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: MOUND VALLEY 3 WSW, KS **COOP ID: 145536**

Climate Division: KS 9 **NWS Call Sign:** **Elevation: 800 Feet** **Lat: 37˚11N** **Lon: 95˚27W**

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	41.8	19.3	30.6	74+	1986	21	39.4	1990	-20+	1984	21	17.7	1979	1069	0	.0	.0	9.9	7.3	27.5	2.0
Feb	48.9	24.4	36.7	86	1962	12	47.6	1976	-16	1979	1	24.5	1978	794	0	.0	.0	13.6	3.8	21.8	1.0
Mar	58.6	34.2	46.4	90+	1974	31	51.4	1974	-2	1967	8	39.9	1996	577	0	.0	@	23.4	.6	13.0	.0
Apr	68.1	43.7	55.9	100	1972	12	61.6	1981	14	1957	13	49.0	1983	289	17	@	.2	28.5	.0	3.6	.0
May	76.6	54.3	65.5	95+	1964	26	71.5	1987	28	1976	3	61.1	1995	93	106	.0	.6	31.0	.0	.1	.0
Jun	85.2	63.6	74.4	104+	1980	28	78.5	1971	40	1982	1	68.1	1982	8	290	.2	8.7	30.0	.0	.0	.0
Jul	91.5	68.1	79.8	116	1954	14	86.6	1980	47+	1972	6	76.8	1992	0	458	3.2	20.6	31.0	.0	.0	.0
Aug	90.7	65.7	78.2	112	1956	18	83.4	2000	45	1988	29	71.8	1992	2	412	3.3	19.5	31.0	.0	.0	.0
Sep	81.8	57.5	69.7	108	2000	3	76.8	1998	27	1984	30	63.6	1974	47	188	.7	7.4	30.0	.0	.1	.0
Oct	71.6	45.5	58.6	98	1963	7	64.3	1973	15	1993	31	52.9	1976	232	32	.0	.6	30.3	.0	3.4	.0
Nov	56.6	33.6	45.1	86	1980	8	52.7	1999	2	1976	29	38.6	1976	597	0	.0	.0	21.5	.6	14.4	.0
Dec	45.5	24.0	34.8	78	1966	7	40.9	1971	-18	1983	30	19.6	1983	938	0	.0	.0	12.7	4.5	24.5	1.1
Ann	68.1	44.5	56.3	116	Jul 1954	14	86.6	Jul 1980	-20+	Jan 1984	21	17.7	Jan 1979	4646	1503	7.4	57.6	292.9	16.8	108.4	4.1

\+ 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: 1951-2001

(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	1.59	1.29	2.31	1973	21	5.24	1973	.00	1986
Feb	1.81	1.63	2.65	1985	23	5.22	1985	.12	1991
Mar	3.69	3.19	4.90	1974	10	11.14	1973	.49	1971
Apr	3.95	3.53	5.82	1994	11	12.26	1994	.34	1989
May	6.00	5.70	4.36	1984	27	10.46	1993	1.35	1988
Jun	5.46	5.05	6.50	1977	22	13.37	1977	.81	1987
Jul	3.78	3.53	7.05	1976	2	16.47	1976	.20	1974
Aug	4.07	3.88	3.22	1960	8	10.14	1977	.01	2000
Sep	4.85	4.18	5.00	1986	30	14.43	1986	.26	1979
Oct	4.43	4.14	6.83	1998	5	12.86	1998	.35	1978
Nov	3.58	3.75	4.72	1979	20	8.41	1979	.00+	1989
Dec	2.23	1.73	2.66	1973	4	5.63	1973	.10	1976
Ann	45.44	43.42	7.05	Jul 1976	2	16.47	Jul 1976	.00+	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.9	3.5	.8	.4
Feb	5.2	3.4	1.2	.4
Mar	8.3	5.6	2.7	1.1
Apr	8.6	6.2	2.9	.9
May	11.1	8.3	4.0	2.0
Jun	9.0	7.1	3.3	1.7
Jul	6.7	4.9	2.3	1.1
Aug	6.9	5.0	2.5	1.6
Sep	8.0	5.8	3.0	1.5
Oct	7.2	5.3	2.8	1.3
Nov	6.5	5.2	2.6	1.0
Dec	6.3	4.0	1.5	.7
Ann	89.7	64.3	29.6	13.7

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	.09	.23	.48	.71	.96	1.23	1.56	1.95	2.50	3.39	4.26
Feb	.24	.38	.64	.89	1.16	1.45	1.79	2.21	2.77	3.70	4.59
Mar	.67	.99	1.54	2.04	2.55	3.11	3.74	4.50	5.52	7.16	8.72
Apr	.94	1.31	1.89	2.40	2.91	3.45	4.06	4.78	5.72	7.22	8.63
May	2.19	2.76	3.57	4.25	4.89	5.55	6.27	7.10	8.17	9.81	11.31
Jun	1.44	1.96	2.75	3.45	4.13	4.85	5.64	6.59	7.82	9.76	11.57
Jul	.39	.67	1.19	1.72	2.29	2.92	3.68	4.61	5.89	8.01	10.09
Aug	.59	.93	1.52	2.08	2.67	3.32	4.06	4.98	6.21	8.21	10.14
Sep	.88	1.31	2.02	2.68	3.35	4.08	4.91	5.91	7.24	9.39	11.43
Oct	.59	.95	1.58	2.20	2.85	3.56	4.39	5.41	6.78	9.04	11.21
Nov	.00	.67	1.40	1.96	2.51	3.09	3.74	4.47	5.47	7.07	8.57
Dec	.16	.30	.59	.89	1.23	1.63	2.10	2.70	3.54	4.95	6.34
Ann	31.76	34.39	37.76	40.33	42.62	44.83	47.12	49.65	52.73	57.20	61.07

\+ 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

Complete documentation available from:
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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	3.7	2.0	1	#
Feb	2.6	.0	#	0
Mar	1.6	.0	#	0
Apr	.0	.0	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	#	.0	#	0
Nov	.7	.0	#	0
Dec	2.3	.0	#	0
Ann	10.9	2.0	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	1978	16	8.1	1973	8	1987	18	4	1987
Feb	12.0	1980	8	13.0	1980	12	1980	8	3	1978
Mar	6.5	1999	14	9.6	1975	4	1989	6	#+	2000
Apr	.0	0	0	.0	0	0	0	0	0	0
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	#	1993	31	#	1993	#	1993	31	#	1993
Nov	6.0	1971	23	6.0	1971	6	1971	23	#+	1992
Dec	9.0	1987	15	12.0	1987	12	2000	14	5	2000
Ann	12.0	Feb 1980	8	13.0	Feb 1980	12+	Dec 2000	14	5	Dec 2000

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.1	.9	.3	.2	.0
Feb	1.0	.9	.3	.1	@
Mar	.7	.6	.2	.1	.0
Apr	.0	.0	.0	.0	.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	.0	.0	.0	.0	.0
Nov	.3	.3	.1	@	.0
Dec	1.1	.7	.2	.1	.0
Ann	4.2	3.4	1.1	.5	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	1.6	1.1	.9	.0
Feb	1.5	.7	.1	.0
Mar	.1	.1	.0	.0
Apr	.0	.0	.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	.0	.0	.0	.0
Nov	.2	.2	@	.0
Dec	1.3	1.2	1.0	.1
Ann	4.7	3.3	2.0	.1

+ 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	5/11	5/06	5/03	4/29	4/26	4/24	4/20	4/17	4/12
32	4/28	4/24	4/20	4/18	4/15	4/13	4/10	4/07	4/03
28	4/19	4/14	4/11	4/08	4/05	4/02	3/30	3/27	3/22
24	4/10	4/03	3/29	3/25	3/21	3/17	3/13	3/09	3/02
20	4/01	3/24	3/18	3/13	3/09	3/04	2/27	2/21	2/13
16	3/19	3/11	3/05	2/28	2/23	2/18	2/13	2/07	1/30

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	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/15	10/20
32	9/29	10/05	10/10	10/13	10/17	10/20	10/24	10/28	11/03
28	10/13	10/19	10/23	10/27	10/30	11/02	11/06	11/10	11/16
24	10/25	11/01	11/06	11/10	11/14	11/18	11/22	11/27	12/04
20	10/30	11/07	11/13	11/18	11/22	11/27	12/02	12/08	12/16
16	11/11	11/18	11/24	11/28	12/03	12/07	12/11	12/17	12/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	181	175	170	166	162	158	154	149	143
32	209	200	194	189	184	179	174	168	159
28	227	220	215	211	207	203	199	194	187
24	265	256	249	243	237	231	225	218	208
20	290	279	271	264	258	251	244	236	225
16	318	305	296	289	282	275	267	258	246

***** 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	1069	794	577	289	93	8	0	2	47	232	597	938	4646
60	914	660	425	174	37	1	0	0	15	127	452	783	3588
57	821	582	339	119	18	0	0	0	7	81	371	697	3035
55	760	530	284	88	10	0	0	0	3	57	319	639	2690
50	615	407	167	34	2	0	0	0	0	19	205	498	1947
32	192	105	7	0	0	0	0	0	0	0	15	134	453

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	146	235	452	718	1036	1272	1481	1433	1131	823	407	219	9353
55	2	16	16	116	333	582	768	720	444	167	21	11	3196
57	0	12	10	86	279	522	706	658	387	129	14	7	2810
60	0	6	2	51	205	433	613	565	306	82	5	0	2268
65	0	0	0	17	106	290	458	412	188	32	0	0	1503
70	0	0	0	4	42	165	305	265	99	8	0	0	888

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	40	112	278	507	807	1045	1244	1202	908	589	235	73	40	152	430	937	1744	2789	4033	5235	6143	6732	6967	7040
45	9	59	177	370	652	895	1089	1047	758	438	140	31	9	68	245	615	1267	2162	3251	4298	5056	5494	5634	5665
50	1	31	99	246	497	745	934	892	610	305	76	12	1	32	131	377	874	1619	2553	3445	4055	4360	4436	4448
55	0	8	45	142	350	595	779	737	464	183	34	2	0	8	53	195	545	1140	1919	2656	3120	3303	3337	3339
60	0	1	16	71	213	445	624	582	329	97	9	0	0	1	17	88	301	746	1370	1952	2281	2378	2387	2387
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	36	92	188	325	519	713	835	801	595	383	154	57	36	128	316	641	1160	1873	2708	3509	4104	4487	4641	4698

(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