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: ATCHISON, KS **COOP ID: 140405**

Climate Division: KS 3 **NWS Call Sign:** **Elevation: 945 Feet** **Lat: 39˚34N** **Lon: 95˚07W**

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	35.5	15.9	25.7	72+	1989	31	38.0	1990	-19	1947	4	11.7	1979	1218	0	.0	.0	5.4	11.3	27.3	3.0
Feb	42.4	21.2	31.8	80	1972	29	42.1	1976	-16+	1979	9	18.6	1979	929	0	.0	.0	9.5	6.9	20.9	1.5
Mar	54.2	31.2	42.7	89	1946	31	47.5	1991	-10+	1978	4	35.9	1984	690	0	.0	.0	20.0	1.3	13.8	.1
Apr	65.6	42.2	53.9	92+	1989	26	62.9	1981	11	1975	3	47.3	1983	342	10	.0	.3	27.7	.0	3.2	.0
May	75.5	54.1	64.8	96+	1956	21	70.6	1998	28	1944	6	59.6	1995	95	88	.0	.4	31.0	.0	@	.0
Jun	84.5	63.1	73.8	105	1980	27	77.7	1971	42	1945	4	68.7	1982	5	270	.1	6.5	30.0	.0	.0	.0
Jul	89.4	68.0	78.7	109	1980	30	84.6	1980	47	1968	3	75.6	1971	0	425	1.7	14.4	31.0	.0	.0	.0
Aug	87.6	64.7	76.2	109	1984	29	83.2	1983	44	1950	20	71.3	1992	7	353	1.2	12.6	31.0	.0	.0	.0
Sep	79.9	56.1	68.0	108	1947	3	73.8	1998	30+	1942	28	62.3	1974	53	142	.2	3.9	30.0	.0	.1	.0
Oct	68.4	45.3	56.9	98	1939	7	62.0	1971	19	1942	26	50.2	1976	264	12	.0	.2	29.7	.0	1.9	.0
Nov	52.0	31.6	41.8	84	1980	8	50.7	1999	-2	1976	28	34.5	1985	696	0	.0	.0	17.7	1.6	13.4	.1
Dec	39.4	20.9	30.2	74	1939	6	35.5	1991	-21	1989	22	12.6	1983	1080	0	.0	.0	6.8	7.4	25.7	1.6
Ann	64.5	42.9	53.7	109+	Aug 1984	29	84.6	Jul 1980	-21	Dec 1989	22	11.7	Jan 1979	5379	1300	3.2	38.3	269.8	28.5	106.3	6.3

\+ 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	.98	1.09	2.16	1965	2	2.73	1993	.00	1986
Feb	1.07	.97	2.18	1955	19	2.96	1997	.00	1991
Mar	2.42	1.91	2.70	1939	11	8.34	1973	.24	1997
Apr	3.27	2.98	3.14	1941	18	7.07	1999	.91	2000
May	4.99	4.27	4.45	1987	3	12.68	1982	.61	1992
Jun	4.65	3.87	4.07	2001	20	10.85	1996	.50	1988
Jul	4.65	3.81	5.07	1958	11	16.51	1992	.20	1983
Aug	4.01	3.33	3.92	1960	18	10.59	1977	.32	1984
Sep	4.46	3.28	4.57	1961	13	12.56	1977	1.27	1990
Oct	3.16	2.96	3.84	1973	11	7.44	1977	.07	1988
Nov	2.45	2.31	2.81	1975	30	5.88	1975	.00	1989
Dec	1.45	1.18	2.45	1980	8	3.75	1980	.06	1979
Ann	37.56	36.08	5.07	Jul 1958	11	16.51	Jul 1992	.00+	Feb 1991

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.1	3.2	.4	.0
Feb	5.9	3.2	.4	.1
Mar	8.4	5.1	1.6	.5
Apr	9.6	6.2	2.4	.8
May	10.7	7.3	3.5	1.5
Jun	9.8	6.8	3.3	1.3
Jul	8.4	6.2	2.9	1.5
Aug	8.4	5.8	2.4	1.1
Sep	8.0	6.1	2.9	1.3
Oct	7.1	5.1	2.3	.9
Nov	7.1	4.5	1.6	.6
Dec	6.0	2.8	1.0	.3
Ann	95.5	62.3	24.7	9.9

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	.05	.14	.29	.44	.59	.76	.96	1.21	1.54	2.09	2.63
Feb	.18	.33	.51	.66	.80	.95	1.11	1.31	1.56	1.96	2.33
Mar	.39	.60	.95	1.28	1.63	2.00	2.43	2.95	3.64	4.77	5.86
Apr	.98	1.29	1.75	2.15	2.54	2.95	3.39	3.92	4.60	5.66	6.64
May	1.29	1.76	2.48	3.12	3.75	4.42	5.16	6.03	7.18	8.98	10.68
Jun	1.32	1.76	2.43	3.01	3.57	4.17	4.82	5.59	6.60	8.17	9.63
Jul	.50	.85	1.49	2.14	2.84	3.62	4.54	5.68	7.24	9.82	12.33
Aug	.68	1.03	1.61	2.16	2.73	3.34	4.04	4.90	6.03	7.88	9.64
Sep	.95	1.36	2.01	2.61	3.20	3.84	4.55	5.41	6.55	8.36	10.07
Oct	.53	.80	1.26	1.69	2.14	2.63	3.18	3.86	4.76	6.23	7.63
Nov	.18	.44	.83	1.19	1.57	1.97	2.45	3.02	3.80	5.06	6.28
Dec	.15	.26	.46	.66	.88	1.12	1.41	1.77	2.26	3.08	3.87
Ann	21.85	24.66	28.38	31.29	33.94	36.54	39.27	42.34	46.12	51.73	56.69

\+ 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

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	6.9	6.2	2	1
Feb	5.6	5.3	2	1
Mar	3.6	1.1	#	#
Apr	.6	.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	1.2	.1	#	#
Dec	4.4	3.0	1	#
Ann	22.5	15.7	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	9.0	1979	13	29.4	1979	20	1979	17	13	1979
Feb	10.0	1978	13	20.0	1978	15	1979	2	10	1979
Mar	12.3	1976	4	16.2	1976	15	1978	7	6	1978
Apr	5.0	1975	2	7.0	1975	6	1975	3	#+	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	6.0	1996	23	6.0	1996	1	1996	23	#+	1996
Nov	5.7	1975	26	9.1	1975	6	1975	27	1	1991
Dec	9.0	1999	5	17.5	1983	9+	1999	5	5	1983
Ann	12.3	Mar 1976	4	29.4	Jan 1979	20	Jan 1979	17	13	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.0	2.2	.8	.2	.0
Feb	3.0	1.9	.8	.2	@
Mar	1.6	1.0	.5	.2	@
Apr	.4	.3	.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	@	@	@	@	.0
Nov	.8	.5	.1	@	.0
Dec	2.9	1.6	.5	.2	.0
Ann	12.7	7.5	2.8	.8	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	10.7	6.7	3.5	1.1
Feb	7.7	4.1	2.4	.7
Mar	2.0	.9	.6	.0
Apr	.3	.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	@	.0	.0	.0
Nov	.7	.2	.1	.0
Dec	5.7	3.0	1.5	.0
Ann	27.1	15.0	8.2	1.8

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

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	9/23	9/29	10/03	10/06	10/09	10/12	10/16	10/19	10/25
32	10/07	10/12	10/16	10/20	10/23	10/26	10/29	11/02	11/07
28	10/15	10/20	10/24	10/28	10/31	11/03	11/07	11/11	11/17
24	10/26	11/01	11/06	11/10	11/14	11/17	11/21	11/26	12/02
20	11/01	11/08	11/12	11/16	11/20	11/24	11/27	12/02	12/08
16	11/11	11/17	11/22	11/26	11/29	12/03	12/07	12/11	12/17

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	194	187	182	177	173	168	164	159	151
32	214	207	203	199	195	191	187	182	176
28	235	227	222	217	213	208	203	198	190
24	266	257	250	244	239	234	228	221	212
20	284	274	266	260	254	248	241	234	223
16	302	292	284	278	272	266	260	252	242

***** 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	1218	929	690	342	95	5	0	7	53	264	696	1080	5379
60	1063	793	538	217	37	0	0	1	15	146	550	925	4285
57	971	716	452	156	17	0	0	0	5	92	466	832	3707
55	911	663	396	120	10	0	0	0	2	66	412	772	3352
50	767	536	269	55	2	0	0	0	0	24	289	628	2570
32	312	190	30	0	0	0	0	0	0	0	39	205	776

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	117	185	362	657	1016	1254	1448	1368	1079	771	333	148	8738
55	2	14	16	88	313	564	735	655	391	124	16	2	2920
57	1	10	10	63	258	504	673	593	335	88	11	0	2546
60	0	4	3	35	185	415	580	501	254	49	4	0	2030
65	0	0	0	10	88	270	425	353	142	12	0	0	1300
70	0	0	0	1	31	144	274	219	66	2	0	0	737

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	22	81	233	480	786	1030	1209	1146	866	554	183	39	22	103	336	816	1602	2632	3841	4987	5853	6407	6590	6629
45	5	39	142	342	631	880	1054	991	716	407	102	15	5	44	186	528	1159	2039	3093	4084	4800	5207	5309	5324
50	0	13	80	223	477	730	899	836	569	272	50	6	0	13	93	316	793	1523	2422	3258	3827	4099	4149	4155
55	0	2	37	128	328	580	744	681	424	161	15	0	0	2	39	167	495	1075	1819	2500	2924	3085	3100	3100
60	0	0	10	61	195	431	589	526	291	76	3	0	0	0	10	71	266	697	1286	1812	2103	2179	2182	2182
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	16	53	145	283	494	704	833	780	565	328	102	27	16	69	214	497	991	1695	2528	3308	3873	4201	4303	4330

(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