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: MADRID, NE **COOP ID: 255090**

Climate Division: NE 7 **NWS Call Sign:** **Elevation: 3,200 Feet** **Lat: 40˚51N** **Lon: 101˚33W**

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	36.6	10.9	23.8	72	1997	3	31.9	1986	-30	1912	12	9.2	1979	1279	0	.0	.0	6.1	9.6	30.3	5.4
Feb	43.4	15.7	29.6	79	1918	22	37.2	1999	-26	1936	8	17.7	1993	994	0	.0	.0	12.0	5.8	26.8	2.7
Mar	51.3	23.0	37.2	101	1910	21	43.6	1986	-23+	1960	3	32.0	1980	864	0	.0	.0	19.7	2.7	24.9	.6
Apr	61.1	32.6	46.9	98	1902	20	54.2	1981	-5	1936	2	40.7	1983	544	0	.0	.4	25.6	.3	12.9	.0
May	71.1	45.3	58.2	103	1934	29	62.6	1987	12+	1909	1	51.1	1995	238	27	.0	1.3	30.5	.0	1.5	.0
Jun	82.6	55.1	68.9	109	1937	23	74.2	1988	32+	1943	4	62.6	1982	44	158	1.4	10.8	29.9	.0	.0	.0
Jul	89.1	60.6	74.9	114+	1940	24	78.9	1980	39	1911	24	69.7	1992	2	306	4.3	19.7	31.0	.0	.0	.0
Aug	86.9	57.9	72.4	112	1936	11	78.5	1983	30	1910	25	66.8	1992	14	243	1.8	16.6	31.0	.0	.0	.0
Sep	78.4	47.3	62.9	106	1931	5	69.1	1998	14	1926	25	59.0	1993	127	62	.3	7.0	29.5	.0	1.1	.0
Oct	65.9	34.1	50.0	96	1934	7	53.4	1974	0	1923	30	45.5	1976	465	0	.0	.4	28.6	.2	9.9	.0
Nov	47.3	21.3	34.3	85	1901	10	43.9	1999	-13	1986	13	23.6	1985	922	0	.0	.0	15.5	3.5	26.2	.5
Dec	38.6	12.9	25.8	77	1939	6	33.4	1980	-33+	1989	22	9.1	1983	1217	0	.0	.0	8.1	7.6	30.3	3.4
Ann	62.7	34.7	48.7	114+	Jul 1940	24	78.9	Jul 1980	-33+	Dec 1989	22	9.1	Dec 1983	6710	796	7.8	56.2	267.5	29.7	163.9	12.6

\+ 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: 1900-2001

(3) Derived from 1971-2000 serially complete daily data

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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	.46	.32	1.15	1990	20	1.25	1992	.00+	1997
Feb	.52	.33	1.19	1971	19	1.73	1993	.00+	1996
Mar	1.40	1.23	1.96	1966	22	5.24	1977	.05	1994
Apr	1.86	1.46	2.51	1938	27	4.55	1971	.00	1992
May	3.39	3.17	4.03	1958	14	7.36	1991	.87	1992
Jun	3.36	3.52	3.95	1911	16	8.41	1982	.38	1985
Jul	3.14	2.84	4.83	1912	25	7.72	1994	1.17	1974
Aug	2.53	2.01	3.75	1999	29	11.32	1999	.12	1991
Sep	1.35	1.07	3.91	1942	2	6.62	1973	.04	1992
Oct	1.23	.98	2.90	1997	12	4.31	1997	.05	1988
Nov	.81	.60	1.76	1956	2	2.14	1998	.00+	1989
Dec	.38	.33	1.44	1913	5	1.32	1973	.00+	2000
Ann	20.43	20.71	4.83	Jul 1912	25	11.32	Aug 1999	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.3	1.6	.2	@
Feb	3.4	1.5	.2	@
Mar	5.9	3.4	.9	.3
Apr	6.0	4.2	1.2	.3
May	8.8	6.2	2.1	.9
Jun	7.9	5.8	2.1	.8
Jul	7.6	5.6	2.2	.8
Aug	6.0	4.4	1.7	.7
Sep	4.6	3.1	.7	.3
Oct	4.0	2.5	.6	.2
Nov	3.3	2.2	.5	.1
Dec	3.2	1.3	.1	.0
Ann	64.0	41.8	12.5	4.4

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	.00	.07	.16	.24	.31	.38	.47	.57	.71	.93	1.14
Feb	.00	.00	.07	.15	.24	.34	.47	.64	.86	1.25	1.65
Mar	.13	.23	.42	.61	.83	1.07	1.35	1.71	2.20	3.02	3.82
Apr	.27	.52	.83	1.09	1.35	1.62	1.92	2.28	2.75	3.50	4.20
May	1.17	1.49	1.96	2.35	2.73	3.11	3.54	4.03	4.67	5.64	6.55
Jun	.69	1.00	1.49	1.94	2.40	2.88	3.43	4.08	4.95	6.34	7.65
Jul	1.23	1.52	1.94	2.28	2.61	2.94	3.29	3.70	4.23	5.03	5.76
Aug	.32	.52	.88	1.23	1.61	2.02	2.50	3.09	3.90	5.22	6.50
Sep	.06	.12	.27	.45	.65	.90	1.21	1.62	2.19	3.18	4.18
Oct	.08	.15	.30	.47	.66	.88	1.14	1.48	1.96	2.76	3.56
Nov	.00	.06	.18	.31	.44	.60	.78	1.00	1.31	1.83	2.35
Dec	.00	.00	.12	.19	.25	.32	.39	.48	.60	.78	.96
Ann	14.12	15.32	16.88	18.06	19.12	20.14	21.20	22.37	23.80	25.88	27.68

\+ 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: 1900-2001
(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	6.6	5.3	2	1
Feb	4.9	3.0	1	#
Mar	8.8	8.8	1	#
Apr	3.4	1.0	#	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	1.2	.0	#	0
Nov	6.4	4.0	#	#
Dec	6.4	5.6	1	#
Ann	37.9	27.7	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	1990	20	16.0	1988	16	1983	3	7	1988
Feb	6.0	1971	19	19.0	1978	14	1993	26	8	1993
Mar	12.0	1977	11	24.0	1971	15	1980	31	4	1982
Apr	10.3	1995	18	12.0	1987	18	1980	2	3	1980
May	1.0	1984	7	1.0	1984	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	2.0	1985	29	3.0	1985	1	1985	29	#	1985
Oct	8.9	1995	23	8.9	1995	8	1995	23	1	1995
Nov	10.0	1990	3	19.0	1990	16	1983	30	3	1975
Dec	12.0	1982	25	18.0	1985	16	1983	2	8	1983
Ann	14.0	Jan 1990	20	24.0	Mar 1971	18	Apr 1980	2	8+	Feb 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.9	2.6	.8	.2	.1
Feb	2.7	2.4	.8	.2	.0
Mar	3.0	2.7	1.1	.5	.2
Apr	1.2	1.1	.4	.2	.1
May	@	@	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.0	.0	.0
Oct	.6	.5	.2	@	.0
Nov	2.0	2.0	.7	.3	@
Dec	2.8	2.4	.8	.2	@
Ann	15.3	13.8	4.8	1.6	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	10.8	6.3	3.4	.9
Feb	4.8	2.6	1.7	.7
Mar	3.8	2.0	1.2	.3
Apr	.8	.5	.3	.2
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	.4	.1	.1	.0
Nov	3.7	1.8	1.1	.4
Dec	7.4	4.6	3.0	1.0
Ann	31.7	17.9	10.8	3.5

+ 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	5/24	5/20	5/17	5/14	5/12	5/09	5/07	5/04	4/29
32	5/16	5/13	5/10	5/07	5/05	5/03	5/01	4/28	4/24
28	5/07	5/03	4/30	4/28	4/26	4/23	4/21	4/18	4/14
24	4/22	4/19	4/16	4/14	4/12	4/10	4/08	4/05	4/01
20	4/17	4/11	4/07	4/04	4/01	3/29	3/25	3/21	3/16
16	4/07	4/02	3/29	3/25	3/22	3/19	3/15	3/11	3/05

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	9/12	9/16	9/18	9/20	9/23	9/25	9/27	9/29	10/03
32	9/16	9/21	9/25	9/28	10/01	10/04	10/07	10/11	10/16
28	9/30	10/05	10/08	10/11	10/13	10/16	10/19	10/22	10/27
24	10/04	10/09	10/13	10/16	10/19	10/22	10/25	10/29	11/03
20	10/17	10/21	10/25	10/28	10/30	11/02	11/05	11/08	11/13
16	10/27	11/01	11/04	11/07	11/10	11/13	11/15	11/19	11/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	148	143	139	136	133	130	127	123	118
32	168	161	156	152	148	144	140	135	128
28	184	179	176	173	170	167	164	161	156
24	206	201	196	193	189	186	183	178	172
20	235	227	221	216	212	207	203	197	189
16	253	246	241	236	232	228	224	219	211

***** 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	1279	994	864	544	238	44	2	14	127	465	922	1217	6710
60	1124	854	709	399	131	12	0	2	52	313	772	1062	5430
57	1031	770	616	317	83	5	0	0	25	228	682	969	4726
55	969	717	554	265	59	2	0	0	13	177	622	907	4285
50	815	587	405	155	20	0	0	0	1	79	480	755	3297
32	324	204	48	2	0	0	0	0	0	0	106	284	968

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	67	134	208	448	812	1105	1327	1253	925	558	175	90	7102
55	0	3	0	21	158	417	614	540	249	21	0	0	2023
57	0	0	0	13	121	359	552	478	200	11	0	0	1734
60	0	0	0	5	75	277	459	387	137	3	0	0	1343
65	0	0	0	0	27	158	306	243	62	0	0	0	796
70	0	0	0	0	6	73	167	126	21	0	0	0	393

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	6	43	131	310	624	925	1131	1071	757	402	84	18	6	49	180	490	1114	2039	3170	4241	4998	5400	5484	5502
45	1	11	62	201	471	776	976	916	610	268	31	0	1	12	74	275	746	1522	2498	3414	4024	4292	4323	4323
50	0	0	23	112	326	626	821	761	465	155	8	0	0	0	23	135	461	1087	1908	2669	3134	3289	3297	3297
55	0	0	5	49	207	477	666	606	326	71	0	0	0	0	5	54	261	738	1404	2010	2336	2407	2407	2407
60	0	0	0	22	111	333	511	453	207	22	0	0	0	0	0	22	133	466	977	1430	1637	1659	1659	1659
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	22	61	129	238	393	585	717	684	487	301	90	35	22	83	212	450	843	1428	2145	2829	3316	3617	3707	3742

(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