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: ALTON 6 SE, MO **COOP ID: 230127**

Climate Division: MO 5 **NWS Call Sign:** **Elevation: 810 Feet** **Lat: 36˚38N** **Lon: 91˚18W**

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	44.6	20.0	32.3	75	1967	23	41.9	1990	-18	1977	11	19.5	1977	1014	0	.0	.0	10.8	4.8	26.2	1.3
Feb	51.1	23.8	37.5	82+	1996	24	45.2	1976	-10	1982	7	25.9	1978	772	0	.0	.0	15.7	1.9	21.2	.6
Mar	60.6	33.1	46.9	90+	1967	13	52.9	1973	3+	1980	2	39.9	1996	563	0	.0	.0	25.7	.2	14.1	.0
Apr	69.7	41.9	55.8	92	1980	23	62.3	1981	20+	1982	11	50.1	1982	285	9	.0	.2	29.1	.0	5.3	.0
May	77.8	51.3	64.6	94	2000	24	69.8	1987	28	1976	4	59.6	1976	103	89	.0	.5	31.0	.0	.3	.0
Jun	85.8	60.4	73.1	100	1978	30	77.4	1971	40	1969	3	68.1	1974	8	251	.1	8.5	30.0	.0	.0	.0
Jul	90.8	65.2	78.0	105	1966	14	83.1	1980	46+	1975	14	74.8	1972	0	403	1.4	18.1	31.0	.0	.0	.0
Aug	89.9	62.8	76.4	105	2000	30	81.3	1980	45	1973	2	71.4	1992	2	354	1.2	15.7	31.0	.0	.0	.0
Sep	82.6	54.4	68.5	103	2000	4	74.4	1980	31	1967	29	62.9	1974	52	157	.5	5.9	30.0	.0	.2	.0
Oct	72.8	42.2	57.5	94	1979	8	65.2	1971	16+	1981	25	52.2	1987	256	23	.0	.5	30.9	.0	5.6	.0
Nov	58.6	33.0	45.8	85	1980	9	52.1	1999	1	1976	29	38.3	1976	577	0	.0	.0	23.1	.1	14.0	.0
Dec	47.9	24.0	36.0	76	2001	5	43.5	1984	-6	1976	31	23.6	1983	902	0	.0	.0	13.9	3.1	23.3	.4
Ann	69.4	42.7	56.0	105+	Aug 2000	30	83.1	Jul 1980	-18	Jan 1977	11	19.5	Jan 1977	4534	1286	3.2	49.4	302.2	10.1	110.2	2.3

\+ 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	2.73	2.39	3.75	1982	31	9.24	1982	.24	1986
Feb	3.10	2.60	2.90	1949	14	7.96	1989	.79	1996
Mar	4.20	3.68	4.38	1977	28	10.27	1977	.76	1971
Apr	4.11	3.86	4.26	1997	5	10.49	1973	.70	2000
May	4.72	4.15	4.60	1950	12	10.34	1973	2.14	1988
Jun	3.41	3.10	3.67	2000	18	7.02	2000	.64	1978
Jul	3.32	3.02	2.60	1972	28	6.90	1972	.36	1975
Aug	3.06	2.67	3.40	1970	9	9.69	1977	.32	1983
Sep	3.57	2.89	4.50	1975	11	10.65	1975	.09	1976
Oct	3.40	2.90	2.80	1951	24	9.05	1984	.67	1971
Nov	5.07	5.14	4.77	1958	17	11.18	1994	.57	1976
Dec	4.16	3.32	8.35	1982	3	19.28	1982	1.04	1980
Ann	44.85	43.71	8.35	Dec 1982	3	19.28	Dec 1982	.09	Sep 1976

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	8.3	5.5	1.8	.8
Feb	7.2	5.7	2.5	.9
Mar	10.6	7.6	3.0	1.1
Apr	8.9	6.7	3.0	1.3
May	11.6	8.7	3.2	1.1
Jun	9.2	6.1	2.2	.7
Jul	8.7	6.6	2.3	.7
Aug	8.1	5.8	2.1	.8
Sep	8.3	6.2	2.4	1.1
Oct	7.5	5.6	2.7	1.0
Nov	9.2	7.2	3.6	1.8
Dec	7.9	5.9	2.7	1.0
Ann	105.5	77.6	31.5	12.3

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	.62	.88	1.28	1.63	1.99	2.37	2.80	3.31	3.98	5.05	6.06
Feb	.99	1.28	1.72	2.09	2.45	2.82	3.23	3.70	4.32	5.27	6.16
Mar	1.34	1.74	2.33	2.83	3.32	3.82	4.38	5.03	5.86	7.16	8.36
Apr	1.27	1.66	2.24	2.74	3.23	3.73	4.28	4.92	5.76	7.06	8.27
May	2.01	2.44	3.04	3.53	3.99	4.45	4.95	5.52	6.24	7.35	8.35
Jun	1.03	1.35	1.84	2.25	2.66	3.08	3.54	4.09	4.79	5.89	6.91
Jul	.86	1.18	1.66	2.09	2.50	2.94	3.43	4.01	4.77	5.97	7.08
Aug	.87	1.16	1.60	1.98	2.36	2.75	3.18	3.68	4.34	5.37	6.33
Sep	.42	.70	1.20	1.70	2.23	2.82	3.51	4.37	5.53	7.44	9.30
Oct	1.14	1.46	1.94	2.34	2.72	3.12	3.55	4.06	4.71	5.71	6.64
Nov	1.33	1.81	2.54	3.19	3.83	4.50	5.24	6.12	7.27	9.08	10.78
Dec	.77	1.14	1.75	2.31	2.89	3.51	4.21	5.07	6.20	8.02	9.75
Ann	30.20	32.98	36.57	39.32	41.78	44.16	46.64	49.39	52.74	57.63	61.89

\+ 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)

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	4.7	1.0	1	#	11.0	1977	9	22.5	1977	15	1977	14	6	1977	1.7	1.0	.5	.2	.1	5.7	4.3	2.4	.5
Feb	2.6	.5	#	#	12.5	1980	8	16.5	1980	10	1978	21	3	1982	1.2	.6	.3	.1	.1	2.6	1.3	.2	.1
Mar	2.1	.0	#	0	11.0	1975	10	22.0	1975	11	1975	14	1	1975	.4	.2	.2	.1	.1	.5	.3	.1	.1
Apr	.1	.0	#	0	.5	1980	14	.6	1971	#+	1998	14	#+	1998	.2	.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	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	1.0	.0	#	0	8.0	1975	27	8.5	1980	6	1975	27	#+	1997	.2	.2	.1	.1	.0	.2	.1	.1	.0
Dec	1.8	.0	#	0	8.0	1975	26	12.0	1975	6	1975	27	1	1975	.6	.6	.2	.1	.0	.7	.4	.2	.0
Ann	12.3	1.5	N/A	N/A	12.5	Feb 1980	8	22.5	Jan 1977	15	Jan 1977	14	6	Jan 1977	4.3	2.6	1.3	.6	.3	9.7	6.4	3.0	.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	5/23	5/16	5/12	5/07	5/04	4/30	4/26	4/21	4/14
32	5/04	4/29	4/25	4/22	4/20	4/17	4/14	4/10	4/05
28	4/21	4/16	4/13	4/10	4/07	4/05	4/02	3/29	3/24
24	4/12	4/06	4/02	3/30	3/27	3/24	3/20	3/16	3/11
20	4/02	3/27	3/22	3/18	3/14	3/11	3/07	3/02	2/24
16	3/18	3/11	3/05	3/01	2/25	2/21	2/16	2/11	2/03

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	9/21	9/25	9/28	9/30	10/02	10/05	10/07	10/10	10/14
32	9/28	10/02	10/06	10/08	10/11	10/14	10/16	10/20	10/24
28	10/09	10/14	10/18	10/21	10/24	10/27	10/30	11/02	11/07
24	10/24	10/30	11/03	11/07	11/10	11/14	11/17	11/22	11/28
20	10/30	11/05	11/09	11/13	11/16	11/20	11/23	11/27	12/03
16	11/07	11/14	11/20	11/25	11/29	12/03	12/08	12/13	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	172	165	159	155	151	147	142	137	130
32	192	186	181	177	174	170	166	162	155
28	217	211	206	202	199	195	191	187	180
24	250	242	237	232	228	223	219	213	205
20	273	264	257	251	246	241	235	228	219
16	306	296	289	282	276	270	264	257	247

***** 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	1014	772	563	285	103	8	0	2	52	256	577	902	4534
60	859	633	417	164	41	1	0	0	16	145	433	747	3456
57	766	555	333	107	19	0	0	0	7	94	352	657	2890
55	706	503	281	77	11	0	0	0	3	68	301	599	2549
50	563	377	174	26	2	0	0	0	0	25	191	457	1815
32	161	77	9	0	0	0	0	0	0	0	11	100	358

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	170	228	469	714	1009	1233	1426	1374	1094	791	424	221	9153
55	2	11	29	101	307	543	713	661	408	146	24	7	2952
57	0	7	18	71	253	483	651	599	351	110	15	3	2561
60	0	1	9	38	181	394	558	506	271	68	7	0	2033
65	0	0	0	9	89	251	403	354	157	23	0	0	1286
70	0	0	0	1	32	129	250	212	75	5	0	0	704

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	57	110	285	483	778	967	1191	1134	867	563	245	82	57	167	452	935	1713	2680	3871	5005	5872	6435	6680	6762
45	24	55	177	344	623	817	1036	979	717	411	152	37	24	79	256	600	1223	2040	3076	4055	4772	5183	5335	5372
50	7	25	93	217	469	667	881	824	567	273	81	14	7	32	125	342	811	1478	2359	3183	3750	4023	4104	4118
55	0	7	42	119	317	517	726	669	422	160	34	3	0	7	49	168	485	1002	1728	2397	2819	2979	3013	3016
60	0	2	12	56	186	367	571	514	284	79	8	0	0	2	14	70	256	623	1194	1708	1992	2071	2079	2079
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	47	94	198	315	504	640	801	758	569	385	168	62	47	141	339	654	1158	1798	2599	3357	3926	4311	4479	4541

(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