

Climatology of the United States

No. 20

1971-2000

Station: GRAFTON, ND

COOP ID: 323594

Climate Division: ND 3

NWS Call Sign:

Elevation: 827 Feet Lat: 48°25N Lon: 97°25W

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	13.0	-2.8	5.1	50	1990	10	18.8	1990	-41	1954	21	-8.5	1982	1859	0	.0	.0	@	27.1	30.9	19.0
Feb	20.9	4.9	12.9	65+	2000	22	27.6	1998	-45	1966	19	-3.6	1979	1459	0	.0	.0	.3	20.2	27.4	12.3
Mar	33.3	18.0	25.7	78	1963	31	36.6	2000	-35	1972	2	15.4	1996	1221	0	.0	.0	3.3	12.1	27.4	5.0
Apr	53.0	32.9	43.0	100	1980	21	52.4	1987	-11	1979	6	33.4	1979	667	5	@	.2	19.3	1.6	16.1	.3
May	69.7	46.6	58.2	100+	1980	23	67.6	1977	14	1967	3	50.2	1979	264	53	.1	1.9	29.8	.0	3.5	.0
Jun	77.7	56.2	67.0	101	1995	17	75.2	1988	31+	1956	1	60.0	1982	78	137	@	3.1	30.0	.0	.0	.0
Jul	81.7	60.4	71.1	102	1988	5	75.7	1983	36+	1983	5	63.8	1992	19	207	.1	4.8	31.0	.0	.0	.0
Aug	81.1	58.1	69.6	105	1964	5	76.6	1983	30	1965	28	63.8	1977	46	188	.6	5.3	31.0	.0	@	.0
Sep	69.7	48.1	58.9	104+	1978	6	64.5	1978	18	1965	26	53.8	1985	218	34	.1	1.1	29.2	.0	2.0	.0
Oct	55.0	36.1	45.6	90	1992	1	50.9	1973	3+	1991	31	39.2	1991	603	0	.0	@	22.1	.8	11.9	.0
Nov	32.9	19.7	26.3	78	1975	5	37.4	1999	-31	1985	30	13.4	1985	1161	0	.0	.0	3.6	13.6	27.4	2.5
Dec	18.3	3.7	11.0	59	1969	1	26.3	1997	-38	1967	31	-1.1	1983	1673	0	.0	.0	.1	25.2	30.8	13.8
Ann	50.5	31.8	41.2	105	Aug 1964	5	76.6	Aug 1983	-45	Feb 1966	19	-8.5	Jan 1982	9268	624	.9	16.4	199.7	100.6	177.4	52.9

+ 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

038-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: GRAFTON, ND

COOP ID: 323594

Climate Division: ND 3

NWS Call Sign:

Elevation: 827 Feet Lat: 48°25N

Lon: 97°25W

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	.52	.46	1.75	1989	8	2.33	1989	.00+	1999	5.2	1.9	.1	.1	.00	.03	.11	.19	.28	.38	.50	.64	.84	1.18	1.52
Feb	.50	.39	1.01	1981	28	1.48	1981	.00	1993	5.4	1.7	.1	@	.04	.09	.17	.25	.32	.40	.50	.61	.77	1.02	1.27
Mar	.85	.77	1.20	1966	3	1.87	1979	.17+	1998	5.9	2.8	.4	.0	.20	.28	.40	.51	.62	.74	.87	1.03	1.23	1.55	1.86
Apr	1.13	.89	1.78	1953	24	3.86	1986	.00+	1988	5.0	2.6	.8	.2	.00	.05	.20	.36	.55	.77	1.04	1.38	1.86	2.68	3.49
May	2.31	1.98	2.90	1996	17	6.00	1977	.14	2000	7.9	5.2	1.7	.5	.33	.52	.85	1.17	1.51	1.88	2.30	2.83	3.53	4.68	5.79
Jun	3.30	2.93	4.79	2000	12	9.97	2000	.66	1988	9.1	6.4	2.2	.8	.98	1.29	1.76	2.17	2.56	2.97	3.42	3.96	4.64	5.72	6.72
Jul	2.77	2.48	4.35	1993	25	7.78	1993	.13	1976	9.1	6.3	1.8	.5	.53	.78	1.19	1.57	1.95	2.35	2.82	3.38	4.12	5.31	6.44
Aug	2.39	1.74	4.05	1974	15	5.68	1985	.35	1996	7.9	5.1	1.6	.5	.57	.79	1.14	1.45	1.76	2.09	2.46	2.89	3.47	4.37	5.23
Sep	1.76	1.48	7.42	1957	2	6.30	1991	.24	1974	6.6	3.8	1.0	.5	.20	.33	.58	.82	1.08	1.38	1.72	2.14	2.72	3.68	4.61
Oct	1.46	1.20	3.40	1949	10	4.37	1984	.04	1989	5.8	3.5	.9	.2	.08	.16	.33	.52	.75	1.01	1.34	1.76	2.35	3.35	4.36
Nov	.90	.57	1.90	2000	2	4.21	2000	.00	1976	4.7	2.4	.3	.2	.04	.12	.25	.38	.52	.68	.87	1.10	1.42	1.95	2.47
Dec	.43	.33	1.20	1988	27	1.50	1988	.00	1998	4.8	1.7	.1	@	.02	.06	.13	.19	.26	.33	.42	.53	.68	.92	1.15
Ann	18.32	18.06	7.42	Sep 1957	2	9.97	Jun 2000	.00+	Jan 1999	77.4	43.4	11.0	3.5	12.33	13.47	14.93	16.05	17.05	18.03	19.04	20.16	21.52	23.52	25.25

+ 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

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No. 20

1971-2000

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Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: GRAFTON, ND

COOP ID: 323594

Climate Division: ND 3

NWS Call Sign:

Elevation: 827 Feet

Lat: 48°25N

Lon: 97°25W

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	4.3	5.1	2	0	5.0	1993	12	10.5	1994	14	1974	31	9	1974	1.9	1.5	.4	.2	.0	-9.9	-9.9	-9.9	-9.9
Feb	2.7	-99.9	3	#	5.5	1991	13	13.5	1995	16	1974	28	16	1974	1.9	1.9	.5	.1	.0	-9.9	-9.9	-9.9	-9.9
Mar	3.0	1.0	#	0	6.0	1999	8	10.0	1999	#	1981	1	#	1981	.9	.8	.3	.1	.0	-9.9	-9.9	-9.9	-9.9
Apr	.5	.0	#	0	6.0	1999	1	7.0	1999	##	1995	23	##	1995	.2	.2	.1	.1	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.0	.0	0	0	.2	1981	24	.3	1981	0	0	0	0	0	.1	.0	.0	.0	.0	.0	.0	.0	.0
Nov	2.1	.0	#	0	10.0	1998	18	10.3	1996	4	1988	15	1	1993	.6	.6	.4	.2	.1	-9.9	-9.9	-9.9	-9.9
Dec	5.2	-99.9	2	0	15.0	1988	27	20.6	1996	12	1988	31	12	1988	1.3	1.2	.5	.2	.1	-9.9	-9.9	-9.9	-9.9
Ann	17.8	-9.9	N/A	N/A	15.0	Dec 1988	27	20.6	Dec 1996	16	Feb 1974	28	16	Feb 1974	6.9	6.2	2.2	.9	.2	-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

Complete documentation available from:

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No. 20 1971-2000

Station: GRAFTON, ND

COOP ID: 323594

Climate Division: ND 3

NWS Call Sign:

Elevation: 827 Feet

Lat: 48°25N

Lon: 97°25W

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	6/09	6/03	5/30	5/27	5/24	5/20	5/17	5/13	5/07
32	5/22	5/17	5/14	5/11	5/09	5/06	5/04	4/30	4/26
28	5/16	5/11	5/07	5/03	4/30	4/27	4/23	4/19	4/14
24	5/06	4/30	4/25	4/22	4/18	4/15	4/11	4/06	3/31
20	4/23	4/17	4/14	4/11	4/08	4/05	4/02	3/29	3/24
16	4/16	4/12	4/09	4/06	4/03	4/01	3/29	3/26	3/22
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	8/27	9/03	9/07	9/11	9/15	9/19	9/23	9/27	10/04
32	9/08	9/14	9/18	9/21	9/24	9/27	10/01	10/05	10/10
28	9/20	9/25	9/28	10/02	10/04	10/07	10/10	10/14	10/19
24	9/26	10/02	10/06	10/10	10/13	10/17	10/20	10/25	10/31
20	10/08	10/14	10/18	10/22	10/25	10/29	11/01	11/05	11/11
16	10/16	10/22	10/26	10/30	11/02	11/05	11/09	11/13	11/19
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	144	134	126	120	114	108	101	94	83
32	160	152	147	142	138	133	128	123	115
28	179	171	166	161	157	152	147	142	134
24	204	195	188	183	177	172	166	160	150
20	224	216	210	205	200	195	190	184	176
16	235	227	221	216	212	207	202	197	189

* 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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Station: GRAFTON, ND

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Climate Division: ND 3 NWS Call Sign: Elevation: 827 Feet Lat: 48°25N Lon: 97°25W

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	1859	1459	1221	667	264	78	19	46	218	603	1161	1673	9268
60	1704	1319	1066	528	166	30	2	15	117	450	1011	1518	7926
57	1611	1235	973	449	119	15	0	6	73	361	921	1425	7188
55	1549	1179	912	399	93	9	0	3	50	304	861	1363	6722
50	1394	1039	762	287	45	1	0	0	14	183	717	1208	5650
32	855	577	306	47	0	0	0	0	0	9	278	691	2763

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	20	42	109	375	812	1049	1211	1165	806	429	107	41	6166
55	0	0	1	37	192	368	498	455	166	11	0	0	1728
57	0	0	0	27	156	314	436	396	129	5	0	0	1463
60	0	0	0	15	110	239	346	312	83	1	0	0	1106
65	0	0	0	5	53	137	207	188	34	0	0	0	624
70	0	0	0	1	21	64	102	97	10	0	0	0	295

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	12	186	570	803	947	905	561	221	22	0	0	0	12	198	768	1571	2518	3423	3984	4205	4227	4227
45	0	0	1	104	425	653	792	750	417	122	9	0	0	0	1	105	530	1183	1975	2725	3142	3264	3273	3273
50	0	0	0	55	293	504	637	595	284	57	0	0	0	0	0	55	348	852	1489	2084	2368	2425	2425	2425
55	0	0	0	24	185	357	482	442	168	18	0	0	0	0	0	24	209	566	1048	1490	1658	1676	1676	1676
60	0	0	0	11	97	223	328	295	91	5	0	0	0	0	0	11	108	331	659	954	1045	1050	1050	1050
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	6	125	364	509	619	585	342	137	12	0	0	0	6	131	495	1004	1623	2208	2550	2687	2699	2699

(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.

- | | |
|---|---|
| <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 |
|---|---|

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