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: GOTHENBURG, NE 1971-2000 COOP ID: 253365

Climate Division: NE 5 NWS Call Sign: Elevation: 2,585 Feet Lat: 40°56N Lon: 100°09W

									r												
	Mea	n (1)						Extr	emes					Degree Base To	Days (1) emp 65		Mean	Numb	er of I	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	36.7	12.6	24.7	78	1913	16	34.6	1986	-29	1930	17	10.2	1979	1252	0	.0	.0	5.2	10.9	30.7	6.1
Feb	43.0	17.6	30.3	79	1930	19	38.8	1999	-33	1899	11	18.1	1978	971	0	.0	.0	10.0	7.3	26.7	3.1
Mar	52.4	25.9	39.2	92	1943	30	45.7	1986	-21	1943	6	30.2	1998	801	0	.0	.0	18.0	2.5	23.8	.5
Apr	63.4	35.7	49.6	101	1910	28	58.8	1981	-3	1936	2	42.7	1983	467	4	.0	.3	25.4	.3	11.3	.0
May	72.7	47.5	60.1	103	1934	29	65.1	1977	18	1909	1	53.2	1995	192	40	@	.8	30.7	.0	1.2	.0
Jun	83.5	57.0	70.3	110	1946	15	76.5	1988	33	1935	7	64.5	1982	32	190	.7	7.5	30.0	.0	.0	.0
Jul	88.5	62.3	75.4	116	1954	11	80.1	1980	40	1900	16	69.2	1992	2	325	2.1	14.4	31.0	.0	.0	.0
Aug	86.5	60.4	73.5	109+	1936	11	79.4	1983	36	1928	24	67.7	1992	13	275	1.1	11.3	31.0	.0	.0	.0
Sep	77.9	49.8	63.9	107	1931	5	69.7	1998	20	1984	30	59.2	1993	113	79	.1	4.1	29.7	.0	1.1	.0
Oct	65.7	37.1	51.4	104	1947	5	56.3	1974	2	1925	28	47.8	1987	422	1	.0	.2	28.2	.2	9.0	.0
Nov	48.5	23.8	36.2	85+	1915	5	43.0	1999	-14	1976	28	25.5	1985	866	0	.0	.0	14.5	3.6	25.5	.6
Dec	39.2	15.2	27.2	76	1939	6	35.7	1979	-30+	1989	22	8.5	1983	1172	0	.0	.0	7.2	8.8	30.5	3.4
Ann	63.2	37.1	50.2	116	Jul 1954	11	80.1	Jul 1980	-33	Feb 1899	11	8.5	Dec 1983	6303	914	4.0	38.6	260.9	33.6	159.8	13.7

⁺ Also occurred on an earlier date(s)

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

Issue Date: February 2004 046-A

[@] 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: 1894-2001

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

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Climate Division: NE 5 NWS Call Sign: Elevation: 2,585 Feet Lat: 40°56N Lon: 100°09W

										Pı	recipi	tation	(incl	nes)										
	Me	ans/	P	recip	itatio	on Total					ean N of D	ays (3)	Proba	ability th		nonthly/	annual j indic	precipita ated am	babilit ation wi nount vs Proba	ll be equ		less tha	in the
	Medi	ans(1)				Extremes	,				any 116	стриацю	ш		Th	ese value	s were det	termined :	from the	incomplet	te gamma	distribut	ion	
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	.45	.42	1.18	1944	27	1.22	1992	.00	1986	4.3	1.3	.2	.0	.04	.09	.16	.23	.30	.37	.45	.55	.68	.90	1.11
Feb	.51	.24	1.07	1987	27	1.75	1987	.00	1996	4.4	1.5	.2	@	.00	.02	.07	.13	.21	.31	.43	.60	.83	1.25	1.68
Mar	1.41	1.22	1.92	1949	30	3.61	1977	.01	1994	6.5	3.3	.7	.3	.11	.20	.39	.58	.80	1.04	1.34	1.71	2.23	3.09	3.95
Apr	2.26	2.00	3.65	1896	17	7.29	1984	.01	1989	7.9	4.3	1.7	.5	.23	.39	.70	1.02	1.36	1.74	2.20	2.76	3.53	4.82	6.07
May	3.71	3.36	4.22	1977	21	8.40	1977	.57	1994	10.9	7.0	2.4	.9	1.20	1.55	2.07	2.51	2.94	3.38	3.87	4.43	5.16	6.30	7.35
Jun	3.67	3.29	6.25	1988	29	7.95	1975	.85	1978	9.3	5.9	2.4	1.0	.96	1.31	1.84	2.31	2.77	3.26	3.80	4.43	5.27	6.58	7.81
Jul	3.23	2.84	2.78	1948	29	7.51	1994	.57	1999	8.8	6.1	2.0	.8	.77	1.08	1.55	1.97	2.39	2.83	3.32	3.91	4.68	5.91	7.06
Aug	2.71	2.58	4.11	1900	6	7.13	1999	.30	2000	7.7	4.5	1.7	.9	.49	.72	1.12	1.49	1.87	2.28	2.74	3.30	4.05	5.26	6.42
Sep	1.55	1.08	2.95	1942	2	4.87	1973	.18	1974	6.0	3.4	.9	.2	.15	.27	.48	.69	.93	1.19	1.50	1.89	2.42	3.30	4.16
Oct	1.41	1.00	2.90	1908	19	4.53	2000	.02	1975	5.4	2.8	1.0	.4	.10	.19	.37	.56	.78	1.03	1.33	1.71	2.23	3.12	4.00
Nov	.89	.87	1.47	1899	19	2.39	1998	.00	1989	4.6	2.2	.6	.2	.02	.07	.19	.31	.46	.62	.83	1.08	1.45	2.07	2.68
Dec	.45	.35	1.40	1913	5	1.50	1973	.00	1998	3.5	1.2	.2	.0	.00	.02	.07	.13	.20	.28	.39	.54	.74	1.10	1.47
Ann	22.25	22.04	6.25	Jun 1988	29	8.40	May 1977	.00+	Dec 1998	79.3	43.5	14.0	5.2	16.21	17.39	18.89	20.03	21.04	22.01	23.01	24.12	25.46	27.39	29.06

⁺ 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

⁽¹⁾ From the 1971-2000 Monthly Normals

⁽²⁾ Derived from station's available digital record: 1894-2001

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Station: GOTHENBURG, NE

Climate Division: NE 5 NWS Call Sign: Elevation: 2,585 Feet Lat: 40°56N Lon: 100°09W

		Snow Fall Snow Pepth Mean Mean Mean Median Mean M																						
		Snow Fall Median Snow Depth Median Med															Mea	n Nu	mber	of Day	ys (1)			
	Mean	s/Medi	ians (1))					Extre	mes (2)							ow Fa			Snow Depth >= Thresholds				
Month	Snow Fall Mean	Fall	Depth	Depth	Daily Snow	Year	Day	Monthly Snow	Year	Daily Snow	Year	Day	Monthly Mean Snow	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10	
Jan	6.1	6.5	2	#	6.5	1976	1	11.0	1976	12+	1979	31	7+	1979	2.9	1.7	.5	.1	.0	11.1	6.6	3.8	1.0	
Feb	3.5	2.0	1	#	7.5	1980	7	18.5	1978	14	1978	17	9	1979	1.8	1.0	.3	.1	.0	4.7	2.9	2.2	.8	
Mar	5.8	3.2	1	0	10.0	1980	28	19.8+	1980	13	1980	29	9	1980	2.2	1.5	.7	.3	.1	2.1	1.3	.9	.3	
Apr	1.4	.0	#	0	3.5	1974	3	5.8	1975	11	1980	2	2	1980	.6	.5	.3	.0	.0	.4	.3	.2	@	
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	.1	.0	#	0	1.5	1971	30	1.5	1971	1	1971	30	#+	1993	.2	.1	.0	.0	.0	@	.0	.0	.0	
Nov	3.1	.3	#	0	9.5	1972	13	14.0	1975	12	1975	30	4	1975	.9	.7	.3	.2	.0	2.5	1.8	1.1	.3	
Dec	5.6	3.2	1	0	8.8	1978	2	17.8	1973	11	1978	2	7	1978	1.9	1.0	.5	.3	.0	6.7	4.9	3.2	.6	
Ann	25.6	15.2	N/A	N/A	10.0	Mar 1980	28	19.8+	Mar 1980	14	Feb 1978	17	9+	Mar 1980	10.5	6.5	2.6	1.0	.1	27.5	17.8	11.4	3.0	

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

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[@] 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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Lat: 40°56N Elevation: 2,585 Feet Lon: 100°09W Franza Data

				Freez	ze Data				
			Spri	ng Freeze D	ates (Month	/Day)			
Temp (F)		F	Probability of	f later date i	n spring (thr	ru Jul 31) tha	n indicated	(*)	
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	5/26	5/21	5/18	5/15	5/13	5/10	5/08	5/05	4/30
32	5/16	5/12	5/09	5/06	5/04	5/02	4/29	4/26	4/22
28	5/08	5/03	4/30	4/27	4/24	4/22	4/19	4/16	4/11
24	4/24	4/20	4/17	4/14	4/12	4/09	4/07	4/04	3/30
20	4/15	4/10	4/07	4/04	4/01	3/29	3/26	3/23	3/18
16	4/10	4/04	3/31	3/28	3/24	3/21	3/18	3/14	3/08
•		•	Fa	ll Freeze Da	tes (Month/I	Day)	•	•	•
Toman (E)		Pro	bability of e	arlier date i	n fall (beginr	ning Aug 1) t	han indicate	ed(*)	
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	9/12	9/16	9/19	9/21	9/23	9/26	9/28	10/01	10/05
32	9/15	9/20	9/23	9/26	9/29	10/01	10/04	10/08	10/13
28	9/27	10/02	10/06	10/09	10/12	10/15	10/18	10/21	10/26
24	10/04	10/10	10/13	10/17	10/20	10/23	10/26	10/30	11/04
20	10/14	10/19	10/23	10/26	10/29	11/01	11/04	11/08	11/13
16	10/22	10/28	11/01	11/04	11/07	11/11	11/14	11/18	11/24
•		•		Freeze I	ree Period		•	•	•
T (E)			Probability	of longer th	an indicated	freeze free p	eriod (Days))	
Temp (F)	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	147	142	139	136	133	130	127	123	118
32	163	158	154	150	147	144	140	136	131
28	190	183	178	174	170	165	161	156	149
24	208	202	197	194	190	186	182	178	172
20	230	223	218	214	211	207	203	198	191
16	251	243	237	232	227	223	218	212	204

^{*} 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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				Deg	ree Days t	o Selected	Base Tem	peratures	(°F)				
Base						Heatin	g Degree l	Days (1)					
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1252	971	801	467	192	32	2	13	113	422	866	1172	6303
60	1097	831	646	329	98	8	0	2	46	275	716	1017	5065
57	1004	751	554	255	59	3	0	0	22	197	626	924	4395
55	942	699	494	211	40	1	0	0	12	152	567	862	3980
50	791	569	352	119	12	0	0	0	2	67	428	717	3057
32	317	202	42	2	0	0	0	0	0	0	84	266	913

Base						Coolin	g Degree l	Days (1)					
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	88	155	264	528	871	1148	1345	1285	956	602	208	118	7568
55	0	8	3	48	198	458	632	572	278	41	1	0	2239
57	0	4	1	32	155	400	570	510	228	24	0	0	1924
60	0	0	0	16	101	315	477	419	162	9	0	0	1499
65	0	0	0	4	40	190	325	275	79	1	0	0	914
70	0	0	0	0	11	95	187	153	30	0	0	0	476

										Gro	wing	Degre	e Uni	ts (2)										
Base	Base Growing Degree Units (Monthly) Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec												Growing Degree Units (Accumulated Monthly)											
														Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	6	36	122	317	630	917	1107	1045	724	376	79	14	6	42	164	481	1111	2028	3135	4180	4904	5280	5359	5373
45	0 9 61 200 477 767 952 890 576 246 27											0	0	9	70	270	747	1514	2466	3356	3932	4178	4205	4205
50	0 0 23 111 329 618 797 735 433 139 6											0	0	0	23	134	463	1081	1878	2613	3046	3185	3191	3191
55	0	0	4	56	201	468	642	581	296	62	0	0	0	0	4	60	261	729	1371	1952	2248	2310	2310	2310
60	0	0	0	27	103	321	487	428	185	19	0	0	0	0	0	27	130	451	938	1366	1551	1570	1570	1570
Base	Growing Degree Units for Corn (Monthly)														Gr	owing D	egree Un	its for C	orn (Acc	umulate	d Month	ly)		
50/86	36 20 52 117 227 389 588 719 685 460 266 78											27	20	72	189	416	805	1393	2112	2797	3257	3523	3601	3628

(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