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: RUSSELL SPRINGS, KS **COOP ID: 147049**

Climate Division: KS 4 **NWS Call Sign:** **Elevation: 2,910 Feet** **Lat: 38˚55N** **Lon: 101˚10W**

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	42.5	11.7	27.1	81	1989	31	37.6	1986	-25	1959	4	15.0	1979	1175	0	.0	.0	11.2	7.5	30.7	3.6
Feb	48.5	16.3	32.4	84	1972	29	39.9	1976	-19+	1982	5	20.3	1978	914	0	.0	.0	15.0	4.3	26.5	2.0
Mar	57.2	23.5	40.4	92	1988	27	47.3	1986	-19	1960	3	34.4	1996	764	0	.0	.1	22.9	1.3	22.5	.4
Apr	67.0	34.0	50.5	101	1989	22	57.8	1981	6+	1997	13	44.5	1983	438	4	@	.8	27.3	.2	10.3	.0
May	75.5	45.7	60.6	102+	1996	19	65.1	1977	21	1966	13	52.7	1995	184	47	.2	2.6	30.8	.0	1.2	.0
Jun	87.3	56.5	71.9	111	1990	28	77.3	1990	30+	1998	7	66.2	1982	28	234	2.7	12.8	30.0	.0	.1	.0
Jul	92.7	61.7	77.2	112	1991	6	81.9	1980	41	1975	12	72.4	1992	0	378	5.9	21.8	31.0	.0	.0	.0
Aug	90.9	59.8	75.4	110	1994	27	82.1	1983	40+	1993	31	67.7	1992	9	331	4.1	19.1	31.0	.0	.0	.0
Sep	82.9	49.2	66.1	105+	1971	7	71.6	1998	21+	1985	30	60.5	1993	85	116	1.1	9.4	29.8	.0	1.0	.0
Oct	71.4	34.9	53.2	95+	1997	3	56.4	1974	6	1997	27	48.2	1976	369	2	.0	1.1	29.6	.2	9.5	.0
Nov	54.7	21.9	38.3	87	1980	6	46.0	1999	-7	1976	28	31.9	1992	802	0	.0	.0	19.3	1.7	24.5	.2
Dec	45.0	13.7	29.4	81	1955	24	36.5	1980	-27	1989	22	15.6	1983	1105	0	.0	.0	12.8	5.1	30.3	2.3
Ann	68.0	35.7	51.9	112	Jul 1991	6	82.1	Aug 1983	-27	Dec 1989	22	15.0	Jan 1979	5873	1112	14.0	67.7	290.7	20.3	156.6	8.5

\+ 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: 1949-2000

(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	.42	.33	1.17	1960	14	1.14	1988	.00+	1998
Feb	.47	.32	.87	1960	3	1.95	1993	.00+	1999
Mar	1.35	.90	2.00	1980	29	5.06	1980	.00	1997
Apr	1.48	1.49	1.59	1982	28	3.98	1984	.33	1992
May	3.13	2.66	3.96	1975	29	6.62	1990	.63	1997
Jun	2.61	2.38	3.00	1955	17	6.13	1982	.04	1976
Jul	3.32	2.86	4.16	1979	23	7.98	1979	1.23	1974
Aug	2.46	2.25	4.20	1980	15	6.02	1993	.05	1995
Sep	1.35	.71	2.36	1976	8	5.11	1973	.14	1978
Oct	.93	.70	2.00	1965	17	4.54	1984	.00+	1988
Nov	.89	.62	2.35	1975	19	4.37	1975	.00+	1999
Dec	.34	.24	1.08	1953	3	1.22	1991	.00+	1999
Ann	18.75	18.38	4.20	Aug 1980	15	7.98	Jul 1979	.00+	Dec 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	2.8	1.4	.2	.0
Feb	2.8	1.4	.3	.0
Mar	5.4	3.1	.8	.2
Apr	5.3	3.5	.9	.2
May	8.6	5.8	2.1	.9
Jun	6.3	4.4	1.9	.5
Jul	7.4	5.8	2.1	1.1
Aug	6.2	4.3	1.6	.6
Sep	4.7	3.0	.8	.3
Oct	3.5	2.3	.6	.2
Nov	3.7	2.0	.5	.1
Dec	3.1	1.3	.1	.0
Ann	59.8	38.3	11.9	4.1

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	.00	.07	.15	.22	.29	.36	.43	.53	.65	.85	1.04
Feb	.00	.00	.06	.14	.23	.32	.44	.59	.79	1.12	1.45
Mar	.03	.12	.29	.48	.70	.95	1.26	1.65	2.19	3.12	4.04
Apr	.40	.54	.75	.94	1.12	1.31	1.53	1.78	2.11	2.63	3.11
May	.85	1.15	1.60	1.99	2.38	2.79	3.24	3.77	4.46	5.55	6.57
Jun	.30	.50	.87	1.23	1.62	2.05	2.56	3.19	4.04	5.45	6.81
Jul	1.09	1.40	1.87	2.26	2.64	3.03	3.46	3.97	4.61	5.62	6.55
Aug	.40	.61	.97	1.31	1.66	2.04	2.47	3.00	3.71	4.86	5.96
Sep	.06	.13	.28	.45	.66	.91	1.22	1.62	2.18	3.16	4.14
Oct	.00	.00	.12	.28	.45	.64	.87	1.16	1.56	2.22	2.88
Nov	.00	.05	.18	.31	.46	.63	.84	1.10	1.46	2.07	2.67
Dec	.00	.00	.03	.09	.16	.23	.32	.43	.58	.83	1.08
Ann	13.23	14.29	15.66	16.70	17.62	18.52	19.44	20.46	21.70	23.50	25.06

\+ 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: 1949-2000
(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	5.2	4.0	1	1
Feb	4.2	2.0	1	#
Mar	5.2	4.5	#	#
Apr	2.0	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	.9	.0	#	0
Nov	2.7	1.0	#	#
Dec	3.5	3.0	1	#
Ann	23.9	14.5	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	9.0	1990	19	18.2	1988	12	1984	20	5	1993
Feb	8.0	1990	20	16.2	1978	13	1978	12	8	1993
Mar	11.0	1987	28	24.5	1980	11+	1999	13	2	1993
Apr	9.0	1989	9	10.5	1994	6	1989	9	#+	1997
May	.0	0	0	.0	0	0	0	0	0	0
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	4.5	1985	29	4.5	1985	2	1985	29	#	1985
Oct	7.0	1991	31	7.0+	1997	7+	1997	27	1	1997
Nov	8.0	1992	24	12.5	1992	10	1991	2	2	1992
Dec	9.0	1979	28	11.0	1973	9	1982	28	4	1992
Ann	11.0	Mar 1987	28	24.5	Mar 1980	13	Feb 1978	12	8	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.1	1.8	.8	.3	.0
Feb	1.5	1.3	.5	.3	.0
Mar	1.7	1.6	.8	.2	.1
Apr	.4	.4	.2	.1	.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
Oct	.2	.2	.1	.1	.0
Nov	1.0	1.0	.5	.1	.0
Dec	2.0	1.5	.5	.1	.0
Ann	8.9	7.8	3.4	1.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	8.3	4.7	2.4	.4
Feb	3.9	2.3	1.1	.2
Mar	2.0	1.1	.4	.1
Apr	.3	.2	@	.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
Oct	.3	.1	.1	.0
Nov	2.1	1.0	.5	.0
Dec	3.0	1.7	1.0	.0
Ann	19.9	11.1	5.5	.7

+ 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	5/27	5/22	5/18	5/15	5/12	5/09	5/06	5/02	4/27
32	5/22	5/16	5/11	5/07	5/03	4/29	4/25	4/21	4/14
28	5/12	5/05	4/30	4/26	4/22	4/18	4/14	4/09	4/03
24	4/29	4/23	4/19	4/16	4/12	4/09	4/06	4/02	3/27
20	4/17	4/11	4/06	4/03	3/30	3/27	3/23	3/18	3/12
16	4/09	4/02	3/28	3/24	3/20	3/16	3/11	3/06	2/27

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	9/13	9/17	9/19	9/22	9/24	9/26	9/28	10/01	10/04
32	9/17	9/22	9/25	9/28	10/01	10/04	10/07	10/11	10/16
28	9/29	10/04	10/07	10/10	10/12	10/15	10/18	10/21	10/25
24	10/05	10/10	10/15	10/18	10/22	10/25	10/29	11/02	11/08
20	10/19	10/24	10/27	10/30	11/02	11/05	11/08	11/12	11/17
16	10/30	11/03	11/06	11/08	11/10	11/12	11/14	11/17	11/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	149	144	140	137	134	131	128	124	118
32	176	167	161	155	150	145	140	134	125
28	196	188	182	177	173	168	163	157	149
24	211	205	200	196	192	188	183	179	172
20	240	232	226	221	216	212	207	201	193
16	259	250	244	239	234	230	224	218	210

***** 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	1175	914	764	438	184	28	0	9	85	369	802	1105	5873
60	1020	774	609	300	93	7	0	1	31	226	652	950	4663
57	927	690	516	227	56	3	0	0	14	152	562	857	4004
55	865	635	455	183	37	1	0	0	7	110	503	795	3591
50	711	506	310	95	10	0	0	0	0	41	364	645	2682
32	240	142	20	0	0	0	0	0	0	0	52	199	653

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	89	152	279	555	886	1197	1401	1345	1021	656	240	117	7938
55	0	2	1	49	210	508	688	632	339	53	1	0	2483
57	0	0	0	32	167	450	626	570	285	32	0	0	2162
60	0	0	0	16	111	364	533	478	212	13	0	0	1727
65	0	0	0	4	47	234	378	331	116	2	0	0	1112
70	0	0	0	0	14	131	232	200	53	0	0	0	630

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	21	64	180	389	683	974	1184	1123	817	452	110	28	21	85	265	654	1337	2311	3495	4618	5435	5887	5997	6025
45	1	22	95	263	528	824	1029	968	668	309	51	7	1	23	118	381	909	1733	2762	3730	4398	4707	4758	4765
50	0	2	47	157	381	675	874	813	523	191	15	0	0	2	49	206	587	1262	2136	2949	3472	3663	3678	3678
55	0	1	16	84	246	525	719	658	384	97	1	0	0	1	17	101	347	872	1591	2249	2633	2730	2731	2731
60	0	0	1	37	135	380	564	503	255	36	0	0	0	0	1	38	173	553	1117	1620	1875	1911	1911	1911
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	50	90	175	285	434	616	752	713	520	339	127	59	50	140	315	600	1034	1650	2402	3115	3635	3974	4101	4160

(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