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: WALTHILL, NE **COOP ID: 258935**

Climate Division: NE 3 **NWS Call Sign:** **Elevation: 1,220 Feet** **Lat: 42˚09N** **Lon: 96˚29W**

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	30.7	9.9	20.3	69	1981	24	31.5	1992	-33+	1970	19	6.5	1979	1386	0	.0	.0	2.3	15.6	30.6	7.8
Feb	37.4	15.9	26.7	72	1999	10	36.5	1987	-34	1962	28	11.7	1979	1074	0	.0	.0	6.0	10.5	26.1	4.5
Mar	49.6	25.6	37.6	89	1986	29	44.0	2000	-25	1960	5	29.9	1984	850	0	.0	.0	15.1	3.5	22.9	.9
Apr	63.7	36.7	50.2	95	1980	22	58.5	1981	6	1982	6	43.1	1983	451	6	.0	.6	26.2	.2	9.8	@
May	74.9	48.4	61.7	104	1967	25	68.0	1988	20	1961	2	56.6	1997	172	69	.0	1.2	30.9	.0	1.4	.0
Jun	84.6	58.2	71.4	107	1988	21	78.0	1988	35+	1983	6	65.9	1982	19	211	.4	8.1	30.0	.0	.0	.0
Jul	88.0	62.7	75.4	108	1995	12	79.7	1974	37	1971	30	69.1	1992	4	325	.9	13.3	31.0	.0	.0	.0
Aug	85.8	61.1	73.5	106	1955	26	80.3	1983	36	1986	28	67.2	1992	14	277	.3	9.0	31.0	.0	.0	.0
Sep	78.7	51.0	64.9	103	2000	2	70.7	1998	20	1984	29	59.6	1993	86	81	.1	3.6	30.0	.0	1.1	.0
Oct	66.0	38.9	52.5	93+	1963	6	57.0	1973	8+	1993	31	46.9	1976	392	2	.0	.2	28.5	.1	8.6	.0
Nov	46.6	25.6	36.1	82	1999	8	45.5	1999	-18	1959	14	27.1	1985	867	0	.0	.0	12.7	3.9	22.6	.6
Dec	33.4	13.7	23.6	76	1998	1	31.2	1979	-27	1989	23	5.8	1983	1285	0	.0	.0	2.9	13.2	30.1	5.0
Ann	61.6	37.3	49.5	108	Jul 1995	12	80.3	Aug 1983	-34	Feb 1962	28	5.8	Dec 1983	6600	971	1.7	36.0	246.6	47.0	153.2	18.8

\+ 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

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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	.63	.51	1.34	1949	3	1.73	1975	.00	1986
Feb	.76	.56	1.70	1969	14	2.94	1971	.00+	1996
Mar	2.19	1.71	2.70	1987	23	7.79	1987	.02	1994
Apr	3.05	2.44	2.37	2001	11	9.88	1984	.62	1981
May	4.12	3.56	2.85	1962	21	7.41	1996	1.24	1994
Jun	4.22	3.44	5.50	2000	25	9.73	1984	1.23	1972
Jul	3.72	3.09	5.48	1996	17	9.33	1972	.26	1974
Aug	3.05	3.20	3.95	1960	28	6.99	1993	.47	2000
Sep	2.69	2.64	2.90	1989	8	6.31	1988	.07	1999
Oct	2.12	2.20	3.54	1979	30	5.83	1984	.02	1988
Nov	1.51	1.33	2.34	2001	24	5.80	1983	.01	1976
Dec	.77	.63	1.30	1970	10	2.60	1982	.22	1976
Ann	28.83	29.49	5.50	Jun 2000	25	9.88	Apr 1984	.00+	Feb 1996

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.4	1.9	.2	.1
Feb	4.1	2.1	.3	.1
Mar	7.3	4.4	1.5	.4
Apr	8.6	5.8	2.2	.8
May	10.1	7.2	2.8	1.0
Jun	9.4	6.9	2.8	1.1
Jul	8.4	5.7	2.4	.8
Aug	8.9	5.3	1.8	.7
Sep	7.7	4.7	1.6	.6
Oct	6.1	4.1	1.5	.5
Nov	5.1	3.1	1.1	.4
Dec	4.6	2.5	.4	.0
Ann	84.7	53.7	18.6	6.5

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	.03	.09	.19	.28	.38	.49	.62	.78	.99	1.35	1.70
Feb	.00	.11	.26	.39	.51	.63	.78	.95	1.18	1.55	1.91
Mar	.20	.35	.65	.95	1.28	1.66	2.11	2.67	3.45	4.74	6.01
Apr	.57	.84	1.29	1.70	2.12	2.58	3.09	3.71	4.54	5.87	7.13
May	1.88	2.24	2.74	3.15	3.53	3.91	4.32	4.79	5.37	6.26	7.06
Jun	1.07	1.47	2.08	2.62	3.16	3.72	4.35	5.10	6.08	7.62	9.06
Jul	.63	.96	1.50	2.01	2.53	3.10	3.75	4.54	5.59	7.29	8.92
Aug	.74	1.03	1.48	1.87	2.26	2.68	3.14	3.69	4.41	5.55	6.62
Sep	.43	.66	1.05	1.42	1.80	2.22	2.70	3.28	4.06	5.33	6.54
Oct	.16	.30	.57	.86	1.19	1.56	2.01	2.58	3.37	4.69	6.00
Nov	.13	.23	.43	.64	.87	1.13	1.44	1.84	2.38	3.29	4.19
Dec	.19	.26	.37	.47	.57	.68	.79	.93	1.11	1.40	1.68
Ann	18.32	20.27	22.81	24.77	26.53	28.26	30.05	32.05	34.51	38.11	41.26

\+ 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	5.0	4.3	3	2
Feb	5.2	4.2	3	1
Mar	5.7	4.0	1	#
Apr	2.5	1.0	#	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.9	.0	#	0
Nov	4.7	2.3	1	#
Dec	5.7	5.0	2	1
Ann	29.7	20.8	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	1982	22	14.0	1973	19	1979	31	12	1979
Feb	9.0	1993	21	17.0	1993	20	1979	13	18	1979
Mar	13.0	1983	26	18.0	1985	16	1979	5	9	1979
Apr	9.0	1986	14	12.0	1997	10	1997	12	1+	1997
May	.0	0	0	.0	0	0	0	0	0	0
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	8.0	1991	31	8.0	1991	8	1991	31	#+	1997
Nov	12.0	1983	27	21.0	1983	18	1983	29	5	1991
Dec	8.0	1978	2	13.0	1994	18	1983	30	15	1983
Ann	13.0	Mar 1983	26	21.0	Nov 1983	20	Feb 1979	13	18	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.2	2.0	.6	.2	.0
Feb	2.7	1.9	.5	.3	.0
Mar	2.3	1.7	.8	.4	.1
Apr	1.0	.9	.5	.1	.0
May	.0	.0	.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
Nov	2.2	1.5	.6	.2	@
Dec	3.2	2.3	.7	.3	.0
Ann	14.8	10.5	3.8	1.5	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	13.6	7.4	4.7	1.5
Feb	12.5	8.3	5.5	3.7
Mar	6.0	3.5	2.3	.8
Apr	.7	.5	.3	.1
May	.0	.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	.2	.1	.0
Nov	5.4	2.4	1.4	.8
Dec	13.9	7.4	4.1	.6
Ann	52.4	29.7	18.4	7.5

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

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	9/08	9/12	9/14	9/17	9/19	9/21	9/24	9/27	10/01
32	9/19	9/22	9/24	9/26	9/28	9/30	10/02	10/04	10/07
28	9/21	9/27	10/01	10/04	10/08	10/11	10/14	10/18	10/24
24	10/03	10/08	10/12	10/15	10/19	10/22	10/25	10/29	11/03
20	10/09	10/16	10/21	10/25	10/28	11/01	11/05	11/10	11/16
16	10/18	10/25	10/29	11/03	11/06	11/10	11/14	11/19	11/25

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	152	144	138	133	128	123	118	112	104
32	166	160	155	151	148	144	140	136	130
28	190	181	175	170	165	160	155	149	140
24	207	200	195	190	186	182	178	173	165
20	241	231	224	218	212	206	200	193	184
16	253	244	238	232	227	222	217	211	202

***** 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	1386	1074	850	451	172	19	4	14	86	392	867	1285	6600
60	1231	934	695	316	91	4	0	2	28	251	717	1130	5399
57	1138	850	603	245	57	1	0	0	11	180	629	1037	4751
55	1076	802	545	202	39	0	0	0	5	139	571	975	4354
50	926	671	404	114	13	0	0	0	0	65	434	822	3449
32	438	278	73	2	0	0	0	0	0	0	93	343	1227

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	75	128	245	547	920	1182	1344	1286	985	634	216	82	7644
55	0	8	5	58	247	492	631	573	300	59	4	0	2377
57	0	0	1	40	202	433	569	511	246	38	1	0	2041
60	0	0	0	22	143	345	476	420	173	17	0	0	1596
65	0	0	0	6	69	211	325	277	81	2	0	0	971
70	0	0	0	1	26	105	187	158	28	0	0	0	505

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	22	114	344	688	955	1108	1044	760	410	78	3	1	23	137	481	1169	2124	3232	4276	5036	5446	5524	5527
45	0	3	55	220	533	805	953	889	611	281	32	1	0	3	58	278	811	1616	2569	3458	4069	4350	4382	4383
50	0	0	21	131	382	655	798	734	464	164	12	0	0	0	21	152	534	1189	1987	2721	3185	3349	3361	3361
55	0	0	5	68	246	505	643	579	324	81	2	0	0	0	5	73	319	824	1467	2046	2370	2451	2453	2453
60	0	0	1	32	137	360	488	424	205	34	0	0	0	0	1	33	170	530	1018	1442	1647	1681	1681	1681
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	28	91	236	437	627	740	699	498	275	61	6	2	30	121	357	794	1421	2161	2860	3358	3633	3694	3700

(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