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: JOHN REDMOND LAKE, KS **COOP ID: 144104**

Climate Division: KS 6 **NWS Call Sign:** **Elevation: 1,091 Feet** **Lat: 38˚15N** **Lon: 95˚45W**

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	37.8	16.6	27.2	74+	1981	25	37.5	1990	-21	1984	3	12.5	1979	1171	0	.0	.0	6.5	10.0	29.6	3.1
Feb	44.0	22.1	33.1	84	1962	13	43.2	1976	-22	1979	1	18.2	1978	895	0	.0	.0	10.2	6.9	24.0	2.0
Mar	55.6	32.3	44.0	88	1968	30	48.5	1986	-1	1962	1	36.3	1975	652	0	.0	.0	20.5	1.1	16.2	.1
Apr	66.1	42.6	54.4	92+	1972	13	61.1	1981	13	1975	3	47.5	1983	330	11	.0	.1	27.7	@	4.1	.0
May	74.9	53.1	64.0	96	1964	27	69.9	1998	29	1967	2	58.5	1976	124	92	.0	.5	30.9	.0	.1	.0
Jun	83.8	62.4	73.1	107	1980	28	78.0	1980	39	1998	5	68.4	1982	12	255	.1	6.6	30.0	.0	.0	.0
Jul	89.3	67.2	78.3	108+	1980	31	87.0	1980	47	1972	5	74.0	1972	0	411	2.0	16.4	31.0	.0	.0	.0
Aug	88.3	65.2	76.8	108	1964	4	84.2	1983	47+	1988	29	70.2	1992	8	372	2.1	15.5	31.0	.0	.0	.0
Sep	80.2	56.3	68.3	109	2000	3	74.2	1998	29	1984	29	61.2	1974	57	155	.3	5.9	30.0	.0	.1	.0
Oct	69.2	44.1	56.7	97	1963	3	61.0	1971	13	1993	31	50.0	1976	272	12	.0	.2	29.9	.0	3.2	.0
Nov	53.8	32.2	43.0	82+	1980	9	51.0	1999	-1	1975	27	36.8	1976	661	0	.0	.0	19.1	1.0	15.9	@
Dec	41.8	21.8	31.8	76	1966	8	36.9	1991	-21	1989	22	16.0	1983	1029	0	.0	.0	9.0	6.0	27.2	1.5
Ann	65.4	43.0	54.2	109	Sep 2000	3	87.0	Jul 1980	-22	Feb 1979	1	12.5	Jan 1979	5211	1308	4.5	45.2	275.8	25.0	120.4	6.7

\+ 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: 1960-2001

(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	.94	.79	2.25	1982	30	2.84	1982	.00	1986
Feb	.97	.86	2.35	1997	21	3.21	1997	.00	1991
Mar	2.53	2.34	1.75	1965	17	7.65	1973	.38	1971
Apr	3.03	2.49	3.63	1994	28	8.61	1994	.35	1989
May	4.27	4.30	3.40	1983	28	12.10	1982	.46	1998
Jun	4.96	4.44	5.80	1979	8	9.55+	1985	1.39	1974
Jul	4.05	2.79	3.90	1968	24	16.29	1992	.04	1975
Aug	3.45	3.12	3.27	1996	17	9.31	1977	.09	2000
Sep	3.75	3.03	5.50	1961	13	12.20	1973	.40	1984
Oct	3.18	2.95	6.75	1998	31	10.96	1998	.24	1978
Nov	2.29	2.57	2.65	1994	20	6.60	1992	.00+	1989
Dec	1.49	1.22	1.82	1992	14	3.85	1987	.08	1979
Ann	34.91	34.61	6.75	Oct 1998	31	16.29	Jul 1992	.00+	Feb 1991

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.7	2.5	.4	.1
Feb	4.1	2.6	.5	.1
Mar	6.8	4.9	1.9	.3
Apr	8.1	5.6	2.2	.6
May	9.0	6.9	3.1	1.1
Jun	8.0	6.2	3.0	1.5
Jul	7.3	5.8	2.7	1.0
Aug	6.9	5.1	2.4	1.0
Sep	6.9	5.5	2.6	1.2
Oct	5.9	4.7	2.0	1.1
Nov	5.3	4.1	1.5	.6
Dec	4.0	2.7	1.1	.5
Ann	76.0	56.6	23.4	9.1

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	.05	.14	.28	.42	.56	.73	.92	1.16	1.48	2.02	2.54
Feb	.04	.12	.27	.41	.56	.74	.94	1.20	1.55	2.13	2.70
Mar	.66	.90	1.27	1.59	1.91	2.25	2.62	3.06	3.63	4.54	5.38
Apr	.61	.88	1.33	1.73	2.15	2.59	3.09	3.69	4.48	5.76	6.97
May	.91	1.30	1.93	2.49	3.07	3.68	4.36	5.19	6.27	8.01	9.65
Jun	1.51	1.98	2.68	3.29	3.88	4.49	5.16	5.95	6.97	8.57	10.05
Jul	.22	.44	.93	1.47	2.10	2.83	3.73	4.89	6.51	9.29	12.06
Aug	.28	.51	.96	1.44	1.97	2.57	3.29	4.20	5.45	7.56	9.63
Sep	.57	.89	1.43	1.95	2.49	3.08	3.76	4.58	5.70	7.50	9.24
Oct	.62	.90	1.37	1.80	2.23	2.70	3.23	3.87	4.72	6.08	7.37
Nov	.00	.57	1.05	1.40	1.73	2.07	2.44	2.85	3.41	4.28	5.10
Dec	.15	.26	.47	.68	.90	1.15	1.45	1.82	2.33	3.17	3.99
Ann	21.93	24.33	27.46	29.89	32.07	34.21	36.43	38.92	41.97	46.45	50.38

\+ 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: 1960-2001
(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	2.7	.5	1	#	8.5	1985	10	17.7	1985	10	1985	12	5	1985	1.5	1.0	.4	.2	.0	4.9	3.0	1.0	.2
Feb	2.1	1.0	#	#	14.0	1980	8	15.0	1980	9	1971	23	4	1983	1.2	.8	.2	@	@	2.5	1.2	.3	.0
Mar	1.6	.0	#	0	10.0	1975	10	10.0	1975	10	1975	10	1	1975	.8	.6	.1	@	@	.4	.1	.0	.0
Apr	.0	.0	#	0	.5	1975	2	.5	1975	#	1990	14	#	1990	@	.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	#	0	.0	0	0	.0	0	#	1980	28	#	1980	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.1	.0	#	0	9.0	1975	26	9.0	1975	9	1975	26	#+	1991	.3	.3	.1	@	.0	.3	.1	.1	.0
Dec	2.5	1.0	#	0	6.5	2000	13	12.0	1987	9	1987	15	1	1990	1.2	1.0	.2	.1	.0	1.5	.5	.3	.0
Ann	10.0	2.5	N/A	N/A	14.0	Feb 1980	8	17.7	Jan 1985	10+	Jan 1985	12	5	Jan 1985	5.0	3.7	1.0	.3	@	9.6	4.9	1.7	.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	5/09	5/05	5/02	4/29	4/27	4/24	4/22	4/19	4/15
32	4/25	4/21	4/18	4/16	4/13	4/11	4/08	4/06	4/02
28	4/14	4/10	4/08	4/05	4/03	4/01	3/30	3/27	3/23
24	4/10	4/04	3/31	3/27	3/24	3/20	3/17	3/13	3/07
20	3/31	3/25	3/20	3/17	3/13	3/10	3/06	3/02	2/24
16	3/22	3/14	3/09	3/04	2/28	2/24	2/19	2/13	2/06

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	182	176	171	167	164	160	156	151	145
32	211	203	198	193	189	185	180	175	167
28	228	222	217	213	209	206	202	197	191
24	256	248	242	237	232	228	222	217	208
20	278	270	263	258	253	248	243	237	228
16	308	297	288	281	275	268	261	253	242

***** 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	1171	895	652	330	124	12	0	8	57	272	661	1029	5211
60	1016	760	500	207	56	2	0	1	18	152	514	874	4100
57	924	682	414	146	31	0	0	0	7	97	431	781	3513
55	864	629	358	111	19	0	0	0	3	69	377	722	3152
50	719	503	234	47	5	0	0	0	0	24	255	578	2365
32	275	167	20	0	0	0	0	0	0	0	26	173	661

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	127	196	391	670	991	1233	1434	1387	1088	763	356	167	8803
55	2	14	16	92	297	543	721	674	401	119	16	3	2898
57	1	11	10	66	247	483	659	612	345	85	10	0	2529
60	0	5	3	37	180	395	566	520	266	48	3	0	2023
65	0	0	0	11	92	255	411	372	155	12	0	0	1308
70	0	0	0	2	36	138	266	237	76	2	0	0	757

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	19	73	217	451	755	1006	1200	1155	862	533	189	43	19	92	309	760	1515	2521	3721	4876	5738	6271	6460	6503
45	3	31	126	314	601	856	1045	1000	712	388	106	13	3	34	160	474	1075	1931	2976	3976	4688	5076	5182	5195
50	1	9	68	200	450	706	890	845	564	258	55	4	1	10	78	278	728	1434	2324	3169	3733	3991	4046	4050
55	0	2	29	111	303	556	735	690	420	152	18	0	0	2	31	142	445	1001	1736	2426	2846	2998	3016	3016
60	0	0	9	50	177	408	580	535	288	72	4	0	0	0	9	59	236	644	1224	1759	2047	2119	2123	2123
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	23	62	146	276	471	679	810	774	557	337	125	37	23	85	231	507	978	1657	2467	3241	3798	4135	4260	4297

(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

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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