

Climatology of the United States No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: WESSINGTON SPRINGS, SD

1971-2000

COOP ID: 399070

Climate Division: SD 7

NWS Call Sign:

Elevation: 1,650 Feet Lat: 44°05N

Lon: 98°34W

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	26.0	6.4	16.2	63	1987	13	30.1	1990	-28	1972	15	2.8	1978	1513	0	.0	.0	1.3	19.1	30.2	10.3
Feb	32.1	12.3	22.2	71	2000	22	33.9	1987	-32	1996	2	7.0	1979	1200	0	.0	.0	3.9	13.3	26.3	5.5
Mar	43.9	23.7	33.8	85	1978	30	42.0	2000	-19	1962	1	25.1	1996	967	0	.0	.0	11.2	6.0	24.1	1.2
Apr	58.8	35.9	47.4	99	1954	5	54.7	1981	5	1975	1	40.3	1995	532	3	.0	.2	22.7	.6	10.4	.0
May	71.2	48.3	59.8	98	1967	25	65.6	1977	20+	1967	3	54.6	1996	203	40	.0	.5	30.5	.0	.7	.0
Jun	81.1	57.9	69.5	109	1988	25	76.4	1988	35+	1998	4	64.5	1982	36	171	.4	4.3	30.0	.0	.0	.0
Jul	86.9	63.1	75.0	110	1966	10	80.5	1975	43	1971	30	66.0	1992	12	322	1.5	11.0	31.0	.0	.0	.0
Aug	85.2	61.4	73.3	109+	1988	15	79.4	1983	43	1992	27	67.5	1992	17	274	1.1	9.7	31.0	.0	.0	.0
Sep	75.4	51.6	63.5	105	1970	6	69.8	1978	23	1965	26	58.7	1993	129	84	.2	3.3	29.7	.0	.5	.0
Oct	61.3	39.0	50.2	97	1963	5	53.9	1973	10	1991	30	45.3	1976	462	1	.0	.2	25.8	.4	6.7	.0
Nov	41.8	24.4	33.1	84	1999	9	45.6	1999	-10+	1985	24	20.5	1985	957	0	.0	.0	9.0	7.6	23.6	.9
Dec	29.3	11.2	20.3	68	1998	3	29.7	1997	-27	1989	21	3.0	1983	1388	0	.0	.0	2.4	16.8	29.9	6.7
Ann	57.8	36.3	47.0	110	Jul 1966	10	80.5	Jul 1975	-32	Feb 1996	2	2.8	Jan 1978	7416	895	3.2	29.2	228.5	63.8	152.4	24.6

+ 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: 1951-2001

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

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Lon: 98°34W

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	.48	.31	1.68	2001	30	1.50	1996	.01	1974	4.1	1.4	.1	.0	.02	.04	.09	.16	.23	.32	.43	.57	.77	1.12	1.48
Feb	.56	.39	1.37	1977	23	2.06	1987	.01	1983	4.2	1.6	.2	.1	.04	.08	.15	.23	.31	.41	.53	.68	.88	1.23	1.58
Mar	1.86	1.53	2.86	1977	12	6.61	1977	.20	1994	6.7	3.9	1.0	.3	.28	.43	.70	.96	1.23	1.52	1.86	2.27	2.83	3.73	4.60
Apr	2.64	2.50	3.14	2001	7	5.70	1995	.32	1981	8.8	5.5	1.8	.2	.68	.93	1.31	1.65	1.99	2.34	2.73	3.19	3.80	4.76	5.66
May	3.78	3.37	3.25	1986	9	7.60	1995	.96	1975	9.2	6.3	2.5	1.1	.95	1.31	1.86	2.35	2.83	3.33	3.90	4.57	5.45	6.84	8.14
Jun	3.12	2.93	3.51	1961	14	6.90	1993	.53	1988	8.7	6.2	1.9	.8	.87	1.17	1.62	2.01	2.39	2.79	3.24	3.76	4.44	5.51	6.51
Jul	2.82	2.93	3.61	1968	26	5.81	1972	.32	1975	8.3	5.8	1.8	.7	.60	.86	1.28	1.65	2.03	2.43	2.89	3.43	4.15	5.29	6.38
Aug	2.22	2.01	3.56	1956	2	4.50	1982	.05	1993	6.9	4.0	1.4	.5	.33	.51	.83	1.14	1.46	1.81	2.22	2.71	3.38	4.47	5.51
Sep	2.16	1.97	2.70	1993	19	6.90	1996	.10+	1979	6.4	4.0	1.3	.5	.14	.27	.54	.84	1.17	1.56	2.02	2.62	3.45	4.85	6.24
Oct	1.82	1.37	2.00	1995	23	6.58	1998	.07	1992	6.0	3.5	1.3	.5	.13	.24	.48	.73	1.01	1.33	1.72	2.21	2.89	4.05	5.19
Nov	1.06	.88	2.20	1992	1	2.77	1992	.00	1990	5.0	2.8	.4	.1	.03	.10	.25	.40	.57	.76	1.00	1.29	1.71	2.40	3.09
Dec	.43	.37	.93	1996	15	1.66	1996	.00	1986	3.9	1.2	.1	.0	.02	.06	.13	.19	.26	.33	.42	.53	.68	.92	1.16
Ann	22.95	22.83	3.61	Jul 1968	26	7.60	May 1995	.00+	Nov 1990	78.2	46.2	13.8	4.8	14.67	16.21	18.22	19.76	21.16	22.51	23.93	25.51	27.44	30.28	32.76

+ 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: 1951-2001

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

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Climate Division: SD 7

NWS Call Sign:

Elevation: 1,650 Feet

Lat: 44°05N

Lon: 98°34W

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	4.8	3.2	3	3	9.0	1996	25	14.3	1975	16	1988	2	12	1988	2.5	1.7	.8	.3	.0	18.7	12.3	5.6	1.3
Feb	5.6	5.1	3	3	10.0	1971	20	12.5	1994	16	1997	4	11	1979	2.4	1.9	.7	.3	@	14.8	10.5	5.5	1.7
Mar	7.4	7.0	1	1	12.0	1985	3	23.0	1989	17	1985	5	5	1985	2.9	2.3	1.2	.5	@	8.9	5.4	2.5	.7
Apr	3.4	2.0	#	#	10.5	1994	28	15.5	1994	15	1995	11	2	1995	1.1	1.1	.7	.3	@	1.2	.7	.3	.1
May	#	.0	0	0	#	1979	9	#+	1979	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	#	.0	#	0	#	1998	3	#	1998	#	1998	3	#	1998	.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	1.5	.0	#	0	12.0	1995	23	16.0	1995	12	1995	23	1	1995	.5	.5	.3	.1	@	.7	.3	.1	@
Nov	5.9	4.5	1	1	10.0	1972	2	23.0	1985	17	1985	30	8	1985	2.4	2.1	.8	.3	@	7.1	4.1	2.4	.9
Dec	5.4	4.0	3	1	12.0	1987	24	23.5	1987	21	1985	21	18	1985	2.4	1.9	.6	.2	.1	13.6	8.6	4.7	1.6
Ann	34.0	25.8	N/A	N/A	12.0+	Oct 1995	23	23.5	Dec 1987	21	Dec 1985	21	18	Dec 1985	14.2	11.5	5.1	2.0	.1	65.0	41.9	21.1	6.3

+ 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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NWS Call Sign:

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Lon: 98° 34W

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	5/23	5/19	5/15	5/13	5/10	5/07	5/04	5/01	4/26
32	5/11	5/07	5/04	5/02	4/29	4/27	4/25	4/22	4/18
28	4/30	4/26	4/23	4/20	4/18	4/16	4/14	4/11	4/07
24	4/19	4/15	4/11	4/09	4/06	4/03	4/01	3/28	3/24
20	4/13	4/08	4/04	4/01	3/29	3/26	3/23	3/19	3/14
16	4/05	3/30	3/27	3/23	3/20	3/17	3/14	3/10	3/05
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	9/16	9/20	9/23	9/26	9/29	10/01	10/04	10/07	10/11
32	9/22	9/27	9/30	10/03	10/06	10/08	10/11	10/15	10/19
28	10/01	10/06	10/09	10/12	10/15	10/18	10/21	10/25	10/30
24	10/13	10/18	10/22	10/25	10/29	11/01	11/04	11/08	11/13
20	10/21	10/26	10/29	11/01	11/04	11/06	11/09	11/13	11/17
16	10/27	11/02	11/07	11/11	11/15	11/18	11/22	11/27	12/03
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	159	153	148	145	141	137	133	129	122
32	178	171	167	162	159	155	151	146	139
28	196	190	186	183	179	176	173	168	163
24	227	219	214	209	205	200	196	190	183
20	240	233	228	223	219	215	211	206	198
16	264	255	249	244	239	233	228	222	213

* 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

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NWS Call Sign:

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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	1513	1200	967	532	203	36	12	17	129	462	957	1388	7416
60	1358	1060	812	392	108	9	1	3	59	312	807	1233	6154
57	1265	976	719	315	68	2	0	1	31	230	717	1140	5464
55	1203	927	658	268	48	1	0	0	19	182	663	1078	5047
50	1052	796	513	166	16	0	0	0	4	87	524	928	4086
32	554	380	124	7	0	0	0	0	0	1	156	442	1664

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	64	105	179	468	861	1126	1333	1280	945	563	189	78	7191
55	0	7	1	39	195	436	620	567	274	30	6	0	2175
57	0	0	0	26	153	378	558	506	226	16	0	0	1863
60	0	0	0	13	100	295	465	415	163	6	0	0	1457
65	0	0	0	3	40	171	322	274	84	1	0	0	895
70	0	0	0	0	11	83	195	156	35	0	0	0	480

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	1	19	74	268	618	888	1087	1044	714	356	63	5	1	20	94	362	980	1868	2955	3999	4713	5069	5132	5137
45	0	1	33	164	465	738	932	889	567	230	27	0	0	1	34	198	663	1401	2333	3222	3789	4019	4046	4046
50	0	0	9	90	323	588	777	734	423	134	10	0	0	0	9	99	422	1010	1787	2521	2944	3078	3088	3088
55	0	0	1	46	195	443	622	579	290	61	2	0	0	0	1	47	242	685	1307	1886	2176	2237	2239	2239
60	0	0	0	17	104	298	468	425	176	25	0	0	0	0	0	17	121	419	887	1312	1488	1513	1513	1513
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	1	14	54	172	371	575	726	689	442	211	35	1	1	15	69	241	612	1187	1913	2602	3044	3255	3290	3291

(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