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: GRACE, ID **COOP ID: 103732**

Climate Division: ID10 **NWS Call Sign:** **Elevation: 5,550 Feet** **Lat: 42˚35N** **Lon: 111˚45W**

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	31.1	11.3	21.2	55	1990	10	27.9	1998	-34	1984	18	9.2	1979	1358	0	.0	.0	.2	16.8	30.3	7.2
Feb	36.5	13.7	25.1	61+	1963	25	36.1	1995	-40	1933	9	16.3	1985	1118	0	.0	.0	1.6	8.6	27.3	5.5
Mar	45.5	22.0	33.8	72	1986	28	41.6	1986	-18	1966	4	23.7	1976	970	0	.0	.0	9.5	1.6	28.1	1.1
Apr	56.5	28.9	42.7	80+	2000	27	48.2	1987	-1+	1936	2	35.0	1975	669	0	.0	.0	21.6	.1	21.3	.0
May	66.1	36.2	51.2	88	1973	16	56.7	1992	11	1972	1	46.7	1975	430	0	.0	.0	29.0	.0	8.8	.0
Jun	76.2	42.4	59.3	99	1988	25	65.5	1988	25	1951	2	54.1	1993	193	22	.0	.6	29.9	.0	1.4	.0
Jul	85.0	47.5	66.3	102+	2001	4	70.5	1998	28+	1993	13	57.8	1993	64	102	.1	5.5	31.0	.0	.2	.0
Aug	84.9	46.2	65.6	101	2001	6	69.0	1971	26+	1992	27	59.8	1993	73	89	@	5.8	31.0	.0	.5	.0
Sep	74.9	38.0	56.5	97	2000	15	62.1	1990	15+	1985	30	51.3	1986	268	11	.0	.3	29.7	.0	6.7	.0
Oct	61.6	29.5	45.6	86+	1992	3	51.9	1988	6	1935	30	40.3	1984	603	0	.0	.0	26.1	.2	20.5	.0
Nov	43.1	20.9	32.0	70	1999	6	40.0	1999	-25	1955	16	25.0	2000	990	0	.0	.0	7.8	4.7	26.9	1.3
Dec	33.0	12.4	22.7	60+	1995	2	31.2	1995	-40	1990	22	12.8	1990	1310	0	.0	.0	1.0	13.8	30.0	5.5
Ann	57.9	29.1	43.5	102+	Jul 2001	4	70.5	Jul 1998	-40+	Dec 1990	22	9.2	Jan 1979	8046	224	.1	12.2	218.4	45.8	202.0	20.6

\+ 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: 1931-2001

(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	1.27	.96	.94	1982	24	3.48	1980	.23	1977
Feb	1.12	1.02	1.35	1963	1	4.41	1986	.20	1991
Mar	1.43	1.46	.82	1946	13	3.00	1982	.44	1994
Apr	1.38	1.28	.90+	1986	2	3.68	1986	.15	1977
May	2.18	1.68	1.44	1996	18	5.66	1980	.35	1973
Jun	1.31	1.24	1.37	1997	11	2.70	1997	.00	1978
Jul	1.10	.99	1.02	1998	29	2.81	1984	.11+	1978
Aug	1.22	1.10	1.26	1931	30	3.36	1977	.07	1996
Sep	1.32	.93	1.64	1947	17	4.19	1973	.00	1974
Oct	1.36	1.32	1.30	1946	27	3.04	1981	.00+	1988
Nov	1.14	1.03	1.15	1942	17	3.41	1983	.00	1976
Dec	1.14	.89	1.14	1955	24	3.58	1983	.06	1989
Ann	15.97	15.61	1.64	Sep 1947	17	5.66	May 1980	.00+	Oct 1988

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.7	4.4	.3	.0
Feb	8.9	4.0	.2	.0
Mar	10.2	5.2	.3	.0
Apr	8.9	4.3	.5	.0
May	11.1	5.9	1.0	.1
Jun	6.9	3.5	.8	.1
Jul	5.9	3.4	.5	.1
Aug	6.4	3.6	.7	.0
Sep	6.3	3.8	.6	.2
Oct	7.1	4.2	.7	.1
Nov	9.6	4.3	.2	.0
Dec	9.0	4.2	.1	.0
Ann	100.0	50.8	5.9	.6

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	.25	.37	.55	.72	.90	1.08	1.29	1.54	1.87	2.41	2.91
Feb	.21	.31	.48	.63	.78	.95	1.14	1.37	1.67	2.16	2.62
Mar	.51	.65	.84	1.00	1.16	1.32	1.49	1.69	1.95	2.35	2.72
Apr	.28	.41	.61	.79	.98	1.18	1.41	1.68	2.04	2.61	3.16
May	.40	.60	.92	1.21	1.52	1.84	2.21	2.66	3.26	4.22	5.14
Jun	.20	.37	.60	.78	.96	1.15	1.36	1.61	1.94	2.45	2.94
Jul	.11	.19	.34	.50	.66	.85	1.06	1.34	1.71	2.33	2.93
Aug	.17	.27	.44	.61	.79	.99	1.22	1.49	1.87	2.49	3.08
Sep	.04	.14	.32	.51	.72	.96	1.25	1.61	2.11	2.95	3.78
Oct	.00	.36	.64	.85	1.04	1.23	1.45	1.69	2.01	2.51	2.98
Nov	.16	.31	.51	.67	.83	1.00	1.18	1.41	1.70	2.17	2.61
Dec	.09	.17	.32	.48	.65	.85	1.09	1.39	1.80	2.49	3.17
Ann	9.58	10.73	12.26	13.44	14.52	15.57	16.68	17.91	19.44	21.69	23.67

\+ 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: 1931-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	2.2	-99.9	6	1
Feb	3.0	3.5	3	#
Mar	2.3	2.0	1	0
Apr	1.8	.0	#	0
May	.0	.0	0	0
Jun	.0	.0	#	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.8	.0	#	0
Nov	2.9	.0	#	0
Dec	10.8	14.5	3	0
Ann	23.8	-9.9	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	5.0	1971	12	11.0	1975	25	1971	12	16	1974
Feb	2.0	1973	7	7.5	1973	15+	1974	1	12	1973
Mar	4.0	1973	11	7.6	1973	8	1974	6	5	1974
Apr	7.5	1971	26	7.5	1971	5	1975	25	1	1976
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	#	1982	15	#	1982
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	.0	0	0	.0	0	0	0	0	0	0
Oct	4.0	1971	18	9.5	1971	4	1971	18	1	1971
Nov	6.0	1971	14	16.0	1971	10	1973	29	3	1973
Dec	12.0	1972	4	26.1	1996	25	1971	21	17	1971
Ann	12.0	Dec 1972	4	26.1	Dec 1996	25+	Dec 1971	21	17	Dec 1971

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9	-9.9
Mar	1.3	.8	.1	.0	.0
Apr	.6	.6	.3	.1	.0
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	.0	.0	.0	.0
Oct	.5	.3	.1	.0	.0
Nov	1.1	.8	.4	.1	.0
Dec	5.6	4.4	.6	.2	.1
Ann	-9.9	-9.9	-9.9	-9.9	-9.9

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	-9.9	-9.9	-9.9	-9.9
Mar	6.5	4.1	1.8	.0
Apr	.7	.1	.1	.0
May	.0	.0	.0	.0
Jun	.0	.0	.0	.0
Jul	.0	.0	.0	.0
Aug	.0	.0	.0	.0
Sep	.0	.0	.0	.0
Oct	.4	@	.0	.0
Nov	2.3	1.6	.7	.1
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	7/14	7/08	7/04	7/01	6/28	6/25	6/21	6/17	6/12
32	6/30	6/23	6/19	6/15	6/11	6/07	6/03	5/29	5/23
28	6/11	6/03	5/28	5/23	5/19	5/14	5/09	5/04	4/26
24	5/17	5/12	5/08	5/05	5/02	4/29	4/26	4/22	4/17
20	4/28	4/23	4/19	4/16	4/13	4/10	4/07	4/04	3/30
16	4/17	4/11	4/06	4/02	3/29	3/26	3/22	3/17	3/11

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	8/11	8/17	8/21	8/25	8/28	8/31	9/04	9/08	9/14
32	8/24	8/29	9/02	9/06	9/09	9/12	9/16	9/20	9/26
28	9/06	9/10	9/14	9/17	9/20	9/22	9/25	9/29	10/04
24	9/18	9/23	9/26	9/29	10/02	10/05	10/08	10/12	10/17
20	9/27	10/03	10/07	10/11	10/15	10/18	10/22	10/26	11/01
16	10/08	10/15	10/19	10/24	10/28	10/31	11/05	11/09	11/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	84	76	70	65	61	56	51	45	37
32	113	105	99	94	90	85	80	74	66
28	153	142	135	129	123	117	111	104	94
24	175	167	162	157	153	148	143	138	130
20	203	196	191	187	183	180	175	171	164
16	242	231	224	217	211	205	199	191	181

***** 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	1358	1118	970	669	430	193	64	73	268	603	990	1310	8046
60	1203	978	815	519	281	93	17	21	149	448	840	1155	6519
57	1110	894	722	433	201	52	6	8	94	357	750	1062	5689
55	1048	838	661	377	154	32	2	3	65	298	690	1000	5168
50	893	698	515	247	66	6	0	0	19	167	542	845	3998
32	372	243	119	16	0	0	0	0	0	2	127	332	1211

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	37	49	171	337	593	819	1061	1039	733	423	127	45	5434
55	0	0	1	9	34	161	350	329	108	5	0	0	997
57	0	0	0	4	19	121	293	272	77	2	0	0	788
60	0	0	0	0	6	72	210	192	43	0	0	0	523
65	0	0	0	0	0	22	102	89	11	0	0	0	224
70	0	0	0	0	0	4	34	27	2	0	0	0	67

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	0	25	141	356	579	806	783	496	214	24	0	0	0	25	166	522	1101	1907	2690	3186	3400	3424	3424
45	0	0	1	63	220	429	651	628	354	107	3	0	0	0	1	64	284	713	1364	1992	2346	2453	2456	2456
50	0	0	0	18	109	287	496	475	221	39	0	0	0	0	0	18	127	414	910	1385	1606	1645	1645	1645
55	0	0	0	3	42	158	342	322	106	8	0	0	0	0	0	3	45	203	545	867	973	981	981	981
60	0	0	0	0	6	66	196	180	37	0	0	0	0	0	0	0	6	72	268	448	485	485	485	485
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	32	124	258	393	530	524	376	202	26	0	0	1	33	157	415	808	1338	1862	2238	2440	2466	2466

(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.
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