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: INDIANOLA, IA **COOP ID: 134063**

Climate Division: IA 8 **NWS Call Sign:** **Elevation: 940 Feet** **Lat: 41˚22N** **Lon: 93˚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	29.7	9.5	19.6	69	1989	31	32.4	1989	-32	1912	12	5.6	1979	1408	0	.0	.0	2.2	15.3	29.7	7.8
Feb	35.7	15.2	25.5	79	1930	24	36.3	1998	-35+	1996	3	11.2	1978	1107	0	.0	.0	5.8	11.1	25.6	4.1
Mar	47.8	26.6	37.2	89	1895	29	43.5	2000	-20	1962	1	27.9	1975	862	0	.0	.0	15.3	3.4	20.3	.6
Apr	60.4	37.1	48.8	92	1930	10	56.0	1981	-2	1982	6	42.0	1983	491	3	.0	.2	25.7	.2	7.9	@
May	71.0	48.8	59.9	106	1934	30	65.6	1977	21	1909	1	54.1	1997	204	45	.0	.1	30.9	.0	.5	.0
Jun	80.2	58.1	69.2	105	1934	26	73.8	1971	36	1945	4	62.5	1982	31	156	.2	3.9	30.0	.0	.0	.0
Jul	84.8	63.0	73.9	112	1934	19	78.2	1974	40	1971	31	69.9	1971	4	279	.5	9.8	31.0	.0	.0	.0
Aug	83.1	60.8	72.0	113	1934	8	79.0	1983	34	1915	4	67.1	1992	20	236	.6	7.4	31.0	.0	.0	.0
Sep	75.6	51.1	63.4	104	1947	8	68.9	1998	23+	1899	29	58.2	1993	117	68	.0	2.5	30.0	.0	.7	.0
Oct	64.3	39.4	51.9	95+	1939	7	58.0	1971	4	1925	30	45.9	1976	410	3	.0	.2	28.9	.0	7.2	.0
Nov	47.1	26.5	36.8	82+	1938	1	46.1	1999	-11	1896	28	29.6	1991	847	0	.0	.0	14.0	2.8	20.6	.2
Dec	33.8	15.1	24.5	70	1939	6	30.9	1982	-26+	1924	28	9.6	1983	1258	0	.0	.0	3.8	11.9	28.8	4.5
Ann	59.5	37.6	48.6	113	Aug 1934	8	79.0	Aug 1983	-35+	Feb 1996	3	5.6	Jan 1979	6759	790	1.3	24.1	248.6	44.7	141.3	17.2

\+ 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: 1893-2001

(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	1.00	.87	2.39	1960	12	2.95	1973	.00	1981
Feb	1.12	1.13	1.89	1911	17	2.74	1973	.12	1991
Mar	2.11	1.96	2.06	1945	15	5.12	1973	.00	1994
Apr	3.67	3.41	2.83	1904	23	8.71	1991	.15	1985
May	4.59	4.47	3.40	1912	11	11.12	1996	1.04	1992
Jun	4.60	4.24	5.66	1947	5	11.38	1980	.60	1992
Jul	4.22	3.70	4.16	1982	6	10.48	1993	.05	1975
Aug	3.63	2.70	8.90	1977	26	14.85	1977	.05	1984
Sep	3.61	2.94	11.21	1931	19	8.38	1978	.48	1979
Oct	2.76	2.71	3.95	1973	11	6.80	1977	.02	1992
Nov	2.14	2.25	4.21	1952	17	4.30	1992	.05	1989
Dec	1.24	1.29	2.65	1895	17	3.22	1982	.01	1976
Ann	34.69	34.99	11.21	Sep 1931	19	14.85	Aug 1977	.00+	Mar 1994

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.1	2.8	.5	.1
Feb	5.6	3.4	.7	.1
Mar	7.2	4.5	1.3	.6
Apr	9.9	6.9	2.5	.9
May	11.6	8.2	3.1	1.0
Jun	10.1	7.1	3.2	1.4
Jul	8.6	6.9	3.1	1.2
Aug	8.1	5.8	2.2	.8
Sep	7.7	5.6	2.4	1.3
Oct	7.3	5.0	1.8	.8
Nov	7.6	5.0	1.6	.4
Dec	5.9	3.4	.6	.2
Ann	94.7	64.6	23.0	8.8

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	.13	.26	.42	.56	.71	.86	1.02	1.23	1.49	1.91	2.31
Feb	.26	.37	.53	.68	.83	.98	1.16	1.36	1.63	2.07	2.47
Mar	.18	.41	.75	1.06	1.38	1.72	2.12	2.60	3.25	4.30	5.31
Apr	.88	1.22	1.75	2.23	2.71	3.21	3.77	4.44	5.32	6.72	8.03
May	1.46	1.90	2.54	3.09	3.62	4.17	4.78	5.48	6.39	7.81	9.12
Jun	1.32	1.75	2.41	2.98	3.54	4.13	4.77	5.53	6.52	8.06	9.50
Jul	.63	.99	1.60	2.18	2.79	3.45	4.22	5.15	6.41	8.46	10.42
Aug	.50	.80	1.32	1.83	2.35	2.94	3.61	4.44	5.55	7.38	9.14
Sep	.81	1.14	1.67	2.15	2.62	3.13	3.70	4.38	5.28	6.70	8.05
Oct	.25	.44	.81	1.19	1.61	2.09	2.66	3.37	4.34	5.98	7.58
Nov	.38	.57	.89	1.18	1.48	1.80	2.16	2.61	3.20	4.15	5.06
Dec	.13	.23	.40	.57	.76	.97	1.21	1.52	1.93	2.62	3.29
Ann	23.21	25.38	28.19	30.34	32.26	34.13	36.08	38.23	40.86	44.71	48.05

\+ 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

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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	6.6	4.6	3	2	12.0	1971	3	22.0	1996	19	1996	31	12	1979	3.4	2.5	.8	.3	.1	13.1	8.1	3.5	.5
Feb	5.5	5.2	3	2	11.0	1978	13	13.0	1975	23	1979	12	15	1979	3.0	2.4	.7	.2	@	10.3	5.9	2.8	.5
Mar	2.0	1.0	1	#	8.0	1999	9	12.0	1999	14	1998	13	4	1998	1.3	.9	.3	.1	.0	2.3	.7	.6	.2
Apr	1.0	.0	#	0	12.0	1973	9	14.0	1973	14	1973	9	1	1997	.4	.3	.1	.1	@	.4	.2	.2	@
May	.0	.0	#	0	.7	1994	1	.7	1994	1	1994	1	#	1994	@	.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	.4	.0	#	0	5.0	1980	27	5.5	1997	5+	1997	27	#+	1997	.2	.1	.1	@	.0	.3	.2	.1	.0
Nov	2.5	1.0	#	#	7.7	1991	23	15.9	1991	11	1991	25	2	1991	1.1	.9	.4	.1	.0	1.9	1.0	.4	.1
Dec	4.9	3.2	1	#	10.0	1985	1	16.8	1985	20	2000	31	11	2000	3.0	2.2	.4	.1	@	8.4	3.9	2.0	.8
Ann	22.9	15.0	N/A	N/A	12.0+	Apr 1973	9	22.0	Jan 1996	23	Feb 1979	12	15	Feb 1979	12.4	9.3	2.8	.9	.1	36.7	20.0	9.6	2.1

+ 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	5/18	5/13	5/10	5/06	5/03	4/29	4/25	4/19
32	5/09	5/05	5/02	4/29	4/27	4/24	4/22	4/19	4/15
28	4/28	4/23	4/19	4/16	4/13	4/10	4/07	4/03	3/29
24	4/15	4/11	4/08	4/06	4/04	4/02	3/30	3/27	3/23
20	4/10	4/06	4/02	3/30	3/28	3/25	3/22	3/18	3/14
16	3/31	3/25	3/21	3/18	3/15	3/12	3/08	3/05	2/27

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	9/13	9/17	9/20	9/22	9/25	9/27	9/30	10/03	10/07
32	9/19	9/24	9/28	10/01	10/04	10/07	10/11	10/14	10/20
28	9/26	10/03	10/07	10/11	10/15	10/18	10/22	10/27	11/02
24	10/12	10/17	10/21	10/25	10/28	10/31	11/04	11/08	11/13
20	10/25	10/30	11/02	11/05	11/08	11/11	11/14	11/17	11/22
16	10/29	11/04	11/09	11/13	11/17	11/21	11/25	11/29	12/06

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	163	155	150	145	141	136	132	126	118
32	181	174	168	164	160	155	151	146	138
28	207	199	193	188	184	179	174	168	160
24	224	218	214	210	206	203	199	195	189
20	244	237	233	229	225	221	217	212	206
16	268	260	255	250	246	242	237	232	225

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1408	1107	862	491	204	31	4	20	117	410	847	1258	6759
60	1253	967	707	352	111	7	0	4	48	270	697	1103	5519
57	1160	883	617	276	70	2	0	1	23	198	608	1010	4848
55	1098	834	561	230	50	1	0	0	13	156	550	948	4441
50	949	703	420	135	17	0	0	0	2	76	413	797	3512
32	460	303	86	3	0	0	0	0	0	1	80	325	1258

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	75	120	247	505	864	1114	1298	1239	941	617	223	91	7334
55	0	7	9	43	201	425	585	526	263	59	4	0	2122
57	0	0	3	28	160	367	523	465	214	39	1	0	1800
60	0	0	0	14	107	281	430	375	148	18	0	0	1373
65	0	0	0	3	45	156	279	236	68	3	0	0	790
70	0	0	0	0	14	66	144	126	22	0	0	0	372

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	4	28	130	359	675	929	1092	1030	752	417	106	10	4	32	162	521	1196	2125	3217	4247	4999	5416	5522	5532
45	0	7	74	240	520	779	937	875	602	280	49	5	0	7	81	321	841	1620	2557	3432	4034	4314	4363	4368
50	0	1	33	144	371	629	782	720	454	171	20	1	0	1	34	178	549	1178	1960	2680	3134	3305	3325	3326
55	0	0	10	78	238	479	627	565	321	92	5	0	0	0	10	88	326	805	1432	1997	2318	2410	2415	2415
60	0	0	4	32	128	334	472	410	203	38	0	0	0	0	4	36	164	498	970	1380	1583	1621	1621	1621
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	23	92	228	416	618	740	694	482	267	70	8	1	24	116	344	760	1378	2118	2812	3294	3561	3631	3639

(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