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: TROY 3 N, KS **COOP ID: 148250**

Climate Division: KS 3 **NWS Call Sign:** **Elevation: 1,040 Feet** **Lat: 39˚50N** **Lon: 95˚05W**

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	33.4	14.5	24.0	70	1989	31	35.4	1990	-18+	1982	10	9.8	1979	1274	0	.0	.0	4.4	12.0	28.1	4.1
Feb	40.5	19.7	30.1	79	1972	29	40.0	1976	-18	1996	2	17.1	1978	978	0	.0	.0	9.1	8.0	22.2	2.1
Mar	52.0	29.2	40.6	89	1986	29	46.3	1986	-13+	1998	12	32.9	1978	757	0	.0	.0	19.5	1.4	16.0	.2
Apr	63.2	40.2	51.7	92+	1989	26	59.4	1981	8	1975	3	45.1	1983	404	4	.0	.3	27.2	.1	4.4	.0
May	73.7	52.5	63.1	95+	1967	24	68.4	1998	29	1976	3	58.3	1995	131	72	.0	.6	31.0	.0	.1	.0
Jun	82.6	61.6	72.1	103+	1988	25	76.1	1988	42+	1990	4	67.3	1982	11	225	.2	6.2	30.0	.0	.0	.0
Jul	87.0	66.0	76.5	106+	1954	18	82.5	1980	45	1971	30	72.2	1971	0	357	.8	13.3	31.0	.0	.0	.0
Aug	85.3	62.9	74.1	106	1983	17	82.4	1983	43	1950	20	68.0	1992	14	295	.7	11.4	31.0	.0	.0	.0
Sep	78.2	54.5	66.4	103+	1975	1	71.3	1998	30+	1999	22	61.0	1993	70	109	.1	4.0	30.0	.0	.2	.0
Oct	66.9	43.0	55.0	95+	1963	6	60.1	1971	17	1993	31	49.4	1976	318	7	.0	.2	29.6	.0	3.5	.0
Nov	50.2	30.2	40.2	83	1980	8	49.2	1999	-7	1976	28	32.9	1976	744	0	.0	.0	17.5	1.9	15.4	.1
Dec	37.2	19.6	28.4	70+	2001	6	34.2	1979	-22+	1989	23	11.7	1983	1134	0	.0	.0	6.4	8.6	26.8	2.3
Ann	62.5	41.2	51.9	106+	Aug 1983	17	82.5	Jul 1980	-22+	Dec 1989	23	9.8	Jan 1979	5835	1069	1.8	36.0	266.7	32.0	116.7	8.8

\+ 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

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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	.90	.86	1.96	1965	1	2.19	1973	.00	1986
Feb	1.13	1.02	2.05	1997	21	3.15	1997	.00	1991
Mar	2.57	2.04	2.68	1957	24	9.28	1973	.10	1988
Apr	3.33	2.97	2.98	1997	11	7.20	1999	.56	1989
May	5.06	4.48	6.80	1958	3	11.24	1982	1.43	1992
Jun	4.74	4.06	5.55	1984	8	14.86	1984	.27	1988
Jul	4.47	3.18	3.56	1993	5	19.20	1993	.22	1983
Aug	4.03	3.29	4.83	1951	3	11.40	1982	.44	1984
Sep	4.53	3.27	4.78	1986	11	12.85	1986	.33	1990
Oct	3.03	3.02	3.16	1973	11	6.30	1977	.00	1988
Nov	2.33	2.26	2.77	1998	2	6.17	1998	.00	1989
Dec	1.31	.95	2.18	1980	7	3.86	1980	.05	1996
Ann	37.43	36.50	6.80	May 1958	3	19.20	Jul 1993	.00+	Feb 1991

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.1	2.9	.4	@
Feb	5.4	3.0	.5	.1
Mar	8.0	4.9	1.7	.6
Apr	9.9	6.6	2.5	.8
May	10.4	7.5	3.7	1.7
Jun	9.3	6.3	3.0	1.5
Jul	8.3	6.1	3.0	1.4
Aug	8.3	5.4	2.4	1.2
Sep	7.7	6.0	3.1	1.4
Oct	6.8	5.0	1.8	1.0
Nov	6.2	4.2	1.6	.6
Dec	5.6	2.8	.7	.3
Ann	91.0	60.7	24.4	10.6

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	.20	.35	.48	.61	.76	.92	1.11	1.38	1.80	2.20
Feb	.11	.24	.43	.60	.77	.95	1.15	1.40	1.73	2.26	2.77
Mar	.36	.58	.95	1.30	1.68	2.09	2.56	3.14	3.92	5.20	6.43
Apr	.95	1.27	1.74	2.16	2.57	2.99	3.46	4.01	4.72	5.85	6.89
May	1.96	2.43	3.10	3.66	4.18	4.72	5.30	5.97	6.82	8.13	9.32
Jun	1.10	1.54	2.23	2.85	3.47	4.13	4.86	5.74	6.90	8.73	10.45
Jul	.57	.93	1.57	2.19	2.84	3.57	4.42	5.46	6.86	9.17	11.41
Aug	.64	.98	1.57	2.12	2.69	3.32	4.04	4.92	6.09	8.00	9.82
Sep	.76	1.15	1.82	2.44	3.08	3.77	4.57	5.53	6.82	8.91	10.90
Oct	.25	.59	1.08	1.52	1.98	2.48	3.05	3.75	4.68	6.19	7.64
Nov	.15	.39	.75	1.09	1.45	1.85	2.31	2.87	3.64	4.89	6.09
Dec	.14	.23	.41	.60	.79	1.01	1.27	1.60	2.04	2.77	3.49
Ann	21.90	24.69	28.37	31.25	33.87	36.44	39.13	42.17	45.90	51.44	56.32

+ 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	5.5	5.0	2	1
Feb	3.8	3.5	1	1
Mar	3.2	1.4	#	#
Apr	.7	.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	1.0	.0	#	#
Dec	3.6	2.9	1	#
Ann	18.0	12.8	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	1979	13	17.4	1979	16	1979	15	10	1979
Feb	10.0	1978	13	10.0+	1978	14	1979	5	10	1979
Mar	8.0	1978	2	11.8	1971	17	1978	2	5	1978
Apr	7.0	1992	21	7.0	1992	6	1975	2	#+	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	4	1996	23	#	1996
Nov	5.0	1975	26	7.3	1991	6	1975	27	1	1991
Dec	6.0	1997	10	15.5	1983	11	2000	31	7	2000
Ann	10.0+	Jan 1979	13	17.4	Jan 1979	17	Mar 1978	2	10+	Feb 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.3	2.1	.6	.2	@
Feb	2.6	1.5	.5	.1	@
Mar	1.6	1.0	.4	.2	.0
Apr	.2	.2	.1	.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	.1	@	@	@	.0
Nov	.6	.4	.1	@	.0
Dec	2.8	1.5	.5	.1	.0
Ann	11.2	6.7	2.2	.7	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	11.6	6.7	3.7	.7
Feb	8.3	4.9	2.8	1.2
Mar	1.8	.7	.1	.0
Apr	.3	.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
Nov	.9	.3	.1	.0
Dec	6.0	3.1	1.0	.1
Ann	28.9	15.8	7.7	2.0

+ 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	5/08	5/04	5/01	4/28	4/26	4/24	4/21	4/18	4/14
32	4/27	4/23	4/20	4/18	4/15	4/13	4/11	4/08	4/04
28	4/18	4/14	4/10	4/08	4/05	4/03	3/31	3/28	3/24
24	4/10	4/05	4/02	3/31	3/28	3/26	3/23	3/20	3/15
20	4/01	3/27	3/22	3/19	3/15	3/12	3/08	3/04	2/26
16	3/29	3/21	3/16	3/11	3/06	3/02	2/25	2/20	2/12

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	9/19	9/23	9/26	9/29	10/01	10/04	10/06	10/09	10/14
32	9/24	9/30	10/05	10/08	10/12	10/15	10/19	10/23	10/29
28	10/12	10/17	10/20	10/23	10/26	10/29	11/01	11/04	11/09
24	10/18	10/23	10/28	10/31	11/03	11/07	11/10	11/14	11/20
20	10/29	11/05	11/10	11/14	11/17	11/21	11/25	11/30	12/07
16	11/10	11/15	11/19	11/22	11/25	11/28	12/01	12/05	12/10

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	173	168	164	161	158	154	151	147	142
32	200	193	187	183	179	174	170	165	157
28	219	214	210	206	203	200	196	192	187
24	242	234	229	224	220	215	211	205	197
20	273	264	257	252	246	241	236	229	220
16	289	280	273	268	263	258	252	246	237

***** 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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1274	978	757	404	131	11	0	14	70	318	744	1134	5835
60	1119	838	602	270	59	1	0	2	22	190	595	979	4677
57	1026	761	516	200	32	0	0	0	8	128	511	886	4068
55	964	709	458	159	20	0	0	0	4	95	456	825	3690
50	815	580	322	79	5	0	0	0	0	39	326	680	2846
32	345	217	45	0	0	0	0	0	0	0	51	239	897

Cooling Degree Days (1)

Base	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	94	163	311	590	964	1204	1380	1304	1029	712	297	128	8176
55	1	11	11	59	270	514	667	591	343	94	12	1	2574
57	0	8	7	40	221	454	605	529	288	65	7	0	2224
60	0	0	0	20	155	366	512	439	211	34	2	0	1739
65	0	0	0	4	72	225	357	295	109	7	0	0	1069
70	0	0	0	0	24	111	212	173	45	1	0	0	566

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	20	66	202	449	771	1011	1168	1109	843	531	166	34	20	86	288	737	1508	2519	3687	4796	5639	6170	6336	6370
45	3	28	119	316	616	861	1013	954	693	388	92	11	3	31	150	466	1082	1943	2956	3910	4603	4991	5083	5094
50	0	10	61	202	462	711	858	799	543	258	43	3	0	10	71	273	735	1446	2304	3103	3646	3904	3947	3950
55	0	2	28	116	317	561	703	644	402	151	14	0	0	2	30	146	463	1024	1727	2371	2773	2924	2938	2938
60	0	0	5	55	187	412	548	490	271	74	3	0	0	0	5	60	247	659	1207	1697	1968	2042	2045	2045
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	13	49	133	277	479	685	803	753	548	329	97	26	13	62	195	472	951	1636	2439	3192	3740	4069	4166	4192

(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