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: IPSWICH, SD **COOP ID: 394206**

Climate Division: SD 2 **NWS Call Sign:** **Elevation: 1,530 Feet** **Lat: 45˚27N** **Lon: 99˚02W**

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	21.5	-1.0	10.3	65	1981	23	24.7	1990	-35	1972	15	-4.5	1982	1699	0	.0	.0	.5	21.3	31.0	15.3
Feb	28.3	5.6	17.0	66	1992	29	29.5	1987	-38	1994	9	-1.0	1979	1346	0	.0	.0	2.7	15.5	27.9	9.6
Mar	40.2	16.9	28.6	81+	1963	31	36.7	2000	-22+	1995	8	20.3	1996	1131	0	.0	.0	8.6	7.6	28.5	3.0
Apr	57.0	29.3	43.2	97	1992	30	51.8	1987	-8	1975	3	35.6	1975	655	0	.0	.2	22.3	.7	17.3	.1
May	69.8	41.3	55.6	102	1969	27	61.8+	1988	18	1981	10	49.7	1979	311	18	.0	.4	30.5	.0	3.4	.0
Jun	78.5	51.1	64.8	106+	1988	24	74.5	1988	28	1985	3	58.3	1985	101	94	.2	3.0	30.0	.0	@	.0
Jul	84.7	56.1	70.4	108+	1973	11	75.5	1988	36	1971	30	62.6	1992	34	200	1.3	9.4	31.0	.0	.0	.0
Aug	83.0	53.6	68.3	110	1965	13	74.0	1983	35	1982	27	63.1	1992	52	155	1.0	8.4	31.0	.0	.0	.0
Sep	73.0	43.0	58.0	105	1983	2	63.5	1998	16+	1984	26	52.5	1984	236	25	.2	2.8	29.6	.0	2.7	.0
Oct	59.5	31.3	45.4	93+	1963	5	49.1	2000	-4	1984	30	40.3	1976	608	0	.0	@	25.7	.3	15.2	@
Nov	38.2	16.9	27.6	77	1999	8	39.7	1999	-24	1964	30	14.6	1985	1122	0	.0	.0	7.7	9.6	28.1	2.1
Dec	25.3	4.2	14.8	65	1998	1	27.1	1997	-40	1983	23	-3.4	1983	1558	0	.0	.0	1.3	19.9	30.9	10.8
Ann	54.9	29.0	42.0	110	Aug 1965	13	75.5	Jul 1988	-40	Dec 1983	23	-4.5	Jan 1982	8853	492	2.7	24.2	220.9	74.9	185.0	40.9

\+ 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: 1948-2001

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

Issue Date: February 2004

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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	.41	.38	.60	1950	24	1.01	1997	.03	1974
Feb	.44	.46	1.30	1958	27	1.06	1987	.03	1985
Mar	1.21	1.11	1.95	1981	31	3.67	1977	.07	1988
Apr	1.91	1.80	2.05	1967	30	6.10	1986	.00	1987
May	2.70	2.35	3.03	1964	3	7.22	1991	.57	1989
Jun	3.44	3.37	3.73	1969	25	7.05	1984	.51	1974
Jul	3.02	2.70	5.02	1994	7	10.65	1993	.34	1975
Aug	2.22	2.02	3.03	1994	9	6.04	1980	.18	1972
Sep	1.64	1.15	2.40	1996	19	6.43	1996	.04	1972
Oct	1.49	.99	2.26	1982	9	5.46	1998	.00+	1993
Nov	.71	.48	1.40	1981	30	2.32	1977	.00+	1999
Dec	.30	.24	.81	1965	11	.91	1993	.00+	1986
Ann	19.49	19.71	5.02	Jul 1994	7	10.65	Jul 1993	.00+	Nov 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.3	1.2	.1	.0
Feb	3.8	1.3	.1	.0
Mar	5.4	2.9	.8	.2
Apr	6.4	4.3	1.4	.3
May	7.7	5.8	1.7	.6
Jun	8.6	6.5	2.4	.8
Jul	7.8	5.8	2.1	.7
Aug	5.9	4.1	1.4	.6
Sep	4.8	3.3	.9	.4
Oct	4.1	2.7	.9	.4
Nov	4.4	2.2	.2	.1
Dec	3.6	.9	.0	.0
Ann	66.8	41.0	12.0	4.1

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	.07	.13	.19	.25	.32	.40	.50	.64	.87	1.09
Feb	.08	.12	.18	.24	.30	.37	.44	.53	.65	.85	1.04
Mar	.17	.27	.45	.61	.79	.98	1.20	1.48	1.85	2.45	3.03
Apr	.17	.39	.70	.98	1.27	1.58	1.93	2.35	2.92	3.84	4.72
May	.64	.90	1.29	1.64	1.99	2.37	2.78	3.27	3.92	4.95	5.92
Jun	.85	1.18	1.68	2.13	2.57	3.03	3.55	4.16	4.97	6.25	7.44
Jul	.53	.80	1.24	1.65	2.08	2.53	3.05	3.68	4.53	5.88	7.18
Aug	.42	.62	.94	1.24	1.55	1.87	2.25	2.70	3.30	4.26	5.17
Sep	.10	.19	.39	.61	.86	1.16	1.52	1.98	2.63	3.73	4.82
Oct	.00	.12	.36	.59	.84	1.11	1.44	1.84	2.40	3.32	4.23
Nov	.00	.00	.10	.21	.33	.47	.65	.87	1.18	1.72	2.25
Dec	.00	.02	.06	.10	.15	.21	.28	.37	.49	.70	.91
Ann	12.38	13.69	15.41	16.74	17.93	19.10	20.31	21.67	23.33	25.77	27.90

\+ 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

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.0	5.0	5	4
Feb	5.7	5.0	4	3
Mar	6.3	4.5	2	1
Apr	2.2	1.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.5	.0	#	0
Nov	6.5	4.0	1	#
Dec	5.1	4.0	4	1
Ann	32.3	23.5	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	10.0	1997	4	18.5	1997	30	1997	10	24	1997
Feb	8.0	1977	23	13.0	1994	24	1997	5	20	1997
Mar	10.0	1982	19	26.5	1975	25	1975	31	10	1997
Apr	7.0	1995	11	19.0	1995	14	1995	13	4	1995
May	1.0	1991	3	1.0	1991	1	1991	3	#	1991
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	.0	0	0	.0	0	0	0	0	0	0
Oct	4.0	1976	18	5.5	1971	4	1976	18	#+	1999
Nov	9.0	1993	24	24.0	1993	20	1993	26	6	1996
Dec	9.0	1988	26	17.0	1977	20	1985	5	16	1993
Ann	10.0+	Jan 1997	4	26.5	Mar 1975	30	Jan 1997	10	24	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.9	2.8	.7	.1	@
Feb	3.2	2.7	.6	.2	.0
Mar	2.9	2.6	.8	.2	@
Apr	1.0	.9	.4	.1	.0
May	@	@	.0	.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	.2	.2	.1	.0	.0
Nov	2.9	2.4	1.0	.3	.0
Dec	3.2	2.5	.4	.1	.0
Ann	17.3	14.1	4.0	1.0	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	21.5	14.5	10.0	3.1
Feb	17.2	11.8	7.5	2.9
Mar	11.0	6.2	3.8	1.0
Apr	1.6	1.0	.5	.2
May	@	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.3	.1	.0	.0
Nov	7.4	3.7	2.5	1.0
Dec	14.9	10.1	8.4	5.1
Ann	73.9	47.4	32.7	13.3

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

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	9/01	9/05	9/08	9/11	9/13	9/16	9/19	9/22	9/26
32	9/11	9/15	9/18	9/20	9/22	9/24	9/26	9/29	10/02
28	9/17	9/22	9/26	9/29	10/02	10/05	10/08	10/11	10/16
24	9/23	9/28	10/02	10/05	10/08	10/11	10/15	10/18	10/24
20	9/30	10/06	10/10	10/14	10/18	10/21	10/25	10/29	11/04
16	10/08	10/15	10/20	10/24	10/28	11/01	11/05	11/10	11/17

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	141	131	124	118	112	106	100	93	83
32	154	147	142	137	133	128	124	119	111
28	173	165	159	155	150	146	141	135	127
24	190	183	177	173	169	165	160	155	148
20	212	204	199	195	190	186	182	176	169
16	234	226	221	216	211	206	201	195	187

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1699	1346	1131	655	311	101	34	52	236	608	1122	1558	8853
60	1544	1206	976	510	191	40	9	16	129	453	972	1403	7449
57	1451	1122	883	425	134	19	2	6	80	361	882	1310	6675
55	1389	1066	821	372	103	12	0	3	54	301	822	1248	6191
50	1235	939	670	251	45	2	0	0	15	169	680	1094	5100
32	719	500	222	21	0	0	0	0	0	4	243	592	2301

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	44	78	114	356	730	983	1189	1125	779	420	111	57	5986
55	0	0	0	17	119	305	476	415	144	4	0	0	1480
57	0	0	0	11	89	252	417	356	109	2	0	0	1236
60	0	0	0	5	53	183	331	273	68	0	0	0	913
65	0	0	0	0	18	94	200	155	25	0	0	0	492
70	0	0	0	0	4	36	106	72	7	0	0	0	225

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	1	32	203	539	791	986	933	591	250	24	0	0	1	33	236	775	1566	2552	3485	4076	4326	4350	4350
45	0	0	6	116	390	641	831	778	445	146	8	0	0	0	6	122	512	1153	1984	2762	3207	3353	3361	3361
50	0	0	1	59	254	492	676	623	309	66	0	0	0	0	1	60	314	806	1482	2105	2414	2480	2480	2480
55	0	0	0	27	140	346	521	468	194	27	0	0	0	0	0	27	167	513	1034	1502	1696	1723	1723	1723
60	0	0	0	8	65	210	366	317	105	7	0	0	0	0	0	8	73	283	649	966	1071	1078	1078	1078
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	3	36	162	345	498	635	596	382	189	28	0	0	3	39	201	546	1044	1679	2275	2657	2846	2874	2874

(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:
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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