

Climatology of the United States

No. 20

1971-2000

Station: RICHARDTON ABBEY, ND

COOP ID: 327530

Climate Division: ND 7

NWS Call Sign:

Elevation: 2,470 Feet Lat: 46° 53N

Lon: 102° 19W

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	22.1	4.8	13.5	61	1981	23	27.3	1992	-35	1966	29	-1.4	1982	1599	0	.0	.0	.5	20.6	30.3	12.2
Feb	29.0	11.7	20.4	66	1958	25	31.6	1984	-36	1962	28	5.2	1979	1250	0	.0	.0	2.3	14.5	27.2	7.2
Mar	39.8	20.7	30.3	75+	1966	30	40.4	1986	-26	1962	1	19.7	1996	1078	0	.0	.0	8.5	8.3	27.8	2.4
Apr	54.5	32.2	43.4	93	1980	21	52.0	1987	-8	1975	1	33.9	1975	651	2	.0	.1	19.9	1.3	16.1	.1
May	67.3	44.1	55.7	95+	1980	22	62.5	1977	8	1967	3	50.2	1974	310	21	.0	.4	29.4	.0	3.0	.0
Jun	75.8	52.8	64.3	103+	1988	23	76.5	1988	31+	1969	20	59.2	1992	117	97	.2	2.1	30.0	.0	.0	.0
Jul	82.0	57.9	70.0	105	1960	20	75.9	1989	38+	1992	1	61.0	1992	47	200	.7	6.7	31.0	.0	.0	.0
Aug	81.1	56.6	68.9	106	1949	7	75.1	1983	36+	1974	31	62.4	1977	62	182	.1	6.1	31.0	.0	.0	.0
Sep	69.5	46.3	57.9	103	1948	15	64.2	1998	18	1974	30	52.2	1984	249	36	.1	1.4	28.7	.0	1.8	.0
Oct	56.1	35.1	45.6	95	1953	1	49.0	1974	-4	1991	30	41.0	1972	602	0	.0	.0	22.4	1.0	11.5	.1
Nov	37.0	20.5	28.8	78+	1999	7	41.6	1999	-20	1985	29	15.1	1985	1088	0	.0	.0	6.1	10.3	26.5	2.0
Dec	25.9	8.9	17.4	64	1979	4	28.8	1979	-33+	1990	30	-7	1983	1475	0	.0	.0	1.0	18.4	30.2	8.9
Ann	53.3	32.6	43.0	106	Aug 1949	7	76.5	Jun 1988	-36	Feb 1962	28	-1.4	Jan 1982	8528	538	1.1	16.8	210.8	74.4	174.4	32.9

+ 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

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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: RICHARDTON ABBEY, ND

COOP ID: 327530

Climate Division: ND 7

NWS Call Sign:

Elevation: 2,470 Feet Lat: 46° 53N

Lon: 102° 19W

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	.45	.41	.61	1997	4	1.20	1997	.06	1987	6.7	1.4	.1	.0	.06	.10	.16	.23	.29	.36	.45	.55	.69	.92	1.13
Feb	.48	.38	.97	1998	26	2.56	1998	.04	1985	5.9	1.5	.1	.0	.04	.07	.13	.20	.27	.36	.46	.59	.76	1.06	1.35
Mar	.86	.61	1.21	1950	23	3.47	1975	.00	1981	7.2	2.5	.3	.1	.04	.11	.24	.36	.50	.65	.83	1.06	1.37	1.88	2.39
Apr	1.75	1.59	2.09	1989	27	4.60	1984	.00	1988	8.0	4.0	1.1	.3	.12	.30	.58	.84	1.11	1.40	1.74	2.16	2.72	3.64	4.53
May	2.49	2.31	3.83	1963	31	6.82	1972	.11	1980	10.2	5.2	1.4	.5	.39	.60	.96	1.30	1.66	2.05	2.50	3.04	3.77	4.96	6.10
Jun	3.39	3.45	3.27	1966	24	7.13	1972	.92	1995	12.1	6.8	2.1	.7	1.07	1.39	1.87	2.27	2.67	3.08	3.53	4.05	4.73	5.79	6.77
Jul	2.27	1.87	3.60	1966	2	5.69	1995	.63	1989	9.1	5.0	1.5	.5	.51	.72	1.05	1.35	1.65	1.97	2.33	2.75	3.32	4.21	5.05
Aug	1.88	1.31	2.78	1999	11	5.87	1998	.12	1971	8.1	3.9	1.1	.3	.19	.33	.58	.84	1.13	1.45	1.82	2.29	2.93	4.00	5.05
Sep	1.60	1.11	2.45	1971	5	5.78	1977	.18	1993	7.1	3.6	.9	.4	.23	.36	.59	.82	1.05	1.30	1.60	1.96	2.44	3.24	4.00
Oct	1.41	.80	2.12	1994	7	5.84	1982	.08	1993	5.5	3.1	.9	.3	.07	.14	.30	.48	.70	.96	1.28	1.69	2.27	3.27	4.27
Nov	.75	.60	1.93	2000	1	2.48	2000	.07	1999	6.4	2.1	.2	@	.08	.13	.23	.34	.45	.57	.72	.91	1.16	1.59	2.00
Dec	.45	.44	.59	1972	30	1.39	1977	.01	1991	7.1	1.3	.1	.0	.04	.07	.13	.19	.26	.34	.43	.54	.71	.98	1.24
Ann	17.78	16.93	3.83	May 1963	31	7.13	Jun 1972	.00+	Apr 1988	93.4	40.4	9.8	3.1	10.94	12.19	13.83	15.10	16.25	17.37	18.55	19.86	21.48	23.86	25.94

+ 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

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
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Station: RICHARDTON ABBEY, ND

COOP ID: 327530

Climate Division: ND 7

NWS Call Sign:

Elevation: 2,470 Feet

Lat: 46° 53N

Lon: 102° 19W

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	6.0	5.8	5	5	7.0	1976	1	14.6	1982	18	1994	21	16	1994	6.4	2.3	.6	.1	.0	22.8	17.8	11.7	4.3
Feb	5.8	6.0	5	3	6.0	2000	14	14.3	1979	22	1978	21	18	1978	5.7	2.2	.6	.2	.0	17.4	10.4	7.6	3.1
Mar	8.5	6.8	3	3	12.0	1975	28	32.4	1975	25	1975	29	11	1978	6.3	2.7	1.0	.3	.1	12.1	8.1	6.1	2.1
Apr	5.6	4.1	1	#	13.0	1984	27	21.3	1984	22	1975	1	12	1975	3.4	1.7	.7	.3	.1	4.9	3.0	2.2	1.1
May	.5	.0	#	0	6.0	1983	12	6.9	1983	11	1984	1	1	1984	.3	.2	.1	@	.0	.4	.2	.1	@
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	.7	.0	#	0	8.0	1984	24	9.0	1984	6	1984	24	#+	1995	.3	.2	.1	@	.0	.2	.1	@	.0
Oct	2.8	.6	#	#	11.0	1991	29	18.0	1991	15	1991	31	2	1991	1.5	.9	.4	.1	@	1.7	.6	.3	.1
Nov	6.6	5.5	2	1	10.0	1986	8	18.3	1986	15	1991	4	7	1986	5.2	2.5	.7	.3	@	11.2	6.3	3.4	1.3
Dec	6.1	5.1	4	3	8.0	1972	30	16.2	1972	13+	1993	24	9+	1996	6.5	2.3	.4	.2	.0	19.5	11.8	8.4	1.6
Ann	42.6	33.9	N/A	N/A	13.0	Apr 1984	27	32.4	Mar 1975	25	Mar 1975	29	18	Feb 1978	35.6	15.0	4.6	1.5	.2	90.2	58.3	39.8	13.6

+ 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: **RICHARDTON ABBEY, ND**

COOP ID: 327530

Climate Division: **ND 7**

NWS Call Sign:

Elevation: **2,470 Feet**

Lat: **46° 53N**

Lon: **102° 19W**

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	6/01	5/28	5/25	5/23	5/21	5/18	5/16	5/13	5/09
32	5/22	5/18	5/15	5/12	5/10	5/07	5/05	5/02	4/28
28	5/14	5/10	5/06	5/03	5/01	4/28	4/25	4/22	4/17
24	5/05	4/30	4/26	4/23	4/19	4/16	4/13	4/09	4/03
20	4/27	4/22	4/18	4/15	4/12	4/09	4/05	4/01	3/27
16	4/14	4/09	4/06	4/03	4/01	3/29	3/26	3/23	3/19
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	9/12	9/15	9/16	9/18	9/20	9/22	9/24	9/27
32	9/11	9/16	9/20	9/23	9/26	9/29	10/02	10/06	10/11
28	9/21	9/26	9/29	10/02	10/05	10/08	10/10	10/14	10/19
24	9/28	10/03	10/07	10/10	10/13	10/16	10/20	10/23	10/29
20	10/09	10/14	10/18	10/21	10/24	10/27	10/30	11/03	11/08
16	10/21	10/26	10/30	11/02	11/05	11/08	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	134	129	126	123	120	117	114	111	106
32	158	151	147	142	139	135	130	126	119
28	173	167	163	160	156	153	150	145	140
24	200	192	186	181	176	172	167	161	153
20	215	208	203	198	194	190	186	181	173
16	237	230	226	222	218	214	210	205	199

* 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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No. 20
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COOP ID: 327530

Climate Division: ND 7

NWS Call Sign:

Elevation: 2,470 Feet Lat: 46° 53N Lon: 102° 19W

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	1599	1250	1078	651	310	117	47	62	249	602	1088	1475	8528
60	1444	1110	923	508	193	52	15	23	146	447	938	1320	7119
57	1351	1026	830	427	137	27	7	12	96	356	848	1227	6344
55	1289	970	768	375	106	17	3	6	70	297	788	1165	5854
50	1142	844	623	259	48	4	0	1	25	167	649	1015	4777
32	643	416	195	29	0	0	0	0	0	5	230	522	2040

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	67	89	140	369	735	970	1176	1142	777	426	132	70	6093
55	0	0	0	25	127	297	466	435	157	5	0	0	1512
57	0	0	0	17	97	247	409	379	123	2	0	0	1274
60	0	0	0	9	59	181	323	297	82	1	0	0	952
65	0	0	0	2	21	97	200	182	36	0	0	0	538
70	0	0	0	0	5	40	110	97	13	0	0	0	265

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	4	35	190	505	745	944	913	557	240	32	0	0	4	39	229	734	1479	2423	3336	3893	4133	4165	4165
45	0	1	7	103	361	595	789	758	415	138	12	0	0	1	8	111	472	1067	1856	2614	3029	3167	3179	3179
50	0	0	0	54	227	445	634	604	281	64	2	0	0	0	0	54	281	726	1360	1964	2245	2309	2311	2311
55	0	0	0	21	127	302	479	450	171	23	0	0	0	0	0	21	148	450	929	1379	1550	1573	1573	1573
60	0	0	0	7	57	176	330	301	91	8	0	0	0	0	0	7	64	240	570	871	962	970	970	970
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	2	33	128	308	456	607	584	334	151	24	0	0	2	35	163	471	927	1534	2118	2452	2603	2627	2627

(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