

Climatology of the United States

No. 20

1971-2000

Station: PRETTY ROCK, ND

COOP ID: 327311

Climate Division: ND 8

NWS Call Sign:

Elevation: 2,480 Feet Lat: 46° 10N

Lon: 101° 51W

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	23.3	3.6	13.5	67	1981	23	27.5	1992	-42	1966	29	-1.1	1978	1598	0	.0	.0	.8	20.1	30.7	13.0
Feb	30.3	10.8	20.6	71	1992	29	31.6	1998	-39	1994	9	5.5	1979	1245	0	.0	.0	3.4	14.5	27.4	7.4
Mar	40.4	19.6	30.0	81	1967	29	40.0	1986	-32	1998	11	20.6	1996	1084	0	.0	.0	8.9	8.4	28.4	2.7
Apr	55.6	30.4	43.0	93+	1987	18	51.6	1987	-6+	1997	8	33.8	1975	660	1	.0	.2	21.1	1.2	18.1	.1
May	68.5	42.0	55.3	97+	1980	22	62.9	1977	10+	1967	5	49.8	1979	319	17	.0	.6	29.6	.0	4.5	.0
Jun	77.4	51.3	64.4	103+	1988	27	76.4	1988	28	1998	3	59.5	1993	113	94	.3	2.8	30.0	.0	.1	.0
Jul	84.6	55.9	70.3	108+	1981	7	75.9	1989	34	1967	3	62.6	1992	39	202	1.3	9.2	31.0	.0	.0	.0
Aug	84.0	54.5	69.3	104+	2001	7	75.2	1983	30	1964	11	63.6	1977	56	189	.5	8.9	31.0	.0	@	.0
Sep	72.7	43.6	58.2	106	1978	5	64.8	1998	12	1965	26	52.7	1984	240	35	.3	2.4	29.2	.0	3.2	.0
Oct	58.5	32.9	45.7	94	1997	2	48.8	1973	-8	1991	30	41.4	1972	599	0	.0	.1	23.7	.8	14.5	.1
Nov	38.6	18.9	28.8	80+	1999	8	40.1	1999	-23	1985	29	14.8	1985	1089	0	.0	.0	7.2	10.0	27.6	2.3
Dec	27.7	7.9	17.8	68	1965	4	28.1	1999	-36+	1990	30	-1.4	1983	1465	0	.0	.0	1.7	17.8	30.6	9.4
Ann	55.1	31.0	43.1	108+	Jul 1981	7	76.4	Jun 1988	-42	Jan 1966	29	-1.4	Dec 1983	8507	538	2.4	24.2	217.6	72.8	185.1	35.0

+ 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/normal/usnormals.html

Issue Date: February 2004

(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

073-A

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: PRETTY ROCK, ND

COOP ID: 327311

Climate Division: ND 8

NWS Call Sign:

Elevation: 2,480 Feet Lat: 46°10N

Lon: 101°51W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.33	.31	.58	1997	4	.90	1976	.00	1991	4.5	.9	.1	.0	.02	.04	.09	.14	.19	.25	.32	.40	.52	.71	.89
Feb	.41	.25	.90	1951	28	2.01	1998	.00	1985	4.7	1.3	.1	.0	.01	.04	.10	.16	.23	.30	.39	.50	.66	.92	1.18
Mar	.86	.66	1.38	1977	29	3.03	1982	.00	1999	5.8	2.2	.4	.2	.03	.10	.22	.34	.48	.63	.82	1.05	1.37	1.90	2.43
Apr	1.89	1.50	1.85	1971	20	4.30	1997	.00	1987	7.4	4.6	1.1	.3	.09	.26	.55	.83	1.12	1.45	1.84	2.33	2.98	4.08	5.14
May	2.64	2.41	4.40	1970	8	7.23	1972	.24	1984	8.8	5.4	1.7	.7	.49	.73	1.12	1.47	1.84	2.23	2.67	3.21	3.93	5.07	6.17
Jun	3.02	2.94	4.67	1964	9	6.25	1984	.65	1974	10.2	6.7	1.9	.6	.97	1.26	1.68	2.04	2.39	2.75	3.14	3.61	4.20	5.12	5.97
Jul	2.34	1.99	2.65	1979	13	9.28	1993	.07	1984	7.7	4.5	1.7	.4	.28	.46	.78	1.11	1.46	1.84	2.30	2.85	3.61	4.86	6.08
Aug	1.76	1.29	4.05	1999	12	4.99	1999	.10	1971	6.1	3.6	.9	.4	.19	.33	.57	.82	1.08	1.37	1.72	2.15	2.73	3.70	4.64
Sep	1.40	.86	3.17	1994	15	5.45	1977	.22	1992	5.7	3.3	.8	.3	.12	.21	.40	.59	.80	1.05	1.34	1.70	2.20	3.04	3.86
Oct	1.34	.87	1.95	1972	5	4.65	1982	.09	1978	5.6	2.9	.8	.2	.10	.19	.36	.55	.75	.99	1.27	1.63	2.12	2.95	3.77
Nov	.62	.40	3.25	2000	1	4.14	2000	.01	1990	4.9	1.7	.2	@	.02	.05	.11	.19	.28	.40	.55	.74	1.01	1.49	1.97
Dec	.31	.23	.50	1993	17	1.14	1972	.00+	1997	4.7	1.0	@	.0	.00	.00	.09	.15	.20	.26	.32	.40	.50	.66	.82
Ann	16.92	16.44	4.67	Jun 1964	9	9.28	Jul 1993	.00+	Mar 1999	76.1	38.1	9.7	3.1	10.78	11.92	13.40	14.54	15.57	16.57	17.62	18.78	20.21	22.30	24.14

+ 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Climatography of the United States

No. 20 1971-2000

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151 Patton Avenue
Asheville, North Carolina 28801
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Station: PRETTY ROCK, ND

COOP ID: 327311

Climate Division: ND 8

NWS Call Sign:

Elevation: 2,480 Feet

Lat: 46° 10N

Lon: 101° 51W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	6.3	4.7	5	4	10.0	1971	10	19.0	1971	18+	1979	23	16	1978	5.8	2.3	.8	.3	@	20.7	14.3	9.8	5.9
Feb	6.6	5.8	5	2	7.0	1998	26	21.2	1979	36	1978	13	27	1978	5.9	2.4	1.2	.1	.0	13.7	5.6	3.6	2.2
Mar	10.1	9.3	3	2	10.0	1982	19	34.9	1982	31	1978	5	18	1978	5.3	3.0	1.3	.6	.1	12.0	7.4	4.8	1.6
Apr	6.3	5.4	1	#	10.0	1999	1	18.9	1982	19	1975	2	7	1975	2.6	1.7	1.0	.5	@	4.2	2.5	1.8	.6
May	.6	.0	#	0	6.0	1991	3	7.0	1996	2	1991	3	#+	1996	.2	.2	.1	@	.0	.1	.0	.0	.0
Jun	.0	.0	#	0	.0	0	0	.0	0	#+	1972	2	#+	1972	.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	.5	.0	0	0	12.0	1984	23	15.5	1984	8	1984	24	1	1984	.1	.1	.1	@	@	.2	.1	.1	.0
Oct	2.9	1.1	#	#	9.0	1991	28	20.0	1991	10	1991	30	2	1991	1.4	.8	.4	.1	.0	1.2	.5	.3	.1
Nov	6.3	4.0	2	1	12.0	1977	20	20.6	1978	24	1996	25	11	1996	5.0	2.5	.9	.4	.1	8.4	4.4	2.2	1.3
Dec	5.9	5.2	4	2	9.0	1988	26	16.5	1977	21	1996	29	17	1996	5.7	2.0	.4	.2	.0	14.6	9.3	6.2	1.6
Ann	45.5	35.5	N/A	N/A	12.0+	Sep 1984	23	34.9	Mar 1982	36	Feb 1978	13	27	Feb 1978	32.0	15.0	6.2	2.2	.2	75.1	44.1	28.8	13.3

+ 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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COOP ID: 327311

Climate Division: ND 8

NWS Call Sign:

Elevation: 2,480 Feet

Lat: 46° 10N

Lon: 101° 51W

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	6/20	6/13	6/07	6/03	5/29	5/25	5/21	5/15	5/08
32	6/02	5/28	5/24	5/21	5/18	5/15	5/11	5/07	5/02
28	5/23	5/18	5/14	5/11	5/08	5/04	5/01	4/27	4/22
24	5/11	5/05	5/02	4/29	4/26	4/23	4/19	4/16	4/10
20	5/01	4/26	4/23	4/20	4/17	4/14	4/11	4/08	4/03
16	4/23	4/18	4/14	4/11	4/08	4/05	4/02	3/29	3/24
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	8/29	9/02	9/05	9/07	9/10	9/13	9/16	9/21
32	9/05	9/09	9/12	9/15	9/17	9/20	9/22	9/25	9/29
28	9/12	9/17	9/20	9/23	9/25	9/28	10/01	10/04	10/09
24	9/18	9/24	9/29	10/02	10/06	10/09	10/13	10/18	10/24
20	9/23	9/30	10/05	10/09	10/12	10/16	10/20	10/25	11/01
16	10/06	10/12	10/16	10/20	10/23	10/27	10/30	11/04	11/10
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	124	116	110	105	100	95	90	84	76
32	141	134	130	126	122	118	114	109	102
28	161	154	149	144	140	136	132	126	119
24	186	178	172	167	163	158	153	147	140
20	201	193	187	182	178	173	168	162	154
16	215	209	205	201	197	194	190	186	179

* 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

Complete documentation available from:

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Climate Division: ND 8 NWS Call Sign: Elevation: 2,480 Feet Lat: 46°10N Lon: 101°51W

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	1598	1245	1084	660	319	113	39	56	240	599	1089	1465	8507
60	1443	1105	929	516	198	48	12	20	136	444	939	1310	7100
57	1350	1021	836	433	141	25	4	9	88	352	849	1217	6325
55	1288	971	774	381	108	15	1	5	62	293	789	1155	5842
50	1138	841	627	262	49	3	0	0	20	161	648	1005	4754
32	638	417	193	27	0	0	0	0	0	4	225	513	2017

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	63	96	132	358	721	971	1185	1155	784	428	126	71	6090
55	0	6	0	21	116	297	473	447	156	4	0	0	1520
57	0	0	0	14	87	246	415	390	122	2	0	0	1276
60	0	0	0	7	51	180	329	307	81	0	0	0	955
65	0	0	0	1	17	94	202	189	35	0	0	0	538
70	0	0	0	0	3	37	109	101	12	0	0	0	262

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	4	35	181	493	740	946	919	559	239	28	1	1	5	40	221	714	1454	2400	3319	3878	4117	4145	4146
45	0	1	7	101	350	590	791	764	415	139	9	0	0	1	8	109	459	1049	1840	2604	3019	3158	3167	3167
50	0	0	0	49	219	441	636	609	284	63	0	0	0	0	0	49	268	709	1345	1954	2238	2301	2301	2301
55	0	0	0	21	121	299	481	457	175	22	0	0	0	0	0	21	142	441	922	1379	1554	1576	1576	1576
60	0	0	0	5	54	175	328	307	90	7	0	0	0	0	0	5	59	234	562	869	959	966	966	966
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	6	37	140	312	462	604	587	361	172	27	2	0	6	43	183	495	957	1561	2148	2509	2681	2708	2710

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

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| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
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References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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