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: MANILA, UT **COOP ID: 425377**

Climate Division: UT 5 **NWS Call Sign:** **Elevation: 6,440 Feet** **Lat: 40˚59N** **Lon: 109˚44W**

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	36.2	13.0	24.6	62	1982	26	32.6	1999	-33	1963	12	11.4	1979	1252	0	.0	.0	2.1	10.9	30.5	4.6
Feb	40.1	15.6	27.9	67	1986	25	36.2	2000	-31	1989	7	15.1	1973	1041	0	.0	.0	4.0	6.4	28.1	3.2
Mar	48.5	23.2	35.9	72	1986	30	42.3	1986	-15	1965	19	28.5	1973	904	0	.0	.0	8.8	1.2	28.2	.2
Apr	57.5	30.4	44.0	82+	1962	19	50.5	1992	9+	1966	19	37.1	1983	632	0	.0	.0	22.7	.3	21.4	.0
May	67.4	38.1	52.8	87+	1984	20	57.2	1992	20+	1965	6	48.1	1983	384	4	.0	.0	30.0	.0	6.0	.0
Jun	78.1	46.4	62.3	96	1981	26	68.8	1988	27	1962	7	55.7	1998	146	63	.0	1.6	30.0	.0	.3	.0
Jul	84.8	53.2	69.0	99+	1973	5	72.6	1988	38	1959	1	63.5	1993	22	146	.0	4.2	31.0	.0	.0	.0
Aug	82.9	51.8	67.4	96	1979	4	71.8	1971	32+	1962	31	64.1	1993	36	109	.0	2.3	31.0	.0	.1	.0
Sep	74.0	42.5	58.3	92	1955	5	63.3	1990	18	1965	17	52.7	1971	219	16	.0	.1	29.6	.0	3.2	.0
Oct	62.2	33.2	47.7	85	1975	5	54.5	1988	2+	1971	29	41.1	1984	537	0	.0	.0	27.3	.1	14.2	.0
Nov	45.2	22.2	33.7	70	1958	9	41.9	1999	-18	1955	16	27.1	2000	939	0	.0	.0	10.0	2.5	27.5	.4
Dec	36.8	14.6	25.7	65	1969	21	34.7	1980	-22	1978	31	15.8	1971	1219	0	.0	.0	2.6	9.7	30.6	2.7
Ann	59.5	32.0	45.8	99+	Jul 1973	5	72.6	Jul 1988	-33	Jan 1963	12	11.4	Jan 1979	7331	338	.0	8.2	229.1	31.1	190.1	11.1

\+ 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: 1952-2001

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

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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	.39	.36	.45+	1955	4	1.73	1997	.05+	1989
Feb	.34	.29	.80+	1953	9	1.07	1989	.00	1973
Mar	.65	.62	.72	1959	24	1.47	1978	.02	1971
Apr	1.13	1.10	1.77	1971	19	2.43	1973	.21	1987
May	1.54	1.27	1.42	1983	11	3.63	1975	.00	1974
Jun	1.00	.89	1.44	1969	16	3.13+	1998	.00	1988
Jul	.98	.94	1.09	1977	23	2.85	1973	.10	1979
Aug	.96	.97	.80	1977	26	2.54	1984	.02	1985
Sep	.91	.71	1.30	1959	23	3.31	1982	.00+	1979
Oct	.95	.88	2.84	1961	8	2.60	1986	.01	1988
Nov	.52	.44	.76	1983	21	2.27	1983	.00	1976
Dec	.32	.29	.73	1956	6	1.11	1983	.02	1976
Ann	9.69	9.73	2.84	Oct 1961	8	3.63	May 1975	.00+	Jun 1988

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.8	1.6	@	.0
Feb	1.9	.8	@	.0
Mar	7.1	2.6	@	.0
Apr	8.2	3.0	.4	.1
May	10.0	4.3	.5	.1
Jun	6.4	2.3	.2	.0
Jul	7.3	3.5	.3	@
Aug	8.6	3.2	.2	.0
Sep	6.9	2.3	.4	.1
Oct	5.4	3.4	.5	.1
Nov	5.7	2.1	.1	.0
Dec	5.0	.8	@	.0
Ann	77.3	29.9	2.6	.4

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	.04	.07	.13	.18	.24	.30	.38	.48	.61	.82	1.03
Feb	.04	.08	.14	.19	.23	.29	.34	.41	.51	.65	.79
Mar	.16	.22	.32	.40	.48	.57	.67	.79	.94	1.18	1.41
Apr	.31	.42	.58	.72	.86	1.01	1.17	1.36	1.61	2.00	2.37
May	.19	.38	.64	.86	1.08	1.31	1.58	1.90	2.32	2.99	3.62
Jun	.07	.17	.33	.48	.63	.80	1.00	1.24	1.56	2.09	2.59
Jul	.12	.19	.33	.47	.61	.78	.97	1.20	1.52	2.05	2.56
Aug	.11	.19	.32	.46	.60	.76	.94	1.17	1.48	1.99	2.48
Sep	.00	.17	.35	.50	.64	.79	.95	1.14	1.39	1.80	2.19
Oct	.07	.13	.25	.38	.52	.69	.90	1.15	1.51	2.11	2.71
Nov	.04	.09	.17	.25	.33	.42	.52	.64	.80	1.07	1.33
Dec	.05	.08	.13	.17	.21	.26	.32	.39	.48	.62	.76
Ann	5.69	6.41	7.36	8.10	8.77	9.43	10.12	10.90	11.85	13.27	14.52

+ 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: 1952-2001
(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	6.1	4.0	2	#
Feb	6.1	5.8	1	#
Mar	8.6	9.1	#	0
Apr	8.1	6.5	#	#
May	4.8	.0	#	0
Jun	.1	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.4	.0	0	0
Oct	1.8	.0	#	0
Nov	4.2	3.0	1	#
Dec	6.1	3.9	2	1
Ann	46.3	32.3	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	8.0	1971	2	14.5	1979	9	1984	22	7	1984
Feb	10.0	1989	4	14.0	1976	6+	1989	2	3	1989
Mar	7.0	1985	3	18.5	1987	3	1977	25	#+	1987
Apr	14.0	1973	18	21.0	1986	6	1988	1	#+	1989
May	22.0	1975	20	46.0	1975	7	1988	1	#	1988
Jun	1.5	1981	14	1.5	1981	0	0	0	0	0
Jul	.0	0	0	.0	0	0	0	0	0	0
Aug	.0	0	0	.0	0	0	0	0	0	0
Sep	8.0	1984	24	8.0	1984	0	0	0	0	0
Oct	8.0	1975	24	8.5	1975	2+	1980	15	#+	1986
Nov	10.5	1983	21	12.5	1978	22	1983	28	5	1983
Dec	6.0	1983	15	25.0	1983	21	1983	2	17	1983
Ann	22.0	May 1975	20	46.0	May 1975	22	Nov 1983	28	17	Dec 1983

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.8	2.7	.6	.2	.0
Feb	2.9	2.1	.7	.2	.0
Mar	4.1	3.1	1.5	.6	.0
Apr	2.6	1.6	1.0	.6	.2
May	.6	.6	.3	.2	.2
Jun	.1	.1	.0	.0	.0
Jul	.0	.0	.0	.0	.0
Aug	.0	.0	.0	.0	.0
Sep	.1	.1	.1	.1	.0
Oct	.7	.6	.3	.1	.0
Nov	2.1	1.8	.6	.3	.1
Dec	3.3	2.4	.5	.1	.0
Ann	20.3	15.1	5.6	2.4	.5

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	-9.9	-9.9	-9.9	-9.9
Apr	.6	.2	.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	.2	.0	.0	.0
Nov	2.5	1.9	1.7	.6
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

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

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

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	6/23	6/18	6/14	6/11	6/08	6/05	6/01	5/28	5/23
32	6/12	6/05	6/01	5/28	5/24	5/21	5/17	5/12	5/06
28	5/21	5/16	5/13	5/10	5/07	5/05	5/02	4/29	4/24
24	5/10	5/05	5/01	4/28	4/25	4/22	4/19	4/15	4/10
20	5/03	4/27	4/22	4/19	4/15	4/11	4/08	4/03	3/28
16	4/20	4/12	4/05	3/31	3/26	3/21	3/16	3/10	3/01

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

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	118	110	105	100	96	92	87	82	74
32	145	136	129	124	118	113	107	101	92
28	177	168	162	157	152	147	141	135	126
24	202	193	187	181	176	171	165	159	150
20	230	220	212	206	200	194	188	181	170
16	267	254	245	238	231	223	216	207	194

***** 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	1252	1041	904	632	384	146	22	36	219	537	939	1219	7331
60	1097	901	749	485	246	70	3	6	112	385	789	1064	5907
57	1004	817	656	401	175	39	1	2	66	298	699	971	5129
55	942	761	594	346	134	25	0	1	43	246	639	909	4640
50	787	625	442	224	59	6	0	0	11	134	494	754	3536
32	301	212	61	12	0	0	0	0	0	2	105	264	957

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	72	95	180	370	643	907	1147	1096	787	488	157	69	6011
55	0	0	0	14	64	242	434	383	140	18	0	0	1295
57	0	0	0	9	42	196	373	322	103	9	0	0	1054
60	0	0	0	3	20	137	282	234	59	3	0	0	738
65	0	0	0	0	4	63	146	109	16	0	0	0	338
70	0	0	0	0	0	21	53	31	2	0	0	0	107

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	1	4	30	150	389	672	895	846	555	261	26	1	1	5	35	185	574	1246	2141	2987	3542	3803	3829	3830
45	0	0	2	69	243	523	740	691	412	140	7	0	0	0	2	71	314	837	1577	2268	2680	2820	2827	2827
50	0	0	0	22	121	379	585	536	274	56	0	0	0	0	0	22	143	522	1107	1643	1917	1973	1973	1973
55	0	0	0	3	43	239	430	381	150	10	0	0	0	0	0	3	46	285	715	1096	1246	1256	1256	1256
60	0	0	0	0	7	123	276	231	61	0	0	0	0	0	0	0	7	130	406	637	698	698	698	698
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	1	7	28	132	266	437	579	546	373	206	24	2	1	8	36	168	434	871	1450	1996	2369	2575	2599	2601

(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