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: MAZAMA, WA **COOP ID: 455133**

Climate Division: WA 6 **NWS Call Sign:** **Elevation: 2,170 Feet** **Lat: 48˚36N** **Lon: 120˚27W**

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	28.8	14.5	21.7	58	1989	30	29.7	1981	-32	1969	23	8.8	1979	1344	0	.0	.0	.3	19.8	31.0	5.4
Feb	36.2	18.8	27.5	55+	1991	27	35.5	1991	-21	1972	3	19.9	1985	1050	0	.0	.0	.8	7.7	28.0	2.5
Mar	46.2	25.2	35.7	74	1994	31	43.0	1992	-8	1976	4	25.7	1971	909	0	.0	.0	8.9	.9	28.3	.3
Apr	57.5	31.3	44.4	90	1977	24	49.4	1977	10	1972	3	37.3	1972	618	0	.0	@	25.0	.0	17.8	.0
May	66.6	39.3	53.0	97	1986	31	57.9	1993	20	1972	1	48.5	1984	375	2	.0	.2	30.9	.0	4.8	.0
Jun	73.5	46.3	59.9	98	1992	25	66.8	1992	26+	1976	2	54.5	1981	189	36	.0	1.5	30.0	.0	.6	.0
Jul	81.7	51.0	66.4	103+	1979	19	71.9	1985	27	1971	8	60.8	1983	78	120	.5	7.2	31.0	.0	.2	.0
Aug	81.9	51.3	66.6	103	1977	17	71.8	1986	32+	1992	23	60.5	1995	66	115	.4	7.3	31.0	.0	.1	.0
Sep	72.5	42.5	57.5	101	1988	4	64.2	1998	19+	1970	14	50.2	1971	263	38	.1	.9	29.9	.0	3.4	.0
Oct	56.5	32.5	44.5	84	1992	1	49.9	1988	9+	1991	28	39.0	1971	636	0	.0	.0	23.2	.2	17.9	.0
Nov	37.5	25.0	31.3	65	1989	9	36.3	1987	-14	1985	28	18.6	1985	1013	0	.0	.0	1.3	6.2	26.1	.7
Dec	27.4	15.2	21.3	51	1979	6	29.3	1979	-48	1968	30	10.5	1983	1355	0	.0	.0	@	21.4	30.8	4.4
Ann	55.5	32.7	44.2	103+	Jul 1979	19	71.9	Jul 1985	-48	Dec 1968	30	8.8	Jan 1979	7896	311	1.0	17.1	212.3	56.2	189.0	13.3

\+ 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: 1950-2001

(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	3.73	3.33	3.07	1980	12	8.39	1974	.43	1977
Feb	2.69	2.45	2.14	2000	1	6.73	1972	.26	1993
Mar	1.68	1.59	1.71	1972	5	4.58	1972	.36	1979
Apr	1.03	.91	1.45	1989	5	2.46	1978	.00	1973
May	1.05	.97	1.30	1951	7	3.16	1998	.01	1992
Jun	1.06	.93	1.52	1992	29	3.66	1992	.08	1976
Jul	.84	.65	1.14	1985	16	2.38	1993	.00	1971
Aug	.79	.68	.99	1951	28	3.08	1976	.00	1985
Sep	.83	.80	1.28	1979	2	2.44	1985	.00+	1976
Oct	1.48	.98	1.97	1994	31	4.60	1997	.01	1987
Nov	3.47	2.99	2.74	1990	24	8.62	1995	.64	1976
Dec	4.07	4.04	2.56	1987	9	8.58	1996	.68	1985
Ann	22.72	22.06	3.07	Jan 1980	12	8.62	Nov 1995	.00+	Aug 1985

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.7	8.8	2.0	.6
Feb	11.4	7.1	1.4	.2
Mar	9.3	4.9	.7	.1
Apr	6.6	3.2	.4	@
May	7.5	3.0	.5	@
Jun	6.4	3.1	.5	.1
Jul	5.5	2.5	.2	.1
Aug	5.6	2.2	.5	.0
Sep	5.5	2.5	.3	@
Oct	8.4	4.0	.7	.2
Nov	14.5	8.9	2.1	.5
Dec	15.0	9.6	2.3	.6
Ann	109.4	59.8	11.6	2.4

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	.80	1.15	1.69	2.19	2.69	3.22	3.81	4.53	5.47	6.97	8.39
Feb	.65	.91	1.30	1.65	1.99	2.36	2.77	3.26	3.90	4.91	5.86
Mar	.35	.51	.75	.98	1.20	1.44	1.71	2.04	2.47	3.15	3.80
Apr	.10	.22	.39	.54	.69	.86	1.05	1.28	1.58	2.07	2.54
May	.12	.20	.34	.49	.64	.82	1.03	1.28	1.63	2.21	2.77
Jun	.12	.20	.34	.49	.65	.83	1.04	1.30	1.65	2.24	2.81
Jul	.03	.09	.20	.33	.46	.61	.79	1.02	1.34	1.88	2.41
Aug	.01	.04	.13	.24	.36	.51	.70	.95	1.30	1.92	2.54
Sep	.00	.03	.13	.24	.38	.54	.75	1.01	1.38	2.01	2.65
Oct	.08	.16	.34	.54	.77	1.04	1.36	1.78	2.37	3.37	4.37
Nov	.69	1.01	1.52	1.99	2.46	2.96	3.54	4.23	5.14	6.60	7.99
Dec	1.06	1.45	2.04	2.56	3.07	3.61	4.21	4.92	5.84	7.30	8.66
Ann	14.24	15.80	17.85	19.43	20.86	22.25	23.71	25.33	27.32	30.26	32.83

\+ 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: 1950-2001
(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	33.6	32.0	27	27
Feb	20.3	19.0	30	30
Mar	6.7	4.9	21	20
Apr	.3	#	3	#
May	#	.0	0	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	1.9	.0	#	0
Nov	17.0	13.9	3	2
Dec	37.4	33.6	16	15
Ann	117.2	103.4	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	29.0	1990	9	68.7	1990	62	1997	1	49	1997
Feb	28.0	2000	1	50.2	1999	61	1999	24	52	1999
Mar	21.0	1972	5	30.7	1972	60+	1999	9	47	1999
Apr	2.0	1982	2	2.0+	1989	31	1997	1	20	1997
May	#	1986	13	#+	1986	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	14.0	1994	31	14.5	1994	14	1994	31	2	1996
Nov	18.0	1995	7	37.6	1995	24	1995	11	14	1994
Dec	28.5	1987	9	112.7	1996	62	1996	31	31	1996
Ann	29.0	Jan 1990	9	112.7	Dec 1996	62+	Jan 1997	1	52	Feb 1999

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	11.7	8.1	3.8	1.6	.5
Feb	8.2	5.8	2.1	1.3	.3
Mar	3.4	2.0	.9	.3	.1
Apr	.3	.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	.7	.5	.2	.1	@
Nov	7.8	4.9	2.1	1.0	.1
Dec	13.1	9.2	4.8	2.5	.5
Ann	45.2	30.6	13.9	6.8	1.5

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	30.4	30.4	30.4	28.4
Feb	27.9	27.7	27.3	26.3
Mar	27.2	26.6	25.6	22.5
Apr	4.4	3.5	2.8	1.7
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	.7	.4	.2	@
Nov	15.3	11.9	7.7	3.7
Dec	30.4	29.4	28.7	23.5
Ann	136.3	129.9	122.7	106.1

+ 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	7/04	6/26	6/19	6/14	6/09	6/04	5/29	5/23	5/14
32	6/22	6/13	6/07	6/02	5/28	5/22	5/17	5/11	5/02
28	6/05	5/27	5/20	5/14	5/09	5/03	4/27	4/21	4/11
24	4/26	4/21	4/17	4/14	4/11	4/08	4/05	4/01	3/27
20	4/12	4/06	4/01	3/28	3/24	3/20	3/16	3/11	3/04
16	4/03	3/26	3/20	3/15	3/10	3/06	2/28	2/22	2/14

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	8/23	8/29	9/01	9/05	9/08	9/11	9/14	9/18	9/23
32	9/03	9/08	9/12	9/16	9/19	9/22	9/26	9/30	10/05
28	9/17	9/22	9/25	9/28	10/01	10/03	10/06	10/09	10/14
24	9/29	10/05	10/09	10/13	10/16	10/20	10/23	10/27	11/02
20	10/13	10/19	10/24	10/27	10/31	11/04	11/08	11/12	11/19
16	10/26	11/01	11/06	11/10	11/14	11/18	11/22	11/27	12/04

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	122	111	103	96	90	84	78	70	59
32	147	136	127	120	114	107	100	92	81
28	182	169	160	152	144	137	129	119	106
24	214	205	199	193	188	182	177	170	161
20	245	237	231	225	221	216	210	204	196
16	286	273	264	256	248	241	233	223	210

***** 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	1344	1050	909	618	375	189	78	66	263	636	1013	1355	7896
60	1189	910	754	468	232	97	26	20	161	483	863	1200	6403
57	1096	826	661	382	159	57	12	8	112	393	773	1107	5586
55	1034	770	599	326	118	36	7	4	86	334	713	1045	5072
50	879	630	448	201	44	10	0	0	37	203	564	890	3906
32	358	180	61	6	0	0	0	0	0	4	142	370	1121

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	37	54	175	378	650	837	1064	1073	765	390	118	38	5579
55	0	0	0	8	54	183	358	364	161	8	0	0	1136
57	0	0	0	4	33	143	302	306	128	4	0	0	920
60	0	0	0	0	14	94	223	225	87	2	0	0	645
65	0	0	0	0	2	36	120	115	38	0	0	0	311
70	0	0	0	0	0	10	48	43	13	0	0	0	114

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	21	165	416	606	827	829	524	170	8	0	0	0	21	186	602	1208	2035	2864	3388	3558	3566	3566
45	0	0	2	74	269	457	672	674	377	81	1	0	0	0	2	76	345	802	1474	2148	2525	2606	2607	2607
50	0	0	0	22	148	312	517	519	241	29	0	0	0	0	0	22	170	482	999	1518	1759	1788	1788	1788
55	0	0	0	3	65	179	367	364	131	7	0	0	0	0	0	3	68	247	614	978	1109	1116	1116	1116
60	0	0	0	0	24	85	227	225	58	0	0	0	0	0	0	0	24	109	336	561	619	619	619	619
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	25	132	273	376	517	521	349	133	0	0	0	0	25	157	430	806	1323	1844	2193	2326	2326	2326

(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