

# Climatology of the United States

## No. 20

### 1971-2000

**Station: TOPEKA BILLARD MNCPL AP, KS**

**COOP ID: 148167**

**Climate Division: KS 6**

**NWS Call Sign: TOP**

**Elevation: 881 Feet Lat: 39°04N Lon: 95°38W**

### 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	37.2	17.2	27.2	73	1967	23	38.0	1989	-20+	1974	12	11.8	1979	1174	0	.0	.0	6.3	10.6	28.9	3.3
Feb	43.8	23.0	33.4	84	1972	29	42.9	1999	-23	1979	1	19.2	1979	898	0	.0	.0	9.8	6.7	22.3	2.1
Mar	55.5	32.9	44.2	89	1986	29	49.8	1986	-7	1978	4	37.3	1975	647	3	.0	.0	20.3	1.3	15.2	.1
Apr	66.1	42.9	54.5	95	1987	29	60.6	1981	10	1975	3	49.4	1983	336	22	.0	.4	27.5	@	4.0	.0
May	75.3	53.4	64.4	97+	1998	30	70.4	1987	26	1963	1	59.3	1995	106	85	.0	1.1	31.0	.0	.2	.0
Jun	84.5	63.2	73.9	107	1953	13	77.2	1990	42	1964	1	69.0	1982	7	278	.2	7.9	30.0	.0	.0	.0
Jul	89.1	67.7	78.4	110+	1980	30	86.4	1980	43	1972	5	73.7	1971	1	419	1.8	15.7	31.0	.0	.0	.0
Aug	87.9	65.4	76.7	110	1984	29	85.4	2000	41	1988	29	71.7	1992	1	357	1.7	14.0	31.0	.0	.0	.0
Sep	80.3	55.9	68.1	109	2000	2	74.0	1998	29+	1984	30	61.3	1974	73	166	.5	5.5	30.0	.0	.2	.0
Oct	68.9	44.3	56.6	96+	1963	5	60.8	1971	19+	1993	31	49.8	1976	287	26	.0	.5	29.6	.0	3.8	.0
Nov	53.1	32.1	42.6	85	1980	8	51.3	1999	2+	1976	29	35.0	1976	665	1	.0	.0	18.1	1.4	16.1	.0
Dec	40.9	21.8	31.4	73+	2001	5	37.4	1991	-26	1989	23	14.4	1983	1030	0	.0	.0	7.4	6.7	26.6	1.5
Ann	65.2	43.3	54.3	110+	Aug 1984	29	86.4	Jul 1980	-26	Dec 1989	23	11.8	Jan 1979	5225	1357	4.2	45.1	272.0	26.7	117.3	7.0

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(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								Mean Number of Days (3)				Precipitation Probabilities (1)										
														Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
Means/Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels											
													These values were determined from the incomplete gamma distribution											
Month	Mean	Median	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.95	.90	1.19	1982	29	2.67	1973	.00	1986	6.2	2.4	.5	.1	.10	.21	.37	.51	.65	.80	.97	1.17	1.44	1.87	2.28
Feb	1.18	.89	1.95	1971	21	3.49	1971	.08	1991	6.1	2.8	.6	.1	.16	.26	.43	.59	.77	.96	1.17	1.44	1.80	2.40	2.97
Mar	2.56	2.09	2.47	1992	18	8.44	1973	.19	1994	9.2	5.1	1.8	.4	.37	.58	.95	1.31	1.68	2.08	2.55	3.13	3.90	5.16	6.37
Apr	3.14	3.04	3.24	1969	26	8.69	1999	.62	1989	10.1	5.8	2.3	.7	.84	1.14	1.59	1.99	2.38	2.79	3.25	3.79	4.50	5.61	6.64
May	4.86	4.41	3.62	1978	31	11.81	1995	.95	1994	11.8	8.0	3.2	1.5	1.56	2.03	2.71	3.29	3.85	4.43	5.06	5.80	6.76	8.25	9.63
Jun	4.88	4.81	4.15	1984	21	10.91	1977	1.14	1972	10.5	6.9	3.0	1.4	1.40	1.87	2.57	3.17	3.76	4.38	5.07	5.87	6.91	8.55	10.07
Jul	3.83	2.90	3.69	1951	12	10.98	1993	.59+	1999	8.6	5.8	2.3	1.3	.59	.91	1.46	1.99	2.54	3.14	3.83	4.68	5.81	7.65	9.41
Aug	3.81	3.99	4.48	1949	18	11.18	1977	.26	1971	8.7	5.7	2.3	1.4	.45	.74	1.28	1.81	2.37	3.00	3.74	4.65	5.89	7.94	9.92
Sep	3.71	2.94	4.35	1989	8	12.71	1973	.83	1990	7.9	5.3	2.5	1.1	.69	1.02	1.56	2.06	2.58	3.13	3.76	4.52	5.52	7.15	8.69
Oct	2.99	3.25	3.48	1980	15	7.24	1980	.05	1975	7.2	4.6	1.9	1.0	.30	.52	.93	1.35	1.80	2.30	2.90	3.65	4.67	6.37	8.03
Nov	2.31	2.17	4.66	1964	15	5.64	1998	.00	1989	7.3	4.2	1.6	.5	.18	.42	.79	1.13	1.49	1.87	2.31	2.86	3.58	4.77	5.91
Dec	1.42	1.19	2.55	1980	7	4.30	1973	.04	1996	6.4	3.0	.8	.2	.11	.20	.38	.58	.79	1.05	1.35	1.73	2.26	3.15	4.03
Ann	35.64	36.57	4.66	Nov 1964	15	12.71	Sep 1973	.00+	Nov 1989	100.0	59.6	22.8	9.7	23.13	25.47	28.51	30.85	32.95	34.99	37.12	39.49	42.39	46.64	50.35

+ 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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Lat: 39°04N

Lon: 95°38W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	5.3	3.8	1	0	11.3	1985	9	17.3	1979	14	1993	10	8	1979	4.5	1.9	.5	.2	@	10.3	5.1	3.2	.6
Feb	4.9	2.4	1	1	11.3	1971	21	22.4	1971	12	1971	22	5+	1985	3.2	1.5	.4	.2	@	7.2	4.2	2.6	.2
Mar	2.3	.9	#	0	7.8	1975	9	7.8	1975	8	1975	10	1+	1990	1.7	.7	.3	.1	.0	1.8	.8	.2	.0
Apr	.5	.0	#	0	3.6	1975	2	4.5	1983	3	1975	3	#	1994	.6	.2	.1	.0	.0	.1	@	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	2000	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.3	.0	#	0	8.0	1996	22	8.0	1996	4	1996	23	#	1996	.0	.0	@	@	.0	.1	@	.0	.0
Nov	1.5	.2	#	0	6.1	1975	25	9.4	1972	8	1975	27	1	1975	1.5	.6	.1	@	.0	.7	.2	.1	.0
Dec	5.0	3.6	1	0	9.0	1973	30	18.8	1983	9+	1983	22	4	1983	3.5	1.6	.5	.2	.0	5.3	2.2	.8	.0
Ann	19.8	10.9	N/A	N/A	11.3+	Jan 1985	9	22.4	Feb 1971	14	Jan 1993	10	8	Jan 1979	15.0	6.5	1.9	.7	@	25.5	12.5	6.9	.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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<b>Freeze Data</b>									
<b>Spring Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of later date in spring (thru Jul 31) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	5/14	5/09	5/06	5/03	4/30	4/27	4/24	4/20	4/15
<b>32</b>	5/03	4/28	4/25	4/22	4/19	4/17	4/14	4/10	4/06
<b>28</b>	4/16	4/12	4/09	4/06	4/03	4/01	3/29	3/26	3/21
<b>24</b>	4/05	3/31	3/27	3/24	3/21	3/18	3/15	3/11	3/06
<b>20</b>	4/03	3/26	3/20	3/16	3/11	3/07	3/02	2/24	2/17
<b>16</b>	3/24	3/15	3/09	3/03	2/27	2/22	2/16	2/10	2/01
<b>Fall Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of earlier date in fall (beginning Aug 1) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	9/17	9/22	9/26	9/29	10/02	10/05	10/09	10/13	10/18
<b>32</b>	9/24	9/30	10/04	10/07	10/11	10/14	10/17	10/21	10/27
<b>28</b>	10/14	10/20	10/24	10/27	10/30	11/02	11/05	11/09	11/15
<b>24</b>	10/22	10/29	11/02	11/06	11/10	11/13	11/17	11/22	11/28
<b>20</b>	10/28	11/05	11/10	11/15	11/19	11/24	11/28	12/04	12/11
<b>16</b>	11/12	11/18	11/23	11/26	11/30	12/03	12/07	12/11	12/17
<b>Freeze Free Period</b>									
<b>Temp (F)</b>	<b>Probability of longer than indicated freeze free period (Days)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	176	169	163	159	155	151	146	141	134
<b>32</b>	193	186	182	177	174	170	166	161	154
<b>28</b>	229	222	217	213	209	205	200	195	188
<b>24</b>	257	249	243	238	233	228	223	217	208
<b>20</b>	288	276	267	260	253	245	238	229	217
<b>16</b>	306	296	288	282	275	269	263	255	245

\* 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

Complete documentation available from:

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**Elevation: 881 Feet**

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**Lon: 95°38W**

### 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
65	1174	898	647	336	106	7	1	1	73	287	665	1030	5225
60	1016	753	493	201	57	1	0	1	22	152	527	889	4112
57	925	674	407	140	32	0	0	0	10	97	444	797	3526
55	866	622	351	105	20	0	0	0	5	69	390	738	3166
50	723	498	228	43	6	0	0	0	0	24	269	595	2386
32	286	171	20	0	0	0	0	0	0	0	33	190	700

### Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	84	169	406	678	1006	1259	1442	1388	1087	766	344	123	8752
55	0	3	29	106	305	569	729	675	408	143	17	2	2986
57	0	2	19	81	252	509	667	613	354	109	11	1	2618
60	0	0	10	52	181	420	574	520	279	69	5	1	2111
65	0	0	3	22	85	278	419	357	166	26	1	0	1357
70	0	0	0	7	32	151	270	224	89	8	0	0	781

### 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	72	219	452	764	1026	1199	1148	856	531	173	36	20	92	311	763	1527	2553	3752	4900	5756	6287	6460	6496
45	3	33	132	313	609	876	1044	993	706	386	97	11	3	36	168	481	1090	1966	3010	4003	4709	5095	5192	5203
50	0	12	72	198	459	726	889	838	557	255	46	6	0	12	84	282	741	1467	2356	3194	3751	4006	4052	4058
55	0	2	33	112	315	576	734	683	419	148	16	0	0	2	35	147	462	1038	1772	2455	2874	3022	3038	3038
60	0	0	6	56	188	428	579	528	286	74	3	0	0	0	6	62	250	678	1257	1785	2071	2145	2148	2148
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	24	61	152	277	481	701	823	777	556	334	114	31	24	85	237	514	995	1696	2519	3296	3852	4186	4300	4331

(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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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.

- |   |   |
|---|---|
| <ol style="list-style-type: none"><li>a. Temperature/ Precipitation Tables<ol style="list-style-type: none"><li>1. 1971-2000 Monthly Normals</li><li>2. Cooperative Summary of the Day</li><li>3. National Weather Service station records</li><li>4. 1971-2000 serially complete daily data</li></ol></li><li>b. Degree Day Table<ol style="list-style-type: none"><li>1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals</li><li>2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data</li></ol></li></ol> | <ol style="list-style-type: none"><li>c. Snow Tables<ol style="list-style-type: none"><li>1. Snow Climatology</li><li>2. Cooperative Summary of the Day</li></ol></li><li>d. Freeze Data Table<br/>1971-2000 serially complete daily data</li></ol> |
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## References

- U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)