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: RICHLAND, OR **COOP ID: 357160**

Climate Division: OR 8 **NWS Call Sign:** **Elevation: 2,215 Feet** **Lat: 44˚46N** **Lon: 117˚10W**

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	37.4	19.1	28.3	62+	1967	31	35.3	1999	-27	1979	31	14.8	1979	1138	0	.0	.0	2.1	7.7	27.8	2.4
Feb	44.8	23.2	34.0	76	1961	11	41.3	1992	-26	1989	5	19.1	1989	869	0	.0	.0	8.7	2.7	24.2	1.0
Mar	55.4	28.2	41.8	85	1966	29	48.1	1992	2	1954	28	36.5	1971	719	0	.0	.0	24.3	.1	22.0	.0
Apr	64.5	32.9	48.7	92	1987	28	54.6	1987	14	1976	1	41.9	1975	490	0	.0	.1	29.3	.0	12.2	.0
May	73.5	40.2	56.9	97	1957	27	61.6	1992	12	1954	1	52.6	1991	265	11	.0	1.4	31.0	.0	2.6	.0
Jun	81.7	47.0	64.4	103+	1974	14	69.7	1986	28	1962	4	60.5	1991	104	84	.3	6.7	30.0	.0	.1	.0
Jul	90.8	52.1	71.5	108	1967	12	76.3	1998	25+	1983	7	62.5	1993	21	221	4.0	19.1	30.9	.0	.2	.0
Aug	90.1	50.3	70.2	109	1961	4	75.1	1971	34+	1992	25	65.9	1980	26	187	3.3	18.3	31.0	.0	.0	.0
Sep	81.0	41.3	61.2	105	1955	4	67.0	1990	21	1999	28	55.0	1986	164	48	.1	5.8	30.0	.0	2.3	.0
Oct	67.6	32.0	49.8	92	1992	2	58.0	1988	6	1971	29	45.9	1995	472	1	.0	.1	30.2	.0	14.1	.0
Nov	48.9	24.6	36.8	78+	1966	20	41.4	1999	-6+	1993	25	25.8	1985	848	0	.0	.0	14.6	.9	24.2	.3
Dec	38.5	19.3	28.9	65	1950	2	35.4	1977	-21	1983	24	14.6	1985	1120	0	.0	.0	2.7	5.5	28.9	1.8
Ann	64.5	34.2	49.4	109	Aug 1961	4	76.3	Jul 1998	-27	Jan 1979	31	14.6	Dec 1985	6236	552	7.7	51.5	264.8	16.9	158.6	5.5

\+ 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

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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	1.50	1.39	3.00	1984	25	5.29	1984	.04	1988
Feb	.96	.86	1.00	1984	4	2.68	1984	.02	1988
Mar	1.06	1.11	1.35	1983	27	1.98	1995	.10	1994
Apr	1.03	1.06	1.08	1978	16	4.76	1978	.00+	1987
May	1.34	1.10	1.60	1998	26	5.34	1998	.12	1974
Jun	1.07	.89	2.03	1993	12	4.59	1993	.00	1994
Jul	.70	.40	1.48	1982	2	3.70	1982	.00+	2000
Aug	.75	.28	1.50	1984	4	3.20	1984	.00+	2000
Sep	.50	.34	.96	1959	14	2.64	1985	.00+	1999
Oct	.67	.46	1.24	1985	29	2.18	1991	.00+	1988
Nov	1.50	1.25	1.50+	1983	22	6.15	1983	.11	1999
Dec	1.39	1.12	2.25	1995	5	3.86	1995	.07	1986
Ann	12.47	11.38	3.00	Jan 1984	25	6.15	Nov 1983	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.4	5.1	.5	.2
Feb	7.1	4.2	.4	.1
Mar	7.3	4.2	.3	.1
Apr	7.4	3.7	.4	@
May	7.3	4.5	.5	.1
Jun	5.7	3.3	.6	@
Jul	3.6	2.2	.3	.1
Aug	3.3	1.9	.4	.1
Sep	3.3	1.9	.2	.0
Oct	4.4	2.4	.2	.1
Nov	9.4	5.1	.6	.1
Dec	7.9	4.5	.7	.2
Ann	76.1	43.0	5.1	1.1

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	.16	.27	.48	.69	.91	1.16	1.46	1.83	2.33	3.16	3.97
Feb	.10	.17	.30	.44	.58	.74	.93	1.17	1.49	2.03	2.55
Mar	.17	.26	.42	.56	.71	.88	1.06	1.29	1.59	2.08	2.56
Apr	.00	.06	.21	.37	.54	.74	.97	1.27	1.68	2.37	3.05
May	.25	.36	.56	.74	.93	1.13	1.35	1.63	1.99	2.58	3.14
Jun	.03	.11	.25	.40	.58	.77	1.01	1.31	1.73	2.43	3.12
Jul	.00	.00	.03	.14	.27	.42	.61	.86	1.20	1.79	2.39
Aug	.00	.00	.03	.13	.26	.42	.63	.90	1.29	1.96	2.65
Sep	.00	.00	.00	.11	.23	.35	.48	.65	.87	1.25	1.60
Oct	.00	.00	.15	.28	.40	.53	.67	.85	1.09	1.46	1.83
Nov	.15	.26	.47	.68	.90	1.16	1.46	1.83	2.35	3.20	4.03
Dec	.14	.24	.43	.62	.83	1.06	1.34	1.69	2.17	2.96	3.73
Ann	4.95	6.10	7.73	9.08	10.36	11.65	13.05	14.66	16.72	19.86	22.72

\+ 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)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	6.7	6.0	2	#
Feb	3.2	.5	1	0
Mar	.3	.0	#	0
Apr	.1	.0	#	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	.0	.0	0	0
Nov	2.9	.0	#	0
Dec	4.6	3.8	1	#
Ann	17.8	10.3	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	10.0	1984	5	16.0	1989	26	1984	22	17	1984
Feb	10.0	1984	4	18.5	1984	20	1984	12	14	1984
Mar	4.0	1972	2	4.0	1972	2	1972	2	#+	1985
Apr	2.0	1975	26	2.0	1975	1	1982	2	#+	1982
May	.0	0	0	.0	0	0	0	0	0	0
Jun	.0	0	0	.0	0	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	.0	0	0	.0	0	0	0	0	0	0
Oct	.4	1985	29	.4	1985	0	0	0	0	0
Nov	8.5	1984	30	18.5	1984	7	1975	30	1	1984
Dec	10.0	1983	25	13.0	1971	22	1983	31	6	1983
Ann	10.0+	Feb 1984	4	18.5+	Nov 1984	26	Jan 1984	22	17	Jan 1984

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.9	1.6	.8	.3	.1
Feb	1.4	1.0	.4	.2	.1
Mar	.2	.1	@	.0	.0
Apr	.1	@	.0	.0	.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	@	.0	.0	.0	.0
Nov	1.0	.9	.3	.1	.0
Dec	2.2	1.8	.6	.2	.1
Ann	6.8	5.4	2.1	.8	.3

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	5.4	3.4	.4	.0
Feb	.5	.0	.0	.0
Mar	.1	.0	.0	.0
Apr	.0	.0	.0	.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	.0	.0	.0	.0
Nov	.8	.5	.1	.0
Dec	6.5	2.5	.3	.0
Ann	13.3	6.4	.8	.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	6/29	6/20	6/14	6/09	6/03	5/29	5/24	5/18	5/09
32	6/13	6/04	5/28	5/23	5/18	5/13	5/07	5/01	4/22
28	5/26	5/18	5/12	5/07	5/03	4/28	4/23	4/17	4/09
24	5/06	4/27	4/21	4/16	4/11	4/06	4/01	3/26	3/18
20	4/14	4/05	3/29	3/23	3/17	3/12	3/06	2/27	2/18
16	3/21	3/09	3/01	2/22	2/15	2/08	2/01	1/24	1/12

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	9/02	9/06	9/10	9/12	9/15	9/17	9/20	9/23	9/27
32	9/15	9/20	9/22	9/25	9/27	9/30	10/02	10/05	10/09
28	9/22	9/27	10/01	10/04	10/08	10/11	10/14	10/18	10/23
24	10/04	10/10	10/14	10/17	10/20	10/24	10/27	10/31	11/06
20	10/21	10/27	10/31	11/04	11/07	11/10	11/14	11/18	11/24
16	11/03	11/09	11/14	11/18	11/22	11/26	11/30	12/05	12/12

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	133	123	115	109	103	96	90	82	72
32	161	151	144	138	132	126	120	113	103
28	187	177	169	163	157	151	145	137	127
24	224	213	205	198	191	185	178	170	159
20	274	260	250	242	234	226	218	208	194
16	320	306	296	288	280	272	263	253	240

***** 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	1138	869	719	490	265	104	21	26	164	472	848	1120	6236
60	983	729	564	346	144	41	4	5	79	324	698	965	4882
57	890	645	471	265	90	19	1	1	45	243	608	872	4150
55	828	589	410	216	61	11	0	0	29	194	548	810	3696
50	685	460	269	116	18	1	0	0	7	96	406	662	2720
32	247	109	11	0	0	0	0	0	0	0	61	214	642

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	132	164	315	500	769	970	1223	1184	874	552	203	117	7003
55	0	0	2	26	117	291	510	472	213	33	0	0	1664
57	0	0	0	16	84	239	448	411	169	19	0	0	1386
60	0	0	0	6	45	171	359	321	113	7	0	0	1022
65	0	0	0	0	11	84	221	187	48	1	0	0	552
70	0	0	0	0	1	31	115	88	14	0	0	0	249

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	8	28	122	314	551	748	988	966	674	339	55	5	8	36	158	472	1023	1771	2759	3725	4399	4738	4793	4798
45	0	5	40	182	398	598	834	811	524	201	16	0	0	5	45	227	625	1223	2057	2868	3392	3593	3609	3609
50	0	0	7	94	253	449	680	656	376	99	2	0	0	0	7	101	354	803	1483	2139	2515	2614	2616	2616
55	0	0	0	40	136	307	529	501	240	35	0	0	0	0	0	40	176	483	1012	1513	1753	1788	1788	1788
60	0	0	0	12	58	180	381	347	130	8	0	0	0	0	0	12	70	250	631	978	1108	1116	1116	1116
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	1	23	106	241	373	473	598	587	464	280	47	0	1	24	130	371	744	1217	1815	2402	2866	3146	3193	3193

(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

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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