1999	12	5.69	1980	.43	1996
Sep	2.06	1.81	2.96	1957	2	4.28	1973	.16	1993
Oct	1.54	1.20	3.74	1985	8	5.06	1985	.00	1999
Nov	.90	.68	1.74	1977	21	3.19	1977	.00+	1999
Dec	.51	.44	.64+	1987	3	1.48	1985	.00+	1979
Ann	20.06	20.49	3.74	Oct 1985	8	8.02	Jul 1997	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.5	2.6	.2	@
Feb	3.5	1.3	.1	.0
Mar	3.9	2.5	.5	.1
Apr	5.1	3.0	.6	.2
May	8.9	5.5	1.4	.3
Jun	11.1	6.9	2.4	.7
Jul	10.3	6.3	2.3	.8
Aug	9.4	5.9	1.9	.5
Sep	7.8	4.5	1.2	.4
Oct	6.3	3.6	.8	.3
Nov	3.8	2.7	.5	@
Dec	4.0	2.0	.1	.0
Ann	78.6	46.8	12.0	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	.08	.16	.28	.37	.47	.57	.68	.82	1.00	1.29	1.56
Feb	.00	.04	.11	.18	.25	.33	.42	.53	.68	.94	1.18
Mar	.07	.13	.25	.38	.53	.70	.89	1.15	1.49	2.08	2.66
Apr	.00	.04	.18	.34	.54	.77	1.05	1.41	1.93	2.83	3.72
May	.53	.74	1.07	1.37	1.67	1.98	2.33	2.75	3.31	4.18	5.01
Jun	1.44	1.77	2.25	2.64	3.01	3.38	3.79	4.26	4.85	5.76	6.59
Jul	.79	1.09	1.57	1.99	2.41	2.85	3.35	3.94	4.71	5.94	7.09
Aug	.78	1.04	1.42	1.76	2.09	2.43	2.81	3.25	3.83	4.73	5.58
Sep	.36	.54	.84	1.12	1.41	1.72	2.08	2.51	3.08	4.00	4.89
Oct	.03	.12	.31	.52	.77	1.06	1.41	1.87	2.51	3.60	4.69
Nov	.00	.06	.21	.34	.49	.66	.86	1.11	1.45	2.02	2.58
Dec	.00	.08	.18	.26	.34	.43	.53	.64	.79	1.04	1.28
Ann	13.42	14.67	16.30	17.54	18.65	19.73	20.86	22.10	23.62	25.85	27.78

\+ 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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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	8.9	7.0	1	1	11.0	1982	23	23.5+	1989	8	1999	13	4	1999	3.9	3.2	1.1	.3	@	-9.9	-9.9	-9.9	-9.9
Feb	6.4	5.5	2	0	5.0	1977	24	20.0	1987	7	1993	27	7	1993	2.7	2.5	.7	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	8.1	6.0	#	0	12.0	1990	16	17.4	1971	#	2000	27	#	2000	2.5	2.3	.9	.3	@	-9.9	-9.9	-9.9	-9.9
Apr	1.5	.0	#	0	9.0	1990	28	9.0+	1990	#	1995	27	#	1995	.9	.8	.3	.1	.0	-9.9	-9.9	-9.9	-9.9
May	.4	.0	0	0	6.0	1991	4	6.0	1991	0	0	0	0	0	.1	.1	@	@	.0	-9.9	-9.9	-9.9	-9.9
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.2	.0	#	0	3.0	1984	24	3.0	1984	2	1972	26	#+	1995	.1	.1	@	.0	.0	.1	.0	.0	.0
Oct	1.9	.5	#	0	10.0	1985	8	10.0	1985	4+	2000	5	#+	2000	.7	.6	.3	.1	@	.2	.2	.0	.0
Nov	6.7	6.5	#	0	12.0	1977	21	24.0	1985	5	1988	16	1	1988	2.9	2.8	1.2	.5	@	-9.9	-9.9	-9.9	-9.9
Dec	6.4	4.8	0	0	6.0	1978	19	19.0	1985	4	1974	23	1	1974	2.7	2.3	.9	.2	.0	-9.9	-9.9	-9.9	-9.9
Ann	40.5	30.3	N/A	N/A	12.0+	Mar 1990	16	24.0	Nov 1985	8	Jan 1999	13	7	Feb 1993	16.5	14.7	5.4	1.7	@	-9.9	-9.9	-9.9	-9.9

+ 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	6/10	6/04	5/31	5/28	5/25	5/22	5/18	5/14	5/09
32	6/02	5/28	5/23	5/20	5/17	5/13	5/10	5/06	4/30
28	5/17	5/12	5/08	5/05	5/02	4/30	4/27	4/23	4/18
24	5/11	5/05	5/01	4/27	4/24	4/21	4/17	4/13	4/07
20	5/03	4/27	4/23	4/20	4/16	4/13	4/10	4/06	3/31
16	4/21	4/16	4/12	4/09	4/06	4/03	3/31	3/28	3/23

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	8/23	8/28	9/01	9/04	9/07	9/10	9/13	9/17	9/22
32	9/08	9/12	9/15	9/17	9/19	9/21	9/24	9/26	9/30
28	9/12	9/17	9/20	9/23	9/26	9/29	10/02	10/05	10/10
24	9/20	9/26	9/30	10/04	10/07	10/10	10/14	10/18	10/24
20	9/29	10/05	10/09	10/13	10/16	10/19	10/23	10/27	11/02
16	10/10	10/16	10/21	10/25	10/29	11/01	11/05	11/10	11/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	127	119	114	109	105	100	96	90	82
32	148	140	134	129	125	120	115	109	101
28	167	160	154	150	146	141	137	132	124
24	192	183	176	170	165	160	154	148	138
20	207	199	192	187	182	177	172	165	157
16	232	222	216	210	205	199	194	187	178

***** 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	1941	1551	1327	772	365	136	57	105	324	723	1249	1754	10304
60	1786	1411	1172	627	245	63	14	44	202	568	1099	1599	8830
57	1693	1327	1079	543	185	34	5	23	141	476	1009	1506	8021
55	1631	1271	1017	489	150	22	1	15	106	415	949	1444	7510
50	1476	1131	865	362	81	6	0	3	43	273	799	1289	6328
32	934	657	384	71	2	0	0	0	0	19	329	755	3151

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	16	31	80	289	682	922	1080	1034	679	319	70	24	5226
55	0	0	0	17	117	254	367	336	95	2	0	0	1188
57	0	0	0	11	90	206	310	282	70	1	0	0	970
60	0	0	0	5	57	145	225	210	41	0	0	0	683
65	0	0	0	1	22	68	113	116	14	0	0	0	334
70	0	0	0	0	7	22	40	50	3	0	0	0	122

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	4	122	454	690	842	795	451	154	12	0	0	0	4	126	580	1270	2112	2907	3358	3512	3524	3524
45	0	0	0	63	318	540	687	640	315	80	2	0	0	0	0	63	381	921	1608	2248	2563	2643	2645	2645
50	0	0	0	29	206	390	532	485	194	36	0	0	0	0	0	29	235	625	1157	1642	1836	1872	1872	1872
55	0	0	0	12	115	255	379	337	104	10	0	0	0	0	0	12	127	382	761	1098	1202	1212	1212	1212
60	0	0	0	1	53	140	232	200	50	3	0	0	0	0	0	1	54	194	426	626	676	679	679	679
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	3	91	284	421	535	501	284	113	11	0	0	0	3	94	378	799	1334	1835	2119	2232	2243	2243

(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