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: SAINT FRANCIS, KS **COOP ID: 147093**

Climate Division: KS 3 **NWS Call Sign:** **Elevation: 3,362 Feet** **Lat: 39˚46N** **Lon: 101˚49W**

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	41.0	13.3	27.2	81	1982	27	36.8	1986	-28	1912	12	15.3	1979	1174	0	.0	.0	9.7	7.6	30.8	3.7
Feb	47.1	17.7	32.4	83	1970	17	39.5+	1999	-25	1933	8	20.8	1978	913	0	.0	.0	13.8	5.1	27.0	2.3
Mar	54.8	25.0	39.9	92	1963	28	45.0	1986	-20	1960	3	34.4	1980	778	0	.0	.0	20.7	2.3	23.8	.5
Apr	64.4	34.0	49.2	97	1910	28	55.8	1981	0	1936	2	43.3	1983	475	2	.0	.5	25.8	.3	11.4	.0
May	73.8	45.3	59.6	103	2000	30	64.4	1994	17	1909	1	52.7	1995	205	36	.1	2.1	30.5	.0	1.1	.0
Jun	85.7	55.9	70.8	109	1937	23	75.9	1977	33+	1998	6	63.5	1982	31	204	2.1	12.4	29.9	.0	.0	.0
Jul	91.3	61.3	76.3	111+	1940	24	79.8	1978	41	1915	4	72.9	1992	0	351	5.2	19.8	31.0	.0	.0	.0
Aug	89.3	59.0	74.2	110	1938	2	79.0	1983	33	1910	26	69.9	1992	7	290	2.5	17.9	31.0	.0	.0	.0
Sep	80.9	48.6	64.8	105+	1985	1	70.8	1998	18	1926	25	59.5	1993	98	91	.7	8.7	29.5	.0	.9	.0
Oct	69.2	35.2	52.2	104	1947	5	55.3	1979	3	1917	29	48.2	1984	398	1	.0	1.1	28.6	.3	9.4	.0
Nov	52.1	23.3	37.7	89	1927	10	46.2	1999	-9	1940	14	30.6	1985	821	0	.0	.0	17.3	2.7	25.7	.2
Dec	43.5	15.5	29.5	80+	1964	23	36.4	1980	-31+	1989	23	14.0	1983	1101	0	.0	.0	11.2	6.1	30.4	2.4
Ann	66.1	36.2	51.2	111+	Jul 1940	24	79.8	Jul 1978	-31+	Dec 1989	23	14.0	Dec 1983	6001	975	10.6	62.5	279.0	24.4	160.5	9.1

\+ 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: 1908-2001

(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	.51	.47	1.15	1990	20	1.32	1990	.00	1986
Feb	.49	.40	1.93	1984	18	1.97	1984	.03	1972
Mar	1.17	.82	1.63	1938	15	5.03	1981	.00+	1997
Apr	1.73	1.47	2.60	1932	24	4.32	1981	.00	1992
May	3.14	3.01	4.52	1915	27	6.99	1988	.28	2000
Jun	2.57	2.33	3.32	1974	9	6.61	1982	.25	1976
Jul	2.97	2.56	3.15	1929	23	6.25	1981	.36	1999
Aug	2.12	1.63	3.20	1933	22	7.24	1992	.33+	2000
Sep	1.16	.92	2.71	1920	2	3.83	1973	.00	1974
Oct	1.04	.85	4.10	1908	19	3.15	1984	.00	1988
Nov	.76	.51	1.22	1908	29	2.12	1975	.03+	1996
Dec	.40	.25	1.23	1924	4	1.61	1973	.00+	2000
Ann	18.06	17.93	4.52	May 1915	27	7.24	Aug 1992	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.8	1.6	.2	@
Feb	3.3	1.6	.1	@
Mar	5.9	2.9	.7	.2
Apr	6.9	3.8	1.0	.3
May	9.7	6.7	1.9	.6
Jun	8.3	5.3	1.7	.5
Jul	8.5	5.7	2.0	.8
Aug	6.9	4.3	1.2	.4
Sep	5.2	2.6	.7	.3
Oct	4.2	2.5	.7	.1
Nov	3.8	2.1	.4	.1
Dec	2.7	1.1	.2	.0
Ann	69.2	40.2	10.8	3.3

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	.04	.09	.18	.25	.33	.42	.51	.64	.80	1.06	1.32
Feb	.04	.07	.13	.20	.27	.36	.46	.59	.77	1.08	1.39
Mar	.00	.06	.23	.41	.60	.83	1.10	1.44	1.92	2.72	3.52
Apr	.37	.61	.90	1.13	1.35	1.58	1.82	2.11	2.48	3.06	3.59
May	.58	.86	1.32	1.75	2.18	2.65	3.18	3.83	4.68	6.05	7.36
Jun	.42	.64	1.01	1.37	1.73	2.13	2.59	3.14	3.88	5.08	6.23
Jul	.65	.93	1.36	1.75	2.15	2.57	3.04	3.60	4.35	5.53	6.65
Aug	.28	.46	.76	1.05	1.36	1.71	2.10	2.59	3.25	4.33	5.38
Sep	.06	.16	.34	.51	.69	.89	1.13	1.43	1.83	2.49	3.14
Oct	.03	.11	.25	.40	.56	.75	.98	1.27	1.67	2.34	3.00
Nov	.06	.11	.21	.31	.43	.56	.72	.92	1.21	1.68	2.15
Dec	.00	.00	.03	.08	.15	.23	.33	.47	.67	1.02	1.37
Ann	12.22	13.33	14.76	15.85	16.83	17.78	18.77	19.86	21.19	23.13	24.82

+ 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: 1908-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	6.9	6.9	2	1	12.0	1990	20	14.0	1990	15	1974	9	10	1974	3.4	2.1	.7	.3	.1	10.8	5.3	2.3	.9
Feb	4.9	5.0	1	#	15.0	1984	18	15.0	1993	15	1984	18	3	1978	2.5	1.7	.6	.2	@	5.8	2.6	1.0	.0
Mar	7.1	5.4	#	#	14.0	1977	12	21.7	1980	18	1981	8	3	1981	3.2	2.1	.6	.3	.1	3.2	1.2	.6	.4
Apr	3.7	1.3	#	0	11.0	1989	9	12.2	1984	15	1980	3	2	1980	1.5	1.1	.4	.2	.1	1.1	.6	.3	.2
May	.2	.0	#	0	3.5	1978	6	3.5	1978	4	1978	6	#+	1979	.1	.1	@	.0	.0	.1	@	.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	.4	.0	0	0	8.0	1995	21	8.0	1995	0	0	0	0	0	.1	.1	.1	@	.0	.0	.0	.0	.0
Oct	1.7	.0	#	0	11.0	1979	31	12.0	1979	11	1991	31	#+	1997	.6	.5	.2	.2	.1	.5	.2	.1	@
Nov	4.9	4.0	1	#	9.0	1972	13	17.9	1975	15	1975	27	5	1975	2.0	1.5	.6	.2	.0	3.6	2.0	1.1	.5
Dec	5.1	3.0	1	#	9.5	1973	25	21.3	1973	14	1973	26	5	1983	2.5	1.7	.5	.2	.0	5.5	3.2	1.9	.4
Ann	34.9	25.6	N/A	N/A	15.0	Feb 1984	18	21.7	Mar 1980	18	Mar 1981	8	10	Jan 1974	15.9	10.9	3.7	1.6	.4	30.6	15.1	7.3	2.4

+ 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	5/22	5/17	5/14	5/12	5/09	5/07	5/04	5/01	4/27
32	5/15	5/10	5/07	5/04	5/02	4/29	4/27	4/24	4/19
28	5/04	4/29	4/25	4/22	4/19	4/16	4/13	4/09	4/04
24	4/24	4/19	4/16	4/13	4/10	4/07	4/04	3/31	3/26
20	4/12	4/07	4/03	3/31	3/28	3/25	3/22	3/18	3/13
16	4/06	3/31	3/26	3/22	3/19	3/15	3/11	3/07	3/01

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	9/14	9/19	9/22	9/24	9/27	9/29	10/02	10/05	10/09
32	9/20	9/25	9/29	10/03	10/06	10/09	10/12	10/16	10/21
28	9/30	10/05	10/09	10/12	10/15	10/18	10/21	10/25	10/30
24	10/10	10/15	10/18	10/21	10/24	10/27	10/29	11/02	11/06
20	10/23	10/27	10/30	11/02	11/04	11/07	11/09	11/12	11/17
16	11/01	11/06	11/09	11/12	11/15	11/18	11/21	11/24	11/29

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	156	150	146	143	140	136	133	129	123
32	176	169	164	160	156	152	148	143	136
28	202	194	188	183	178	174	169	163	155
24	218	210	205	201	197	192	188	183	175
20	244	236	230	225	220	216	211	205	197
16	264	256	250	245	241	236	231	225	217

***** 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	1174	913	778	475	205	31	0	7	98	398	821	1101	6001
60	1019	773	623	333	107	8	0	1	37	250	671	946	4768
57	926	689	530	255	65	3	0	0	17	172	581	853	4091
55	864	638	468	208	44	1	0	0	9	127	522	791	3672
50	711	507	322	112	13	0	0	0	0	49	384	642	2740
32	243	147	23	0	0	0	0	0	0	0	63	202	678

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	92	158	268	517	854	1164	1373	1307	983	626	232	125	7699
55	0	4	0	35	185	475	660	594	302	40	2	0	2297
57	0	0	0	22	144	416	598	532	250	22	0	0	1984
60	0	0	0	10	93	331	505	440	180	8	0	0	1567
65	0	0	0	2	36	204	351	290	91	1	0	0	975
70	0	0	0	0	9	106	204	159	37	0	0	0	515

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	18	58	153	338	643	941	1154	1087	776	430	107	29	18	76	229	567	1210	2151	3305	4392	5168	5598	5705	5734
45	0	20	81	221	493	791	999	932	628	296	54	6	0	20	101	322	815	1606	2605	3537	4165	4461	4515	4521
50	0	2	31	126	347	641	844	777	482	176	16	0	0	2	33	159	506	1147	1991	2768	3250	3426	3442	3442
55	0	0	8	66	219	491	689	622	347	87	1	0	0	0	8	74	293	784	1473	2095	2442	2529	2530	2530
60	0	0	0	26	115	352	534	467	226	28	0	0	0	0	0	26	141	493	1027	1494	1720	1748	1748	1748
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	37	80	152	250	403	590	736	694	490	317	114	52	37	117	269	519	922	1512	2248	2942	3432	3749	3863	3915

(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