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: COLUMBUS 1 SW, KS **COOP ID: 141740**

Climate Division: KS 9 **NWS Call Sign:** **Elevation: 900 Feet** **Lat: 37˚10N** **Lon: 94˚51W**

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	40.6	21.4	31.0	77	1911	11	41.1	1990	-19	1930	22	17.6	1979	1054	0	.0	.0	9.3	7.2	26.1	1.6
Feb	47.5	26.4	37.0	85	1996	23	45.4	1976	-28	1905	13	24.4	1978	786	0	.0	.0	13.5	4.3	20.0	.8
Mar	57.3	35.0	46.2	93	1916	21	50.6	1985	-17	1943	7	40.0	1975	584	0	.0	@	23.2	.6	12.0	.0
Apr	67.1	44.0	55.6	97	1972	12	63.0	1981	16	1957	13	48.8	1983	294	11	.0	.1	28.6	.0	3.0	.0
May	75.3	54.7	65.0	98	1934	31	70.9	1987	28	1909	1	60.2	1976	100	98	.0	.3	31.0	.0	@	.0
Jun	84.0	63.7	73.9	108	1918	18	78.4	1994	42	1917	15	68.7	1982	9	274	.2	7.5	30.0	.0	.0	.0
Jul	89.7	68.5	79.1	117	1954	14	86.2	1980	45	1972	6	74.9	1971	0	437	1.8	19.0	31.0	.0	.0	.0
Aug	89.1	66.4	77.8	115	1936	9	83.8	1983	44	1915	31	72.0	1992	4	399	2.0	17.2	31.0	.0	.0	.0
Sep	80.7	58.3	69.5	108	1939	3	75.6	1998	30	1942	27	61.8	1974	42	178	.5	5.9	30.0	.0	@	.0
Oct	70.4	46.9	58.7	98	1963	7	62.6	1973	15	1917	30	52.3	1976	219	22	.0	.4	30.2	.0	1.7	.0
Nov	55.7	35.5	45.6	84+	1978	3	54.6	1999	4+	1976	29	37.1	1976	582	0	.0	.0	21.4	.6	11.6	.0
Dec	44.7	25.8	35.3	76	1966	7	41.4	1984	-15+	1989	24	20.2	1983	922	0	.0	.0	12.4	4.5	22.5	.8
Ann	66.8	45.6	56.2	117	Jul 1954	14	86.2	Jul 1980	-28	Feb 1905	13	17.6	Jan 1979	4596	1419	4.5	50.4	291.6	17.2	96.9	3.2

\+ 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	1.58	1.35	2.65	1916	21	3.89	1982	.01	1986
Feb	2.00	1.71	5.58	1985	23	7.87	1985	.08	1996
Mar	3.43	3.16	3.07	1974	11	9.09	1973	.69	1972
Apr	4.14	3.71	5.57	1994	12	12.73	1994	.26	1989
May	5.69	5.80	6.20	1943	19	11.87	1993	1.26	1988
Jun	4.99	4.60	8.40	1948	22	12.36	1977	1.06	1972
Jul	3.71	2.59	7.98	1976	3	10.60	1992	.30	1980
Aug	3.90	3.45	7.45	1996	18	11.05	1996	.00	2000
Sep	4.70	3.83	7.58	1993	25	15.92	1993	.20	1979
Oct	3.89	3.36	3.22	1998	5	9.65	1983	.20	1995
Nov	4.08	3.94	5.53	1979	21	9.53	1985	.01+	1989
Dec	2.36	2.04	2.94	1932	23	6.08	1992	.21	1996
Ann	44.47	44.76	8.40	Jun 1948	22	15.92	Sep 1993	.00	Aug 2000

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.7	3.8	.8	.2
Feb	6.2	3.4	1.4	.5
Mar	9.6	6.2	2.3	.9
Apr	10.2	6.4	2.5	1.3
May	11.7	7.9	4.0	1.9
Jun	10.3	7.4	3.5	1.4
Jul	7.6	5.1	2.4	1.2
Aug	7.6	5.0	2.3	1.4
Sep	8.6	6.0	2.8	1.5
Oct	8.1	5.3	2.7	1.2
Nov	7.9	5.2	2.4	1.3
Dec	7.2	4.2	1.8	.6
Ann	102.7	65.9	28.9	13.4

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	.15	.26	.47	.69	.93	1.20	1.52	1.92	2.48	3.39	4.30
Feb	.26	.42	.71	.98	1.28	1.60	1.98	2.44	3.06	4.09	5.08
Mar	.76	1.08	1.58	2.03	2.49	2.97	3.51	4.16	5.01	6.37	7.65
Apr	.68	1.04	1.64	2.21	2.79	3.43	4.16	5.05	6.24	8.17	10.01
May	1.86	2.40	3.19	3.87	4.52	5.20	5.93	6.80	7.90	9.63	11.22
Jun	1.30	1.77	2.49	3.13	3.76	4.42	5.15	6.02	7.15	8.94	10.62
Jul	.47	.76	1.29	1.81	2.35	2.96	3.66	4.53	5.70	7.63	9.50
Aug	.32	.75	1.39	1.96	2.55	3.19	3.92	4.81	6.01	7.95	9.81
Sep	.54	.90	1.56	2.22	2.91	3.70	4.61	5.74	7.28	9.82	12.29
Oct	.71	1.05	1.62	2.15	2.69	3.27	3.94	4.74	5.81	7.54	9.18
Nov	.20	.41	.88	1.42	2.05	2.80	3.72	4.91	6.59	9.47	12.35
Dec	.33	.52	.86	1.19	1.53	1.91	2.34	2.88	3.60	4.78	5.91
Ann	30.31	33.00	36.47	39.13	41.50	43.79	46.18	48.82	52.04	56.72	60.80

\+ 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	3.9	3.0	1	#	6.0	1995	19	23.5	1979	8	1979	31	4	1979	3.6	1.6	.4	.1	.0	6.6	2.3	.9	.0
Feb	2.3	1.0	#	#	14.0	1980	8	15.2	1980	14	1980	11	3	1980	1.9	.7	.2	.1	@	2.4	1.0	.5	.2
Mar	1.5	.5	#	#	8.5	1999	14	9.5	1999	9	1999	14	1	1999	1.2	.4	.2	.1	.0	1.1	.4	.1	.0
Apr	.0	.0	#	0	.3	1973	9	.3	1973	#	1973	9	#	1973	@	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	#	1973	27	#	1973	.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	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.7	.0	#	0	4.8	1971	23	4.9	1971	10	1975	26	3	1975	.5	.3	.1	.0	.0	.4	.1	@	.0
Dec	2.6	1.5	#	#	6.0	2000	13	14.1	2000	10	2000	14	3	2000	2.0	1.0	.2	.1	.0	3.5	1.4	.4	@
Ann	11.0	6.0	N/A	N/A	14.0	Feb 1980	8	23.5	Jan 1979	14	Feb 1980	11	4	Jan 1979	9.2	4.0	1.1	.4	@	14.0	5.2	1.9	.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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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	5/05	4/30	4/27	4/24	4/21	4/18	4/15	4/12	4/07
32	4/22	4/18	4/15	4/12	4/10	4/07	4/05	4/02	3/29
28	4/12	4/07	4/03	3/31	3/28	3/25	3/21	3/18	3/12
24	4/03	3/28	3/24	3/20	3/16	3/13	3/09	3/05	2/27
20	3/22	3/15	3/11	3/07	3/03	2/28	2/24	2/19	2/13
16	3/11	3/04	2/27	2/22	2/18	2/14	2/09	2/04	1/28

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	9/27	10/02	10/06	10/09	10/12	10/15	10/18	10/21	10/27
32	10/10	10/15	10/19	10/22	10/25	10/28	11/01	11/04	11/09
28	10/22	10/28	11/01	11/05	11/09	11/12	11/16	11/21	11/27
24	11/04	11/10	11/14	11/17	11/21	11/24	11/27	12/01	12/07
20	11/09	11/17	11/22	11/27	12/01	12/05	12/10	12/15	12/23
16	11/15	11/25	12/02	12/08	12/14	12/19	12/25	1/02	1/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	196	188	182	177	173	168	163	158	150
32	219	212	206	202	198	194	189	184	177
28	248	241	235	230	225	221	216	210	202
24	273	265	258	253	248	243	238	232	223
20	301	291	284	278	272	266	260	253	243
16	328	316	308	301	295	289	283	276	266

***** 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	1054	786	584	294	100	9	0	4	42	219	582	922	4596
60	899	652	432	174	39	1	0	0	11	112	442	769	3531
57	808	574	346	116	19	0	0	0	4	67	360	682	2976
55	748	522	291	85	11	0	0	0	1	45	310	624	2637
50	606	399	173	30	2	0	0	0	0	13	201	484	1908
32	197	100	7	0	0	0	0	0	0	0	16	127	447

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	166	238	446	707	1022	1255	1460	1418	1126	827	424	229	9318
55	4	16	16	102	320	565	747	705	438	159	27	13	3112
57	1	12	10	74	266	505	685	643	380	119	18	8	2721
60	0	6	2	41	193	416	592	550	298	70	9	2	2179
65	0	0	0	11	98	274	437	399	178	22	0	0	1419
70	0	0	0	2	38	153	285	258	91	4	0	0	831

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	46	126	281	504	803	1040	1239	1198	910	608	251	81	46	172	453	957	1760	2800	4039	5237	6147	6755	7006	7087
45	14	66	178	364	648	890	1084	1043	761	455	159	36	14	80	258	622	1270	2160	3244	4287	5048	5503	5662	5698
50	4	30	100	239	494	740	929	888	612	315	87	13	4	34	134	373	867	1607	2536	3424	4036	4351	4438	4451
55	0	9	46	137	344	590	774	733	465	197	41	3	0	9	55	192	536	1126	1900	2633	3098	3295	3336	3339
60	0	1	20	63	206	442	619	578	329	103	14	0	0	1	21	84	290	732	1351	1929	2258	2361	2375	2375
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	34	89	178	311	513	710	841	811	600	382	153	55	34	123	301	612	1125	1835	2676	3487	4087	4469	4622	4677

(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