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: HALFWAY, OR **COOP ID: 353604**

Climate Division: OR 8 **NWS Call Sign:** **Elevation: 2,665 Feet** **Lat: 44˚53N** **Lon: 117˚07W**

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	32.8	14.7	23.8	57	1959	24	31.8	1981	-34	1949	25	8.9	1979	1279	0	.0	.0	.2	12.7	30.1	4.8
Feb	40.0	19.2	29.6	66	1995	24	39.1	1992	-33	1950	2	16.8	1989	992	0	.0	.0	2.9	4.8	26.0	2.2
Mar	51.7	26.6	39.2	78+	1986	29	46.2	1992	-8	1952	2	30.4	1985	801	0	.0	.0	17.6	.1	23.8	.1
Apr	62.4	31.4	46.9	90	1977	24	52.1	1987	9	1960	16	41.4	1975	543	0	.0	@	28.5	.0	17.0	.0
May	71.0	37.5	54.3	95+	1987	8	59.3	1992	18+	1999	10	51.0	1978	336	2	.0	.5	30.9	.0	7.7	.0
Jun	78.9	43.7	61.3	100+	1974	14	66.3	1977	26	1996	19	57.8	1993	147	35	@	3.7	30.0	.0	1.3	.0
Jul	87.7	48.1	67.9	104+	2000	31	73.2	1998	30	1955	2	58.2	1993	54	143	.8	14.4	31.0	.0	.1	.0
Aug	87.2	47.1	67.2	108	1961	4	72.5	1971	28+	1992	24	62.7	1980	54	121	.5	13.4	31.0	.0	.3	.0
Sep	77.9	39.3	58.6	104	1955	5	64.6	1990	18	1965	18	53.4	1985	219	26	.1	2.8	30.0	.0	5.6	.0
Oct	64.7	31.1	47.9	87+	2001	1	55.7	1988	7	1971	29	44.2	1984	530	0	.0	.0	29.4	.0	19.1	.0
Nov	45.6	25.4	35.5	71	1965	1	40.4	1999	-23	1985	23	24.9	1985	885	0	.0	.0	10.0	1.7	24.4	.4
Dec	34.1	16.4	25.3	61	1987	5	33.1	1977	-31	1964	17	11.5	1985	1233	0	.0	.0	.7	11.1	29.9	3.4
Ann	61.2	31.7	46.5	108	Aug 1961	4	73.2	Jul 1998	-34	Jan 1949	25	8.9	Jan 1979	7073	327	1.4	34.8	242.2	30.4	185.3	10.9

\+ 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: 1948-2001

(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	3.31	3.03	10.30	1951	10	5.57	1995	.29	1985
Feb	2.46	2.22	1.80	1949	6	6.86	1999	.66	1977
Mar	2.01	1.84	1.09	1983	29	6.14	1983	.11	1994
Apr	1.58	1.45	1.95	1956	17	5.08	1978	.17	1977
May	1.67	1.31	1.65	1998	21	7.18	1998	.13	1974
Jun	1.28	1.03	.86	1963	5	3.22	1993	.14	1986
Jul	.64	.52	1.00	1996	30	2.01	1997	.03	1979
Aug	.62	.31	1.47	1984	4	2.69	1984	.00	1994
Sep	.84	.52	1.57	1959	14	2.81	1986	.00+	1999
Oct	1.21	1.02	1.51	1982	29	3.09	1975	.00+	1988
Nov	3.03	2.81	2.32	1988	25	7.36	1988	.17	1976
Dec	3.60	3.86	2.25	1966	13	7.21	1973	.22	1976
Ann	22.25	21.67	10.30	Jan 1951	10	7.36	Nov 1988	.00+	Sep 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	12.1	8.5	1.8	.5
Feb	10.4	6.8	1.5	.2
Mar	10.4	6.7	.8	@
Apr	8.9	4.6	.7	.1
May	8.5	4.6	.9	.1
Jun	6.9	3.6	.8	.0
Jul	4.0	2.1	.3	@
Aug	3.8	1.8	.2	.1
Sep	4.5	2.5	.5	@
Oct	5.9	3.2	.5	.1
Nov	12.1	7.6	1.9	.2
Dec	11.6	8.1	2.2	.8
Ann	99.1	60.1	12.1	2.1

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	1.12	1.43	1.89	2.28	2.65	3.03	3.45	3.94	4.57	5.54	6.43
Feb	.59	.82	1.18	1.50	1.81	2.15	2.53	2.97	3.56	4.49	5.36
Mar	.45	.63	.93	1.19	1.46	1.74	2.06	2.44	2.94	3.73	4.49
Apr	.31	.45	.69	.90	1.11	1.34	1.61	1.92	2.34	3.01	3.64
May	.25	.39	.63	.86	1.11	1.37	1.67	2.04	2.54	3.35	4.13
Jun	.22	.33	.52	.69	.87	1.07	1.29	1.56	1.92	2.51	3.07
Jul	.05	.09	.18	.27	.36	.47	.61	.77	1.01	1.40	1.78
Aug	.00	.02	.07	.14	.23	.35	.51	.72	1.03	1.58	2.15
Sep	.00	.00	.05	.19	.34	.53	.75	1.04	1.44	2.12	2.82
Oct	.00	.00	.31	.53	.73	.96	1.22	1.53	1.94	2.62	3.28
Nov	.68	.96	1.41	1.81	2.21	2.63	3.11	3.68	4.43	5.63	6.75
Dec	.63	.94	1.47	1.96	2.46	3.01	3.63	4.39	5.40	7.02	8.58
Ann	15.56	16.84	18.49	19.75	20.87	21.95	23.07	24.31	25.81	28.00	29.89

\+ 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: 1948-2001
(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	23.9	17.5	15	13	26.0	1982	23	68.5	1993	52	1989	15	36	1989	7.2	6.6	3.3	1.8	.4	28.2	27.7	24.8	19.6
Feb	10.0	5.5	13	12	13.0	1989	17	45.8	1999	43	1989	18	31	1989	4.1	3.3	1.2	.7	.1	22.6	22.0	20.7	13.3
Mar	3.8	2.0	4	1	11.0	1997	1	12.0+	1985	33	1984	1	16	1985	1.7	1.3	.5	.1	@	7.9	7.5	6.0	3.2
Apr	.3	.0	#	0	3.0	1982	7	4.0	1982	1	1993	10	#+	1993	.3	.2	@	.0	.0	.0	.0	.0	.0
May	#	.0	0	0	#	1979	7	#	1979	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	.3	.0	#	0	3.0	1975	25	5.0	1975	2	1975	25	#+	1985	.1	.1	@	.0	.0	.1	.0	.0	.0
Nov	12.4	9.0	1	1	20.0	1988	25	41.0	1988	25	1988	28	7	1985	3.7	3.4	1.7	.8	.1	6.0	4.6	2.9	1.2
Dec	22.8	18.5	7	6	16.0	1973	27	54.0	1992	31	1971	14	19	1971	7.2	6.5	3.0	1.4	.3	22.0	19.4	16.3	10.8
Ann	73.5	52.5	N/A	N/A	26.0	Jan 1982	23	68.5	Jan 1993	52	Jan 1989	15	36	Jan 1989	24.3	21.4	9.7	4.8	.9	86.8	81.2	70.7	48.1

+ 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	7/13	7/08	7/04	7/01	6/28	6/25	6/22	6/19	6/14
32	6/29	6/22	6/17	6/13	6/09	6/05	6/01	5/27	5/20
28	6/03	5/28	5/23	5/20	5/16	5/13	5/09	5/04	4/28
24	5/19	5/13	5/08	5/04	5/01	4/27	4/23	4/18	4/12
20	5/02	4/23	4/16	4/10	4/04	3/30	3/24	3/17	3/07
16	4/04	3/26	3/19	3/14	3/09	3/04	2/26	2/20	2/11

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	8/15	8/21	8/25	8/28	8/31	9/03	9/07	9/11	9/16
32	8/29	9/03	9/06	9/09	9/12	9/15	9/18	9/22	9/27
28	9/12	9/17	9/21	9/24	9/27	9/30	10/03	10/06	10/11
24	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/15	10/20
20	9/30	10/06	10/11	10/14	10/18	10/21	10/25	10/30	11/05
16	10/15	10/22	10/27	10/31	11/04	11/08	11/12	11/17	11/24

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	86	78	73	68	63	59	54	48	40
32	122	113	106	100	95	89	84	77	68
28	155	147	142	137	133	129	124	119	111
24	183	174	168	163	158	153	147	141	133
20	233	220	211	203	196	189	181	172	160
16	275	263	254	247	240	233	225	217	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.

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	1279	992	801	543	336	147	54	54	219	530	885	1233	7073
60	1124	852	646	394	196	61	15	14	117	378	735	1078	5610
57	1031	768	553	310	128	29	6	4	72	290	645	985	4821
55	969	712	495	256	91	15	2	2	49	235	585	923	4334
50	814	579	353	141	29	2	0	0	14	121	439	768	3260
32	321	184	43	1	0	0	0	0	0	0	73	292	914

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	66	116	265	448	690	879	1112	1091	797	493	178	81	6216
55	0	0	4	13	68	204	401	379	156	15	0	0	1240
57	0	0	0	7	42	157	343	320	119	8	0	0	996
60	0	0	0	1	18	99	259	237	74	2	0	0	690
65	0	0	0	0	2	35	143	121	26	0	0	0	327
70	0	0	0	0	0	8	63	46	6	0	0	0	123

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	8	73	228	454	647	869	841	559	263	38	0	0	8	81	309	763	1410	2279	3120	3679	3942	3980	3980
45	0	0	23	121	303	497	714	686	410	141	9	0	0	0	23	144	447	944	1658	2344	2754	2895	2904	2904
50	0	0	1	46	175	350	559	531	271	61	0	0	0	0	1	47	222	572	1131	1662	1933	1994	1994	1994
55	0	0	0	15	81	214	405	379	149	16	0	0	0	0	0	15	96	310	715	1094	1243	1259	1259	1259
60	0	0	0	0	30	107	259	235	64	1	0	0	0	0	0	0	30	137	396	631	695	696	696	696
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	9	70	198	334	434	546	544	419	243	30	0	0	9	79	277	611	1045	1591	2135	2554	2797	2827	2827

(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