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: BROTHERS, OR **COOP ID: 351067**

Climate Division: OR 7 **NWS Call Sign:** **Elevation: 4,640 Feet** **Lat: 43˚49N** **Lon: 120˚36W**

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	36.6	16.2	26.4	61+	1994	18	32.4	1994	-30	1962	22	15.9	1979	1198	0	.0	.0	2.2	7.7	28.8	2.5
Feb	41.1	19.4	30.3	67	1995	23	37.4	1991	-19+	1985	4	18.7	1993	974	0	.0	.0	5.3	3.9	25.8	1.2
Mar	47.6	21.8	34.7	73	1966	29	39.8	1986	-10	1971	1	29.2	1971	939	0	.0	.0	13.3	.5	28.1	.1
Apr	55.1	24.7	39.9	85	1987	27	47.3	1987	1	1968	13	33.0	1975	752	0	.0	.0	21.2	.1	23.2	.0
May	62.6	30.6	46.6	92	1983	28	54.2	1992	8	1985	12	40.7	1977	570	0	.0	.2	28.3	.0	16.7	.0
Jun	71.5	37.5	54.5	96	1961	16	59.8	1992	12	1976	2	49.7	1976	322	8	.0	.6	29.9	.0	7.4	.0
Jul	80.3	41.8	61.1	100	1960	18	66.1	1998	18	1962	2	53.1	1993	171	48	.0	5.4	31.0	.0	2.9	.0
Aug	80.2	40.8	60.5	103	1961	4	64.8	1986	20+	1962	27	55.1	1980	170	32	@	5.3	31.0	.0	3.3	.0
Sep	72.0	33.4	52.7	97	1988	4	58.7	1990	10	1970	14	45.3	1985	381	12	.0	.8	29.5	.0	11.1	.0
Oct	61.3	26.9	44.1	87+	1980	4	52.7	1988	2	1971	29	38.5	1984	647	0	.0	.0	26.0	.1	21.7	.0
Nov	44.4	21.5	33.0	72	1980	4	40.6	1999	-16	1993	24	22.9	1985	963	0	.0	.0	9.3	2.4	25.3	.6
Dec	37.5	16.4	27.0	61	1959	7	34.2	1980	-30	1983	23	19.7	1990	1180	0	.0	.0	3.2	6.8	29.1	2.0
Ann	57.5	27.6	42.6	103	Aug 1961	4	66.1	Jul 1998	-30+	Dec 1983	23	15.9	Jan 1979	8267	100	@	12.3	230.2	21.5	223.4	6.4

\+ 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: 1959-2001

(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	.81	.61	1.32	1967	31	2.71	1995	.00	2000
Feb	.43	.37	.55	1970	28	1.01	1983	.09	1997
Mar	.70	.70	.50	1992	26	1.63	1993	.08	1999
Apr	.65	.50	.85	1978	26	2.41	1978	.00	1999
May	1.18	.98	1.70	1998	29	4.65	1998	.03	1999
Jun	.81	.78	1.13	1965	17	2.32	1982	.00	1999
Jul	.64	.41	1.96	1987	22	3.37	1987	.00+	1996
Aug	.65	.25	1.44	1959	20	4.67	1976	.00+	2000
Sep	.54	.48	1.19	1982	20	2.05	1982	.00+	1999
Oct	.67	.66	.95	1967	2	1.49	1992	.00+	1988
Nov	1.04	.89	3.09	1960	25	2.76	1973	.10	1993
Dec	.96	.84	1.70	1968	26	2.95	1995	.00+	2000
Ann	9.08	9.56	3.09	Nov 1960	25	4.67	Aug 1976	.00+	Dec 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	7.2	3.4	.2	@
Feb	6.4	1.4	.0	.0
Mar	7.8	2.7	@	.0
Apr	6.6	2.0	.1	.0
May	7.1	3.3	.4	.1
Jun	5.1	2.7	.2	.0
Jul	3.6	1.7	.3	@
Aug	3.7	1.6	.4	.1
Sep	3.9	1.7	.2	@
Oct	5.2	2.4	.1	.0
Nov	8.5	3.3	.5	.1
Dec	7.8	3.1	.3	@
Ann	72.9	29.3	2.7	.3

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	.05	.12	.25	.37	.49	.63	.80	1.00	1.27	1.73	2.17
Feb	.10	.14	.20	.26	.31	.37	.44	.52	.63	.79	.95
Mar	.11	.18	.28	.37	.47	.58	.70	.85	1.05	1.37	1.68
Apr	.03	.09	.18	.28	.38	.50	.63	.80	1.03	1.41	1.78
May	.14	.23	.39	.56	.73	.93	1.16	1.44	1.82	2.45	3.07
Jun	.07	.16	.29	.41	.53	.66	.82	1.00	1.25	1.66	2.05
Jul	.00	.00	.08	.19	.30	.44	.60	.80	1.09	1.55	2.02
Aug	.00	.00	.05	.13	.23	.37	.54	.77	1.10	1.69	2.29
Sep	.00	.00	.04	.14	.24	.36	.50	.68	.93	1.33	1.75
Oct	.00	.00	.25	.37	.47	.59	.71	.86	1.04	1.33	1.61
Nov	.11	.19	.33	.47	.63	.81	1.01	1.27	1.62	2.20	2.77
Dec	.00	.11	.28	.43	.59	.76	.96	1.19	1.52	2.05	2.57
Ann	4.72	5.46	6.47	7.27	8.01	8.75	9.52	10.40	11.50	13.14	14.61

\+ 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: 1959-2001
(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	5.4	5.0	1	1	6.0	1988	3	14.0	1988	8	1984	1	4	1984	2.7	1.9	.4	@	.0	12.7	5.5	1.1	.0
Feb	3.0	2.8	1	#	4.0	1979	4	8.5+	1979	9	1986	19	5	1993	1.6	1.2	.2	.0	.0	2.8	1.4	.4	.0
Mar	2.3	2.0	#	#	9.0	2000	1	9.0	2000	5	1975	25	1	1975	1.1	.9	.2	@	.0	.6	.1	.0	.0
Apr	1.2	.0	#	#	5.0	1971	21	5.8	1971	3	1989	25	#+	1999	.7	.5	.1	@	.0	.3	@	.0	.0
May	.7	.0	#	0	4.0	1980	10	4.0	1980	#+	1986	21	#+	1986	.4	.3	.1	.0	.0	.0	.0	.0	.0
Jun	#	.0	0	0	#	1988	7	#+	1988	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	1.0	1982	29	1.0	1982	0	0	0	0	0	@	@	.0	.0	.0	.0	.0	.0	.0
Oct	.3	.0	#	0	6.0	1971	15	6.0	1971	3	1980	26	#+	1997	.2	.2	.1	@	.0	.1	@	.0	.0
Nov	4.4	3.0	#	#	8.0	1973	5	17.0	1973	6	1985	30	3	1985	1.6	1.4	.3	.1	.0	2.1	1.0	.2	.0
Dec	6.3	5.5	1	#	5.0	1971	12	19.0	1981	10	1983	29	5	1983	2.6	2.3	.6	.2	.0	5.4	2.2	.6	.0
Ann	23.6	18.3	N/A	N/A	9.0	Mar 2000	1	19.0	Dec 1981	10	Dec 1983	29	5+	Feb 1993	10.9	8.7	2.0	.3	.0	24.0	10.2	2.3	.0

+ 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	8/02	7/29	7/26	7/24	7/22	7/20	7/17	7/15	7/11
32	7/29	7/23	7/19	7/16	7/12	7/09	7/05	7/01	6/26
28	7/24	7/17	7/12	7/07	7/03	6/29	6/25	6/20	6/12
24	7/08	6/29	6/22	6/17	6/12	6/06	6/01	5/25	5/16
20	6/12	6/03	5/28	5/23	5/18	5/14	5/08	5/02	4/24
16	5/23	5/14	5/08	5/02	4/27	4/22	4/16	4/10	4/01

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	7/29	8/02	8/06	8/09	8/11	8/14	8/17	8/20	8/25
32	7/31	8/05	8/09	8/13	8/17	8/20	8/24	8/29	9/04
28	8/05	8/14	8/19	8/24	8/29	9/03	9/08	9/13	9/22
24	8/25	9/01	9/07	9/11	9/15	9/20	9/24	9/29	10/07
20	9/08	9/15	9/20	9/25	9/29	10/03	10/08	10/13	10/20
16	9/21	9/28	10/04	10/08	10/13	10/17	10/22	10/27	11/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	39	32	27	23	20	16	12	7	1
32	62	52	46	40	35	29	24	17	8
28	89	78	70	63	56	50	43	34	23
24	128	117	109	102	95	89	82	74	63
20	165	154	146	139	133	126	120	112	100
16	206	193	183	176	168	161	153	143	130

***** 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	1198	974	939	752	570	322	171	170	381	647	963	1180	8267
60	1043	834	784	602	417	195	86	80	255	493	813	1025	6627
57	950	750	691	514	331	134	48	42	191	403	723	932	5709
55	888	694	629	456	275	100	30	26	155	344	663	870	5130
50	733	554	475	319	157	37	8	5	81	212	516	715	3812
32	239	147	54	26	2	0	0	0	0	5	113	218	804

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	64	97	138	264	456	675	900	885	621	380	141	62	4683
55	0	0	0	4	15	85	217	198	86	7	0	0	612
57	0	0	0	2	9	59	173	152	63	4	0	0	462
60	0	0	0	0	2	31	118	97	36	1	0	0	285
65	0	0	0	0	0	8	48	32	12	0	0	0	100
70	0	0	0	0	0	1	14	7	3	0	0	0	25

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	12	39	120	273	467	697	679	431	210	38	4	1	13	52	172	445	912	1609	2288	2719	2929	2967	2971
45	0	0	4	57	157	326	542	524	294	109	9	0	0	0	4	61	218	544	1086	1610	1904	2013	2022	2022
50	0	0	0	19	83	199	392	373	177	45	0	0	0	0	0	19	102	301	693	1066	1243	1288	1288	1288
55	0	0	0	0	36	106	252	237	89	12	0	0	0	0	0	0	36	142	394	631	720	732	732	732
60	0	0	0	0	8	43	135	121	30	0	0	0	0	0	0	0	8	51	186	307	337	337	337	337
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	17	50	127	230	346	487	479	349	209	35	1	0	17	67	194	424	770	1257	1736	2085	2294	2329	2330

(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