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: CHANUTE JOHNSON AP, KS **COOP ID: 141427**

Climate Division: KS 9 **NWS Call Sign: CNU** **Elevation: 979 Feet** **Lat: 37˚40N** **Lon: 95˚29W**

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	40.5	21.0	30.8	75	1950	24	40.4	1990	-23	1949	30	17.2	1979	1062	0	.0	.0	7.3	7.8	27.6	1.6
Feb	47.2	26.0	36.6	83	1962	12	47.1	1976	-13	1979	1	24.3	1979	796	0	.0	.0	11.8	4.6	21.5	1.1
Mar	57.8	35.4	46.6	89	1995	22	52.0	1986	1	1960	3	39.8	1975	571	0	.0	.0	22.8	.7	12.0	.0
Apr	67.9	44.9	56.4	95	1972	12	63.4	1981	18	1975	3	49.2	1983	274	17	.0	.1	28.6	.0	2.4	.0
May	75.8	54.8	65.3	94+	1963	10	70.9	1987	31	1976	3	60.9	1976	93	103	.0	.3	31.0	.0	@	.0
Jun	84.7	63.8	74.3	108	1980	27	78.9	1980	45+	2001	1	69.9	1982	6	285	.3	5.9	30.0	.0	.0	.0
Jul	90.5	68.5	79.5	115	1954	14	88.4	1980	49+	1972	6	74.9	1971	0	449	2.3	18.9	31.0	.0	.0	.0
Aug	89.3	66.7	78.0	110+	1956	17	84.6	2000	45	1988	29	71.4	1992	3	405	1.7	16.5	31.0	.0	.0	.0
Sep	81.0	58.4	69.7	107	2000	2	76.5	1998	30	1984	30	62.0	1974	46	187	.4	5.3	30.0	.0	@	.0
Oct	70.0	46.8	58.4	98	1963	7	62.2	2000	17	1993	31	52.2	1976	223	19	.0	.4	30.1	.0	1.8	.0
Nov	55.3	34.8	45.1	83	1980	6	53.6	1999	1	1975	27	38.1	1976	598	0	.0	.0	21.2	.7	12.8	.0
Dec	44.0	25.0	34.5	77	1966	7	39.6	1982	-17+	1989	23	19.5	1983	947	0	.0	.0	9.9	4.6	25.3	.8
Ann	67.0	45.5	56.3	115	Jul 1954	14	88.4	Jul 1980	-23	Jan 1949	30	17.2	Jan 1979	4619	1465	4.7	47.4	284.7	18.4	103.4	3.5

\+ 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: 1948-2001

(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	1.28	.93	2.04	1975	30	5.29	1973	.02	1986
Feb	1.90	1.63	2.08	1987	28	5.53	1985	.02	1991
Mar	3.47	2.87	2.87	1985	4	12.08	1973	.29	1971
Apr	3.83	3.34	5.80	1994	28	16.25	1994	.26	1989
May	5.29	4.09	7.87	1990	26	18.35	1990	1.66	1988
Jun	5.05	5.10	4.86	1984	8	9.70	1984	.53	1980
Jul	4.24	3.09	6.51	1959	14	16.36	1992	.05	1974
Aug	3.96	3.58	4.60	1985	22	9.67	1985	.00	2000
Sep	3.95	3.15	5.59	1993	24	13.83	1993	.03	1979
Oct	4.03	3.71	6.66	1986	3	12.02	1986	.18	1995
Nov	3.06	2.73	4.07	1979	20	6.40	1992	.00	1989
Dec	1.89	1.60	1.85	1973	4	6.03	1984	.09	1981
Ann	41.95	39.16	7.87	May 1990	26	18.35	May 1990	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.1	2.7	.5	.2
Feb	5.8	3.3	.9	.4
Mar	8.5	4.9	1.9	.9
Apr	9.5	6.0	2.4	.9
May	10.4	6.9	3.3	1.6
Jun	9.5	6.6	2.9	1.6
Jul	6.6	4.3	2.4	1.3
Aug	7.0	4.5	2.3	1.3
Sep	7.2	5.0	2.3	1.0
Oct	7.0	4.9	2.1	1.2
Nov	6.9	4.4	1.8	.7
Dec	6.5	3.3	1.2	.5
Ann	91.0	56.8	24.0	11.6

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	.12	.21	.38	.56	.75	.97	1.23	1.56	2.01	2.77	3.51
Feb	.20	.34	.61	.87	1.16	1.47	1.85	2.31	2.95	4.00	5.03
Mar	.59	.89	1.40	1.87	2.36	2.89	3.50	4.23	5.21	6.80	8.31
Apr	.66	1.00	1.56	2.08	2.62	3.20	3.87	4.67	5.75	7.49	9.15
May	1.21	1.70	2.47	3.17	3.86	4.60	5.43	6.42	7.72	9.78	11.73
Jun	1.56	2.04	2.76	3.37	3.96	4.58	5.25	6.05	7.07	8.67	10.15
Jul	.38	.67	1.24	1.83	2.47	3.20	4.07	5.17	6.67	9.18	11.65
Aug	.49	.99	1.66	2.22	2.79	3.39	4.07	4.88	5.95	7.65	9.27
Sep	.28	.53	1.03	1.58	2.18	2.88	3.73	4.80	6.28	8.79	11.27
Oct	.71	1.06	1.65	2.20	2.77	3.38	4.07	4.92	6.04	7.86	9.60
Nov	.28	.62	1.13	1.57	2.03	2.53	3.09	3.78	4.70	6.19	7.61
Dec	.16	.29	.54	.80	1.09	1.42	1.81	2.30	2.98	4.12	5.23
Ann	27.78	30.45	33.91	36.56	38.94	41.25	43.65	46.32	49.58	54.34	58.50

\+ 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: 1948-2001
(3) Derived from 1971-2000 serially complete daily data

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Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	5.4	3.4	1	0
Feb	5.3	4.9	1	1
Mar	1.7	.0	#	0
Apr	.2	.0	#	0
May	.0	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	#	.0	0	0
Nov	1.7	.0	#	0
Dec	2.5	.3	#	0
Ann	16.8	8.6	N/A	N/A

Extremes (2)

Month	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year
Jan	7.0	1987	9	23.3	1979	9+	1979	15	4	1979
Feb	8.6	1975	22	15.5	1980	12+	1980	11	3+	1980
Mar	10.0	1975	9	12.8	1988	10+	1975	10	2	1975
Apr	3.0	1979	3	3.5	1979	2	1979	4	#	1979
May	.0	0	0	.0	0	0	0	0	#	1995
Jun	.0	0	0	.0	0	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	#	1980	28	#+	1980	0	0	0	0	0
Nov	6.6	1975	25	9.6	1972	9	1975	26	1+	1975
Dec	7.2	1973	19	13.1	1973	7+	1987	16	1+	1987
Ann	10.0	Mar 1975	9	23.3	Jan 1979	12+	Feb 1980	11	4	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.5	2.3	.6	.2	.0
Feb	2.6	1.6	.6	.3	.0
Mar	.8	.4	.2	.1	.1
Apr	.2	.1	.1	.0	.0
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.0	.0	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.7	.5	.4	.1	.0
Dec	1.6	.9	.2	.2	.0
Ann	9.4	5.8	2.1	.9	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	7.8	4.2	1.9	.0
Feb	5.3	3.0	1.5	.2
Mar	1.0	.4	.2	.1
Apr	.1	.0	.0	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.0	.0	.0	.0
Nov	.5	.4	.2	.0
Dec	3.4	1.0	.4	.0
Ann	18.1	9.0	4.2	.3

+ 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	5/04	4/29	4/25	4/22	4/19	4/15	4/12	4/08	4/03
32	4/21	4/16	4/13	4/10	4/07	4/05	4/02	3/29	3/25
28	4/12	4/07	4/03	3/31	3/27	3/24	3/21	3/17	3/12
24	4/02	3/27	3/22	3/19	3/15	3/11	3/07	3/03	2/25
20	3/24	3/17	3/12	3/07	3/03	2/27	2/22	2/17	2/09
16	3/15	3/09	3/04	2/28	2/24	2/20	2/15	2/09	0/00

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	10/01	10/05	10/08	10/11	10/14	10/18	10/22	10/27
32	10/10	10/16	10/20	10/24	10/27	10/30	11/03	11/07	11/13
28	10/19	10/25	10/29	11/01	11/05	11/08	11/11	11/15	11/21
24	10/25	11/02	11/07	11/11	11/16	11/20	11/25	11/30	12/07
20	11/05	11/13	11/19	11/24	11/29	12/03	12/08	12/14	12/22
16	11/16	11/22	11/27	12/01	12/04	12/08	12/13	12/19	0/00

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	201	192	186	180	175	170	164	158	149
32	226	218	212	207	202	197	192	186	177
28	248	239	232	227	221	216	211	204	195
24	278	267	259	252	245	239	232	223	212
20	306	293	285	277	270	263	255	247	234
16	>365	305	295	289	283	278	272	266	257

***** 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	1062	796	571	274	93	6	0	3	46	223	598	947	4619
60	907	664	422	161	36	0	0	0	14	112	455	792	3563
57	816	586	336	107	17	0	0	0	6	66	373	702	3009
55	755	534	282	78	10	0	0	0	3	44	321	645	2672
50	612	413	170	28	2	0	0	0	0	12	209	502	1948
32	199	113	9	0	0	0	0	0	0	0	17	130	468

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	160	242	461	732	1033	1269	1472	1425	1130	819	409	206	9358
55	4	19	21	120	330	579	759	712	443	150	23	8	3168
57	2	14	13	89	275	519	697	650	386	110	15	3	2773
60	0	9	6	53	201	429	604	557	305	64	7	0	2235
65	0	0	0	17	103	285	449	405	187	19	0	0	1465
70	0	0	0	4	40	160	302	264	100	3	0	0	873

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	33	93	261	507	790	1038	1234	1188	894	578	221	55	33	126	387	894	1684	2722	3956	5144	6038	6616	6837	6892
45	8	48	158	368	635	888	1079	1033	744	429	128	21	8	56	214	582	1217	2105	3184	4217	4961	5390	5518	5539
50	0	17	85	238	481	738	924	878	594	290	61	4	0	17	102	340	821	1559	2483	3361	3955	4245	4306	4310
55	0	7	40	136	332	588	769	723	447	172	28	0	0	7	47	183	515	1103	1872	2595	3042	3214	3242	3242
60	0	1	10	64	193	438	614	568	315	83	8	0	0	1	11	75	268	706	1320	1888	2203	2286	2294	2294
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	26	70	167	306	495	709	836	809	588	353	132	38	26	96	263	569	1064	1773	2609	3418	4006	4359	4491	4529

(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