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: MEADE, KS **COOP ID: 145171**

Climate Division: KS 7 **NWS Call Sign:** **Elevation: 2,477 Feet** **Lat: 37˚17N** **Lon: 100˚21W**

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	45.0	18.3	31.7	83	1986	20	42.2	1986	-20	1959	4	19.3	1979	1034	0	.0	.0	13.9	6.4	29.8	1.8
Feb	51.4	21.9	36.7	89	1981	20	44.4	1976	-13+	1982	5	22.9	1978	793	0	.0	.0	16.8	3.9	24.3	.9
Mar	59.9	29.1	44.5	93	1963	28	51.5	1986	-6	1960	3	37.5	1998	636	0	.0	@	24.0	1.1	17.2	.1
Apr	69.6	38.4	54.0	101	1989	23	62.1	1981	15	1975	3	46.6	1983	343	13	.1	.9	28.4	.1	4.9	.0
May	77.9	48.9	63.4	106+	1996	19	69.3	1996	27+	1966	13	57.4	1995	132	81	.3	3.7	30.8	.0	.2	.0
Jun	88.6	59.7	74.2	110+	1998	30	80.0	1994	41+	2000	19	67.4	1989	18	291	3.3	15.4	30.0	.0	.0	.0
Jul	94.2	64.5	79.4	110+	1986	28	84.0	1980	47+	1990	15	75.4	1989	0	446	7.9	24.3	31.0	.0	.0	.0
Aug	92.6	63.7	78.2	110	1952	17	83.6	1983	45	1950	20	74.3	1974	2	410	6.3	22.2	31.0	.0	.0	.0
Sep	84.4	54.7	69.6	106	1995	6	75.7	1998	30+	1985	30	62.5	1974	44	181	1.9	11.7	29.7	.0	.3	.0
Oct	73.3	41.9	57.6	97+	2000	2	62.4	1979	14+	1993	31	51.2	1976	245	15	.0	2.1	30.0	.1	3.9	.0
Nov	57.3	28.9	43.1	90	1980	8	50.6	1999	2	1976	28	36.4	1985	658	0	.0	@	21.3	1.1	19.7	.0
Dec	47.5	20.9	34.2	88	1955	24	39.2	1994	-17+	1989	23	21.0	1983	954	0	.0	.0	15.4	4.2	28.8	1.1
Ann	70.1	40.9	55.6	110+	Jun 1998	30	84.0	Jul 1980	-20	Jan 1959	4	19.3	Jan 1979	4859	1437	19.8	80.3	302.3	16.9	129.1	3.9

\+ 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	.63	.52	1.15	1971	3	1.75	1980	.00+	1986
Feb	.57	.29	1.42	2001	24	1.92	1985	.00+	1981
Mar	1.98	1.14	2.45	1973	10	12.32	1973	.00	1997
Apr	1.92	1.62	2.55	1994	28	5.56	1994	.17	1996
May	3.47	3.17	3.13	1959	4	7.22	1979	.30	1974
Jun	3.11	3.32	2.80	1993	19	7.80	1989	.05	1977
Jul	3.17	3.04	4.48	1962	24	7.20	1996	.00	1983
Aug	2.02	1.93	5.09	1958	20	5.03	1974	.07	1983
Sep	2.03	1.77	3.60	1973	12	7.66	1973	.00	1979
Oct	1.64	1.07	7.57	1998	2	9.80	1998	.00	1975
Nov	.91	.49	2.36	1971	17	4.09	1971	.00	1989
Dec	.74	.55	2.30	1997	24	3.52	1997	.00+	1988
Ann	22.19	21.28	7.57	Oct 1998	2	12.32	Mar 1973	.00+	Mar 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.5	1.9	.4	@
Feb	3.0	1.5	.4	.0
Mar	5.2	3.4	1.4	.4
Apr	5.5	3.6	1.4	.5
May	8.2	5.6	2.5	.9
Jun	7.3	5.2	2.1	.9
Jul	6.5	4.6	2.1	1.1
Aug	5.9	4.0	1.3	.4
Sep	5.4	3.6	1.3	.5
Oct	4.7	2.8	1.0	.3
Nov	3.8	2.3	.5	.1
Dec	3.5	2.0	.3	.1
Ann	62.5	40.5	14.7	5.2

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	.09	.21	.31	.41	.52	.64	.79	.99	1.30	1.61
Feb	.00	.01	.04	.11	.19	.30	.45	.65	.95	1.48	2.04
Mar	.02	.10	.30	.55	.86	1.24	1.72	2.35	3.25	4.84	6.44
Apr	.22	.36	.63	.90	1.18	1.50	1.88	2.34	2.97	4.02	5.03
May	.89	1.22	1.72	2.17	2.61	3.07	3.58	4.20	4.99	6.26	7.44
Jun	.29	.52	.94	1.37	1.84	2.37	3.00	3.79	4.87	6.67	8.43
Jul	.36	.75	1.28	1.74	2.20	2.69	3.25	3.91	4.79	6.20	7.54
Aug	.23	.39	.67	.96	1.26	1.59	1.98	2.47	3.13	4.22	5.28
Sep	.04	.15	.40	.68	1.00	1.39	1.85	2.46	3.31	4.77	6.23
Oct	.01	.08	.24	.45	.71	1.02	1.42	1.95	2.70	4.02	5.36
Nov	.01	.03	.12	.23	.37	.54	.77	1.07	1.51	2.28	3.07
Dec	.00	.04	.15	.26	.38	.52	.69	.91	1.21	1.72	2.22
Ann	15.12	16.47	18.21	19.53	20.71	21.86	23.05	24.37	25.98	28.32	30.36

\+ 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	4.4	4.5	1	#
Feb	3.4	1.0	1	#
Mar	4.0	2.1	#	#
Apr	.9	.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
Oct	.1	.0	#	0
Nov	1.1	.0	#	0
Dec	4.0	3.0	#	#
Ann	17.9	10.6	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	1971	3	10.0	1971	14	1988	7	3	1988
Feb	8.0	1971	21	15.0+	1978	11	1993	17	5	1978
Mar	9.7	1999	12	14.1	1999	10	1999	12	1	1999
Apr	9.0	1983	4	9.0	1983	7	1983	4	#+	1997
May	1.0	1978	3	1.0	1978	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	#	1995	22	#+	1995	#	1995	22	#	1995
Oct	.8	1993	29	.8	1993	1	1993	29	#+	1997
Nov	4.0	1972	18	11.0	1972	14	1992	25	2	1992
Dec	13.6	1997	24	16.5	1997	12	1997	24	3	1971
Ann	13.6	Dec 1997	24	16.5	Dec 1997	14+	Nov 1992	25	5	Feb 1978

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.4	2.1	.3	.1	@
Feb	1.6	1.4	.6	.2	.0
Mar	1.3	1.2	.4	.2	.0
Apr	.3	.2	.1	.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	.1	.0	.0	.0	.0
Nov	.8	.7	.1	.0	.0
Dec	1.9	1.3	.4	.2	@
Ann	8.4	6.9	1.9	.8	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	3.0	1.4	.4	.0
Feb	1.6	1.0	.6	.1
Mar	1.5	.6	.4	@
Apr	.1	.1	@	.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	.1	.0	.0	.0
Nov	.7	.2	.0	.0
Dec	2.2	.9	.4	.2
Ann	9.2	4.2	1.8	.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	5/11	5/07	5/04	5/01	4/28	4/26	4/23	4/20	4/15
32	5/05	4/29	4/25	4/21	4/18	4/14	4/11	4/07	4/01
28	4/17	4/13	4/10	4/07	4/05	4/03	3/31	3/28	3/24
24	4/09	4/04	4/01	3/29	3/27	3/24	3/22	3/18	3/14
20	4/05	3/30	3/26	3/23	3/19	3/16	3/12	3/08	3/02
16	3/29	3/22	3/16	3/12	3/07	3/03	2/26	2/21	2/13

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	9/21	9/26	9/30	10/03	10/06	10/09	10/12	10/16	10/21
32	9/28	10/04	10/08	10/11	10/15	10/18	10/21	10/25	10/31
28	10/14	10/19	10/22	10/25	10/28	10/31	11/03	11/06	11/11
24	10/23	10/29	11/01	11/05	11/08	11/11	11/14	11/18	11/24
20	10/29	11/04	11/08	11/12	11/15	11/19	11/22	11/26	12/02
16	11/07	11/14	11/18	11/22	11/26	11/29	12/03	12/08	12/14

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	174	168	164	160	156	151	146	139
32	200	193	188	183	179	175	171	165	158
28	226	219	214	209	205	201	197	192	185
24	244	238	233	229	225	222	218	213	206
20	263	255	249	245	240	236	231	226	218
16	292	282	275	268	263	257	250	243	233

***** 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	1034	793	636	343	132	18	0	2	44	245	658	954	4859
60	879	656	482	221	60	4	0	0	13	130	509	799	3753
57	787	578	395	160	33	1	0	0	5	78	423	706	3166
55	726	526	337	126	21	0	0	0	2	53	369	644	2804
50	581	401	210	59	5	0	0	0	0	16	244	499	2015
32	167	96	9	0	0	0	0	0	0	0	18	107	397

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	155	227	397	660	973	1264	1469	1431	1126	793	351	176	9022
55	2	13	12	96	280	574	756	718	438	133	11	0	3033
57	1	10	7	70	231	515	694	656	381	96	6	0	2667
60	0	3	1	41	165	428	601	563	299	54	1	0	2156
65	0	0	0	13	81	291	446	410	181	15	0	0	1437
70	0	0	0	3	31	175	292	263	93	3	0	0	860

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	43	108	256	475	779	1054	1252	1209	905	573	190	56	43	151	407	882	1661	2715	3967	5176	6081	6654	6844	6900
45	9	51	157	340	624	904	1097	1054	756	429	104	19	9	60	217	557	1181	2085	3182	4236	4992	5421	5525	5544
50	0	16	82	223	473	754	942	899	610	290	45	2	0	16	98	321	794	1548	2490	3389	3999	4289	4334	4336
55	0	5	35	123	323	604	787	744	466	174	15	0	0	5	40	163	486	1090	1877	2621	3087	3261	3276	3276
60	0	0	8	59	196	455	632	589	331	87	1	0	0	0	8	67	263	718	1350	1939	2270	2357	2358	2358
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	65	118	210	330	491	679	801	776	576	382	161	78	65	183	393	723	1214	1893	2694	3470	4046	4428	4589	4667

(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