

Climatology of the United States

No. 20

1971-2000

Station: MARSHALLTOWN, IA

COOP ID: 135198

Climate Division: IA 5

NWS Call Sign:

Elevation: 870 Feet Lat: 42°04N Lon: 92°56W

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	26.5	7.1	16.8	62+	1897	1	29.2	1990	-31+	1912	12	4.6	1979	1495	0	.0	.0	.9	19.6	30.6	10.6
Feb	32.6	12.8	22.7	72	1921	15	35.2	1998	-35	1996	3	8.6	1979	1185	0	.0	.0	3.1	13.5	26.5	5.8
Mar	45.2	24.9	35.1	90+	1895	29	42.0	1973	-32	1962	1	23.9	1975	928	0	.0	@	11.2	4.3	23.3	.8
Apr	59.2	36.6	47.9	94+	1910	29	54.4	1977	4	1982	6	42.1	1975	516	2	.0	.1	23.2	.3	9.1	.0
May	71.1	49.1	60.1	104+	1934	30	67.4	1977	20	1907	4	53.9	1997	209	57	.0	.6	30.7	.0	.7	.0
Jun	80.7	59.2	70.0	105	1934	28	75.5	1971	30	1943	21	64.5	1982	26	174	.1	3.4	30.0	.0	.0	.0
Jul	84.4	63.3	73.9	112	1936	14	78.6	1983	42	1947	22	68.4	1992	6	281	.2	7.3	31.0	.0	.0	.0
Aug	82.0	60.2	71.1	109	1934	8	78.6	1983	35	1915	30	66.2	1992	27	217	.3	4.6	31.0	.0	.0	.0
Sep	74.8	50.1	62.5	103	1939	7	67.9	1998	20	1942	28	57.8	1993	129	53	.0	1.3	30.0	.0	.9	.0
Oct	62.3	38.3	50.3	94	1953	2	57.2	1973	-3	1925	30	44.3	1988	458	3	.0	.1	27.5	@	10.0	.0
Nov	45.2	25.8	35.5	81	1938	1	43.0	1999	-11	1977	26	28.6	1991	886	0	.0	.0	11.0	4.2	22.7	.4
Dec	30.9	13.6	22.3	71	1998	5	29.8	1998	-28	1985	19	8.3	1983	1326	0	.0	.0	2.1	15.4	29.8	5.9
Ann	57.9	36.8	47.4	112	Jul 1936	14	78.6+	Aug 1983	-35	Feb 1996	3	4.6	Jan 1979	7191	787	.6	17.4	231.7	57.3	153.6	23.5

+ 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/normal/usnormals.html

Issue Date: February 2004

(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

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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: MARSHALLTOWN, IA

COOP ID: 135198

Climate Division: IA 5

NWS Call Sign:

Elevation: 870 Feet Lat: 42°04N

Lon: 92°56W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	.95	.97	1.80	1934	3	2.07	1982	.08	1981	5.6	3.0	.3	@	.17	.25	.39	.52	.65	.79	.96	1.16	1.42	1.85	2.26
Feb	1.05	1.08	2.01	1948	28	3.48	1971	.07	1987	5.3	3.1	.5	.1	.14	.22	.37	.52	.67	.84	1.04	1.28	1.61	2.15	2.67
Mar	2.39	2.00	2.31	1990	13	7.15	1990	.00	1994	7.3	4.9	1.6	.6	.22	.49	.88	1.23	1.59	1.98	2.42	2.96	3.67	4.83	5.94
Apr	3.31	3.01	2.80	1928	21	6.89	1995	.87	1985	9.9	6.4	2.2	.8	.91	1.22	1.70	2.11	2.52	2.95	3.42	3.98	4.71	5.86	6.92
May	4.25	3.81	3.76	1960	6	9.22	1974	.89	1981	11.4	8.3	2.9	.8	1.15	1.55	2.17	2.70	3.23	3.78	4.40	5.12	6.07	7.56	8.94
Jun	5.57	5.40	4.90	1924	8	14.61	1998	1.13	1988	10.2	7.9	3.3	1.8	1.52	2.05	2.86	3.56	4.25	4.97	5.77	6.72	7.95	9.88	11.69
Jul	4.58	4.10	6.58	1962	14	13.64	1993	.99	1998	9.3	7.2	3.1	1.4	1.00	1.42	2.10	2.70	3.31	3.96	4.69	5.56	6.71	8.54	10.27
Aug	4.74	3.77	5.54	1977	16	14.92	1987	.46	1984	8.6	6.5	2.9	1.5	.70	1.09	1.78	2.43	3.12	3.87	4.73	5.79	7.22	9.54	11.77
Sep	3.53	3.32	5.07	1926	19	8.94	1986	.61	1979	8.5	5.9	2.5	1.1	.87	1.20	1.71	2.17	2.62	3.10	3.63	4.27	5.10	6.41	7.65
Oct	2.63	2.50	4.10	1911	1	6.75	1998	.21	1975	7.0	5.1	1.7	.7	.34	.55	.92	1.29	1.67	2.10	2.60	3.21	4.04	5.40	6.71
Nov	2.16	1.89	2.49	1931	23	5.73	1992	.02	1976	7.2	4.7	1.3	.5	.27	.44	.75	1.05	1.37	1.72	2.13	2.64	3.33	4.46	5.55
Dec	1.24	1.17	1.58	1982	28	3.41	1982	.13	1998	5.8	3.6	.7	.1	.24	.35	.53	.70	.87	1.06	1.26	1.52	1.85	2.38	2.89
Ann	36.40	35.08	6.58	Jul 1962	14	14.92	Aug 1987	.00	Mar 1994	96.1	66.6	23.0	9.4	22.58	25.12	28.44	31.02	33.34	35.62	37.99	40.65	43.91	48.70	52.91

+ 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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Station: MARSHALLTOWN, IA

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Climate Division: IA 5

NWS Call Sign:

Elevation: 870 Feet

Lat: 42°04N

Lon: 92°56W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	7.0	6.5	3	2	14.3	1971	4	23.5	1982	18+	1979	31	12	1982	4.0	2.8	.9	.3	@	16.9	11.4	6.5	2.0
Feb	6.4	6.0	3	3	9.0	1972	10	21.1	1972	22+	1979	20	19	1979	3.2	2.4	.8	.2	.0	14.7	9.9	7.0	2.7
Mar	4.5	4.0	1	1	8.5	1983	27	17.5	1984	12	1984	21	3+	1979	1.9	1.6	.6	.2	.0	6.1	3.3	1.9	.1
Apr	1.2	.0	#	0	10.0	1973	9	13.4	1973	13	1973	10	1+	1982	.5	.4	.2	.1	@	.7	.5	.3	.1
May	.0	.0	#	0	.5	1994	1	.5	1994	0	0	0	#	2000	.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	#	1989	11	#	1989	.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	.2	.0	#	0	3.5	1997	27	3.5	1997	1+	1997	28	#	1997	.1	.1	@	.0	.0	.1	.0	.0	.0
Nov	2.3	1.5	#	0	6.0	1992	26	7.9	1971	6	1991	27	1+	1991	1.1	.8	.3	@	.0	1.7	.6	.1	.0
Dec	6.5	5.3	2	1	10.0	1990	3	19.5	1977	14	2000	29	10	1985	3.4	2.4	.9	.3	.1	12.2	7.3	4.4	1.6
Ann	28.1	23.3	N/A	N/A	14.3	Jan 1971	4	23.5	Jan 1982	22+	Feb 1979	20	19	Feb 1979	14.2	10.5	3.7	1.1	.1	52.4	33.0	20.2	6.5

+ 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

Complete documentation available from:

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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	5/19	5/15	5/12	5/09	5/07	5/05	5/02	4/29	4/25
32	5/09	5/05	5/01	4/29	4/26	4/23	4/21	4/17	4/13
28	4/26	4/21	4/18	4/15	4/12	4/10	4/07	4/03	3/30
24	4/18	4/14	4/11	4/09	4/06	4/04	4/01	3/29	3/25
20	4/11	4/05	4/01	3/29	3/25	3/22	3/18	3/14	3/09
16	4/06	3/31	3/27	3/23	3/19	3/16	3/12	3/07	3/01
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	9/11	9/15	9/18	9/21	9/23	9/25	9/28	10/01	10/05
32	9/18	9/23	9/27	9/30	10/02	10/05	10/08	10/12	10/17
28	9/27	10/02	10/06	10/09	10/11	10/14	10/17	10/21	10/26
24	10/11	10/15	10/19	10/22	10/25	10/28	10/31	11/03	11/08
20	10/22	10/27	10/31	11/03	11/06	11/09	11/12	11/15	11/20
16	10/28	11/03	11/07	11/11	11/14	11/17	11/21	11/25	12/01
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	156	150	145	142	138	135	131	127	121
32	179	172	167	163	159	155	150	145	138
28	202	195	190	185	181	177	173	168	161
24	217	212	208	204	201	198	194	190	184
20	247	240	234	229	225	220	216	210	202
16	266	257	250	244	239	234	228	222	212

* 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	1495	1185	928	516	209	26	6	27	129	458	886	1326	7191
60	1340	1045	773	373	118	5	0	6	53	316	736	1171	5936
57	1247	961	680	295	78	2	0	1	27	241	646	1078	5256
55	1185	905	622	246	57	1	0	0	15	196	588	1016	4831
50	1030	777	479	143	21	0	0	0	2	106	448	864	3870
32	521	355	114	3	0	0	0	0	0	2	93	382	1470

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	49	94	208	479	871	1138	1298	1213	914	569	197	79	7109
55	0	0	3	32	215	449	585	500	239	51	2	0	2076
57	0	0	0	21	174	390	523	440	190	33	1	0	1772
60	0	0	0	9	121	304	430	351	127	16	0	0	1358
65	0	0	0	2	57	174	281	217	53	3	0	0	787
70	0	0	0	0	20	77	150	115	15	0	0	0	377

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	0	10	82	294	636	900	1050	967	685	351	77	6	0	10	92	386	1022	1922	2972	3939	4624	4975	5052	5058
45	0	1	43	183	482	750	895	812	536	227	32	3	0	1	44	227	709	1459	2354	3166	3702	3929	3961	3964
50	0	0	20	100	337	600	740	657	394	131	14	0	0	0	20	120	457	1057	1797	2454	2848	2979	2993	2993
55	0	0	6	51	208	451	585	502	263	67	2	0	0	0	6	57	265	716	1301	1803	2066	2133	2135	2135
60	0	0	1	20	112	309	431	347	158	27	0	0	0	0	1	21	133	442	873	1220	1378	1405	1405	1405
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	10	59	183	384	595	709	642	440	230	53	3	0	10	69	252	636	1231	1940	2582	3022	3252	3305	3308

(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:

www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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