

# Climatology of the United States

No. 20

1971-2000

Station: WESTHOPE, ND

COOP ID: 329333

Climate Division: ND 2

NWS Call Sign:

Elevation: 1,502 Feet Lat: 48° 55N

Lon: 101° 01W

## 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	14.2	-4.9	4.7	46	1987	11	20.1	1987	-43+	1954	20	-11.5	1982	1873	0	.0	.0	@	26.4	31.0	18.8
Feb	22.3	3.3	12.8	63	1988	27	25.6	1998	-47	1967	14	-4.0	1979	1462	0	.0	.0	.4	20.0	28.0	12.1
Mar	34.6	15.7	25.2	76	1963	23	37.2	1973	-37	1972	2	14.7	1989	1236	0	.0	.0	3.6	11.5	29.4	5.5
Apr	54.8	29.6	42.2	95	1980	21	50.5	1987	-13	1975	2	31.9	1979	685	1	.0	.1	20.1	1.7	18.8	.3
May	69.6	42.2	55.9	100	1980	22	65.0	1977	16	1967	2	49.7	1974	306	23	@	1.1	29.7	.0	4.6	.0
Jun	76.9	51.1	64.0	101+	1988	10	74.6	1988	28	1969	12	57.5	1985	119	88	.2	2.2	30.0	.0	.1	.0
Jul	81.0	54.7	67.9	104	1960	20	72.1	1975	33	1967	3	61.6	1993	49	137	.1	3.7	31.0	.0	.0	.0
Aug	81.0	52.8	66.9	106	1949	7	72.9	1983	29	1982	27	60.8	1977	81	140	.1	5.4	31.0	.0	.1	.0
Sep	69.7	42.6	56.2	99+	1978	5	62.0	1998	17	1974	30	50.7	1985	284	20	.0	1.3	28.8	.0	3.2	.0
Oct	55.7	31.0	43.4	93	1992	1	47.6	1973	-9	1991	30	37.5	1991	670	0	.0	@	21.6	1.0	16.7	.1
Nov	33.4	15.8	24.6	74+	1999	7	36.2	1999	-27+	1985	29	11.8	1985	1213	0	.0	.0	3.7	13.3	28.5	3.8
Dec	19.0	.9	10.0	58	1969	1	24.4	1997	-41	1983	23	-2.3	1983	1708	0	.0	.0	.2	24.5	30.9	14.5
Ann	51.0	27.9	39.5	106	Aug 1949	7	74.6	Jun 1988	-47	Feb 1967	14	-11.5	Jan 1982	9686	409	.4	13.8	200.1	98.4	191.3	55.1

+ 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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**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: WESTHOPE, ND**

**COOP ID: 329333**

**Climate Division: ND 2**

**NWS Call Sign:**

**Elevation: 1,502 Feet Lat: 48°55N**

**Lon: 101°01W**

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	.47	.38	.73	1960	1	1.39	1995	.00	1973	5.6	1.5	@	.0	.04	.09	.17	.24	.31	.39	.48	.59	.73	.97	1.20
Feb	.46	.23	1.32	1998	26	3.94	1998	.00+	1988	4.1	1.3	.2	@	.00	.02	.07	.14	.21	.30	.41	.56	.76	1.11	1.46
Mar	.71	.59	.85	1995	27	2.37	1995	.02	1977	5.0	2.2	.2	.0	.08	.13	.23	.33	.44	.56	.70	.87	1.11	1.50	1.88
Apr	1.16	1.02	1.46	1975	28	3.72	1984	.09	1983	6.2	2.5	.6	.2	.11	.19	.35	.51	.68	.88	1.12	1.41	1.82	2.50	3.16
May	2.06	1.75	1.80	1986	5	7.87	1999	.21	1984	8.3	5.0	1.4	.2	.42	.60	.91	1.18	1.46	1.76	2.10	2.50	3.04	3.90	4.72
Jun	3.03	2.76	3.30	1949	1	5.54	1998	1.10	1974	11.0	6.3	1.8	.6	1.27	1.55	1.93	2.25	2.55	2.85	3.18	3.55	4.02	4.74	5.40
Jul	2.90	2.21	3.55	2000	4	6.91	1996	.33	1976	9.1	5.1	1.6	.8	.47	.72	1.14	1.54	1.95	2.40	2.91	3.54	4.37	5.73	7.03
Aug	2.04	1.55	2.26	1975	8	5.15	1980	.11	1984	8.1	4.4	1.2	.5	.31	.48	.77	1.06	1.35	1.67	2.04	2.49	3.09	4.08	5.03
Sep	1.87	1.65	2.90	1973	1	5.42	1973	.07+	1997	7.3	3.6	1.1	.4	.19	.33	.58	.85	1.13	1.44	1.82	2.28	2.92	3.97	5.00
Oct	1.21	.80	1.72	1984	6	4.48	1994	.03	1987	5.5	2.6	.7	.2	.03	.08	.20	.35	.54	.76	1.05	1.42	1.97	2.92	3.88
Nov	.62	.45	1.34	2000	1	2.70	2000	.00+	1976	4.8	1.8	.2	@	.00	.03	.11	.21	.31	.43	.58	.76	1.02	1.46	1.89
Dec	.49	.47	.90	2001	5	1.36	1977	.03	1985	5.6	1.5	.1	.0	.04	.07	.13	.20	.28	.36	.46	.59	.77	1.06	1.36
Ann	17.02	16.69	3.55	Jul 2000	4	7.87	May 1999	.00+	Feb 1988	80.6	37.8	9.1	2.9	10.79	11.94	13.45	14.61	15.65	16.67	17.73	18.92	20.37	22.51	24.37

+ 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:  
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**Climate Division: ND 2**

**NWS Call Sign:**

**Elevation: 1,502 Feet**

**Lat: 48°55N**

**Lon: 101°01W**

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	5.5	9	8	10.0	1989	6	17.6	1995	32	1989	9	24	1978	4.6	2.6	.7	.3	.1	30.3	27.9	22.7	13.9
Feb	6.1	3.7	9	6	10.0	1998	26	31.0	1998	30	1976	29	25	1976	3.5	2.1	.7	.2	@	24.8	20.6	16.6	12.7
Mar	5.1	4.8	7	4	10.0	1987	17	15.8	1976	41	1976	15	35	1976	2.7	2.2	.8	.3	@	17.7	14.5	11.2	7.3
Apr	2.3	.7	1	#	10.0	1984	28	18.6	1984	20	1976	1	13	1979	1.1	.8	.3	.2	@	3.1	2.1	1.5	1.0
May	.4	.0	#	0	3.0	1983	12	5.0	1991	3+	1991	3	#+	1991	.2	.1	.1	.0	.0	.2	.1	.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	#	1995	20	#+	1995	#+	1995	20	#+	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	2.3	.0	#	#	10.0	1991	28	17.5	1991	15	1991	31	2	1991	.8	.7	.4	.2	@	1.3	.4	.3	.0
Nov	4.3	1.4	2	2	11.0	1975	29	16.8	1975	16	1991	5	8	1991	2.7	2.0	.6	.2	@	9.8	4.7	3.0	.8
Dec	7.2	6.7	5	4	6.0	1988	13	18.1	1975	22+	1996	31	18	1977	4.6	2.6	.7	.2	.0	24.2	15.9	11.9	4.3
Ann	34.0	22.8	N/A	N/A	11.0	Nov 1975	29	31.0	Feb 1998	41	Mar 1976	15	35	Mar 1976	20.2	13.1	4.3	1.6	.1	111.4	86.2	67.2	40.0

+ 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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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	6/12	6/07	6/02	5/28	5/24	5/19	5/13	5/05
32	5/29	5/25	5/22	5/19	5/17	5/14	5/11	5/08	5/04
28	5/21	5/16	5/13	5/10	5/07	5/04	5/01	4/27	4/22
24	5/13	5/07	5/03	4/30	4/27	4/24	4/20	4/16	4/11
20	4/29	4/24	4/21	4/18	4/15	4/12	4/09	4/06	4/01
16	4/16	4/12	4/09	4/07	4/05	4/03	3/31	3/28	3/25
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	8/20	8/26	8/30	9/03	9/06	9/09	9/13	9/17	9/23
32	9/02	9/07	9/11	9/14	9/17	9/19	9/23	9/26	10/01
28	9/13	9/17	9/20	9/23	9/25	9/27	9/30	10/03	10/07
24	9/20	9/25	9/28	10/01	10/04	10/07	10/10	10/13	10/18
20	9/30	10/06	10/11	10/14	10/18	10/21	10/25	10/29	11/04
16	10/06	10/12	10/17	10/21	10/24	10/28	11/01	11/05	11/12
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	130	120	112	106	100	94	88	80	70
32	141	135	130	126	122	119	115	110	104
28	161	154	149	145	141	137	132	127	120
24	179	172	167	163	159	155	151	146	140
20	207	200	194	189	185	181	176	170	163
16	224	216	211	206	202	198	193	188	180

\* 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	1873	1462	1236	685	306	119	49	81	284	670	1213	1708	9686
60	1718	1322	1081	542	190	52	12	31	170	515	1063	1553	8249
57	1625	1238	990	460	135	27	5	16	114	423	973	1460	7466
55	1563	1182	933	407	104	17	1	9	83	363	913	1398	6973
50	1408	1043	789	288	47	4	0	1	30	227	766	1243	5846
32	879	585	346	45	0	0	0	0	0	13	310	714	2892

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	29	47	133	350	741	959	1111	1082	725	366	87	29	5659
55	0	0	6	22	132	287	399	378	118	3	0	0	1345
57	0	0	2	15	101	237	341	322	89	1	0	0	1108
60	0	0	0	7	63	172	255	244	55	0	0	0	796
65	0	0	0	1	23	88	137	140	20	0	0	0	409
70	0	0	0	0	6	33	57	65	6	0	0	0	167

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	9	168	507	732	874	846	502	189	14	0	0	0	9	177	684	1416	2290	3136	3638	3827	3841	3841
45	0	0	0	89	363	582	719	691	360	105	4	0	0	0	0	89	452	1034	1753	2444	2804	2909	2913	2913
50	0	0	0	40	237	432	564	536	231	45	0	0	0	0	0	40	277	709	1273	1809	2040	2085	2085	2085
55	0	0	0	16	135	288	409	386	131	11	0	0	0	0	0	16	151	439	848	1234	1365	1376	1376	1376
60	0	0	0	4	62	162	259	243	62	3	0	0	0	0	0	4	66	228	487	730	792	795	795	795
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	9	132	324	451	564	540	320	142	12	0	0	0	9	141	465	916	1480	2020	2340	2482	2494	2494

(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)