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: TRENTON DAM, NE **COOP ID: 258628**

Climate Division: NE 7 **NWS Call Sign:** **Elevation: 2,810 Feet** **Lat: 40˚10N** **Lon: 101˚04W**

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	38.9	12.7	25.8	75	1951	26	36.2	1986	-24	1984	18	13.5	1979	1215	0	.0	.0	7.8	9.7	31.0	5.1
Feb	45.3	17.5	31.4	80	1951	10	39.5	1999	-22	1951	1	18.7	1978	942	0	.0	.0	12.2	6.6	27.3	3.2
Mar	53.7	25.3	39.5	89+	1989	11	46.8	1986	-25	1960	3	33.4	1996	791	0	.0	.0	19.2	2.6	24.8	.7
Apr	64.2	34.9	49.6	101	1977	11	56.6	1981	9	1949	1	43.4	1983	466	4	@	.4	25.4	.3	11.9	.0
May	73.1	45.9	59.5	102	2000	30	64.6	1985	23	1989	1	52.7	1995	210	40	@	1.3	30.5	.0	1.4	.0
Jun	84.1	56.4	70.3	109	1954	25	75.9	1988	34	1950	4	65.0	1982	29	187	1.2	8.7	29.9	.0	.0	.0
Jul	90.2	62.2	76.2	110	1990	2	80.5	1980	42+	1987	13	71.6	1992	1	348	4.2	17.3	31.0	.0	.0	.0
Aug	88.8	60.0	74.4	111	1954	4	81.7	1983	42	1950	20	68.8	1992	10	302	2.6	15.8	31.0	.0	.0	.0
Sep	80.3	49.7	65.0	105+	2000	7	71.6	1998	25+	1985	30	59.2	1993	103	102	.7	7.7	29.5	.0	.7	.0
Oct	68.3	36.5	52.4	95+	1997	3	55.9	1979	10+	1997	27	47.4	1976	392	2	.0	.8	28.5	.2	8.7	.0
Nov	51.1	24.6	37.9	85	1980	7	45.7	1999	-16	1952	28	29.2	1985	816	0	.0	.0	16.9	2.9	25.4	.4
Dec	41.8	15.7	28.8	78	1964	24	35.5	1999	-31+	1989	23	11.8	1983	1123	0	.0	.0	9.4	7.6	30.6	2.8
Ann	65.0	36.8	50.9	111	Aug 1954	4	81.7	Aug 1983	-31+	Dec 1989	23	11.8	Dec 1983	6098	985	8.7	52.0	271.3	29.9	161.8	12.2

\+ 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: 1949-2001

(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	.52	.29	1.33	1990	20	1.67	1992	.00	1986
Feb	.52	.38	1.39	1971	19	1.86	1971	.00	1996
Mar	1.42	1.02	1.85	1984	19	4.24	1977	.13+	1997
Apr	2.04	1.66	2.20	1984	21	5.97	1984	.20	1989
May	3.44	2.95	2.20	1962	18	7.24	1982	.50	1994
Jun	3.17	2.93	3.85	1987	9	6.84	1975	.41	1990
Jul	3.32	2.60	6.16	1981	18	9.17	1979	.57	1977
Aug	2.52	1.92	2.48	1982	14	6.20	1993	.17	1971
Sep	1.52	1.03	2.52	1963	21	7.27	1973	.04	1984
Oct	1.28	1.01	2.55	2000	29	3.82	2000	.00	1999
Nov	1.04	.65	1.57	1972	13	2.91	1983	.00	1989
Dec	.47	.38	.93	1959	27	1.63	1982	.00+	2000
Ann	21.26	20.98	6.16	Jul 1981	18	9.17	Jul 1979	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	3.0	1.6	.3	.1
Feb	3.5	1.7	.2	.1
Mar	6.2	3.6	.9	.2
Apr	7.5	4.3	1.3	.5
May	11.1	7.0	2.1	.7
Jun	8.6	5.5	2.0	.6
Jul	8.8	6.0	2.2	.7
Aug	7.7	4.8	1.7	.6
Sep	5.8	3.0	1.0	.3
Oct	5.2	2.6	.7	.2
Nov	4.3	2.3	.6	.2
Dec	2.9	1.2	.3	.0
Ann	74.6	43.6	13.3	4.2

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	.02	.05	.12	.20	.28	.37	.49	.63	.83	1.16	1.49
Feb	.01	.04	.10	.18	.26	.36	.48	.63	.85	1.21	1.58
Mar	.16	.27	.47	.67	.88	1.11	1.39	1.73	2.20	2.97	3.72
Apr	.48	.67	.96	1.23	1.50	1.78	2.09	2.47	2.96	3.75	4.48
May	.91	1.23	1.73	2.17	2.60	3.05	3.56	4.15	4.93	6.15	7.30
Jun	.97	1.27	1.72	2.10	2.48	2.87	3.30	3.80	4.45	5.47	6.41
Jul	.80	1.11	1.60	2.03	2.46	2.91	3.41	4.02	4.81	6.06	7.24
Aug	.31	.51	.86	1.22	1.59	2.00	2.48	3.08	3.89	5.22	6.51
Sep	.08	.17	.35	.56	.79	1.06	1.40	1.83	2.43	3.46	4.48
Oct	.03	.10	.26	.44	.64	.88	1.17	1.55	2.07	2.96	3.85
Nov	.06	.15	.31	.46	.63	.81	1.02	1.28	1.63	2.21	2.78
Dec	.00	.00	.09	.18	.27	.36	.47	.60	.78	1.07	1.35
Ann	14.24	15.57	17.28	18.59	19.76	20.90	22.09	23.40	25.00	27.34	29.38

\+ 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: 1949-2001
(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	5.7	4.0	2	1
Feb	3.9	3.7	1	#
Mar	5.5	4.9	#	#
Apr	2.6	.5	#	#
May	.0	.0	#	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.2	.0	#	0
Oct	.8	.0	#	0
Nov	4.6	3.2	1	#
Dec	5.3	2.6	2	1
Ann	28.6	18.9	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	13.2	1990	20	15.9	1994	16	1993	10	8	1974
Feb	8.5	1984	19	10.7	1978	9	1980	8	4	1993
Mar	14.9	1984	19	16.0	1984	20	1980	30	3	1980
Apr	11.7	1979	12	11.7	1979	12	1980	1	3	1980
May	.0	0	0	.0	0	#	1995	13	#	1995
Jun	.0	0	0	.0	0	#	1972	26	#	1972
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	5.5	1985	29	5.5	1985	6	1985	29	#	1985
Oct	7.4	1995	23	7.4	1995	7	1995	23	#+	1997
Nov	9.6	2000	12	18.0	1975	15	1983	29	4	1975
Dec	10.0	1973	25	20.0	1973	15	1973	26	9	1983
Ann	14.9	Mar 1984	19	20.0	Dec 1973	20	Mar 1980	30	9	Dec 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	2.5	2.0	.6	.3	@
Feb	2.2	1.5	.4	.1	.0
Mar	2.6	2.1	.6	.1	@
Apr	1.1	.9	.2	.1	@
May	.0	.0	.0	.0	.0
Jun	.0	.0	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	@	@	@	@	.0
Oct	.3	.3	.1	.1	.0
Nov	1.8	1.4	.5	.2	.0
Dec	2.1	1.6	.5	.3	.1
Ann	12.6	9.8	2.9	1.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	11.5	7.5	5.0	1.6
Feb	5.6	3.1	1.6	.0
Mar	3.5	1.4	.6	.1
Apr	1.1	.4	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.1	@	@	.0
Oct	.2	.1	.1	.0
Nov	3.2	1.6	1.0	.3
Dec	7.0	4.3	2.7	.9
Ann	32.2	18.4	11.1	2.9

+ 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	5/21	5/17	5/15	5/12	5/10	5/08	5/06	5/03	4/29
32	5/16	5/11	5/08	5/05	5/03	4/30	4/27	4/24	4/19
28	4/30	4/27	4/24	4/22	4/20	4/18	4/16	4/13	4/09
24	4/23	4/17	4/14	4/10	4/08	4/05	4/01	3/29	3/23
20	4/12	4/06	4/02	3/30	3/27	3/24	3/20	3/16	3/11
16	4/08	4/01	3/27	3/22	3/18	3/14	3/10	3/05	2/26

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	9/23	9/26	9/28	10/01	10/04	10/08
32	9/22	9/27	10/01	10/04	10/07	10/10	10/13	10/16	10/21
28	10/02	10/07	10/11	10/14	10/16	10/19	10/22	10/26	10/31
24	10/11	10/16	10/20	10/23	10/26	10/29	11/01	11/05	11/10
20	10/20	10/25	10/29	11/02	11/05	11/08	11/12	11/16	11/22
16	10/31	11/05	11/09	11/13	11/16	11/20	11/23	11/27	12/03

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	154	148	144	141	138	134	131	127	121
32	173	167	163	159	156	153	149	145	139
28	194	189	185	182	179	176	173	169	163
24	220	213	209	205	201	197	193	189	182
20	246	238	232	227	223	218	213	207	199
16	267	258	252	247	242	237	232	226	218

***** 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	1215	942	791	466	210	29	1	10	103	392	816	1123	6098
60	1060	802	636	327	114	7	0	2	42	247	666	968	4871
57	967	722	543	252	72	2	0	0	21	170	576	875	4200
55	905	670	483	206	51	1	0	0	12	126	518	813	3785
50	753	540	339	113	17	0	0	0	2	50	381	667	2862
32	276	180	34	0	0	0	0	0	0	0	63	225	778

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	84	163	266	528	853	1148	1370	1314	989	632	237	125	7709
55	0	8	2	44	191	459	657	601	311	46	3	0	2322
57	0	5	0	29	150	400	595	539	260	28	0	0	2006
60	0	0	0	14	99	315	502	448	191	11	0	0	1580
65	0	0	0	4	40	187	348	302	102	2	0	0	985
70	0	0	0	0	12	90	205	175	45	0	0	0	527

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	7	49	132	324	624	921	1134	1084	758	413	98	20	7	56	188	512	1136	2057	3191	4275	5033	5446	5544	5564
45	0	12	67	213	471	771	979	929	612	282	46	2	0	12	79	292	763	1534	2513	3442	4054	4336	4382	4384
50	0	2	25	122	324	621	824	774	466	169	13	0	0	2	27	149	473	1094	1918	2692	3158	3327	3340	3340
55	0	0	4	58	203	474	669	619	331	80	1	0	0	0	4	62	265	739	1408	2027	2358	2438	2439	2439
60	0	0	0	23	104	328	514	466	215	28	0	0	0	0	0	23	127	455	969	1435	1650	1678	1678	1678
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	26	72	133	236	387	585	733	692	479	304	102	39	26	98	231	467	854	1439	2172	2864	3343	3647	3749	3788

(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