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: KIRLEY 6 N, SD **COOP ID: 394596**

Climate Division: SD 6 **NWS Call Sign:** **Elevation: 2,160 Feet** **Lat: 44˚37N** **Lon: 101˚20W**

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	27.6	6.7	17.2	69	1987	13	30.1	1990	-27+	1982	10	2.0	1978	1485	0	.0	.0	1.8	17.3	30.2	10.3
Feb	34.2	13.2	23.7	72+	1995	22	36.2	1999	-34	1994	9	8.3	1979	1157	0	.0	.0	5.1	12.4	26.9	5.8
Mar	43.9	22.6	33.3	83	1988	28	40.7	1986	-24	1998	11	23.1	1996	984	0	.0	.0	11.1	6.4	26.2	1.7
Apr	58.1	34.4	46.3	98	1980	22	53.0	1981	0	1975	3	39.7	1995	564	2	.0	.2	22.0	.9	13.0	@
May	69.8	46.1	58.0	101	1992	20	65.7	1977	24	1980	8	51.9	1996	252	34	@	1.2	29.6	.0	1.7	.0
Jun	80.0	55.6	67.8	110	1988	25	79.0	1988	36	1998	3	62.3	1993	70	153	.6	4.3	30.0	.0	.0	.0
Jul	87.8	60.8	74.3	110	1998	19	80.1	1974	41	1971	30	65.2	1992	18	307	3.1	13.4	31.0	.0	.0	.0
Aug	87.7	59.2	73.5	110	1988	16	80.0	1983	38	1974	31	65.9	1992	25	287	2.7	13.7	31.0	.0	.0	.0
Sep	76.6	48.4	62.5	108	1976	7	70.6	1998	22	1974	30	56.9	1993	155	80	.8	4.8	29.4	.0	1.2	.0
Oct	62.0	36.3	49.2	97	1989	1	52.8	1973	-3	1991	30	45.7	1976	491	0	.0	.5	25.2	.4	9.3	@
Nov	42.9	21.9	32.4	84	1999	9	43.6	1999	-15+	1985	28	17.2	1985	978	0	.0	.0	10.3	7.1	25.9	1.2
Dec	31.2	10.6	20.9	70	1998	2	31.4	1999	-33	1990	30	3.7	1983	1368	0	.0	.0	3.1	15.5	30.4	6.5
Ann	58.5	34.7	46.6	110+	Jul 1998	19	80.1	Jul 1974	-34	Feb 1994	9	2.0	Jan 1978	7547	863	7.2	38.1	229.6	60.0	164.8	25.5

\+ 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

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1970-2001

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

Issue Date: February 2004

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: KIRLEY 6 N, SD **COOP ID: 394596**

Climate Division: SD 6 **NWS Call Sign:** **Elevation: 2,160 Feet** **Lat: 44˚37N** **Lon: 101˚20W**

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	.43	.41	1.16	1997	4	1.36	1997	.02	1984
Feb	.62	.45	1.17	1987	27	2.56	1987	.07	1999
Mar	1.38	.99	1.93	1977	29	4.26	1977	.15	1971
Apr	1.91	1.61	1.85	2000	19	5.93	1986	.07+	1987
May	3.10	2.98	2.53	1973	27	6.37	1982	.43	1980
Jun	2.87	2.66	2.62	1994	8	6.95	1984	.95	1974
Jul	2.63	2.46	2.26	2001	24	6.29	1992	.10	1971
Aug	1.71	1.73	1.78	1977	15	4.42	1978	.09	2000
Sep	1.35	.76	2.46	1971	5	5.33	1977	.09	1972
Oct	1.65	1.35	2.63	1982	9	5.35	1998	.11	1978
Nov	.68	.61	1.19	1992	1	2.27	1985	.02	1999
Dec	.50	.44	.57	1993	17	1.71	1996	.00+	1991
Ann	18.83	18.84	2.63	Oct 1982	9	6.95	Jun 1984	.00+	Dec 1991

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.0	1.4	.1	@
Feb	4.6	1.8	.3	.1
Mar	6.5	3.4	.6	.2
Apr	7.7	4.5	1.3	.3
May	10.0	6.0	2.1	.8
Jun	10.0	6.5	1.6	.5
Jul	8.4	5.1	2.0	.6
Aug	6.3	3.6	1.2	.3
Sep	5.3	2.9	.7	.3
Oct	5.8	3.4	1.1	.3
Nov	4.8	2.0	.3	.1
Dec	5.3	1.8	.1	.0
Ann	79.7	42.4	11.4	3.5

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	.04	.08	.14	.20	.26	.33	.42	.53	.68	.92	1.16
Feb	.07	.12	.20	.29	.38	.49	.61	.76	.96	1.30	1.62
Mar	.16	.27	.46	.65	.86	1.09	1.35	1.68	2.13	2.87	3.59
Apr	.18	.31	.57	.83	1.12	1.45	1.84	2.32	2.99	4.10	5.19
May	.82	1.11	1.56	1.96	2.34	2.75	3.20	3.74	4.44	5.54	6.56
Jun	1.00	1.27	1.67	2.00	2.31	2.64	2.99	3.41	3.93	4.75	5.50
Jul	.53	.77	1.16	1.51	1.87	2.25	2.68	3.20	3.89	5.00	6.05
Aug	.21	.34	.58	.82	1.08	1.36	1.69	2.09	2.64	3.55	4.43
Sep	.09	.18	.35	.53	.74	.98	1.27	1.64	2.15	3.01	3.86
Oct	.13	.24	.46	.68	.94	1.23	1.57	2.01	2.61	3.63	4.63
Nov	.04	.08	.17	.26	.37	.49	.64	.83	1.09	1.54	1.99
Dec	.00	.07	.17	.25	.33	.41	.51	.63	.79	1.04	1.29
Ann	11.65	12.97	14.70	16.03	17.24	18.42	19.66	21.04	22.73	25.23	27.42

\+ 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: 1970-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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

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: KIRLEY 6 N, SD **COOP ID: 394596**

Climate Division: SD 6 **NWS Call Sign:** **Elevation: 2,160 Feet** **Lat: 44°37N** **Lon: 101°20W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	5.8	5.7	4	3
Feb	7.4	6.1	4	3
Mar	9.2	4.8	3	2
Apr	4.6	2.0	1	#
May	.4	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	#	.0	0	0
Oct	1.4	.0	#	#
Nov	6.0	5.2	1	1
Dec	6.8	6.5	3	2
Ann	41.6	30.3	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	7.0	1992	8	17.1	1996	19	1997	17	18	1997
Feb	12.0	1987	27	30.0	1987	24	1997	4	18	1997
Mar	13.0	1975	28	38.6	1975	30	1975	28	10	1978
Apr	14.0	1995	11	26.8	1995	17	1975	1	7	1975
May	4.0	1991	3	6.7	1979	4	1991	3	#+	1994
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	#	1984	24	#+	1984	0	0	0	0	0
Oct	6.0	1989	30	8.5	1971	7	1991	30	1	1991
Nov	14.0	1985	9	38.4	1985	15	1985	30	7	1985
Dec	8.0	1984	2	22.0	1996	19	1996	23	13	1996
Ann	14.0+	Apr 1995	11	38.6	Mar 1975	30	Mar 1975	28	18+	Feb 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.7	2.2	.5	.1	.0
Feb	5.1	2.3	.8	.3	.1
Mar	4.8	2.4	1.1	.6	.1
Apr	2.1	1.6	.6	.3	@
May	.2	.1	.1	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.9	.6	.1	.1	.0
Nov	4.1	1.8	.7	.2	@
Dec	5.7	2.5	.6	.2	.0
Ann	28.6	13.5	4.5	1.8	.2

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	20.3	13.1	8.3	1.0
Feb	15.0	10.2	7.2	2.6
Mar	10.1	6.3	4.5	1.4
Apr	2.6	1.5	.8	.3
May	.1	.1	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.6	.3	.1	.0
Nov	7.9	4.7	2.7	.3
Dec	17.0	9.0	6.5	2.3
Ann	73.6	45.2	30.1	7.9

+ 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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: KIRLEY 6 N, SD **COOP ID: 394596**

Climate Division: SD 6 **NWS Call Sign:** **Elevation: 2,160 Feet** **Lat: 44˚37N** **Lon: 101˚20W**

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

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	9/14	9/16	9/18	9/20	9/22	9/24	9/27	9/30
32	9/15	9/20	9/23	9/26	9/29	10/01	10/04	10/07	10/12
28	9/21	9/27	10/01	10/05	10/09	10/12	10/16	10/21	10/27
24	10/01	10/07	10/11	10/15	10/18	10/21	10/25	10/29	11/04
20	10/15	10/21	10/25	10/28	11/01	11/04	11/07	11/12	11/17
16	10/19	10/26	10/30	11/04	11/07	11/11	11/15	11/20	11/26

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	140	136	132	129	126	122	118	113
32	164	157	153	148	145	141	137	132	125
28	192	184	178	172	168	163	157	151	143
24	209	202	196	192	188	184	179	174	167
20	232	224	219	214	210	205	201	195	188
16	252	243	236	231	226	221	215	209	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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: KIRLEY 6 N, SD **COOP ID: 394596**

Climate Division: SD 6 **NWS Call Sign:** **Elevation: 2,160 Feet** **Lat: 44˚37N** **Lon: 101˚20W**

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	1485	1157	984	564	252	70	18	25	155	491	978	1368	7547
60	1330	1017	829	421	148	26	4	7	77	339	828	1213	6239
57	1237	941	736	342	99	13	0	3	44	252	738	1120	5525
55	1176	890	677	292	73	7	0	1	28	198	684	1058	5084
50	1033	759	533	185	29	1	0	0	8	92	543	916	4099
32	541	359	144	9	0	0	0	0	0	1	166	438	1658

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	79	126	183	437	805	1073	1312	1284	915	533	179	93	7019
55	2	13	3	30	165	390	599	572	253	17	6	0	2050
57	0	9	0	20	129	335	537	512	209	9	0	0	1760
60	0	0	0	9	85	258	448	423	152	3	0	0	1378
65	0	0	0	2	34	153	307	287	80	0	0	0	863
70	0	0	0	0	10	77	188	174	35	0	0	0	484

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	20	64	250	565	833	1063	1035	675	321	60	2	2	22	86	336	901	1734	2797	3832	4507	4828	4888	4890
45	0	1	27	148	416	683	908	880	533	204	23	0	0	1	28	176	592	1275	2183	3063	3596	3800	3823	3823
50	0	0	7	80	281	533	753	725	393	116	9	0	0	0	7	87	368	901	1654	2379	2772	2888	2897	2897
55	0	0	2	41	168	390	598	571	268	56	0	0	0	0	2	43	211	601	1199	1770	2038	2094	2094	2094
60	0	0	0	14	89	257	447	419	164	21	0	0	0	0	0	14	103	360	807	1226	1390	1411	1411	1411
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	23	54	167	336	528	688	658	419	213	50	6	1	24	78	245	581	1109	1797	2455	2874	3087	3137	3143

(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.
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