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

COOP ID: 132203

Lon: 93°40W

Station: DES MOINES AP, IA

Climate Division: IA 5 NWS Call Sign: DSM

Temperature (°F) Degree Days (1) Mean (1) Mean Number of Days (3) **Extremes** Base Temp 65 Max Max Max Max Min Min Highest Lowest Daily Daily Highest Lowest Month(1) Month(1) Cooling >= >= >= <= <= <= Month Mean Year Day Year Year Day Year Heating Max Min Daily(2) Daily(2) Mean Mean 100 90 50 32 32 0 29.1 11.7 20.4 65 1989 31 32.5 1989 -24 1970 21 7.3 1979 1385 0 .0 .0 1.7 16.8 30.0 7.3 Jan 35.4 17.8 73 1972 29 36.5 2000 -26 1996 3 13.1 1978 1090 0 .0 .0 4.6 12.1 24.6 3.3 Feb 26.6 Mar 48.2 28.7 38.4 91 1986 29 45.1 2000 -22 1962 29.1 1975 826 .0 @ 13.9 3.9 19.4 .3 93 22 1977 9 3 1983 Apr 61.3 39.9 50.6 1980 57.8 1975 45.0 439 12 .0. .1 24.8 .3 6.2 0. May 72.3 51.4 61.9 98 1967 25 68.8 1977 30+ 1954 4 55.9 1997 153 60 .0 .3 30.9 .0 .1 .0 1971 41 3 4.5 Jun 81.8 61.0 71.4 103 1988 21 76.2 1998 66.7 1982 16 219 .2 30.0 .0 .0 .0 Jul 86.0 76.1 105 1955 31 80.6 1977 47 1971 30 71.2 1992 353 .8 9.6 31.0 .0 .0 66.1 .0 1992 .5 83.9 63.9 73.9 108 1983 16 82.9 1983 40 1950 20 68.3 6 285 6.9 31.0 .0 .0 .0 Aug 28 .2 Sep 75.9 54.3 65.1 99+ 1953 28 70.4 1998 1984 29 59.2 1993 103 110 .0 2.1 29.9 .0 .0 42.2 47.3 1972 Oct 63.5 52.8 95 1963 5 59.8 1971 14 1972 19 386 12 .0 .1 28.0 .0 4.7 .0 46.7 29.0 37.9 81 1999 13 47.4 1999 -4 1991 8 30.0 1985 804 0 .0 .0 12.7 3.7 19.0 .2 Nov Dec 33.1 16.7 24.9 69 1984 28 31.3 1982 -22 1989 23 9.5 1983 1227 0 .0 .0 3.3 13.4 28.7 4.0 Aug Aug Feb Jan 59.8 40.2 50.0 108 1983 16 82.9 1983 -26 1996 3 7.3 1979 6436 1052 1.5 23.6 241.8 50.2 132.9 15.1 Ann

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Issue Date: February 2004 037-A

Elevation: 957 Feet Lat: 41°32N

⁺ Also occurred on an earlier date(s)

[@] Denotes mean number of days greater than 0 but less than .05

⁽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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COOP ID: 132203

Station: DES MOINES AP, IA

Climate Division: IA 5 NWS Call Sign: DSM Elevation: 957 Feet Lat: 41°32N Lon: 93°40W

										Pı	recipi	tation	(incl	nes)										
	Me	ans/	P	recip	itatio	on Total	s			M	ean N	Numb Oays (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										
		ans(1)				Extreme	5			Daily Precipitation				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	1.03	.98	2.13	1960	12	2.99	1996	.04	1997	7.6	2.9	.3	.1	.11	.18	.33	.47	.62	.80	1.00	1.26	1.61	2.18	2.75
Feb	1.19	1.01	1.64	1973	1	2.43	1976	.17	1991	7.7	3.4	.6	.1	.32	.43	.60	.76	.90	1.06	1.23	1.43	1.70	2.11	2.50
Mar	2.21	2.06	2.11	1990	7	5.82	1990	.17	1994	9.5	4.5	1.4	.5	.28	.45	.77	1.07	1.40	1.76	2.18	2.70	3.40	4.55	5.67
Apr	3.58	3.33	3.80	1974	28	7.76	1976	.23	1985	11.0	6.7	2.3	.6	.80	1.13	1.65	2.13	2.60	3.10	3.66	4.34	5.23	6.64	7.98
May	4.25	3.81	3.23	1996	9	12.13	1996	1.45	1992	12.0	8.3	3.0	.9	1.33	1.73	2.33	2.85	3.34	3.86	4.43	5.09	5.95	7.28	8.52
Jun	4.57	4.02	4.23	1990	16	9.95	1998	1.02	1992	11.0	7.1	3.0	1.4	1.33	1.76	2.42	2.98	3.54	4.11	4.75	5.49	6.46	7.98	9.39
Jul	4.18	3.96	3.18	1981	3	9.75	1993	.04	1975	9.9	6.4	2.8	1.2	.66	1.02	1.63	2.21	2.80	3.45	4.20	5.11	6.33	8.31	10.20
Aug	4.51	3.08	6.18	1975	27	13.68	1977	.25	1984	9.4	6.4	2.7	1.5	.67	1.05	1.70	2.33	2.98	3.69	4.51	5.51	6.86	9.05	11.16
Sep	3.15	2.79	4.42	1961	12	7.07	1973	.69	1998	8.5	5.6	1.8	.7	.72	1.01	1.47	1.89	2.30	2.74	3.23	3.82	4.59	5.82	6.97
Oct	2.62	2.32	2.30	1970	8	6.28	1984	.36	1999	8.1	4.8	2.0	.8	.46	.70	1.08	1.44	1.80	2.20	2.65	3.20	3.92	5.10	6.22
Nov	2.10	1.67	2.47	1948	19	6.52	1983	.10	1976	8.6	4.4	1.4	.3	.32	.50	.81	1.09	1.40	1.72	2.10	2.56	3.18	4.19	5.15
Dec	1.33	1.13	1.48	1982	27	3.43	1982	.03	1998	8.5	3.4	.7	.1	.16	.26	.45	.63	.83	1.05	1.31	1.63	2.06	2.78	3.47
Ann	34.72	32.68	6.18	Aug 1975	27	13.68	Aug 1977	.03	Dec 1998	111.8	63.9	22.0	8.2	23.38	25.53	28.31	30.44	32.34	34.18	36.10	38.23	40.82	44.61	47.90

⁺ Also occurred on an earlier date(s)

Complete documentation available from:

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

[#] 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

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⁽²⁾ Derived from station's available digital record: 1948-2001

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Climatography of the United States No. 20 1971-2000

Elevation: 957 Feet

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Lon: 93°40W

Station: DES MOINES AP, IA

Climate Division: IA 5 NWS Call Sign: DSM

COOP ID: 132203

Lat: 41°32N

										Snov	w (incl	hes)													
						Sn	ow To	tals							Mean Number of Days (1)										
	Mean	s/Medi	ans (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	8.8	8.3	3	2	13.7	1996	26	22.3	1996	19+	1996	28	9	1982	6.7	2.5	.9	.3	.1	18.8	11.7	6.8	1.4		
Feb	8.2	6.9	2	3	9.8	1976	21	18.6	1978	17+	1979	9	11	1979	5.8	2.5	.8	.4	.0	14.1	9.0	5.8	1.7		
Mar	4.1	3.0	#	1	7.3	1983	26	13.7	1984	11+	1999	9	4	1978	3.6	1.2	.4	@	.0	4.9	2.6	1.2	.1		
Apr	2.7	.4	#	0	10.3	1973	9	15.6	1982	12	1973	10	1+	1982	1.4	.6	.3	.2	@	1.0	.5	.3	@		
May	#	.0	#	0	#	1976	2	#	1976	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	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	#	1985	30	#	1985	#	1985	24	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0		
Oct	.4	.0	0	0	7.4	1980	27	7.4	1980	3	1972	20	0	0	.2	.1	@	@	.0	@	@	.0	.0		
Nov	4.5	2.7	#	0	9.3	1992	25	14.7	1991	9	1991	24	2	1991	3.1	1.3	.5	.2	.0	2.6	1.2	.5	.0		
Dec	7.3	6.6	2	1	7.7	1977	31	22.0	1977	16	2000	19	9	1985	5.9	2.3	.5	.3	.0	12.7	7.6	4.4	1.1		
Ann	36.0	27.9	N/A	N/A	13.7	Jan 1996	26	22.3	Jan 1996	19+	Jan 1996	28	11	Feb 1979	26.7	10.5	3.4	1.4	.1	54.1	32.6	19.0	4.3		

⁺ Also occurred on an earlier date(s) #Denotes trace amounts

- (1) Derived from Snow Climatology and 1971-2000 daily data
- (2) Derived from 1971-2000 daily data

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

[@] 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

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Lon: 93°40W

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1971-2000 **Elevation: 957 Feet**

Station: DES MOINES AP, IA

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				Freez	e Data										
			Spri	ng Freeze Da	ates (Month/	Day)									
Temp (F)		P	robability of	later date in	n spring (thr	u Jul 31) tha	n indicated(*)							
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	5/13	5/09	5/05	5/03	4/30	4/27	4/25	4/21	4/17						
32	5/02	4/28	4/25	4/22	4/20	4/18	4/15	4/12	4/08						
28	4/18	4/14	4/12	4/09	4/07	4/05	4/02	3/30	3/27						
24	4/13	4/09	4/06	4/03	4/01	3/29	3/27	3/24	3/19						
20	4/10	4/04	3/30	3/26	3/23	3/19	3/15	3/10	3/04						
16	3/29	3/23	3/19	3/15	3/11	3/08	3/04	2/28	2/22						
			Fal	l Freeze Dat	es (Month/D	ay)									
T (E)	Probability of earlier date in fall (beginning Aug 1) than indicated(*)														
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	9/20	9/25	9/29	10/02	10/05	10/08	10/11	10/14	10/19						
32	9/26	10/02	10/06	10/09	10/12	10/15	10/18	10/22	10/27						
28	10/09	10/15	10/19	10/22	10/25	10/29	11/01	11/05	11/11						
24	10/19	10/25	10/29	11/01	11/04	11/08	11/11	11/15	11/21						
20	10/29	11/03	11/07	11/10	11/13	11/16	11/19	11/22	11/28						
16	11/03	11/10	11/14	11/18	11/22	11/26	11/30	12/04	12/11						
-		•		Freeze F	ree Period	•	•	•	•						
Torrer (F)			Probability	of longer tha	an indicated	freeze free p	eriod (Days)								
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90						
36	176	169	165	161	157	153	149	145	138						
32	190	185	181	177	174	171	168	164	158						
28	219	213	208	204	201	197	193	189	183						
24	237	230	225	221	217	213	209	204	197						
20	261	252	245	240	234	229	224	217	208						
16	282	273	266	260	255	249	244	237	227						

^{*} 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.

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Climate Division: IA 5 NWS Call Sign: DSM Elevation: 957 Feet Lat: 41°32N Lon: 93°40W

	Degree Days to Selected Base Temperatures (°F)														
Base						Heatin	g Degree l	Days (1)							
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann		
65	1385	1090	826	439	153	16	1	6	103	386	804	1227	6436		
60	1228	935	669	303	89	3	0	3	31	250	665	1087	5263		
57	1135	855	582	231	55	1	0	0	14	183	578	994	4628		
55	1073	803	524	189	38	0	0	0	7	144	522	932	4232		
50	921	672	385	103	13	0	0	0	1	71	388	785	3339		
32	433	280	72	1	0	0	0	0	0	1	74	321	1182		

Base						Coolin	g Degree l	Days (1)					
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	30	83	268	568	933	1190	1372	1303	999	655	239	54	7694
55	0	0	12	68	246	500	659	590	325	89	7	0	2496
57	0	0	8	50	198	441	597	529	274	65	4	0	2166
60	0	0	4	30	136	353	504	436	205	38	2	0	1708
65	0	0	1	12	60	219	353	285	110	12	0	0	1052
70	0	0	0	3	19	106	206	155	48	3	0	0	540

										Gro	wing]	Degre	e Uni	ts (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	3	28	122	355	695	957	1131	1064	769	425	106	6	3	31	153	508	1203	2160	3291	4355	5124	5549	5655	5661
45	0	9	69	234	540	807	976	909	619	288	54	5	0	9	78	312	852	1659	2635	3544	4163	4451	4505	4510
50	0	1	35	139	388	657	821	754	472	176	22	0	0	1	36	175	563	1220	2041	2795	3267	3443	3465	3465
55	0	0	10	73	252	507	666	599	333	96	5	0	0	0	10	83	335	842	1508	2107	2440	2536	2541	2541
60	0	0	3	32	141	360	511	444	212	39	0	0	0	0	3	35	176	536	1047	1491	1703	1742	1742	1742
Base				Gro	wing De	gree Unit	s for Co	rn (Mont	hly)						Gr	owing D	egree Un	its for C	orn (Acc	umulate	d Month	ly)		
50/86	2	22	81	208	418	641	781	725	487	246	61	6	2	24	105	313	731	1372	2153	2878	3365	3611	3672	3678

(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

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

- c. Snow Tables
 - 1. Snow Climatology
 - 2. Cooperative Summary of the Day
- d. Freeze Data Table

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

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