

Climatology of the United States

No. 20

1971-2000

Station: WEBSTER, SD

COOP ID: 399004

Climate Division: SD 3

NWS Call Sign:

Elevation: 1,855 Feet Lat: 45° 20N

Lon: 97° 32W

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	19.4	.5	10.0	64	1981	24	25.0	1990	-36	1972	15	-3.3	1982	1706	0	.0	.0	.2	24.0	31.0	15.3
Feb	25.8	7.5	16.7	64	1958	25	29.7	1987	-35	1962	28	1.9	1979	1353	0	.0	.0	1.1	17.4	27.7	9.2
Mar	38.0	19.6	28.8	79	1963	31	37.6	2000	-23	1962	1	19.4	1975	1123	0	.0	.0	6.1	9.0	27.4	3.1
Apr	54.6	32.8	43.7	96	1980	21	51.7	1987	-6	1975	4	34.7	1975	642	2	.0	.1	20.5	1.0	15.4	.1
May	68.3	45.8	57.1	96	1959	1	65.1	1977	18	1967	2	50.6	1979	276	30	.0	.1	29.8	.0	2.3	.0
Jun	76.7	55.7	66.2	105	1988	24	73.0	1988	33	1990	3	61.1+	1993	73	109	@	2.0	30.0	.0	.0	.0
Jul	82.2	61.0	71.6	107	1987	31	76.3	1974	39+	1975	12	63.8	1992	22	227	.5	6.9	31.0	.0	.0	.0
Aug	79.7	59.3	69.5	104+	1965	13	75.9	1983	37	1965	28	64.4	1977	40	179	.3	5.0	31.0	.0	.0	.0
Sep	69.4	48.2	58.8	98+	1983	2	65.5	1998	17	1974	30	54.4	1993	215	28	.0	1.3	29.4	.0	1.4	.0
Oct	56.1	36.0	46.1	91	1963	5	50.9	1973	5	1991	30	42.1	1987	587	0	.0	.0	23.8	.5	12.2	.0
Nov	36.7	20.2	28.5	76	1965	2	40.1	1999	-20+	1985	24	17.7	1985	1097	0	.0	.0	5.7	11.3	26.8	1.6
Dec	23.5	6.5	15.0	56+	1969	1	25.4	1979	-34	1967	31	-1.9	1983	1551	0	.0	.0	.4	21.7	30.7	10.2
Ann	52.5	32.8	42.7	107	Jul 1987	31	76.3	Jul 1974	-36	Jan 1972	15	-3.3	Jan 1982	8685	575	.8	15.4	209.0	84.9	174.9	39.5

+ 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/normals/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1952-2001

(3) Derived from 1971-2000 serially complete daily data

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: WEBSTER, SD

COOP ID: 399004

Climate Division: SD 3

NWS Call Sign:

Elevation: 1,855 Feet Lat: 45°20N

Lon: 97°32W

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	.75	.60	1.70	1997	4	2.47	1975	.00+	1990	5.2	2.3	.4	@	.00	.08	.22	.34	.46	.59	.75	.93	1.18	1.60	1.99
Feb	.57	.52	.89	1955	20	1.13	1987	.15	1973	4.9	2.3	.1	.0	.17	.22	.30	.37	.44	.51	.59	.68	.80	.99	1.16
Mar	1.10	.95	1.10	1982	19	2.94	1977	.00	1996	6.0	3.3	.5	.1	.13	.27	.45	.61	.77	.93	1.12	1.35	1.65	2.13	2.59
Apr	1.84	1.51	2.46	1960	13	7.47	1986	.12	1987	6.6	4.2	1.2	.3	.20	.34	.60	.86	1.13	1.44	1.80	2.25	2.86	3.87	4.86
May	2.63	2.27	2.97	1998	11	7.41	1972	.48	1992	8.5	5.6	1.8	.4	.60	.84	1.23	1.58	1.92	2.29	2.70	3.19	3.84	4.87	5.84
Jun	3.48	3.21	3.50	1971	29	7.36	1971	.99	1974	10.3	6.7	2.3	.8	.95	1.28	1.78	2.22	2.65	3.10	3.60	4.19	4.96	6.16	7.29
Jul	3.73	2.68	4.44	1993	24	11.23	1993	.37	1976	9.5	5.9	2.3	1.1	.64	.97	1.51	2.03	2.55	3.12	3.77	4.56	5.61	7.31	8.93
Aug	3.06	2.96	3.08	1955	24	6.17	1978	.91	1976	7.9	5.4	2.2	.8	1.12	1.41	1.82	2.17	2.50	2.83	3.20	3.63	4.17	5.01	5.78
Sep	1.88	1.53	2.75	1989	21	5.77	1986	.00	1998	6.7	3.9	1.1	.3	.08	.23	.51	.78	1.08	1.41	1.81	2.30	2.98	4.11	5.22
Oct	1.69	1.03	2.52	1961	10	5.75	1998	.20	1993	5.9	3.7	1.1	.3	.16	.28	.51	.75	1.00	1.29	1.63	2.06	2.65	3.62	4.58
Nov	.85	.61	1.10	1998	10	3.29	2000	.00+	1999	5.1	2.7	.4	@	.00	.05	.17	.30	.45	.61	.80	1.05	1.39	1.97	2.54
Dec	.48	.43	.84	1960	5	1.62	1993	.00+	1999	4.4	2.0	@	.0	.00	.00	.08	.17	.25	.35	.46	.60	.79	1.10	1.40
Ann	22.06	22.29	4.44	Jul 1993	24	11.23	Jul 1993	.00+	Dec 1999	81.0	48.0	13.4	4.1	12.36	14.07	16.35	18.14	19.77	21.39	23.09	25.00	27.37	30.90	34.02

+ 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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Station: WEBSTER, SD

COOP ID: 399004

Climate Division: SD 3

NWS Call Sign:

Elevation: 1,855 Feet

Lat: 45° 20N

Lon: 97° 32W

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	5.0	5.0	7	6	20.0	1997	4	20.0	1997	31	1978	31	25	1978	3.6	2.7	.9	.4	.1	-9.9	-9.9	-9.9	-9.9
Feb	5.8	4.9	6	3	6.0	1991	18	13.7	1994	34	1978	28	33	1978	3.3	2.0	.8	.2	.0	-9.9	-9.9	-9.9	-9.9
Mar	3.8	2.5	3	#	11.5	1985	3	19.8	1975	35	1978	7	21	1979	1.6	1.1	.5	.2	.1	3.3	1.7	1.3	.0
Apr	1.9	.0	#	0	7.5	1997	6	8.5	1994	10	1979	3	3	1979	.6	.6	.5	.3	.0	.2	.1	.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	#	1995	5	#	1995	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	#	.0	0	0	#	1991	18	#	1991	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.5	.0	#	0	10.0	1995	23	10.0	1995	2+	1990	17	#+	1992	.2	.2	@	@	@	.2	.0	.0	.0
Nov	4.6	1.1	1	0	11.0	1993	24	23.0	1993	17	1985	29	10	1985	2.2	1.6	.8	.3	.2	3.2	2.1	1.9	.9
Dec	6.3	7.3	4	#	4.5	1993	21	15.1	1993	24	1985	26	21	1985	2.9	2.1	.7	.0	.0	-9.9	-9.9	-9.9	-9.9
Ann	27.9	20.8	N/A	N/A	20.0	Jan 1997	4	23.0	Nov 1993	35	Mar 1978	7	33	Feb 1978	14.4	10.3	4.2	1.4	.4	-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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NWS Call Sign:

Elevation: 1,855 Feet

Lat: 45°20N

Lon: 97°32W

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	6/02	5/28	5/25	5/22	5/19	5/16	5/13	5/09	5/04
32	5/19	5/14	5/11	5/08	5/06	5/03	4/30	4/27	4/22
28	5/15	5/10	5/06	5/03	5/01	4/28	4/25	4/21	4/16
24	5/02	4/26	4/22	4/19	4/16	4/13	4/09	4/05	3/31
20	4/20	4/15	4/12	4/09	4/07	4/04	4/01	3/29	3/25
16	4/12	4/07	4/04	4/01	3/29	3/26	3/23	3/20	3/15
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	9/10	9/13	9/16	9/19	9/21	9/23	9/25	9/28	10/02
32	9/16	9/20	9/23	9/25	9/27	9/30	10/02	10/05	10/09
28	9/21	9/25	9/29	10/02	10/04	10/07	10/10	10/14	10/18
24	9/29	10/04	10/07	10/10	10/13	10/16	10/19	10/23	10/28
20	10/09	10/15	10/19	10/23	10/27	10/30	11/03	11/07	11/13
16	10/22	10/27	10/31	11/03	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	145	138	133	128	124	120	116	111	104
32	164	157	152	148	144	140	136	131	124
28	176	169	164	160	156	152	148	143	137
24	203	195	189	184	180	175	170	164	156
20	226	218	212	207	202	197	192	186	178
16	241	234	229	225	221	216	212	207	200

* 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	1706	1353	1123	642	276	73	22	40	215	587	1097	1551	8685
60	1551	1213	968	499	169	24	6	11	112	433	947	1396	7329
57	1458	1129	875	418	118	10	0	4	67	342	857	1303	6581
55	1396	1073	813	367	90	5	0	1	45	285	797	1241	6113
50	1241	940	664	252	41	0	0	0	11	162	650	1086	5047
32	718	491	223	27	0	0	0	0	0	5	220	577	2261

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	35	62	123	377	777	1026	1227	1162	803	441	113	49	6195
55	0	0	0	27	154	341	514	450	158	8	0	0	1652
57	0	0	0	18	120	286	452	390	120	4	0	0	1390
60	0	0	0	9	78	210	365	305	75	1	0	0	1043
65	0	0	0	2	30	109	227	179	28	0	0	0	575
70	0	0	0	0	9	42	122	88	7	0	0	0	268

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	31	203	550	801	988	927	585	247	25	0	0	0	31	234	784	1585	2573	3500	4085	4332	4357	4357
45	0	0	9	119	404	651	833	772	442	144	8	0	0	0	9	128	532	1183	2016	2788	3230	3374	3382	3382
50	0	0	0	62	268	501	678	617	308	70	1	0	0	0	0	62	330	831	1509	2126	2434	2504	2505	2505
55	0	0	0	30	159	355	523	462	188	28	0	0	0	0	0	30	189	544	1067	1529	1717	1745	1745	1745
60	0	0	0	12	80	221	370	313	102	7	0	0	0	0	0	12	92	313	683	996	1098	1105	1105	1105
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	26	137	339	508	647	605	359	154	19	0	0	1	27	164	503	1011	1658	2263	2622	2776	2795	2795

(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