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: PACKWOOD, WA **COOP ID: 456262**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,060 Feet** **Lat: 46˚37N** **Lon: 121˚40W**

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	42.7	29.2	36.0	67+	1962	31	43.5	1981	-9	1957	26	29.9	1980	901	0	.0	.0	4.9	1.6	19.2	.1
Feb	47.7	30.5	39.1	77	1992	26	44.4	1992	-2+	1985	4	32.8	1989	726	0	.0	.0	10.4	.6	16.5	.1
Mar	53.0	33.3	43.2	85	1960	21	48.0	1992	2	1955	5	37.2	1971	678	0	.0	.0	18.9	.0	13.6	.0
Apr	59.5	36.7	48.1	90+	1998	30	51.8	1977	20+	1976	2	44.4	1975	507	0	.0	@	24.8	.0	7.1	.0
May	66.3	42.4	54.4	102	1983	28	58.4	1983	20	1954	1	50.0	1999	333	2	@	.6	30.1	.0	1.8	.0
Jun	71.4	47.8	59.6	104	1961	16	64.4	1982	28	1976	3	54.6	1971	182	21	.0	1.2	30.0	.0	.1	.0
Jul	78.1	51.5	64.8	108+	1958	28	71.0	1985	28	1955	1	59.4	1993	76	71	.4	4.1	31.0	.0	@	.0
Aug	78.8	51.0	64.9	105	1981	8	69.6	1986	29	1969	29	61.1	1980	78	75	.6	3.6	31.0	.0	@	.0
Sep	73.7	44.6	59.2	105	1988	2	63.3	1990	23	1970	13	54.2	1972	195	20	.1	1.7	30.0	.0	1.5	.0
Oct	62.3	37.9	50.1	97	1987	1	55.3	1988	18	1971	28	46.9	1984	462	0	.0	.2	28.1	.0	7.9	.0
Nov	47.9	33.7	40.8	75	1954	1	44.5	1987	-3	1985	23	32.7	1985	727	0	.0	.0	10.1	.4	11.6	.1
Dec	42.0	29.7	35.9	63	1968	11	40.5	1980	-8	1972	9	29.2	1990	904	0	.0	.0	3.5	1.6	19.1	.2
Ann	60.3	39.0	49.7	108+	Jul 1958	28	71.0	Jul 1985	-9	Jan 1957	26	29.2	Dec 1990	5769	189	1.1	11.4	252.8	4.2	98.4	.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

Issue Date: February 2004

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: PACKWOOD, WA **COOP ID: 456262**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,060 Feet** **Lat: 46˚37N** **Lon: 121˚40W**

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	9.32	8.71	4.50	1990	9	18.13	1990	.59	1985
Feb	7.04	6.57	3.95	1996	8	15.67	1996	.12	1993
Mar	5.32	4.79	2.44	1997	19	13.51	1997	1.01	1992
Apr	3.67	3.26	2.56	1991	5	7.96	1991	.82	1999
May	2.59	2.70	1.55	1953	1	4.52	1978	.22	1992
Jun	2.05	1.93	2.20	1985	7	5.09	1981	.71	1982
Jul	1.01	.93	1.50	1999	17	3.02	1983	.00+	1984
Aug	1.14	.72	1.45	1975	18	4.03	1976	.05	1973
Sep	2.39	2.64	2.03	1992	24	5.93	1972	.00+	1993
Oct	4.63	3.83	3.96	1997	30	11.70	1997	.18	1987
Nov	9.30	8.91	4.18	1990	24	22.60	1995	2.11	1979
Dec	9.34	8.96	3.95	1972	26	18.45	1975	1.91	1985
Ann	57.80	58.53	4.50	Jan 1990	9	22.60	Nov 1995	.00+	Sep 1993

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	17.7	13.2	5.9	2.8
Feb	15.4	11.3	4.6	2.1
Mar	17.2	11.6	3.2	.9
Apr	15.5	9.1	2.0	.4
May	13.8	8.0	1.2	.2
Jun	10.7	5.6	.9	.2
Jul	5.7	2.9	.5	.1
Aug	5.7	2.8	.7	.1
Sep	8.3	5.4	1.6	.4
Oct	12.6	8.7	3.1	1.2
Nov	19.0	14.9	6.6	2.3
Dec	18.3	13.8	6.3	2.7
Ann	159.9	107.3	36.6	13.4

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	1.95	2.80	4.17	5.41	6.66	8.00	9.51	11.33	13.72	17.55	21.18
Feb	1.34	1.97	3.00	3.95	4.92	5.97	7.15	8.58	10.47	13.52	16.41
Mar	1.71	2.22	2.96	3.60	4.22	4.85	5.55	6.36	7.41	9.04	10.55
Apr	1.07	1.42	1.95	2.40	2.84	3.30	3.81	4.41	5.18	6.39	7.52
May	.80	1.05	1.41	1.73	2.03	2.34	2.69	3.10	3.62	4.44	5.19
Jun	.68	.87	1.16	1.40	1.63	1.87	2.13	2.44	2.83	3.45	4.01
Jul	.00	.09	.26	.42	.58	.77	.99	1.25	1.61	2.21	2.80
Aug	.07	.13	.27	.42	.60	.80	1.05	1.37	1.82	2.58	3.34
Sep	.00	.20	.60	.97	1.37	1.81	2.33	2.97	3.84	5.30	6.72
Oct	.67	1.06	1.73	2.37	3.04	3.77	4.62	5.66	7.05	9.32	11.51
Nov	2.87	3.75	5.07	6.20	7.29	8.43	9.68	11.15	13.04	15.99	18.73
Dec	2.81	3.70	5.03	6.17	7.28	8.43	9.71	11.20	13.13	16.15	18.95
Ann	37.27	41.09	46.07	49.91	53.35	56.71	60.20	64.10	68.87	75.86	81.96

\+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data,
and Information Services

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: PACKWOOD, WA **COOP ID: 456262**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,060 Feet** **Lat: 46˚37N** **Lon: 121˚40W**

Snow (inches)

Snow Totals

Means/Medians (1)

Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median
Jan	11.6	5.8	2	1
Feb	7.3	1.0	1	#
Mar	2.0	.0	#	0
Apr	.2	.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	1.2	.0	#	0
Dec	5.5	3.1	1	#
Ann	27.8	9.9	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	17.2	1980	9	50.1	1980	28	1980	11	11	1980
Feb	19.5	1990	15	52.0	1990	26	1990	15	9	1990
Mar	5.0	1977	14	10.0	1997	7	1985	31	1	1985
Apr	2.0	1991	10	2.0	1991	#	1982	18	#	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	.0	0	0	.0	0	0	0	0	0	0
Nov	8.0	1985	21	10.5	1993	14	1985	21	5	1985
Dec	10.0	1996	29	27.5	1996	19	1996	29	4	1985
Ann	19.5	Feb 1990	15	52.0	Feb 1990	28	Jan 1980	11	11	Jan 1980

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.0	2.7	1.5	.7	.2
Feb	2.1	1.7	.7	.4	.2
Mar	1.1	.6	.3	.1	.0
Apr	.2	.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	.0
Nov	1.0	.7	.3	.1	.0
Dec	2.5	2.0	.7	.3	@
Ann	9.9	7.8	3.5	1.6	.4

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	9.1	6.5	4.0	1.9
Feb	4.4	2.8	2.0	.8
Mar	.4	.2	.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	1.2	.7	.5	.3
Dec	5.8	3.2	1.1	.3
Ann	20.9	13.4	7.6	3.3

+ 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: PACKWOOD, WA **COOP ID: 456262**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,060 Feet** **Lat: 46˚37N** **Lon: 121˚40W**

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	6/27	6/17	6/11	6/05	5/31	5/26	5/20	5/14	5/05
32	6/07	5/30	5/25	5/20	5/15	5/11	5/06	4/30	4/22
28	5/12	5/03	4/28	4/22	4/18	4/13	4/08	4/02	3/25
24	4/18	4/07	3/29	3/22	3/16	3/10	3/03	2/23	2/11
20	3/13	3/01	2/21	2/13	2/07	1/31	1/24	1/15	1/03
16	2/23	2/12	2/04	1/28	1/21	1/13	1/04	12/22	0/00

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	9/04	9/08	9/12	9/15	9/19	9/22	9/27	10/03
32	9/08	9/15	9/20	9/24	9/27	10/01	10/05	10/10	10/17
28	9/25	10/03	10/08	10/12	10/16	10/21	10/25	10/30	11/06
24	10/15	10/24	10/31	11/05	11/10	11/16	11/21	11/28	12/07
20	10/29	11/09	11/17	11/24	11/30	12/06	12/13	12/21	1/01
16	11/25	12/08	12/17	12/26	1/03	1/12	1/23	2/13	0/00

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	142	129	121	113	106	99	92	83	71
32	169	157	148	141	134	128	121	112	100
28	219	206	196	188	181	174	166	156	143
24	282	267	256	247	239	230	221	210	195
20	342	324	312	303	294	285	276	265	250
16	>365	>365	>365	>365	352	336	323	310	293

***** 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

Complete documentation available from:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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: PACKWOOD, WA **COOP ID: 456262**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,060 Feet** **Lat: 46˚37N** **Lon: 121˚40W**

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	901	726	678	507	333	182	76	78	195	462	727	904	5769
60	746	586	523	357	192	85	19	21	93	309	577	749	4257
57	653	502	430	269	122	45	7	8	51	222	487	656	3452
55	591	446	368	213	85	26	2	3	31	171	427	594	2957
50	438	311	227	96	23	5	0	0	6	69	287	440	1902
32	51	17	3	0	0	0	0	0	0	0	14	51	136

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	173	216	349	483	692	829	1018	1021	815	561	277	170	6604
55	0	0	0	6	64	165	307	310	155	19	0	0	1026
57	0	0	0	2	39	124	249	253	116	9	0	0	792
60	0	0	0	0	16	74	169	173	68	2	0	0	502
65	0	0	0	0	2	21	71	75	20	0	0	0	189
70	0	0	0	0	0	3	16	19	4	0	0	0	42

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	24	55	125	243	445	585	776	779	581	319	82	27	24	79	204	447	892	1477	2253	3032	3613	3932	4014	4041
45	1	7	41	127	292	435	621	624	431	181	21	0	1	8	49	176	468	903	1524	2148	2579	2760	2781	2781
50	0	0	0	51	161	288	466	469	284	78	0	0	0	0	0	51	212	500	966	1435	1719	1797	1797	1797
55	0	0	0	10	73	158	314	316	157	22	0	0	0	0	0	10	83	241	555	871	1028	1050	1050	1050
60	0	0	0	2	28	67	176	170	66	3	0	0	0	0	0	2	30	97	273	443	509	512	512	512
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	7	35	83	156	257	332	469	476	362	198	28	1	7	42	125	281	538	870	1339	1815	2177	2375	2403	2404

(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:
www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

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