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: INDEPENDENCE, KS **COOP ID: 143954**

Climate Division: KS 9 **NWS Call Sign:** **Elevation: 805 Feet** **Lat: 37˚14N** **Lon: 95˚42W**

Temperature (˚F)

Month	Mean (1) Daily Max	Mean (1) Daily Min	Mean (1) Mean	Extremes Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Degree Days (1) Base Temp 65 Heating	Cooling	Mean Number of Days (3) Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	42.3	20.7	31.5	78	1950	24	41.6	1990	-19+	1949	30	17.4	1979	1040	0	.0	.0	10.8	7.0	26.3	1.2
Feb	48.8	25.4	37.1	88	1962	12	48.1	1976	-23	1905	13	23.8	1979	781	0	.0	.0	14.2	3.7	20.1	.8
Mar	59.1	34.3	46.7	98	1907	19	51.0	1986	-5+	1948	12	40.3	1984	568	0	.0	.1	24.3	.6	11.3	.0
Apr	69.0	44.7	56.9	101	1972	12	63.8	1981	15	1936	3	47.5	1983	268	23	@	.5	29.2	.0	2.4	.0
May	76.5	55.7	66.1	102	1934	31	71.6	1987	28	1909	1	61.7+	1983	79	112	.0	.9	31.0	.0	@	.0
Jun	85.3	64.6	75.0	109	1936	22	79.7	1994	42+	1954	4	69.8	1982	5	304	.2	9.5	30.0	.0	.0	.0
Jul	91.5	69.4	80.5	115	1954	14	88.0	1980	46	1924	3	76.7	1972	0	479	3.3	21.5	31.0	.0	.0	.0
Aug	91.2	67.0	79.1	116	1936	9	84.9	1983	43	1915	31	73.8	1992	2	440	3.6	19.8	31.0	.0	.0	.0
Sep	82.6	59.0	70.8	111	1939	2	78.3	1998	29	1984	30	61.7	1974	42	216	1.0	8.2	30.0	.0	@	.0
Oct	72.1	46.8	59.5	99	1939	6	63.7	1973	16+	1925	31	53.1	1976	200	28	.0	.8	30.5	.0	1.5	.0
Nov	57.5	34.6	46.1	88	1963	16	55.3	1999	5	1976	29	39.4	1976	568	0	.0	.0	22.3	.4	12.3	.0
Dec	46.0	24.8	35.4	78	1966	7	40.9	1971	-16	1989	22	19.2	1983	918	0	.0	.0	13.0	4.0	23.4	.7
Ann	68.5	45.6	57.1	116	Aug 1936	9	88.0	Jul 1980	-23	Feb 1905	13	17.4	Jan 1979	4471	1602	8.1	61.3	297.3	15.7	97.3	2.7

\+ 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: 1900-2001

(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	1.47	1.10	2.54	1975	30	5.07	1973	.01+	1986
Feb	1.88	1.77	3.41	1997	21	5.30	1985	.04	1996
Mar	3.75	3.12	5.48	1974	10	10.03	1973	.28	1971
Apr	3.89	3.48	3.76	1944	10	9.48	1994	.34	1989
May	5.86	5.89	7.69	1984	27	10.67	1984	2.22	1996
Jun	5.45	4.88	6.17	1978	18	11.49	1977	.74	1980
Jul	3.54	2.99	6.38	1976	2	9.68	1992	.12	1980
Aug	3.65	3.21	4.48	1975	17	9.68	1975	.06	1971
Sep	4.48	3.83	6.39	1986	29	15.11	1986	.71	1981
Oct	4.09	2.90	6.08	1983	20	14.75	1998	.05	1995
Nov	3.26	3.14	7.35	1979	20	8.58	1979	.01+	1989
Dec	2.14	1.54	2.51	1933	19	5.83	1984	.09	1977
Ann	43.46	42.61	7.69	May 1984	27	15.11	Sep 1986	.01+	Nov 1989

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.2	3.4	.7	.3
Feb	5.9	3.5	1.3	.4
Mar	8.5	5.9	2.9	1.0
Apr	9.1	6.6	2.8	1.0
May	10.9	8.0	4.2	1.7
Jun	9.4	6.9	3.4	1.6
Jul	7.0	5.0	2.1	.9
Aug	7.4	5.2	2.3	1.3
Sep	8.1	5.6	2.8	1.4
Oct	7.4	4.9	2.5	1.2
Nov	6.7	4.6	2.2	.9
Dec	6.8	3.7	1.5	.6
Ann	93.4	63.3	28.7	12.3

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	.09	.18	.36	.56	.79	1.05	1.37	1.78	2.35	3.32	4.28
Feb	.17	.30	.55	.82	1.10	1.43	1.81	2.29	2.96	4.07	5.15
Mar	.62	.95	1.49	2.01	2.54	3.12	3.78	4.58	5.65	7.39	9.05
Apr	1.00	1.37	1.93	2.43	2.92	3.44	4.02	4.70	5.60	7.01	8.33
May	2.23	2.78	3.56	4.20	4.82	5.45	6.13	6.92	7.92	9.47	10.88
Jun	1.44	1.95	2.74	3.44	4.12	4.84	5.63	6.58	7.81	9.75	11.56
Jul	.23	.45	.89	1.37	1.91	2.55	3.31	4.28	5.64	7.94	10.22
Aug	.38	.66	1.16	1.67	2.21	2.83	3.55	4.46	5.69	7.72	9.72
Sep	.69	1.07	1.72	2.34	2.98	3.68	4.49	5.48	6.80	8.94	11.00
Oct	.34	.62	1.16	1.72	2.35	3.06	3.91	4.97	6.45	8.91	11.34
Nov	.13	.28	.63	1.05	1.55	2.16	2.91	3.89	5.28	7.70	10.13
Dec	.13	.26	.52	.81	1.14	1.53	1.99	2.59	3.42	4.84	6.24
Ann	30.44	32.95	36.16	38.61	40.79	42.90	45.08	47.49	50.42	54.68	58.37

\+ 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

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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	4.0	2.0	1	#	7.5	1988	6	16.6	1987	9	1988	6	4	1979	2.1	1.3	.5	.2	.0	4.7	2.6	1.0	.0
Feb	3.8	2.3	1	#	12.0	1980	7	16.0	1980	15	1980	10	3	1980	1.7	1.1	.4	.2	@	3.6	2.0	1.2	.2
Mar	1.6	.0	#	0	7.0	1975	9	10.0	1988	7+	1999	14	1	1999	.7	.5	.2	.1	.0	.9	.4	.1	.0
Apr	.0	.0	#	0	.5	1979	3	.5	1979	#+	1997	9	#+	1997	@	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	#	.0	#	0	#	1997	27	#+	1997	#+	1997	27	#+	1997	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.6	.0	#	0	3.5	1971	23	5.0	1971	3	1972	18	#+	2000	.5	.4	.1	.0	.0	.3	.1	.0	.0
Dec	1.7	.0	#	#	10.0	1987	14	10.0	1987	12	1987	14	4	2000	1.5	1.0	.3	.1	@	3.0	1.6	.9	.2
Ann	11.7	4.3	N/A	N/A	12.0	Feb 1980	7	16.6	Jan 1987	15	Feb 1980	10	4+	Dec 2000	6.5	4.3	1.5	.6	@	12.5	6.7	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	5/02	4/27	4/23	4/20	4/17	4/14	4/10	4/07	4/01
32	4/22	4/18	4/14	4/11	4/08	4/06	4/03	3/30	3/26
28	4/09	4/04	3/31	3/27	3/24	3/21	3/17	3/13	3/08
24	4/02	3/26	3/21	3/17	3/13	3/09	3/04	2/27	2/20
20	3/24	3/16	3/10	3/05	2/28	2/24	2/19	2/13	2/04
16	3/11	3/04	2/26	2/21	2/16	2/12	2/07	2/01	1/24

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	9/26	10/02	10/06	10/10	10/14	10/17	10/21	10/26	11/01
32	10/10	10/15	10/19	10/22	10/25	10/28	10/31	11/04	11/09
28	10/24	10/30	11/03	11/07	11/10	11/14	11/18	11/22	11/28
24	11/03	11/09	11/13	11/16	11/19	11/23	11/26	11/30	12/06
20	11/07	11/14	11/19	11/24	11/28	12/02	12/07	12/12	12/19
16	11/11	11/21	11/29	12/05	12/10	12/16	12/22	12/29	1/08

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	206	197	190	185	179	174	168	161	152
32	221	214	208	203	199	194	190	184	176
28	258	248	242	236	231	225	220	213	204
24	280	270	263	257	251	245	239	232	221
20	305	294	285	278	272	265	258	250	239
16	329	316	307	300	294	287	281	273	262

***** 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	1040	781	568	268	79	5	0	2	42	200	568	918	4471
60	886	653	419	159	28	0	0	0	13	97	428	764	3447
57	795	575	334	108	13	0	0	0	6	56	347	676	2910
55	735	524	280	80	7	0	0	0	3	36	297	618	2580
50	593	406	168	30	1	0	0	0	0	9	191	477	1875
32	191	114	8	0	0	0	0	0	0	0	14	119	446

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	174	257	463	745	1057	1288	1502	1461	1164	851	436	224	9622
55	6	23	22	135	350	598	789	748	477	175	29	11	3363
57	3	18	14	103	294	538	727	686	420	132	19	6	2960
60	1	12	6	64	217	448	634	593	337	80	10	1	2403
65	0	0	0	23	112	304	479	440	216	28	0	0	1602
70	0	0	0	6	44	175	325	294	123	6	0	0	973

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	52	129	305	547	836	1069	1270	1234	940	631	254	83	52	181	486	1033	1869	2938	4208	5442	6382	7013	7267	7350
45	19	70	195	404	681	919	1115	1079	791	479	158	36	19	89	284	688	1369	2288	3403	4482	5273	5752	5910	5946
50	2	33	112	273	526	769	960	924	641	333	86	12	2	35	147	420	946	1715	2675	3599	4240	4573	4659	4671
55	1	11	58	159	372	619	805	769	495	208	38	2	1	12	70	229	601	1220	2025	2794	3289	3497	3535	3537
60	0	3	20	83	235	469	650	614	356	112	13	0	0	3	23	106	341	810	1460	2074	2430	2542	2555	2555
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	46	100	199	342	538	732	857	822	619	393	162	60	46	146	345	687	1225	1957	2814	3636	4255	4648	4810	4870

(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