

# Climatology of the United States

## No. 20 1971-2000

**Station: ELKHART, KS**

**COOP ID: 142432**

**Climate Division: KS 7**

**NWS Call Sign:**

**Elevation: 3,599 Feet Lat: 37°00N**

**Lon: 101°53W**

### 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	45.1	18.3	31.7	83	1986	30	40.7	1986	-22	1984	19	19.4	1979	1033	0	.0	.0	14.2	5.6	29.0	1.4
Feb	50.6	22.2	36.4	87	1963	1	45.4	2000	-18	1905	13	22.4	1978	801	0	.0	.0	16.9	3.6	24.0	.9
Mar	58.6	29.9	44.3	91	1963	28	50.5	1986	-18	1920	7	38.4	1998	645	0	.0	.0	24.4	1.2	18.1	@
Apr	68.1	38.9	53.5	95+	1987	18	60.1	1981	8	1920	4	46.7	1997	356	11	@	.7	27.7	.1	6.6	.0
May	77.8	49.0	63.4	104	1956	20	68.9	1974	21	1979	4	58.0	1995	128	78	.3	3.9	30.6	.0	.3	.0
Jun	88.9	58.9	73.9	110+	1980	27	79.2	1977	33	1919	2	68.1	1989	12	279	3.7	15.6	30.0	.0	.0	.0
Jul	93.4	64.2	78.8	110+	1934	31	84.6	1980	45+	1905	9	75.9	1972	0	428	5.8	23.2	31.0	.0	.0	.0
Aug	90.9	62.7	76.8	108+	1982	14	81.6	1983	43	1915	30	72.1	1992	2	367	3.6	20.6	31.0	.0	.0	.0
Sep	82.3	54.0	68.2	105	2000	5	75.1	1998	25+	1985	30	63.0	1974	46	141	.7	9.1	29.7	.0	.3	.0
Oct	71.6	41.1	56.4	96+	1980	1	59.5	1998	6	1917	29	50.9	1976	276	6	.0	1.0	29.6	.1	4.0	.0
Nov	56.3	28.9	42.6	91	1980	9	50.9	1999	-7	1976	28	35.2	1972	673	0	.0	@	21.1	1.2	19.1	.1
Dec	46.9	20.6	33.8	85	1939	6	39.6	1994	-18	1916	21	20.7	1983	969	0	.0	.0	14.8	4.2	28.5	1.2
Ann	69.2	40.7	55.0	110+	Jun 1980	27	84.6	Jul 1980	-22	Jan 1984	19	19.4	Jan 1979	4941	1310	14.1	74.1	301.0	16.0	129.9	3.6

+ 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: 1900-2001

(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	.54	.38	1.36	1944	26	1.94	1980	.00+	1998	3.3	1.7	.3	@	.00	.00	.13	.22	.31	.42	.53	.68	.87	1.20	1.51	
Feb	.44	.28	3.10	1912	25	1.81	1983	.00+	1994	3.1	1.5	.1	@	.00	.00	.03	.08	.16	.25	.37	.52	.75	1.13	1.53	
Mar	1.38	1.04	2.53	1982	19	4.61	2000	.00	1997	5.2	3.3	.7	.2	.04	.15	.34	.54	.76	1.01	1.31	1.69	2.22	3.10	3.97	
Apr	1.67	1.07	2.85	1942	20	5.45	1980	.09	1996	5.4	3.5	1.0	.4	.10	.20	.40	.63	.89	1.19	1.55	2.02	2.67	3.78	4.89	
May	2.75	2.99	4.65	1979	2	8.36	1979	.53	1998	7.8	5.4	2.0	.6	.76	1.02	1.41	1.76	2.10	2.46	2.85	3.32	3.92	4.88	5.76	
Jun	2.50	2.85	3.26	1942	9	5.96	2000	.34	1973	7.4	5.0	1.7	.6	.47	.69	1.06	1.40	1.75	2.12	2.54	3.05	3.73	4.82	5.85	
Jul	2.82	2.33	6.80	1911	31	7.89	1998	.28	1999	7.3	5.0	1.9	.6	.43	.67	1.08	1.47	1.87	2.31	2.82	3.44	4.27	5.63	6.92	
Aug	2.74	2.47	6.75	1972	24	7.74	1996	.39	1984	6.9	4.5	1.7	.5	.49	.73	1.13	1.51	1.89	2.30	2.77	3.34	4.10	5.33	6.50	
Sep	1.69	1.61	6.12	1923	15	4.61	1987	.00	1980	5.2	3.3	1.0	.4	.04	.14	.36	.60	.87	1.18	1.56	2.05	2.73	3.89	5.05	
Oct	1.11	.85	3.05	1946	7	5.19	2000	.00+	1987	3.7	2.2	.7	.3	.00	.00	.15	.31	.50	.72	1.00	1.35	1.84	2.69	3.54	
Nov	.78	.54	1.80+	1971	16	3.72	1972	.00+	1995	3.6	1.9	.4	.1	.00	.02	.11	.22	.35	.50	.69	.94	1.30	1.92	2.54	
Dec	.48	.33	2.76	1911	20	1.42	1997	.00	1976	3.1	1.3	.2	@	.02	.06	.13	.20	.27	.36	.46	.59	.77	1.07	1.37	
Ann	18.90	17.85	6.80	Jul 1911	31	8.36	May 1979	.00+	Jan 1998	62.0	38.6	11.7	3.7	14.05	15.01	16.22	17.14	17.95	18.73	19.54	20.42	21.49	23.03	24.36	

+ 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: 1900-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:  
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Lon: 101°53W

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	5.5	4.7	1	#	6.0	1980	29	16.3	1980	10+	1999	30	3	1987	2.3	1.6	.8	.3	.0	3.2	1.7	.9	.1
Feb	4.5	1.0	1	#	11.0	1983	1	17.5+	1990	13	1983	2	7	1983	2.0	1.5	.5	.2	@	.9	.1	.0	.0
Mar	4.9	3.0	#	#	10.0	1999	19	20.5	1999	9+	1999	19	2	1985	1.5	1.2	.6	.2	@	1.5	.9	.3	.0
Apr	1.1	.0	#	0	14.0	1988	2	14.0	1988	12	1988	2	#+	1996	.4	.3	.1	@	@	.1	@	@	@
May	.2	.0	0	0	4.3	1978	3	4.3	1978	0	0	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	.1	.0	0	0	3.0	1984	29	3.0	1984	0	0	0	0	0	@	@	@	.0	.0	.0	.0	.0	.0
Oct	1.0	.0	#	0	9.0	1979	31	9.0+	1997	7	1991	31	#+	2000	.2	.1	.1	.1	.0	.2	@	@	.0
Nov	1.6	.0	#	0	6.0	1980	25	6.5	1992	10	1991	1	1	1991	1.0	.7	.3	.1	.0	.4	.3	.2	@
Dec	3.4	3.2	#	#	6.0	1997	23	16.0	1973	10	1997	24	3	1997	1.9	1.2	.6	.1	.0	1.8	.8	.4	.1
Ann	22.3	11.9	N/A	N/A	14.0	Apr 1988	2	20.5	Mar 1999	13	Feb 1983	2	7	Feb 1983	9.3	6.6	3.0	1.0	@	8.1	3.8	1.8	.2

+ 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>	5/13	5/09	5/06	5/03	5/01	4/29	4/26	4/24	4/20
<b>32</b>	5/07	5/02	4/28	4/25	4/22	4/19	4/16	4/12	4/07
<b>28</b>	4/23	4/19	4/16	4/13	4/11	4/08	4/06	4/03	3/29
<b>24</b>	4/15	4/09	4/05	4/02	3/30	3/27	3/24	3/20	3/14
<b>20</b>	4/07	3/31	3/26	3/22	3/18	3/14	3/10	3/05	2/26
<b>16</b>	4/02	3/25	3/20	3/15	3/10	3/06	3/01	2/23	2/15
<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>	9/23	9/28	10/01	10/04	10/07	10/10	10/13	10/16	10/21
<b>32</b>	9/29	10/05	10/09	10/13	10/16	10/19	10/23	10/27	11/02
<b>28</b>	10/12	10/17	10/21	10/25	10/28	10/31	11/04	11/08	11/13
<b>24</b>	10/27	10/31	11/03	11/06	11/09	11/11	11/14	11/17	11/21
<b>20</b>	10/31	11/06	11/09	11/13	11/16	11/19	11/22	11/25	12/01
<b>16</b>	11/07	11/15	11/20	11/24	11/28	12/02	12/06	12/11	12/19
<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>	174	169	165	161	158	155	151	147	142
<b>32</b>	196	189	184	180	176	173	169	164	157
<b>28</b>	221	214	208	204	199	195	190	185	177
<b>24</b>	245	238	232	227	223	218	214	208	200
<b>20</b>	268	259	252	247	242	237	231	225	216
<b>16</b>	294	283	275	268	262	256	249	241	230

\* 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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**Lon: 101°53W**

<b>Degree Days to Selected Base Temperatures (°F)</b>													
<b>Base</b>	<b>Heating Degree Days (1)</b>												
<b>Below</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Ann</b>
<b>65</b>	1033	801	645	356	128	12	0	2	46	276	673	969	4941
<b>60</b>	878	661	490	230	58	2	0	0	11	149	525	814	3818
<b>57</b>	785	585	401	167	31	0	0	0	4	92	441	721	3227
<b>55</b>	725	533	344	132	19	0	0	0	1	63	386	659	2862
<b>50</b>	578	406	213	62	4	0	0	0	0	21	260	510	2054
<b>32</b>	161	96	9	0	0	0	0	0	0	0	23	105	394

<b>Base</b>	<b>Cooling Degree Days (1)</b>												
<b>Above</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Ann</b>
<b>32</b>	151	218	387	645	973	1257	1451	1388	1084	754	340	160	8808
<b>55</b>	2	11	9	86	279	567	738	675	395	104	12	0	2878
<b>57</b>	0	8	4	62	229	507	676	613	338	71	7	0	2515
<b>60</b>	0	0	1	35	163	419	583	520	256	35	2	0	2014
<b>65</b>	0	0	0	11	78	279	428	367	141	6	0	0	1310
<b>70</b>	0	0	0	2	28	160	274	224	62	1	0	0	751

<b>Growing Degree Units (2)</b>																								
<b>Base</b>	<b>Growing Degree Units (Monthly)</b>												<b>Growing Degree Units (Accumulated Monthly)</b>											
	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul</b>	<b>Aug</b>	<b>Sep</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>
<b>40</b>	55	107	239	447	746	1030	1214	1157	860	540	182	59	55	162	401	848	1594	2624	3838	4995	5855	6395	6577	6636
<b>45</b>	21	50	138	315	592	880	1059	1002	713	393	102	22	21	71	209	524	1116	1996	3055	4057	4770	5163	5265	5287
<b>50</b>	2	17	69	199	443	730	904	847	566	260	46	4	2	19	88	287	730	1460	2364	3211	3777	4037	4083	4087
<b>55</b>	0	2	28	107	300	580	749	692	424	149	12	0	0	2	30	137	437	1017	1766	2458	2882	3031	3043	3043
<b>60</b>	0	0	6	46	177	431	594	537	291	66	0	0	0	0	6	52	229	660	1254	1791	2082	2148	2148	2148
<b>Base</b>	<b>Growing Degree Units for Corn (Monthly)</b>												<b>Growing Degree Units for Corn (Accumulated Monthly)</b>											
<b>50/86</b>	68	114	197	312	468	648	778	746	541	359	148	74	68	182	379	691	1159	1807	2585	3331	3872	4231	4379	4453

(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/normals/usnormals.html](http://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](http://www.ncdc.noaa.gov/normals.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normals/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normals/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)