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: PRINCETON 6 SW, MO **COOP ID: 236866**

Climate Division: MO 1 **NWS Call Sign:** **Elevation: 980 Feet** **Lat: 40˚22N** **Lon: 93˚44W**

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	31.1	14.1	22.6	72	1989	31	34.1	1990	-26	1974	12	8.8	1979	1314	0	.0	.0	3.2	13.8	29.5	5.7
Feb	37.5	19.6	28.6	75	1995	25	38.7	2000	-24+	1996	3	14.7	1978	1020	0	.0	.0	7.1	9.3	23.7	3.0
Mar	50.0	30.1	40.1	87	1986	29	45.7	2000	-25	1960	5	31.6	1984	772	0	.0	.0	17.1	2.2	18.4	.2
Apr	62.6	40.9	51.8	92	1989	25	58.9	1981	10	1975	3	45.2	1983	402	5	.0	.2	26.7	.1	6.2	.0
May	71.8	51.3	61.6	97	1953	26	67.2	1991	28+	1989	6	57.0	1997	168	61	.0	.1	31.0	.0	.3	.0
Jun	80.7	60.3	70.5	106	1988	25	75.7	1971	37	1969	3	65.2	1982	20	183	.2	3.9	30.0	.0	.0	.0
Jul	85.1	64.8	75.0	107+	1980	30	80.3	1980	42	1972	5	71.7	1994	1	308	.8	10.8	31.0	.0	.0	.0
Aug	83.4	62.4	72.9	110	1984	29	81.4	1983	35	1986	28	67.3	1986	19	265	1.2	8.1	31.0	.0	.0	.0
Sep	75.8	53.8	64.8	100+	1984	1	70.4	1998	25	1984	29	59.7	1974	90	84	@	2.7	30.0	.0	.3	.0
Oct	64.8	42.4	53.6	95+	1963	5	60.0	1971	13	1952	29	47.0	1988	361	7	.0	@	29.3	.0	5.0	.0
Nov	48.4	30.1	39.3	80+	1980	8	49.3	1999	-12	1964	30	32.2	1976	773	0	.0	.0	15.4	2.3	18.3	.2
Dec	35.1	18.8	27.0	70+	2001	6	32.7	1979	-25	1989	23	10.9	1983	1180	0	.0	.0	4.6	9.7	28.1	2.9
Ann	60.5	40.7	50.7	110	Aug 1984	29	81.4	Aug 1983	-26	Jan 1974	12	8.8	Jan 1979	6120	913	2.2	25.8	256.4	37.4	129.8	12.0

\+ 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: 1952-2001

(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	.90	.73	1.34	1955	5	2.06	1973	.00	1986
Feb	1.07	.93	1.72	1997	21	3.03	1997	.10	1991
Mar	2.35	1.93	3.45	1976	4	8.53	1973	.15	1989
Apr	3.53	3.46	3.25	1992	16	7.44	1992	.84	1985
May	4.58	4.25	2.37	1960	6	11.01	1995	.85	1992
Jun	4.24	4.06	4.25	1967	13	10.38	2000	.95	1988
Jul	5.11	3.60	5.42	1993	11	20.94	1993	.33	1983
Aug	3.72	3.38	3.80	1996	23	9.08	1996	.38	1984
Sep	3.86	3.42	4.50	1961	13	8.03	1973	1.52	1987
Oct	2.96	2.62	3.20	1958	9	7.31	1998	.16	1975
Nov	2.28	2.27	2.68	1961	2	5.26	1983	.00	1989
Dec	1.51	1.30	3.00	1980	7	4.20	1980	.02	1996
Ann	36.11	35.95	5.42	Jul 1993	11	20.94	Jul 1993	.00+	Nov 1989

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.4	2.9	.4	.0
Feb	5.9	3.2	.4	.1
Mar	8.3	5.3	1.5	.4
Apr	10.4	6.7	2.6	.7
May	12.0	8.4	3.4	.9
Jun	9.9	7.1	2.9	1.2
Jul	8.4	6.4	3.0	1.6
Aug	8.4	5.9	2.4	1.2
Sep	7.5	5.6	2.8	1.1
Oct	7.4	5.2	1.9	.8
Nov	7.7	4.9	1.6	.4
Dec	6.2	3.7	.9	.2
Ann	97.5	65.3	23.8	8.6

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	.09	.20	.35	.48	.61	.75	.91	1.11	1.36	1.78	2.17
Feb	.26	.36	.52	.66	.79	.94	1.10	1.29	1.54	1.94	2.31
Mar	.32	.51	.85	1.18	1.52	1.90	2.34	2.88	3.60	4.79	5.94
Apr	.99	1.33	1.84	2.28	2.71	3.16	3.66	4.25	5.01	6.21	7.33
May	1.51	1.94	2.58	3.12	3.64	4.18	4.77	5.46	6.35	7.73	9.00
Jun	1.42	1.82	2.41	2.91	3.39	3.88	4.43	5.06	5.87	7.13	8.29
Jul	.66	1.07	1.79	2.50	3.25	4.09	5.05	6.24	7.85	10.49	13.05
Aug	.80	1.14	1.69	2.18	2.68	3.21	3.81	4.52	5.47	6.97	8.40
Sep	1.44	1.80	2.32	2.75	3.16	3.58	4.04	4.57	5.25	6.29	7.24
Oct	.49	.75	1.18	1.59	2.01	2.46	2.98	3.62	4.46	5.83	7.13
Nov	.32	.62	1.00	1.32	1.64	1.98	2.35	2.80	3.39	4.32	5.19
Dec	.15	.25	.46	.67	.90	1.15	1.46	1.84	2.36	3.23	4.08
Ann	23.27	25.66	28.78	31.18	33.33	35.43	37.62	40.06	43.04	47.41	51.23

\+ 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: 1952-2001
(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	6.1	7.0	#	0
Feb	2.3	.0	#	0
Mar	.6	.0	#	0
Apr	.7	.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
Nov	1.5	.0	#	0
Dec	4.0	2.0	#	0
Ann	15.2	9.0	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	5.0	1974	8	12.0	1973	10	1974	10	3	1974
Feb	5.5	1976	2	8.0	1975	5	1976	2	1	1975
Mar	4.0	1975	10	5.5	1975	2	1975	9	#+	1997
Apr	7.0	1973	8	7.0	1973	4	1975	2	#	1975
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	.0	0	0	.0	0	0	0	0	0	0
Oct	#	1993	30	#	1993	0	0	0	0	0
Nov	4.5	1975	26	5.5	1974	5+	1975	26	#+	1976
Dec	5.0	1972	9	12.0	1972	5	1973	20	1	1973
Ann	7.0	Apr 1973	8	12.0+	Jan 1973	10	Jan 1974	10	3	Jan 1974

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.6	1.5	.8	.1	.0
Feb	1.0	.9	.3	.1	.0
Mar	.1	.1	.1	.0	.0
Apr	.1	.1	.1	.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	.0	.0	.0
Oct	.0	.0	.0	.0	.0
Nov	.3	.3	.2	.0	.0
Dec	.6	.6	.1	.1	.0
Ann	3.7	3.5	1.6	.4	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	1.0	.3	.1	.0
Mar	.1	.0	.0	.0
Apr	@	@	.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	.3	.2	.1	.0
Dec	.2	.0	.0	.0
Ann	-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	5/12	5/08	5/04	5/02	4/29	4/26	4/23	4/20	4/15
32	5/02	4/28	4/25	4/23	4/21	4/19	4/16	4/13	4/10
28	4/20	4/16	4/13	4/11	4/09	4/06	4/04	4/01	3/28
24	4/16	4/11	4/08	4/05	4/02	3/31	3/28	3/24	3/20
20	4/07	4/01	3/28	3/24	3/21	3/17	3/14	3/09	3/03
16	3/30	3/24	3/19	3/15	3/11	3/08	3/04	2/27	2/21

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	9/14	9/19	9/23	9/27	9/30	10/03	10/06	10/10	10/16
32	9/23	9/29	10/03	10/06	10/09	10/13	10/16	10/20	10/26
28	10/03	10/09	10/13	10/16	10/20	10/23	10/26	10/31	11/05
24	10/12	10/18	10/23	10/27	10/30	11/03	11/07	11/11	11/18
20	10/25	10/31	11/05	11/08	11/12	11/16	11/20	11/24	12/01
16	11/05	11/11	11/15	11/19	11/22	11/26	11/29	12/04	12/10

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	175	168	162	158	153	149	144	139	131
32	189	183	178	175	171	167	164	159	153
28	215	207	202	198	193	189	185	179	172
24	234	226	220	215	211	206	201	195	187
20	264	254	247	241	236	230	224	217	207
16	281	272	266	260	255	250	245	239	230

***** 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	1314	1020	772	402	168	20	1	19	90	361	773	1180	6120
60	1159	880	618	268	85	4	0	4	32	229	624	1025	4928
57	1066	804	534	199	51	1	0	1	14	164	538	932	4304
55	1004	752	476	159	34	0	0	0	7	127	483	870	3912
50	854	622	342	79	10	0	0	0	0	60	351	725	3043
32	376	250	58	0	0	0	0	0	0	0	60	274	1018

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	86	154	308	593	916	1154	1330	1269	984	669	277	118	7858
55	0	11	13	61	237	464	617	556	300	82	11	0	2352
57	0	8	9	42	192	405	555	494	248	57	5	0	2015
60	0	0	1	21	133	317	462	405	175	30	1	0	1545
65	0	0	0	5	61	183	308	265	84	7	0	0	913
70	0	0	0	0	20	81	167	151	30	0	0	0	449

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	47	160	397	702	948	1120	1053	775	458	128	18	8	55	215	612	1314	2262	3382	4435	5210	5668	5796	5814
45	0	16	93	272	548	798	965	898	627	316	71	5	0	16	109	381	929	1727	2692	3590	4217	4533	4604	4609
50	0	3	51	165	396	648	810	743	480	194	31	2	0	3	54	219	615	1263	2073	2816	3296	3490	3521	3523
55	0	0	20	89	257	498	655	589	336	106	9	0	0	0	20	109	366	864	1519	2108	2444	2550	2559	2559
60	0	0	3	37	139	348	500	434	215	45	2	0	0	0	3	40	179	527	1027	1461	1676	1721	1723	1723
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	3	35	104	243	429	634	761	707	496	279	76	14	3	38	142	385	814	1448	2209	2916	3412	3691	3767	3781

(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