U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Service

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: DUPREE 15 SSE, SD **COOP ID: 392446**

Climate Division: SD 1 **NWS Call Sign:** **Elevation: 2,100 Feet** **Lat: 44˚52N** **Lon: 101˚28W**

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	25.5	4.2	14.9	67+	1981	23	28.9	1992	-40	1966	29	-.7	1978	1555	0	.0	.0	1.9	18.2	30.5	11.0
Feb	32.0	10.5	21.3	73	1982	21	33.8	1999	-32	1996	2	4.6	1979	1225	0	.0	.0	5.0	12.6	27.3	6.3
Mar	42.3	20.6	31.5	85	1967	29	39.5	1992	-30	1980	1	22.2	1975	1040	0	.0	.0	10.7	6.5	26.4	1.8
Apr	56.7	32.5	44.6	97	1980	21	51.2	1987	1+	1997	8	38.5	1983	613	1	.0	.2	22.4	1.0	14.0	.0
May	68.7	44.2	56.5	104	1969	27	63.8	1977	18	1967	3	50.9	1996	291	26	@	1.0	29.8	.0	2.6	.0
Jun	78.9	53.7	66.3	110+	1988	25	77.6	1988	30	1969	2	60.7	1982	90	129	.6	4.5	30.0	.0	@	.0
Jul	86.7	59.1	72.9	110	1977	18	77.7	1974	35	1971	31	64.8	1992	24	268	2.9	13.1	31.0	.0	.0	.0
Aug	86.1	57.2	71.7	111	1988	16	78.1	1983	35	1977	11	65.8	1992	39	246	2.4	13.3	31.0	.0	.0	.0
Sep	75.2	45.7	60.5	106+	1983	1	70.0	1998	13	1984	29	54.9	1986	199	62	.8	4.3	29.4	.0	2.4	.0
Oct	60.7	33.1	46.9	97	1963	4	50.5	1989	-5	1991	30	42.5	1972	561	0	.0	.3	25.3	.4	12.4	.1
Nov	41.3	18.6	30.0	83	1999	9	43.7	1999	-18	1985	27	14.0	1985	1051	0	.0	.0	9.9	7.2	27.0	1.5
Dec	29.1	8.2	18.7	72	1965	4	30.9	1999	-33	1967	31	.7	1983	1438	0	.0	.0	2.6	15.6	30.7	7.2
Ann	56.9	32.3	44.7	111	Aug 1988	16	78.1	Aug 1983	-40	Jan 1966	29	-.7	Jan 1978	8126	732	6.7	36.7	229.0	61.5	173.3	27.9

+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1963-2001

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

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Precipitation (inches)

Precipitation Totals

Month	Means/ Medians(1) Mean	Means/ Medians(1) Median	Extremes Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year
Jan	.32	.29	.65	1997	4	1.49	1997	.00+	1984
Feb	.47	.37	.96	1991	18	2.04	1987	.00+	1984
Mar	1.08	.59	2.17	1973	14	3.41	1987	.05	1978
Apr	1.64	1.41	2.71	1991	12	4.79	2000	.00	1981
May	3.03	2.73	2.50	1978	27	7.84	1982	.50	1979
Jun	2.98	2.87	3.40	1978	30	5.87	1993	.47	1997
Jul	2.58	2.25	2.43	1992	22	7.74	1992	.43	1971
Aug	1.52	1.19	1.72	1990	23	5.58	1987	.00	2000
Sep	1.29	.91	3.80	1996	18	8.17	1996	.10	1972
Oct	1.60	1.29	1.73	1995	5	5.75	1998	.09+	1988
Nov	.58	.40	1.23	1992	1	2.60	1985	.00+	1990
Dec	.36	.32	.70	1965	11	1.42	1996	.00	1986
Ann	17.45	17.32	3.80	Sep 1996	18	8.17	Sep 1996	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.9	1.2	@	.0
Feb	3.9	1.6	.2	.0
Mar	5.0	3.0	.6	.1
Apr	6.3	3.9	.8	.2
May	7.9	5.6	2.0	.8
Jun	8.4	6.3	1.8	.7
Jul	6.6	4.9	1.8	.6
Aug	4.9	3.4	1.0	.2
Sep	4.1	2.6	.6	.3
Oct	4.0	3.1	1.1	.4
Nov	3.7	1.8	.2	@
Dec	4.1	1.5	@	.0
Ann	62.8	38.9	10.1	3.3

Precipitation Probabilities (1)

Probability that the monthly/annual precipitation will be equal to or less than the indicated amount

Monthly/Annual Precipitation vs Probability Levels
These values were determined from the incomplete gamma distribution

Month	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.00	.00	.09	.15	.21	.27	.33	.41	.52	.68	.84
Feb	.00	.04	.12	.20	.27	.36	.46	.58	.75	1.02	1.29
Mar	.08	.15	.29	.44	.60	.79	1.02	1.31	1.72	2.40	3.07
Apr	.07	.21	.46	.69	.95	1.24	1.59	2.02	2.60	3.57	4.53
May	.59	.86	1.30	1.71	2.13	2.57	3.08	3.69	4.50	5.80	7.03
Jun	.85	1.13	1.56	1.93	2.29	2.67	3.09	3.58	4.23	5.23	6.17
Jul	.55	.79	1.16	1.51	1.85	2.22	2.63	3.13	3.79	4.83	5.82
Aug	.08	.22	.45	.68	.92	1.18	1.49	1.87	2.40	3.26	4.10
Sep	.07	.15	.30	.48	.68	.91	1.19	1.56	2.07	2.94	3.80
Oct	.10	.19	.39	.60	.85	1.14	1.48	1.93	2.56	3.62	4.67
Nov	.00	.00	.09	.18	.28	.40	.54	.71	.95	1.36	1.77
Dec	.03	.07	.12	.18	.23	.29	.36	.44	.55	.73	.91
Ann	10.17	11.47	13.19	14.54	15.76	16.97	18.23	19.65	21.40	24.00	26.29

\+ 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: 1963-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	5.8	5.0	5	4	9.0	1996	18	26.2	1997	32	1997	18	28	1997	3.3	2.3	.8	.1	.0	15.3	12.0	9.4	2.0
Feb	6.0	4.5	4	1	11.0	1991	18	20.4	1987	27	1997	15	22	1997	3.3	2.2	.7	.3	@	13.1	8.8	7.3	3.2
Mar	6.7	4.0	2	1	9.0	1975	23	31.2	1975	18+	1997	7	10	1997	3.0	2.1	1.2	.4	.0	8.3	5.8	3.8	1.4
Apr	4.7	2.0	1	#	28.0	1991	12	35.0	1991	30	1991	12	13	1997	1.9	1.4	.7	.3	.1	2.3	1.6	1.0	.6
May	.3	.0	#	0	6.0	1991	3	6.0	1991	5	1991	3	#+	2000	.1	.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	0	#	1985	30	#+	1985	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	1.4	.0	#	#	7.0	1991	29	8.0	1991	8	1991	31	1+	1999	.6	.5	.2	@	.0	.7	.4	.2	.0
Nov	5.6	3.9	2	1	12.0	1985	9	32.2	1985	31	1985	30	15	1985	2.6	2.0	.7	.2	@	7.8	5.6	3.6	1.6
Dec	6.2	4.3	4	1	8.0	1975	14	30.5	1996	36	1985	21	32	1985	3.2	2.1	.7	.2	.0	13.2	7.3	4.2	2.4
Ann	36.7	23.7	N/A	N/A	28.0	Apr 1991	12	35.0	Apr 1991	36	Dec 1985	21	32	Dec 1985	18.0	12.7	5.0	1.5	.1	60.7	41.5	29.5	11.2

+ 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	6/18	6/09	6/03	5/29	5/24	5/19	5/14	5/08	4/30
32	5/26	5/20	5/17	5/13	5/10	5/07	5/04	4/30	4/25
28	5/16	5/11	5/08	5/05	5/02	4/29	4/26	4/22	4/18
24	5/07	5/02	4/28	4/25	4/22	4/19	4/16	4/12	4/07
20	4/28	4/23	4/19	4/15	4/12	4/08	4/05	4/01	3/26
16	4/15	4/10	4/06	4/02	3/30	3/27	3/24	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	9/02	9/07	9/11	9/14	9/17	9/20	9/23	9/27	10/02
32	9/07	9/13	9/16	9/20	9/23	9/26	9/29	10/03	10/09
28	9/15	9/20	9/24	9/28	10/01	10/04	10/08	10/12	10/17
24	9/27	10/02	10/05	10/08	10/11	10/14	10/17	10/21	10/26
20	10/07	10/13	10/17	10/21	10/24	10/27	10/31	11/04	11/10
16	10/12	10/19	10/24	10/29	11/02	11/06	11/11	11/16	11/23

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	144	134	127	121	115	109	103	96	86
32	161	152	146	140	135	130	124	118	109
28	174	167	161	156	152	147	142	137	129
24	195	187	181	176	172	167	162	156	148
20	218	210	204	199	195	190	185	179	171
16	244	234	228	222	216	211	205	198	188

***** 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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Degree Days to Selected Base Temperatures (˚F)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1555	1225	1040	613	291	90	24	39	199	561	1051	1438	8126
60	1400	1085	885	468	178	36	7	14	109	407	901	1283	6773
57	1307	1008	792	385	124	19	1	6	69	318	811	1190	6030
55	1246	957	731	332	94	11	0	3	48	262	753	1128	5565
50	1098	825	585	216	40	2	0	0	16	142	615	983	4522
32	601	413	170	13	0	0	0	0	0	4	213	496	1910

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	69	112	153	390	758	1029	1267	1230	854	466	152	80	6560
55	1	12	1	20	139	351	554	520	212	11	2	0	1823
57	0	8	0	12	107	298	493	460	173	5	0	0	1556
60	0	0	0	5	68	226	406	375	123	2	0	0	1205
65	0	0	0	1	26	129	268	246	62	0	0	0	732
70	0	0	0	0	7	61	158	144	26	0	0	0	396

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	2	11	55	232	540	814	1043	1014	646	294	46	2	2	13	68	300	840	1654	2697	3711	4357	4651	4697	4699
45	0	0	22	135	394	664	888	859	498	179	17	0	0	0	22	157	551	1215	2103	2962	3460	3639	3656	3656
50	0	0	5	69	261	515	733	704	361	97	4	0	0	0	5	74	335	850	1583	2287	2648	2745	2749	2749
55	0	0	0	28	151	371	578	549	239	41	0	0	0	0	0	28	179	550	1128	1677	1916	1957	1957	1957
60	0	0	0	12	74	234	425	396	140	13	0	0	0	0	0	12	86	320	745	1141	1281	1294	1294	1294
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	19	51	165	336	516	668	643	412	214	46	9	2	21	72	237	573	1089	1757	2400	2812	3026	3072	3081

(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

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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.
Compete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normals/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 are 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.

a. Temperature/ Precipitation Tables
   1. 1971-2000 Monthly Normals
   2. Cooperative Summary of the Day
   3. National Weather Service station records
   4. 1971-2000 serially complete daily data

b. Degree Day Table
   1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
   2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data

c. Snow Tables
   1. Snow Climatology
   2. Cooperative Summary of the Day

d. Freeze Data Table
   1971-2000 serially complete daily data

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normals.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normals/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