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: KIMBALL 2 N, NE **COOP ID: 254440**

Climate Division: NE 3 **NWS Call Sign:** **Elevation: 4,760 Feet** **Lat: 41˚16N** **Lon: 103˚40W**

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	39.6	11.1	25.4	73	1904	14	32.3	1983	-36	1930	17	13.9	1979	1229	0	.0	.0	7.3	9.0	30.5	4.9
Feb	44.7	15.1	29.9	76	1962	11	37.6	1992	-30	1899	11	18.8	1989	982	0	.0	.0	10.6	5.8	27.4	2.7
Mar	51.1	21.6	36.4	82+	1963	28	43.7	1986	-20	1922	1	31.4	1975	888	0	.0	.0	17.0	3.3	27.8	.8
Apr	60.0	29.9	45.0	95	1910	27	51.5	1981	-11	1975	2	38.2	1984	602	0	.0	@	22.7	.9	17.6	@
May	69.7	40.5	55.1	99	1934	29	60.1	1994	8	1907	2	48.7	1995	317	11	.0	.5	29.2	.0	3.3	.0
Jun	81.0	50.2	65.6	108	1936	28	72.2	1988	28	1919	3	60.9	1982	83	100	.1	5.1	29.9	.0	.0	.0
Jul	88.0	56.2	72.1	110	1934	15	75.1	1980	37+	1952	8	67.7	1972	5	224	1.2	13.3	31.0	.0	.0	.0
Aug	86.2	54.1	70.2	104+	1935	14	74.7	1983	26	1910	25	65.9	1992	20	179	.4	10.0	31.0	.0	.0	.0
Sep	76.9	43.5	60.2	102	1929	1	66.4	1998	11+	1945	22	55.4	1971	184	39	.0	3.8	29.0	.1	2.6	.0
Oct	64.5	31.3	47.9	94	1922	3	51.3	1974	0	1923	30	44.0	1984	530	0	.0	.2	26.4	.5	14.9	.0
Nov	48.9	19.9	34.4	83	1999	9	43.6	1999	-18	1896	26	24.8	1985	919	0	.0	.0	14.1	4.6	27.1	.7
Dec	41.5	12.5	27.0	75	1939	6	35.4	1980	-35	1989	22	13.8	1983	1178	0	.0	.0	8.5	7.8	30.3	3.7
Ann	62.7	32.2	47.4	110	Jul 1934	15	75.1	Jul 1980	-36	Jan 1930	17	13.8	Dec 1983	6937	553	1.7	32.9	256.7	32.0	181.5	12.8

\+ 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: 1893-2001

(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	.41	.35	.82	1949	4	.99	1980	.00	1998
Feb	.32	.30	1.20	1909	22	.91	1987	.00	1972
Mar	1.15	1.03	1.87	1959	25	2.74	1983	.08	1972
Apr	1.53	1.27	2.50	1988	20	3.90	1984	.11	1992
May	2.86	2.66	3.81	1957	30	7.87	1997	.67	1984
Jun	2.61	2.30	4.41	1989	8	6.08	1982	.79	2000
Jul	2.84	2.36	4.70	1897	18	7.28	1998	.40	1991
Aug	1.91	2.00	2.32	1989	13	3.86	1989	.26	1973
Sep	1.43	1.32	2.74	1902	21	4.68	1973	.13	1978
Oct	.97	.70	1.57	2000	29	3.10	1998	.00	1988
Nov	.62	.58	2.10	1922	4	1.48	1979	.05	1984
Dec	.76	.41	.90	1933	1	8.39	2000	.01	1991
Ann	17.41	17.44	4.70	Jul 1897	18	8.39	Dec 2000	.00+	Jan 1998

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.7	1.3	.1	.0
Feb	4.5	1.2	.0	.0
Mar	6.6	3.2	.7	.1
Apr	8.3	4.0	.8	.1
May	11.7	6.4	1.7	.4
Jun	9.4	5.8	1.4	.4
Jul	9.2	5.4	1.8	.7
Aug	9.0	4.6	1.1	.4
Sep	6.6	3.2	.9	.2
Oct	5.3	2.8	.5	.1
Nov	4.9	1.8	.2	.0
Dec	4.8	1.6	.1	.0
Ann	85.0	41.3	9.3	2.4

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	.05	.11	.17	.23	.29	.35	.42	.50	.61	.78	.95
Feb	.01	.03	.07	.11	.16	.22	.29	.38	.51	.72	.93
Mar	.11	.19	.35	.51	.68	.88	1.11	1.40	1.80	2.46	3.10
Apr	.26	.39	.62	.83	1.04	1.27	1.54	1.86	2.29	2.99	3.66
May	.68	.95	1.37	1.74	2.11	2.51	2.94	3.47	4.15	5.24	6.27
Jun	.76	1.01	1.38	1.70	2.02	2.35	2.71	3.13	3.68	4.55	5.35
Jul	.56	.82	1.23	1.62	2.00	2.42	2.89	3.46	4.21	5.42	6.56
Aug	.35	.52	.80	1.06	1.33	1.61	1.94	2.33	2.86	3.70	4.50
Sep	.18	.29	.50	.69	.91	1.14	1.41	1.75	2.20	2.95	3.67
Oct	.02	.08	.21	.34	.50	.68	.90	1.18	1.57	2.23	2.90
Nov	.09	.14	.23	.31	.40	.50	.62	.76	.95	1.26	1.56
Dec	.01	.03	.09	.18	.29	.43	.61	.87	1.24	1.92	2.61
Ann	11.75	12.83	14.21	15.27	16.21	17.13	18.09	19.14	20.43	22.31	23.95

\+ 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: 1893-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	6.5	5.2	2	1
Feb	3.8	3.9	1	1
Mar	10.3	9.6	1	1
Apr	5.3	3.3	#	#
May	.7	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.4	.0	#	0
Oct	1.7	.2	#	#
Nov	7.0	5.1	1	#
Dec	7.7	7.0	1	1
Ann	43.4	34.3	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	14.0	1988	18	19.4	1976	13	1976	2	6	1974
Feb	5.5	1987	27	10.4	1987	9	1980	1	3	1986
Mar	14.0	1992	9	23.0+	1973	14	1992	9	2	1990
Apr	8.0	1984	3	29.5	1984	12	1984	3	2	1984
May	6.0	1983	18	7.0+	1983	5	1979	10	#+	1995
Jun	.0	0	0	.0	0	1	1997	26	#+	1997
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	3.5	1985	29	3.5	1985	3	1985	29	#+	2000
Oct	6.0	1990	8	7.0	1997	8	1982	10	1+	1997
Nov	13.0	1979	21	23.0	1979	19	1979	22	7	1979
Dec	11.0	1978	2	20.5+	1987	13+	1985	25	8	1985
Ann	14.0+	Mar 1992	9	29.5	Apr 1984	19	Nov 1979	22	8	Dec 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	4.0	2.2	.7	.3	.1
Feb	3.3	1.7	.2	@	.0
Mar	4.7	3.3	1.2	.5	.1
Apr	2.6	1.8	.8	.2	.0
May	.2	.2	.1	.1	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.2	.2	.1	.0	.0
Oct	.9	.5	.2	.1	.0
Nov	3.3	2.4	1.0	.3	.1
Dec	4.2	2.7	.9	.4	@
Ann	23.4	15.0	5.2	1.9	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	11.1	5.4	2.6	.3
Feb	6.7	2.0	.9	.0
Mar	5.9	2.9	1.5	.3
Apr	2.4	1.1	.5	.1
May	.2	.1	.1	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.2	@	.0	.0
Oct	.9	.4	.2	.0
Nov	6.5	3.0	1.3	.6
Dec	10.8	5.5	3.7	.8
Ann	44.7	20.4	10.8	2.1

+ 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	6/11	6/04	5/31	5/27	5/23	5/20	5/16	5/11	5/05
32	5/19	5/15	5/13	5/11	5/09	5/07	5/05	5/02	4/29
28	5/13	5/09	5/06	5/03	5/01	4/28	4/25	4/22	4/18
24	5/04	4/29	4/24	4/21	4/18	4/14	4/11	4/07	4/01
20	4/24	4/19	4/15	4/12	4/09	4/06	4/03	3/30	3/25
16	4/17	4/10	4/06	4/02	3/29	3/26	3/22	3/17	3/11

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	9/10	9/13	9/15	9/17	9/18	9/20	9/22	9/24	9/27
32	9/13	9/17	9/20	9/22	9/25	9/27	9/29	10/02	10/06
28	9/21	9/25	9/29	10/02	10/05	10/08	10/11	10/14	10/19
24	10/02	10/07	10/10	10/12	10/15	10/17	10/20	10/23	10/28
20	10/09	10/14	10/18	10/21	10/24	10/27	10/30	11/03	11/08
16	10/19	10/25	10/29	11/01	11/04	11/08	11/11	11/15	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	135	129	125	121	117	114	110	105	99
32	155	149	145	141	138	135	131	127	122
28	177	170	165	161	157	152	148	143	136
24	201	194	188	184	180	175	171	166	158
20	218	211	206	202	197	193	189	184	176
16	243	235	229	224	219	215	210	204	196

***** 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	1229	982	888	602	317	83	5	20	184	530	919	1178	6937
60	1074	842	733	454	192	30	0	3	91	376	769	1023	5587
57	981	758	640	369	131	14	0	1	52	286	679	930	4841
55	919	702	578	314	98	8	0	0	33	229	619	868	4368
50	764	567	425	193	40	1	0	0	8	111	480	714	3303
32	277	168	50	5	0	0	0	0	0	1	109	241	851

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	71	110	185	393	717	1008	1242	1183	846	494	180	86	6515
55	0	0	0	12	103	325	529	470	189	9	0	0	1637
57	0	0	0	7	74	271	467	409	148	4	0	0	1380
60	0	0	0	2	41	198	374	318	96	1	0	0	1030
65	0	0	0	0	11	100	224	179	39	0	0	0	553
70	0	0	0	0	2	38	100	74	11	0	0	0	225

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	8	32	86	214	476	769	992	937	615	289	74	23	8	40	126	340	816	1585	2577	3514	4129	4418	4492	4515
45	0	6	35	120	337	620	837	782	471	177	29	1	0	6	41	161	498	1118	1955	2737	3208	3385	3414	3415
50	0	0	9	61	211	471	682	628	337	89	6	0	0	0	9	70	281	752	1434	2062	2399	2488	2494	2494
55	0	0	0	23	111	330	527	473	218	34	0	0	0	0	0	23	134	464	991	1464	1682	1716	1716	1716
60	0	0	0	3	45	201	374	320	115	9	0	0	0	0	0	3	48	249	623	943	1058	1067	1067	1067
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	24	50	92	174	305	478	630	590	404	240	81	36	24	74	166	340	645	1123	1753	2343	2747	2987	3068	3104

(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