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: OLATHE 3 E, KS **COOP ID: 145972**

Climate Division: KS 6 **NWS Call Sign:** **Elevation: 1,055 Feet** **Lat: 38˚53N** **Lon: 94˚46W**

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	38.3	19.9	29.1	72	1950	24	39.5	1990	-18	1943	19	15.3	1979	1113	0	.0	.0	6.2	9.7	26.6	2.6
Feb	44.8	25.3	35.1	81	1972	29	45.6	1976	-12+	1982	6	21.7	1978	839	0	.0	.0	10.6	6.3	20.2	1.3
Mar	56.1	34.7	45.4	85+	1995	22	50.5	1991	-8	1978	4	37.9	1984	609	0	.0	.0	20.8	1.0	13.7	.1
Apr	66.7	44.8	55.8	91	1987	29	63.7	1981	13	1975	3	47.7	1983	292	14	.0	@	27.7	.0	2.9	.0
May	75.6	54.9	65.3	95+	1956	22	71.7	1998	30	1976	3	60.3	1995	100	108	.0	.3	31.0	.0	@	.0
Jun	84.3	63.8	74.1	105	1980	27	78.2	1988	43	1982	1	68.6	1982	6	279	.1	5.6	30.0	.0	.0	.0
Jul	89.4	68.5	79.0	114	1954	14	86.5	1980	48	1972	5	74.3	1971	0	432	1.4	14.4	31.0	.0	.0	.0
Aug	87.8	66.5	77.2	107	2000	27	84.0	2000	46+	1986	28	71.8	1992	6	383	1.1	11.6	31.0	.0	.0	.0
Sep	80.1	58.3	69.2	106+	2000	2	74.3	1978	30	1942	27	62.4	1974	45	171	.1	4.1	30.0	.0	.0	.0
Oct	69.3	47.3	58.3	98	1939	7	63.1	1971	18	1993	31	53.0	1976	226	19	.0	.2	29.9	.0	1.5	.0
Nov	53.8	34.8	44.3	84	1978	4	53.8	1999	1	1959	17	38.2	1976	622	0	.0	.0	18.7	1.0	12.8	.0
Dec	42.0	24.2	33.1	76	1939	6	38.8	1991	-22	1989	22	15.7	1983	989	0	.0	.0	8.4	6.4	24.3	1.0
Ann	65.7	45.3	55.5	114	Jul 1954	14	86.5	Jul 1980	-22	Dec 1989	22	15.3	Jan 1979	4847	1406	2.7	36.2	275.3	24.4	102.0	5.0

\+ 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: 1939-2001

(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	1.26	1.20	2.13	1982	30	3.31	1982	.03	1986
Feb	1.27	1.15	2.62	1997	21	3.94	1997	.03	1991
Mar	2.74	2.12	2.24	1957	24	10.41	1973	.86	1971
Apr	3.78	3.52	3.28	1994	28	10.11	1994	.48	2000
May	5.41	4.97	6.20	1990	16	12.35	1990	1.23	1992
Jun	5.22	4.96	8.00	1984	9	13.40	1984	1.22	1986
Jul	4.03	3.42	4.51	1958	31	15.59	1993	.27	1983
Aug	3.56	3.07	4.06	1943	1	7.76	1985	.43	1971
Sep	4.69	3.76	5.42	1961	13	14.65	1986	.50	1990
Oct	3.48	3.59	4.23	1985	10	7.82	1985	.31	1988
Nov	2.97	2.77	3.58	1973	20	8.51	1992	.00	1989
Dec	1.76	1.45	2.30	1971	15	4.89	1992	.01	1976
Ann	40.17	41.07	8.00	Jun 1984	9	15.59	Jul 1993	.00	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.0	3.2	.6	.2
Feb	5.7	3.4	.5	.2
Mar	8.6	5.5	2.0	.5
Apr	9.8	6.7	2.7	.9
May	11.4	8.4	3.8	1.6
Jun	9.2	7.1	3.3	1.6
Jul	8.2	5.9	2.4	1.2
Aug	8.4	5.7	2.2	1.0
Sep	7.7	5.6	2.8	1.5
Oct	7.7	5.5	2.3	1.0
Nov	7.2	5.1	2.1	.7
Dec	6.5	3.5	1.1	.4
Ann	96.4	65.6	25.8	10.8

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	.12	.21	.38	.55	.74	.96	1.22	1.54	1.98	2.71	3.42
Feb	.17	.27	.46	.63	.82	1.02	1.26	1.55	1.94	2.59	3.21
Mar	.77	1.03	1.42	1.77	2.10	2.45	2.84	3.30	3.90	4.83	5.71
Apr	.94	1.29	1.84	2.33	2.81	3.32	3.89	4.57	5.45	6.85	8.16
May	1.52	2.04	2.81	3.49	4.15	4.84	5.61	6.51	7.68	9.52	11.23
Jun	1.61	2.11	2.84	3.48	4.09	4.73	5.43	6.25	7.31	8.96	10.49
Jul	.45	.76	1.32	1.88	2.48	3.15	3.94	4.92	6.25	8.45	10.59
Aug	.60	.91	1.42	1.91	2.41	2.96	3.58	4.34	5.35	6.99	8.55
Sep	.65	1.04	1.71	2.36	3.04	3.79	4.66	5.73	7.16	9.51	11.78
Oct	.55	.85	1.36	1.84	2.33	2.87	3.49	4.25	5.26	6.91	8.48
Nov	.47	.86	1.37	1.78	2.19	2.61	3.09	3.65	4.38	5.54	6.63
Dec	.13	.24	.46	.70	.97	1.29	1.66	2.14	2.80	3.92	5.03
Ann	25.79	28.47	31.95	34.63	37.04	39.39	41.84	44.58	47.92	52.82	57.11

\+ 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: 1939-2001
(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	5.7	4.3	1	#
Feb	4.2	3.3	1	#
Mar	2.7	1.3	#	#
Apr	.4	.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	.2	.0	#	0
Nov	1.4	.5	#	#
Dec	2.7	1.8	#	#
Ann	17.3	11.2	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	1982	4	20.5	1979	16	1977	23	8	1979
Feb	8.0	1978	13	14.0	1993	14	1979	1	7	1979
Mar	8.0	1978	25	13.5	1978	8	1978	25	2	1978
Apr	3.0	1979	4	3.0	1979	2	1979	4	#+	1996
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	4.5	1996	23	4.5	1996	2	1996	23	#+	1996
Nov	7.0	1975	26	8.0	1975	7	1975	27	1	1975
Dec	7.0	1987	15	11.3	1983	9	1983	29	3	1983
Ann	8.0+	Mar 1978	25	20.5	Jan 1979	16	Jan 1977	23	8	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.1	.7	.2	.0
Feb	2.4	1.6	.5	.2	.0
Mar	1.4	1.1	.3	.1	.0
Apr	.2	.2	@	.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	.1	.1	@	.0	.0
Nov	.8	.7	.2	@	.0
Dec	2.1	1.3	.3	.1	.0
Ann	10.0	7.1	2.0	.6	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	9.1	4.3	2.4	.3
Feb	7.0	3.1	1.9	.6
Mar	2.0	.8	.3	.0
Apr	.2	.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	.1	.0	.0	.0
Nov	1.1	.2	.1	.0
Dec	5.3	1.7	.8	.0
Ann	24.8	10.1	5.5	.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

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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	5/04	4/30	4/27	4/25	4/22	4/20	4/17	4/14	4/10
32	4/20	4/16	4/14	4/11	4/09	4/06	4/04	4/01	3/28
28	4/14	4/10	4/07	4/05	4/02	3/31	3/29	3/26	3/22
24	4/07	3/31	3/27	3/23	3/19	3/16	3/12	3/07	3/01
20	4/01	3/24	3/19	3/14	3/09	3/05	2/28	2/22	2/14
16	3/22	3/14	3/08	3/02	2/26	2/21	2/16	2/10	2/02

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	9/26	10/01	10/04	10/07	10/10	10/13	10/16	10/20	10/24
32	10/15	10/19	10/22	10/25	10/27	10/30	11/01	11/04	11/09
28	10/16	10/23	10/27	11/01	11/04	11/08	11/13	11/17	11/24
24	10/27	11/03	11/07	11/11	11/14	11/18	11/21	11/26	12/02
20	11/06	11/12	11/17	11/21	11/24	11/28	12/02	12/06	12/13
16	11/12	11/20	11/25	11/29	12/03	12/07	12/12	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	191	184	179	174	170	166	162	157	150
32	218	212	208	204	201	198	194	190	184
28	238	230	225	220	215	211	206	200	193
24	268	258	251	245	239	234	228	220	211
20	290	280	272	265	259	253	247	239	228
16	316	303	295	287	280	273	265	256	243

***** 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	1113	839	609	292	100	6	0	6	45	226	622	989	4847
60	958	709	461	175	41	1	0	0	13	117	480	834	3789
57	868	630	375	119	21	0	0	0	5	70	398	746	3232
55	808	579	321	88	12	0	0	0	2	48	346	689	2893
50	665	457	205	33	2	0	0	0	0	15	233	546	2156
32	244	144	16	0	0	0	0	0	0	0	24	163	591

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	154	229	430	712	1031	1262	1455	1400	1116	816	393	197	9195
55	5	20	22	110	330	572	742	687	427	151	24	10	3100
57	2	15	14	81	277	512	680	625	370	111	16	5	2708
60	0	10	7	47	204	423	587	533	289	64	8	0	2172
65	0	0	0	14	108	279	432	383	171	19	0	0	1406
70	0	0	0	3	44	153	283	246	87	3	0	0	819

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	32	92	241	476	785	1020	1209	1154	875	572	206	47	32	124	365	841	1626	2646	3855	5009	5884	6456	6662	6709
45	8	45	146	340	630	870	1054	999	726	423	123	22	8	53	199	539	1169	2039	3093	4092	4818	5241	5364	5386
50	0	17	82	219	475	720	899	844	577	288	61	5	0	17	99	318	793	1513	2412	3256	3833	4121	4182	4187
55	0	4	39	122	326	570	744	689	431	173	26	2	0	4	43	165	491	1061	1805	2494	2925	3098	3124	3126
60	0	1	9	58	192	421	589	534	296	87	7	0	0	1	10	68	260	681	1270	1804	2100	2187	2194	2194
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	23	60	147	279	491	699	833	788	574	341	113	31	23	83	230	509	1000	1699	2532	3320	3894	4235	4348	4379

(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