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: SMYRNA, WA **COOP ID: 457727**

Climate Division: WA 8 **NWS Call Sign:** **Elevation: 560 Feet** **Lat: 46˚50N** **Lon: 119˚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	39.7	24.1	31.9	69	1971	31	40.5	1990	-28	1957	26	16.4	1979	1025	0	.0	.0	5.3	8.6	26.9	1.4
Feb	47.0	27.5	37.3	71	1971	1	42.8	1991	-24	1996	3	26.9	1989	777	0	.0	.0	12.0	2.6	21.1	.7
Mar	58.2	32.4	45.3	82	1960	25	49.4	1992	3	1993	1	40.6	1971	610	0	.0	.0	27.0	.1	16.2	.0
Apr	67.1	38.3	52.7	96	1977	25	56.8	1994	21+	1997	6	47.6	1975	371	2	.0	.1	29.9	.0	6.0	.0
May	75.8	45.6	60.7	105	1986	31	65.2	1993	24	1954	1	56.0	1984	162	27	.1	2.4	31.0	.0	.4	.0
Jun	83.4	52.7	68.1	109	1961	17	73.7	1992	34+	1984	1	63.8	1971	39	131	.8	6.9	30.0	.0	.0	.0
Jul	91.0	57.6	74.3	113	1998	27	80.8	1998	41+	1981	8	69.0	1993	7	295	4.9	17.4	31.0	.0	.0	.0
Aug	90.7	56.3	73.5	115	1961	4	78.8	1971	39	1980	29	69.0	1995	9	274	4.4	16.6	31.0	.0	.0	.0
Sep	80.9	46.8	63.9	103	1998	2	69.6	1998	26+	2000	23	58.7	1985	114	79	.3	4.8	30.0	.0	.7	.0
Oct	66.9	36.3	51.6	89+	1958	5	56.8	1988	15+	1995	31	48.7	1984	416	0	.0	.0	30.2	.0	9.9	.0
Nov	49.4	30.1	39.8	75	1975	5	45.6	1999	-19	1985	23	26.9	1985	758	0	.0	.0	15.5	1.3	18.0	.3
Dec	39.0	23.9	31.5	70	1980	27	38.3	1991	-19	1990	21	20.1	1985	1040	0	.0	.0	5.5	8.2	26.4	1.1
Ann	65.8	39.3	52.6	115	Aug 1961	4	80.8	Jul 1998	-28	Jan 1957	26	16.4	Jan 1979	5328	808	10.5	48.2	278.4	20.8	125.6	3.5

\+ 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: 1951-2001

(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	.99	.84	1.13	1963	31	2.66	1995	.06	1977
Feb	.79	.53	.85	1958	12	2.20	1980	.00	1988
Mar	.72	.56	.85	1991	24	2.43	1983	.05	1973
Apr	.45	.39	.80	1994	8	1.56	1995	.00+	1985
May	.56	.40	1.33	1972	21	1.88	1980	.00	1992
Jun	.48	.31	1.20	1984	20	2.06	1984	.00+	1996
Jul	.37	.21	.63	1987	18	2.51	1993	.00+	1994
Aug	.33	.16	.84	1977	30	1.39	1976	.00+	1996
Sep	.40	.29	.76	1980	14	1.40	1971	.00+	1999
Oct	.52	.37	1.08	1982	29	1.71	1996	.00+	1987
Nov	1.15	1.01	1.05	1996	19	4.08	1973	.00+	1990
Dec	1.28	.96	.99	1995	11	3.48	1996	.05	1976
Ann	8.04	7.71	1.33	May 1972	21	4.08	Nov 1973	.00+	Sep 1999

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	6.4	3.5	.2	.0
Feb	5.2	3.1	.1	.0
Mar	5.4	2.7	.2	.0
Apr	3.9	1.6	.1	.0
May	4.3	1.7	.2	@
Jun	3.3	1.4	.2	@
Jul	2.3	.9	.2	@
Aug	1.9	.9	.2	.0
Sep	2.6	1.2	.1	.0
Oct	3.5	1.7	.1	@
Nov	7.3	3.8	.4	@
Dec	7.3	4.2	.5	.0
Ann	53.4	26.7	2.5	@

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	.18	.27	.41	.55	.68	.83	1.00	1.21	1.48	1.92	2.33
Feb	.06	.15	.28	.39	.51	.64	.79	.97	1.21	1.61	1.98
Mar	.08	.13	.23	.33	.44	.56	.70	.87	1.11	1.51	1.90
Apr	.00	.03	.10	.17	.24	.33	.43	.55	.72	1.01	1.29
May	.05	.12	.21	.29	.37	.46	.56	.69	.86	1.12	1.38
Jun	.00	.02	.08	.15	.23	.32	.44	.58	.78	1.13	1.48
Jul	.00	.00	.01	.07	.13	.21	.31	.45	.64	.96	1.29
Aug	.00	.00	.00	.03	.08	.15	.25	.37	.56	.90	1.25
Sep	.00	.00	.00	.07	.14	.23	.34	.48	.69	1.03	1.38
Oct	.00	.02	.08	.16	.24	.35	.47	.63	.86	1.25	1.65
Nov	.00	.22	.45	.64	.81	1.00	1.20	1.44	1.76	2.27	2.75
Dec	.15	.25	.43	.61	.80	1.01	1.26	1.56	1.98	2.66	3.32
Ann	4.41	5.05	5.89	6.55	7.16	7.76	8.39	9.11	10.00	11.31	12.49

\+ 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: 1951-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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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	.5	.0	#	#
Feb	.1	.0	#	0
Mar	.1	.0	#	0
Apr	#	.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
Nov	.1	.0	#	0
Dec	.4	-99.9	#	#
Ann	1.2	-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	3.1	2000	24	3.1	2000	4	1998	14	1	1998
Feb	.4	1986	12	.4+	1986	3	1997	11	#+	2000
Mar	2.0	1997	15	2.0	1997	1	1993	3	#+	1998
Apr	#	1985	21	#	1985	0	0	0	0	0
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	.3	1971	31	.3	1971	#+	1991	30	#+	1991
Nov	.8	1977	19	.8	1977	1	1996	30	#+	2000
Dec	2.1	1985	7	2.1	1985	3	1980	2	1	1996
Ann	3.1	Jan 2000	24	3.1	Jan 2000	4	Jan 1998	14	1+	Jan 1998

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.9	.5	.1	.0	.0
Feb	.3	.0	.0	.0	.0
Mar	.1	@	.0	.0	.0
Apr	.0	.0	.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	.0	.0	.0
Dec	.9	.1	.0	.0	.0
Ann	2.3	.6	.1	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	1.3	.0	.0	.0
Feb	.0	.0	.0	.0
Mar	.0	.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	.2	.0	.0	.0
Dec	.2	.0	.0	.0
Ann	1.7	.0	.0	.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	5/22	5/18	5/14	5/11	5/08	5/06	5/03	4/29	4/24
32	5/09	5/04	5/01	4/28	4/25	4/22	4/19	4/15	4/10
28	4/25	4/19	4/15	4/12	4/09	4/05	4/02	3/29	3/23
24	4/10	4/01	3/26	3/21	3/16	3/11	3/06	2/28	2/20
20	3/20	3/10	3/04	2/26	2/20	2/15	2/09	2/03	1/24
16	3/01	2/20	2/14	2/09	2/04	1/30	1/24	1/17	1/07

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	9/17	9/21	9/23	9/25	9/27	9/29	10/01	10/04	10/07
32	9/25	9/29	10/02	10/05	10/07	10/09	10/12	10/15	10/19
28	10/04	10/09	10/12	10/15	10/17	10/20	10/22	10/25	10/30
24	10/16	10/22	10/26	10/29	11/02	11/05	11/09	11/13	11/19
20	10/27	11/04	11/10	11/15	11/20	11/24	11/29	12/05	12/13
16	11/03	11/14	11/21	11/28	12/05	12/11	12/18	12/27	1/09

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	158	152	148	145	141	138	134	130	124
32	186	178	173	169	164	160	156	150	143
28	211	204	199	195	191	187	183	178	171
24	261	250	243	236	230	224	217	210	199
20	309	296	287	279	271	264	256	247	234
16	>365	337	322	311	302	293	284	273	259

***** 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	1025	777	610	371	162	39	7	9	114	416	758	1040	5328
60	870	637	455	232	69	8	0	1	46	264	608	885	4075
57	777	553	363	160	34	2	0	0	22	180	524	792	3407
55	721	499	303	119	19	0	0	0	12	131	468	730	3002
50	577	370	168	45	3	0	0	0	1	47	335	585	2131
32	177	59	2	0	0	0	0	0	0	0	51	166	455

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	175	206	414	621	888	1082	1312	1287	955	607	283	149	7979
55	6	3	2	50	195	392	599	574	276	25	10	0	2132
57	0	0	1	30	148	334	537	512	226	12	6	0	1806
60	0	0	0	12	89	250	444	421	160	3	0	0	1379
65	0	0	0	2	27	131	295	274	79	0	0	0	808
70	0	0	0	0	4	52	164	148	30	0	0	0	398

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	22	55	186	387	652	852	1072	1049	721	372	92	25	22	77	263	650	1302	2154	3226	4275	4996	5368	5460	5485
45	2	13	74	242	497	702	917	894	571	232	34	4	2	15	89	331	828	1530	2447	3341	3912	4144	4178	4182
50	0	2	19	124	342	552	762	739	424	115	11	0	0	2	21	145	487	1039	1801	2540	2964	3079	3090	3090
55	0	0	0	47	205	403	607	584	282	41	1	0	0	0	0	47	252	655	1262	1846	2128	2169	2170	2170
60	0	0	0	8	100	259	452	429	157	13	0	0	0	0	0	8	108	367	819	1248	1405	1418	1418	1418
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	11	39	137	260	409	534	669	652	468	267	54	11	11	50	187	447	856	1390	2059	2711	3179	3446	3500	3511

(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