

# Climatography of the United States

No. 20

1971-2000

Station: WATERTOWN MUNICIPAL AP, SD

COOP ID: 398932

Climate Division: SD 7

NWS Call Sign: ATY

Elevation: 1,746 Feet Lat: 44° 56N

Lon: 97° 09W

## 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	20.0	-1	10.0	65	1981	24	23.9	1990	-35	1972	15	-3.3	1982	1709	0	.0	.0	.2	23.7	31.0	15.5
Feb	26.6	7.3	17.0	66	1958	23	29.4	1987	-35	1994	9	2.7	1979	1346	0	.0	.0	1.2	17.2	27.9	9.3
Mar	38.2	19.1	28.7	77	1967	30	37.8	2000	-27	1948	11	19.7	1975	1128	0	.0	.0	6.3	8.7	27.2	2.8
Apr	54.5	31.4	43.0	95	1980	21	50.5	1987	-2	1975	1	35.9	1975	663	1	.0	.1	20.6	.9	15.4	.1
May	67.9	43.6	55.8	95	1959	1	63.4	1977	17	1976	6	49.8	1979	311	25	.0	.1	29.9	.0	2.5	.0
Jun	77.1	53.3	65.2	105+	1988	24	73.2	1988	32	1989	9	59.2	1982	89	94	.2	2.2	30.0	.0	@	.0
Jul	82.5	58.2	70.4	108	1966	10	74.6	1988	37	1971	30	62.1	1992	30	195	.4	6.3	31.0	.0	.0	.0
Aug	80.0	56.0	68.0	102	1965	13	75.4	1983	32	1965	28	62.3	1992	59	151	.2	4.3	31.0	.0	.0	.0
Sep	70.3	45.7	58.0	100	1976	6	64.9	1998	20	1965	26	52.5	1984	236	26	@	1.4	29.4	.0	1.7	.0
Oct	56.7	33.9	45.3	91	1951	1	51.3	1973	8	1991	30	41.2	1976	611	0	.0	.0	24.0	.4	11.8	.0
Nov	37.3	19.2	28.3	77	1999	8	39.7	1999	-20	1964	30	17.3	1985	1103	0	.0	.0	5.7	10.6	27.2	1.4
Dec	24.0	5.6	14.8	57	1990	8	25.3	1997	-33	1967	31	-1.0	1983	1556	0	.0	.0	.6	21.6	31.0	10.1
Ann	52.9	31.1	42.0	108	Jul 1966	10	75.4	Aug 1983	-35+	Feb 1994	9	-3.3	Jan 1982	8841	492	.8	14.4	209.9	83.1	175.7	39.2

+ 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](http://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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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: WATERTOWN MUNICIPAL AP, SD**

**COOP ID: 398932**

**Climate Division: SD 7**

**NWS Call Sign: ATY**

**Elevation: 1,746 Feet Lat: 44°56N**

**Lon: 97°09W**

**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	.57	.42	.60	1967	6	2.11	1979	.01	1991	7.5	1.9	.1	@	.05	.08	.16	.24	.32	.42	.54	.69	.89	1.24	1.58	
Feb	.48	.45	1.54	1977	23	1.86	1977	.08	1983	6.5	1.5	@	@	.12	.16	.23	.29	.36	.42	.50	.59	.70	.89	1.06	
Mar	1.30	1.00	1.21	1954	12	3.94	1977	.15	1971	7.8	3.7	.7	.1	.22	.34	.53	.70	.88	1.08	1.31	1.58	1.94	2.53	3.10	
Apr	1.96	1.55	2.00	1957	19	5.45	1986	.06	1996	8.8	4.7	1.3	.3	.33	.50	.78	1.05	1.32	1.62	1.97	2.39	2.94	3.85	4.71	
May	2.61	2.23	2.57	1963	12	8.25	1972	.41	1992	10.5	5.7	1.6	.5	.64	.88	1.27	1.60	1.94	2.30	2.69	3.16	3.78	4.76	5.68	
Jun	4.01	3.15	4.35	1977	15	11.37	1991	.65	1988	10.5	7.0	2.4	1.0	.72	1.08	1.66	2.21	2.77	3.37	4.06	4.89	5.99	7.78	9.48	
Jul	2.91	2.57	2.80	1950	7	5.51	1972	.51	1976	9.9	6.1	1.9	.5	.93	1.21	1.62	1.97	2.30	2.65	3.03	3.48	4.06	4.95	5.78	
Aug	2.85	2.78	3.37	1994	9	5.21	1979	.79	1976	8.2	5.3	2.0	.6	1.03	1.30	1.69	2.01	2.32	2.63	2.98	3.38	3.89	4.67	5.39	
Sep	2.03	1.84	2.42	1985	8	5.66	1977	.22	1974	7.5	4.2	1.4	.4	.33	.50	.80	1.08	1.37	1.68	2.04	2.48	3.07	4.02	4.94	
Oct	1.92	1.59	3.72	1971	16	8.10	1971	.03	1986	6.1	3.6	1.3	.5	.11	.22	.45	.71	1.01	1.35	1.78	2.32	3.08	4.37	5.67	
Nov	.91	.65	1.50+	1977	9	3.11	1983	.02	1990	6.5	2.6	.3	.1	.05	.10	.21	.33	.47	.63	.83	1.09	1.46	2.08	2.70	
Dec	.39	.32	1.33	1953	3	1.37	1977	.00	1986	6.0	1.2	@	.0	.03	.07	.13	.19	.25	.32	.39	.49	.61	.82	1.02	
Ann	21.94	20.47	4.35	Jun 1977	15	11.37	Jun 1991	.00	Dec 1986	95.8	47.5	13.0	4.0	12.88	14.51	16.66	18.34	19.86	21.36	22.93	24.70	26.88	30.10	32.94	

+ 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

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Climate Division: SD 7

NWS Call Sign: ATY

Elevation: 1,746 Feet

Lat: 44° 56N

Lon: 97° 09W

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	6.2	4.2	5	4	5.0	1975	27	24.9	1975	23+	1979	31	14	1994	6.9	2.1	.6	.1	.0	25.5	18.6	11.2	3.2
Feb	5.2	4.0	5	3	7.5	1994	8	13.4	1989	24+	1979	26	23	1979	6.0	1.8	.4	.1	.0	21.5	16.4	10.1	4.5
Mar	6.9	5.4	2	2	12.0	1985	3	20.2	1975	20+	1979	2	11	1979	5.0	2.1	.6	.2	.1	13.2	8.3	5.7	2.1
Apr	1.8	1.0	#	0	4.8	1995	11	11.5	1995	12+	1975	2	2	1975	1.8	.7	.1	.0	.0	1.7	.5	.3	.2
May	.0	.0	#	0	1.0	1979	9	1.0	1979	#+	1979	9	#	1995	.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	.2	1995	21	.2	1995	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.1	.1	#	0	10.4	1995	23	12.6	1995	5+	1995	25	#	1995	.8	.4	@	@	@	.4	.1	.1	.0
Nov	5.5	2.8	1	0	13.0	1977	9	21.8	1977	14	1985	30	5	1977	4.5	1.8	.4	.2	@	7.0	3.3	1.6	.3
Dec	4.6	4.7	3	2	4.0	1973	24	11.4	1977	19	1985	2	14	1985	6.0	1.7	.2	.0	.0	20.7	13.8	8.5	2.4
Ann	31.3	22.2	N/A	N/A	13.0	Nov 1977	9	24.9	Jan 1975	24+	Feb 1979	26	23	Feb 1979	31.0	10.6	2.3	.6	.1	90.0	61.0	37.5	12.7

+ 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	6/03	5/30	5/26	5/23	5/21	5/18	5/15	5/11	5/07
32	5/26	5/20	5/17	5/13	5/10	5/07	5/04	4/30	4/25
28	5/13	5/09	5/05	5/03	4/30	4/28	4/25	4/22	4/17
24	5/01	4/26	4/23	4/20	4/17	4/14	4/12	4/08	4/03
20	4/22	4/17	4/14	4/11	4/09	4/06	4/03	3/31	3/26
16	4/11	4/07	4/04	4/01	3/29	3/27	3/24	3/21	3/16
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	9/07	9/11	9/14	9/17	9/19	9/22	9/24	9/27	10/01
32	9/14	9/17	9/20	9/22	9/25	9/27	9/29	10/02	10/05
28	9/21	9/26	9/29	10/02	10/05	10/07	10/10	10/14	10/18
24	9/27	10/03	10/07	10/11	10/15	10/18	10/22	10/27	11/02
20	10/10	10/16	10/20	10/24	10/27	10/30	11/03	11/07	11/13
16	10/21	10/26	10/30	11/02	11/05	11/08	11/11	11/14	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	142	135	130	125	121	117	112	107	99
32	160	152	146	141	137	132	127	121	113
28	174	168	164	160	157	154	150	146	140
24	204	196	190	185	180	175	170	164	156
20	224	216	210	205	201	196	191	185	177
16	241	233	228	224	220	216	212	207	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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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	1709	1346	1128	663	311	89	30	59	236	611	1103	1556	8841
60	1554	1206	973	517	197	33	8	19	130	457	953	1401	7448
57	1461	1122	880	433	142	15	1	8	82	366	863	1308	6681
55	1399	1066	818	380	111	8	0	4	57	308	803	1246	6200
50	1244	932	665	259	52	1	0	0	17	181	655	1091	5097
32	718	484	212	22	0	0	0	0	0	6	219	575	2236

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	32	61	107	350	737	995	1189	1115	780	418	106	42	5932
55	0	0	0	17	135	314	476	406	147	7	0	0	1502
57	0	0	0	11	104	261	414	348	112	3	0	0	1253
60	0	0	0	5	66	188	328	266	70	1	0	0	924
65	0	0	0	1	25	94	195	151	26	0	0	0	492
70	0	0	0	0	7	34	100	71	7	0	0	0	219

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	30	192	535	799	985	920	587	247	26	0	0	0	30	222	757	1556	2541	3461	4048	4295	4321	4321
45	0	0	8	106	388	649	830	765	443	139	9	0	0	0	8	114	502	1151	1981	2746	3189	3328	3337	3337
50	0	0	1	52	254	501	675	610	306	70	1	0	0	0	1	53	307	808	1483	2093	2399	2469	2470	2470
55	0	0	0	23	147	355	520	455	188	26	0	0	0	0	0	23	170	525	1045	1500	1688	1714	1714	1714
60	0	0	0	7	69	222	368	303	102	7	0	0	0	0	0	7	76	298	666	969	1071	1078	1078	1078
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	28	131	327	511	652	595	360	154	21	0	0	1	29	160	487	998	1650	2245	2605	2759	2780	2780

(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](http://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](http://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"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
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## References

U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)