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: ANTHONY, KS **COOP ID: 140264**

Climate Division: KS 8 **NWS Call Sign:** **Elevation: 1,340 Feet** **Lat: 37˚09N** **Lon: 98˚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	41.5	20.4	31.0	80	1967	22	40.1	1986	-15	1947	4	15.7	1979	1057	0	.0	.0	11.6	6.3	26.2	.8
Feb	49.0	24.9	37.0	90	1996	22	46.8	1976	-8	1951	1	22.5	1978	786	0	.0	@	15.6	3.5	19.3	.5
Mar	58.0	33.2	45.6	94	1940	31	51.6	1986	-2	1948	11	40.3	1996	602	0	.0	.1	25.3	.5	11.8	.0
Apr	67.7	43.4	55.6	98	1953	22	63.3	1981	17	1957	13	48.0	1983	298	15	.0	.5	29.2	.0	2.3	.0
May	77.4	55.1	66.3	105	1953	31	72.0	1996	30	1954	3	61.4	1995	81	121	.1	3.0	30.9	.0	@	.0
Jun	88.3	64.4	76.4	111	1953	15	81.7	1990	43	1954	4	71.5	1982	6	346	2.7	16.5	30.0	.0	.0	.0
Jul	93.8	69.5	81.7	113	1954	14	89.7	1980	51+	1961	10	77.8	1972	0	516	9.1	24.9	31.0	.0	.0	.0
Aug	92.4	67.5	80.0	112	1964	6	85.8	2000	46+	1952	6	73.7	1992	2	465	7.7	23.3	31.0	.0	.0	.0
Sep	83.5	59.3	71.4	111+	1939	3	79.6	1998	30	1984	30	63.3	1974	33	225	1.8	10.7	30.0	.0	@	.0
Oct	71.7	46.5	59.1	100	1954	4	65.3	1979	16	1993	31	53.4	1976	207	24	.0	1.3	30.4	.0	1.2	.0
Nov	55.7	33.2	44.5	84	1945	6	53.6	1999	7+	1975	26	39.2	1991	618	0	.0	.0	22.2	.5	11.8	.0
Dec	43.9	23.8	33.9	85	1955	24	39.6	1988	-15	1989	22	18.5	1983	966	0	.0	.0	12.2	3.5	24.8	.6
Ann	68.6	45.1	56.9	113	Jul 1954	14	89.7	Jul 1980	-15+	Dec 1989	22	15.7	Jan 1979	4656	1712	21.4	80.3	299.4	14.3	97.4	1.9

+ 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: 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	1.01	.76	2.30	1982	30	3.63	1973	.00	1986
Feb	1.01	.66	2.78	1948	26	3.28	1990	.00	1991
Mar	2.97	2.46	3.11	1947	12	10.80	1973	.02	1971
Apr	3.16	2.57	4.32	1970	18	7.11	1977	.06	1996
May	4.38	3.92	7.49	1987	5	13.23	1987	1.22	1984
Jun	4.37	4.09	4.56	1983	11	10.28	1983	.34	1973
Jul	3.54	3.18	4.74	1959	14	8.46	1972	.00	1983
Aug	2.53	1.33	3.58	1989	14	8.87	1974	.00	2000
Sep	2.93	2.02	3.13	1957	15	9.37	1973	.04	1979
Oct	2.36	1.53	3.70	1998	31	8.33	2000	.00	1978
Nov	2.18	1.63	5.23	1998	1	8.11	1998	.00	1976
Dec	1.23	.95	1.96	1973	4	4.26	1999	.00	1977
Ann	31.67	31.54	7.49	May 1987	5	13.23	May 1987	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.0	2.3	.7	.2
Feb	4.1	2.3	.6	.1
Mar	6.7	4.7	2.1	1.0
Apr	7.2	5.3	2.4	1.0
May	9.5	6.6	2.9	1.2
Jun	8.2	6.0	2.9	1.4
Jul	6.8	4.9	2.4	1.1
Aug	6.3	3.9	1.6	.7
Sep	6.3	4.1	1.8	.8
Oct	5.1	3.5	1.6	.6
Nov	5.3	3.7	1.2	.5
Dec	4.3	2.7	.8	.2
Ann	73.8	50.0	21.0	8.8

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	.03	.10	.24	.38	.54	.73	.95	1.24	1.63	2.29	2.95
Feb	.02	.08	.20	.34	.50	.69	.92	1.22	1.63	2.35	3.06
Mar	.17	.35	.71	1.11	1.57	2.10	2.75	3.59	4.76	6.74	8.72
Apr	.39	.63	1.08	1.52	1.99	2.51	3.11	3.86	4.87	6.54	8.16
May	1.00	1.40	2.04	2.62	3.20	3.81	4.49	5.31	6.39	8.11	9.72
Jun	.93	1.33	1.97	2.56	3.14	3.77	4.47	5.32	6.43	8.21	9.89
Jul	.20	.54	1.09	1.61	2.16	2.77	3.48	4.36	5.56	7.52	9.44
Aug	.04	.19	.49	.84	1.24	1.72	2.30	3.06	4.12	5.93	7.75
Sep	.20	.38	.75	1.15	1.60	2.12	2.75	3.56	4.67	6.56	8.44
Oct	.06	.21	.52	.85	1.23	1.67	2.20	2.87	3.81	5.41	7.00
Nov	.03	.15	.40	.70	1.04	1.46	1.97	2.63	3.56	5.17	6.78
Dec	.05	.15	.33	.51	.70	.92	1.18	1.51	1.96	2.71	3.44
Ann	21.82	23.70	26.13	27.98	29.63	31.22	32.88	34.71	36.94	40.19	43.01

\+ 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	3.1	1.0	#	#
Feb	3.1	.5	#	0
Mar	2.1	.0	#	#
Apr	.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	.1	.0	#	0
Nov	1.4	.0	#	0
Dec	2.5	2.0	#	#
Ann	12.4	3.5	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	12.0	1988	6	15.0	1988	8	1993	11	4	1983
Feb	13.0	1975	17	20.0	1975	11	1980	8	3	1979
Mar	8.0	1999	13	13.0	1999	9	1999	14	1	1999
Apr	1.5	1997	8	1.5	1997	2	1997	8	#	1997
May	.0	0	0	.0	0	#	1976	27	#	1976
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	1.5	1991	31	1.5	1991	2	1991	31	#	1991
Nov	6.0	1972	18	12.0	1972	5	1975	26	#+	1997
Dec	6.5	1999	5	8.2	1973	7	1999	5	1+	2000
Ann	13.0	Feb 1975	17	20.0	Feb 1975	11	Feb 1980	8	4	Jan 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.5	1.0	.4	.2	@
Feb	1.3	.9	.4	.2	@
Mar	.8	.6	.4	.1	.0
Apr	.1	.1	.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
Nov	.4	.4	.2	.1	.0
Dec	1.2	1.0	.4	.1	.0
Ann	5.3	4.0	1.8	.7	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	2.1	.9	.4	.0
Feb	.7	.3	.2	.0
Mar	1.3	.7	.2	.0
Apr	@	.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
Nov	.5	.1	@	.0
Dec	1.7	.7	.1	.0
Ann	6.3	2.7	.9	.0

+ 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	4/30	4/26	4/23	4/20	4/17	4/15	4/12	4/09	4/04
32	4/19	4/14	4/11	4/08	4/06	4/03	3/31	3/28	3/23
28	4/09	4/04	4/01	3/30	3/27	3/25	3/22	3/19	3/15
24	4/01	3/26	3/22	3/19	3/16	3/13	3/10	3/06	2/28
20	3/28	3/20	3/13	3/08	3/03	2/26	2/21	2/14	2/06
16	3/16	3/07	3/01	2/23	2/18	2/13	2/08	2/01	1/23

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	10/02	10/07	10/10	10/13	10/16	10/19	10/22	10/26	10/30
32	10/16	10/21	10/24	10/27	10/30	11/02	11/04	11/08	11/13
28	10/22	10/28	11/01	11/05	11/08	11/12	11/15	11/20	11/26
24	11/02	11/08	11/11	11/15	11/18	11/21	11/24	11/28	12/04
20	11/07	11/14	11/19	11/24	11/28	12/02	12/06	12/11	12/18
16	11/15	11/23	11/28	12/03	12/07	12/12	12/17	12/22	12/30

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	202	195	189	185	181	177	173	167	160
32	230	222	216	211	206	202	197	191	183
28	245	238	233	229	225	221	217	212	205
24	268	261	255	251	246	242	237	232	224
20	302	290	282	275	269	262	256	247	236
16	328	316	307	299	291	284	276	267	254

***** 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	1057	786	602	298	81	6	0	2	33	207	618	966	4656
60	902	657	450	181	31	0	0	0	9	101	471	811	3613
57	811	579	364	124	14	0	0	0	3	58	387	718	3058
55	752	528	308	93	8	0	0	0	1	38	334	657	2719
50	608	408	188	37	1	0	0	0	0	10	216	513	1981
32	197	114	10	0	0	0	0	0	0	0	15	121	457

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	164	252	430	708	1062	1331	1539	1487	1182	839	387	178	9559
55	5	22	16	111	357	641	826	774	492	164	16	1	3425
57	3	17	9	82	301	581	764	712	435	122	9	0	3035
60	1	11	3	49	225	491	671	619	351	72	3	0	2496
65	0	0	0	15	121	346	516	465	225	24	0	0	1712
70	0	0	0	4	51	215	362	319	128	5	0	0	1084

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	51	134	301	544	855	1129	1330	1289	988	651	238	60	51	185	486	1030	1885	3014	4344	5633	6621	7272	7510	7570
45	17	69	187	400	700	979	1175	1134	839	501	140	24	17	86	273	673	1373	2352	3527	4661	5500	6001	6141	6165
50	1	29	105	270	546	829	1020	979	689	355	71	5	1	30	135	405	951	1780	2800	3779	4468	4823	4894	4899
55	0	8	50	157	395	679	865	824	541	227	28	0	0	8	58	215	610	1289	2154	2978	3519	3746	3774	3774
60	0	0	16	71	254	529	710	669	400	122	8	0	0	0	16	87	341	870	1580	2249	2649	2771	2779	2779
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	44	106	202	341	548	744	870	842	645	407	147	52	44	150	352	693	1241	1985	2855	3697	4342	4749	4896	4948

(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