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: NEWTON 2 SW, KS **COOP ID: 145744**

Climate Division: KS 8 **NWS Call Sign:** **Elevation: 1,447 Feet** **Lat: 38˚03N** **Lon: 97˚22W**

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	39.0	19.0	29.0	75	1981	24	39.3	1990	-20	1947	4	14.0	1979	1116	0	.0	.0	7.8	8.7	27.8	1.8
Feb	46.6	24.3	35.5	82+	1962	12	45.2	1976	-13	1951	1	20.6	1978	830	0	.0	.0	12.4	5.1	20.9	1.3
Mar	56.4	33.3	44.9	90	1967	29	52.4	1986	-7	1960	3	38.0	1984	624	0	.0	.0	22.8	1.0	13.3	.1
Apr	66.2	43.1	54.7	95+	1972	12	63.1	1981	14	1975	3	47.4	1983	324	13	.0	.2	28.1	@	3.2	.0
May	75.8	53.8	64.8	99+	1998	30	70.0	1998	28	1944	6	58.5	1995	111	106	.0	1.3	31.0	.0	.1	.0
Jun	86.8	63.9	75.4	109+	1980	30	80.0	1980	40	1954	4	69.9	1982	9	318	1.6	12.8	30.0	.0	.0	.0
Jul	92.7	69.1	80.9	112	1954	14	89.5	1980	43	1975	13	76.7	1994	0	493	6.1	22.4	31.0	.0	.0	.0
Aug	90.9	67.6	79.3	111+	1964	6	86.6	2000	46+	1974	4	73.5	1992	3	444	5.0	19.7	31.0	.0	.0	.0
Sep	82.0	58.8	70.4	108+	2000	2	78.1	1998	29	1984	30	62.7	1974	44	206	1.3	8.7	30.0	.0	.1	.0
Oct	70.0	47.3	58.7	98+	1954	4	63.4	1979	14	1993	31	52.9	1976	218	22	.0	.6	30.0	@	1.8	.0
Nov	53.5	33.4	43.5	84	1980	8	52.9	1999	-4	1940	13	38.3+	1993	646	0	.0	.0	19.7	.9	13.6	@
Dec	41.9	23.1	32.5	81	1955	24	38.6	1988	-20	1989	22	16.2	1983	1007	0	.0	.0	9.2	5.3	26.5	.8
Ann	66.8	44.7	55.8	112	Jul 1954	14	89.5	Jul 1980	-20+	Dec 1989	22	14.0	Jan 1979	4932	1602	14.0	65.7	283.0	21.0	107.3	4.0

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1939-2001

(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	.78	.68	1.93	1946	4	2.09	1979	.00+	1997
Feb	.95	.67	2.05	2001	24	2.61	1993	.00+	1991
Mar	2.67	1.97	4.30	1984	19	11.23	1973	.17	1994
Apr	2.80	2.82	3.96	1976	28	6.75	1976	.23	1982
May	4.66	4.43	3.52+	1989	22	12.03	1993	.12	1994
Jun	4.28	3.72	4.70	1999	19	10.40	1975	1.39	1988
Jul	3.35	3.11	5.69	1958	4	11.90	1993	.00	1984
Aug	3.23	2.58	5.65	1960	26	8.29	1989	.12	2000
Sep	2.92	2.09	7.55	1969	15	9.11	1973	.27	2000
Oct	2.49	2.00	3.94	1985	10	8.07	2000	.11	1978
Nov	2.23	1.74	5.35	1998	1	8.60	1998	.00	1989
Dec	1.16	1.01	2.60	1944	4	3.81	1984	.00+	1989
Ann	31.52	30.83	7.55	Sep 1969	15	12.03	May 1993	.00+	Jan 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.4	2.0	.5	.1
Feb	4.3	2.4	.6	.1
Mar	7.6	4.8	1.9	.7
Apr	7.8	4.8	1.9	.9
May	9.9	6.7	3.3	1.3
Jun	7.9	5.9	3.0	1.3
Jul	7.7	5.0	2.4	1.0
Aug	6.8	4.8	2.0	1.0
Sep	6.6	4.4	1.9	.8
Oct	5.8	3.7	1.7	.6
Nov	6.0	3.7	1.3	.5
Dec	4.6	2.6	.8	.2
Ann	79.4	50.8	21.3	8.5

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	.00	.04	.16	.27	.41	.56	.74	.96	1.28	1.81	2.34
Feb	.00	.06	.21	.35	.51	.69	.91	1.17	1.55	2.17	2.78
Mar	.23	.41	.77	1.14	1.54	2.00	2.55	3.25	4.20	5.80	7.37
Apr	.48	.73	1.14	1.52	1.91	2.34	2.82	3.41	4.20	5.47	6.68
May	.82	1.24	1.92	2.55	3.20	3.91	4.71	5.68	6.98	9.07	11.07
Jun	1.33	1.74	2.34	2.86	3.36	3.88	4.45	5.12	5.99	7.33	8.58
Jul	.22	.56	1.09	1.58	2.10	2.67	3.33	4.14	5.23	7.03	8.77
Aug	.24	.44	.86	1.30	1.80	2.37	3.05	3.92	5.13	7.16	9.17
Sep	.42	.67	1.09	1.49	1.91	2.38	2.91	3.57	4.45	5.89	7.27
Oct	.20	.37	.70	1.04	1.42	1.86	2.37	3.03	3.93	5.45	6.94
Nov	.06	.22	.53	.85	1.20	1.61	2.11	2.73	3.60	5.06	6.50
Dec	.00	.17	.39	.57	.76	.96	1.18	1.45	1.81	2.39	2.95
Ann	20.32	22.40	25.12	27.22	29.10	30.93	32.84	34.97	37.57	41.39	44.72

\+ 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: 1939-2001
(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	2.6	.5	1	0	9.0	1993	9	9.0	1993	10	1987	16	7	1979	1.7	1.3	.5	.2	.0	1.4	.4	.3	.0
Feb	2.8	1.0	1	0	10.0	1975	17	14.5	1982	16	1983	2	13	1983	1.0	.9	.4	.2	.1	-9.9	-9.9	-9.9	-9.9
Mar	.9	.0	#	0	7.0	1975	10	8.5	1975	6	1998	20	#+	1998	.5	.3	.1	@	.0	.1	.0	.0	.0
Apr	.1	.0	#	0	3.0	1983	5	3.0+	1983	1	1973	8	#	1973	.1	.1	@	.0	.0	.1	.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	.1	.0	#	0	1.5	1991	31	1.5	1991	1	1991	31	#	1991	@	@	.0	.0	.0	.1	.0	.0	.0
Nov	1.0	.0	#	0	4.8	1975	26	5.3	1975	4	1971	23	#+	1991	.4	.3	.2	.0	.0	.3	.1	.0	.0
Dec	2.6	1.5	#	0	6.5	1973	31	10.5	1973	10	1999	5	6	1983	1.0	.9	.3	@	.0	1.2	.1	.0	.0
Ann	10.1	3.0	N/A	N/A	10.0	Feb 1975	17	14.5	Feb 1982	16	Feb 1983	2	13	Feb 1983	4.7	3.8	1.5	.4	.1	-9.9	-9.9	-9.9	-9.9

+ 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	5/07	5/03	4/30	4/27	4/25	4/22	4/20	4/17	4/12
32	4/29	4/23	4/19	4/16	4/13	4/10	4/06	4/02	3/28
28	4/15	4/11	4/08	4/05	4/03	3/31	3/28	3/25	3/21
24	4/10	4/04	3/30	3/27	3/23	3/20	3/16	3/11	3/05
20	3/31	3/24	3/19	3/15	3/12	3/08	3/04	2/27	2/20
16	3/23	3/15	3/09	3/03	2/27	2/22	2/16	2/10	2/02

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	9/20	9/25	9/29	10/03	10/06	10/09	10/13	10/16	10/22
32	10/05	10/10	10/14	10/17	10/20	10/23	10/27	10/31	11/05
28	10/15	10/21	10/25	10/29	11/01	11/04	11/08	11/12	11/18
24	10/23	10/30	11/04	11/08	11/12	11/17	11/21	11/26	12/03
20	11/02	11/10	11/15	11/19	11/24	11/28	12/02	12/08	12/15
16	11/10	11/17	11/23	11/27	12/01	12/05	12/10	12/15	12/22

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	186	178	173	168	163	159	154	149	141
32	215	207	200	195	190	185	180	173	164
28	236	228	222	217	212	207	202	196	187
24	265	254	246	240	234	227	221	213	202
20	285	275	268	262	256	251	245	237	227
16	310	299	291	283	277	270	263	255	243

***** 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)

Base	Heating Degree Days (1)												
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1116	830	624	324	111	9	0	3	44	218	646	1007	4932
60	961	700	474	203	49	1	0	0	14	109	499	852	3862
57	870	622	388	143	27	0	0	0	6	64	416	759	3295
55	810	571	333	110	16	0	0	0	3	43	363	699	2948
50	665	451	213	47	4	0	0	0	0	12	243	555	2190
32	235	145	16	0	0	0	0	0	0	0	23	153	572

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	142	242	415	679	1018	1300	1516	1464	1152	827	367	169	9291
55	4	24	19	99	321	610	803	751	465	157	17	2	3272
57	2	18	12	73	269	550	741	689	408	116	10	0	2888
60	0	12	5	42	199	461	648	596	326	68	3	0	2360
65	0	0	0	13	106	318	493	444	206	22	0	0	1602
70	0	0	0	3	45	193	341	301	116	4	0	0	1003

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	34	99	257	486	798	1080	1287	1240	935	603	200	42	34	133	390	876	1674	2754	4041	5281	6216	6819	7019	7061
45	5	47	160	346	643	930	1132	1085	785	456	114	12	5	52	212	558	1201	2131	3263	4348	5133	5589	5703	5715
50	0	19	86	225	490	780	977	930	636	316	53	3	0	19	105	330	820	1600	2577	3507	4143	4459	4512	4515
55	0	4	39	130	344	630	822	775	490	191	20	0	0	4	43	173	517	1147	1969	2744	3234	3425	3445	3445
60	0	0	10	65	212	480	667	620	355	102	4	0	0	0	10	75	287	767	1434	2054	2409	2511	2515	2515
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	27	80	168	295	507	724	854	823	611	370	122	33	27	107	275	570	1077	1801	2655	3478	4089	4459	4581	4614

(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