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: OLGA 2 SE, WA **COOP ID: 456096**

Climate Division: WA 2 **NWS Call Sign:** **Elevation: 80 Feet** **Lat: 48˚37N** **Lon: 122˚48W**

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	44.7	33.7	39.2	65+	1931	28	44.8	1986	-8	1950	13	33.4	1979	800	0	.0	.0	8.0	1.1	9.9	.0
Feb	47.7	35.5	41.6	66	1986	27	45.6	1998	-4	1893	2	34.2	1989	655	0	.0	.0	11.5	.3	5.8	@
Mar	51.9	37.4	44.7	74	1928	19	48.3	1992	10	1920	28	40.3	1976	631	0	.0	.0	22.5	.0	2.4	.0
Apr	56.9	39.9	48.4	78	1926	14	51.1+	1992	28	1936	1	44.1	1972	499	0	.0	.0	28.4	.0	.4	.0
May	62.3	43.5	52.9	87+	1984	29	56.8	1993	31	1954	1	49.6	1974	375	0	.0	.0	31.0	.0	.0	.0
Jun	66.3	46.7	56.5	87+	1995	29	60.0	1978	37	1933	10	53.6	1971	255	0	.0	.0	30.0	.0	.0	.0
Jul	69.8	49.1	59.5	92	1941	17	61.4	1996	40+	1949	2	56.7	1986	172	0	.0	.0	31.0	.0	.0	.0
Aug	70.1	49.7	59.9	89+	1990	11	62.0	1997	38	1980	29	57.3	1973	160	1	.0	.0	31.0	.0	.0	.0
Sep	66.3	47.3	56.8	87	1951	14	59.5	1974	32	1926	24	53.4	1972	248	0	.0	.0	30.0	.0	.0	.0
Oct	57.6	42.8	50.2	77	1987	1	52.6	2000	26	1935	30	47.1	1984	459	0	.0	.0	29.4	.0	.4	.0
Nov	49.6	38.1	43.9	67	1980	4	46.9	1999	4	1985	27	33.5	1985	635	0	.0	.0	16.1	.5	3.5	.0
Dec	45.1	34.5	39.8	65	1994	27	44.1	1979	2	1968	29	33.7	1983	781	0	.0	.0	7.6	1.5	8.8	.0
Ann	57.4	41.5	49.5	92	Jul 1941	17	62.0	Aug 1997	-8	Jan 1950	13	33.4	Jan 1979	5670	1	.0	.0	276.5	3.4	31.2	@

\+ 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: 1891-2001

(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	3.86	4.04	3.40	1935	21	7.75	1971	.62	1985
Feb	2.79	2.80	2.80	1949	16	6.36	1982	.42	1993
Mar	2.27	2.04	1.74	1948	21	4.00	1972	1.13+	1996
Apr	1.89	1.90	1.48	1901	6	3.53	1972	.48	1998
May	1.72	1.58	1.98	1948	28	3.68	2000	.39	1995
Jun	1.40	1.31	1.85	1946	14	2.89	1980	.38	1996
Jul	.94	.85	1.60	1932	10	2.97	1982	.00	1984
Aug	1.06	.80	2.05	1891	6	3.07	1975	.00	1986
Sep	1.34	1.32	2.50	1983	1	3.03	1983	.05	1991
Oct	2.42	2.10	2.61	1945	25	5.54	1985	.22	1987
Nov	4.38	4.51	1.83	1955	3	8.79	1995	1.13	1976
Dec	4.09	4.05	2.32	1982	3	8.35	1979	.60	1985
Ann	28.16	28.47	3.40	Jan 1935	21	8.79	Nov 1995	.00+	Aug 1986

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	14.5	10.2	2.1	.5
Feb	12.7	8.4	1.2	.2
Mar	13.1	8.2	.7	@
Apr	11.2	6.5	.6	.0
May	9.6	5.2	.6	.2
Jun	8.1	4.6	.5	@
Jul	5.0	2.8	.4	.1
Aug	5.1	2.8	.6	@
Sep	6.8	4.0	.6	.1
Oct	11.0	7.2	1.0	.1
Nov	16.1	11.4	2.4	.6
Dec	15.0	10.9	2.1	.5
Ann	128.2	82.2	12.8	2.3

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	1.16	1.53	2.08	2.55	3.01	3.49	4.01	4.63	5.43	6.68	7.84
Feb	.95	1.21	1.60	1.92	2.24	2.56	2.91	3.32	3.85	4.67	5.42
Mar	1.04	1.24	1.52	1.74	1.95	2.16	2.38	2.64	2.96	3.44	3.88
Apr	.74	.91	1.16	1.37	1.56	1.76	1.97	2.22	2.54	3.02	3.46
May	.46	.62	.87	1.09	1.31	1.53	1.78	2.08	2.46	3.07	3.63
Jun	.52	.65	.83	.99	1.14	1.30	1.46	1.66	1.90	2.28	2.63
Jul	.15	.28	.44	.57	.70	.83	.98	1.16	1.39	1.75	2.09
Aug	.06	.15	.31	.47	.64	.82	1.04	1.31	1.68	2.29	2.88
Sep	.13	.23	.41	.60	.80	1.03	1.30	1.64	2.10	2.87	3.62
Oct	.61	.84	1.19	1.50	1.81	2.14	2.50	2.92	3.48	4.37	5.20
Nov	1.45	1.86	2.47	2.99	3.49	4.00	4.56	5.22	6.07	7.38	8.59
Dec	1.56	1.94	2.48	2.94	3.37	3.81	4.28	4.83	5.54	6.61	7.60
Ann	20.39	21.91	23.84	25.31	26.60	27.86	29.15	30.57	32.30	34.80	36.95

\+ 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: 1891-2001
(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	2.6	1.5	#	0	9.5	1971	11	16.1	1971	10	1971	11	2	1971	1.0	.8	.3	.1	.0	.4	.0	.0	.0
Feb	1.3	.0	#	0	5.0	1989	17	9.5	1989	3	1993	20	#+	1993	.8	.6	.1	.1	.0	.3	.1	.0	.0
Mar	.2	.0	#	0	4.5	1989	1	4.5+	1989	1	1991	1	#+	1991	.2	.1	.1	.0	.0	.0	.0	.0	.0
Apr	#	.0	0	0	#	1976	15	#	1976	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	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	.1	.0	#	0	3.0	1991	28	3.0	1991	#	1971	26	#	1971	.1	.1	.1	.0	.0	.0	.0	.0	.0
Nov	.7	.0	#	0	4.5	1985	26	11.5	1985	11	1985	27	2	1985	.5	.3	.1	.0	.0	.6	.3	.3	.1
Dec	2.3	.0	#	0	10.0	1996	27	30.0	1996	27	1996	29	3	1996	.7	.6	.3	.2	.1	.3	.1	.0	.0
Ann	7.2	1.5	N/A	N/A	10.0	Dec 1996	27	30.0	Dec 1996	27	Dec 1996	29	3	Dec 1996	3.3	2.5	1.0	.4	.1	1.6	.5	.3	.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	5/10	5/03	4/28	4/24	4/20	4/16	4/11	4/06	3/30
32	4/14	4/03	3/27	3/20	3/14	3/08	3/01	2/21	2/11
28	3/04	2/23	2/16	2/10	2/04	1/29	1/22	1/14	12/29
24	2/18	2/06	1/28	1/20	1/13	1/05	12/27	12/13	0/00
20	2/10	1/28	1/18	1/08	12/29	12/13	0/00	0/00	0/00
16	1/20	1/06	12/21	0/00	0/00	0/00	0/00	0/00	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	10/15	10/21	10/25	10/29	11/02	11/05	11/09	11/13	11/19
32	10/27	11/04	11/09	11/14	11/19	11/23	11/28	12/04	12/12
28	11/13	11/22	11/29	12/06	12/11	12/17	12/24	1/01	1/17
24	11/22	12/05	12/15	12/23	1/01	1/10	1/21	2/11	0/00
20	12/04	12/17	12/28	1/07	1/19	2/04	0/00	0/00	0/00
16	12/23	1/08	1/25	0/00	0/00	0/00	0/00	0/00	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	226	215	208	201	195	189	182	175	164
32	291	277	266	258	249	241	232	221	207
28	>365	345	329	318	309	301	292	282	269
24	>365	>365	>365	>365	357	342	330	319	304
20	>365	>365	>365	>365	>365	>365	>365	337	320
16	>365	>365	>365	>365	>365	>365	>365	>365	>365

***** 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	800	655	631	499	375	255	172	160	248	459	635	781	5670
60	645	515	476	349	221	115	46	41	112	304	485	626	3935
57	552	431	383	260	138	54	10	8	53	212	395	533	3029
55	490	375	321	203	92	27	2	2	27	155	339	471	2504
50	343	242	177	84	20	2	0	0	2	48	205	325	1448
32	22	5	0	0	0	0	0	0	0	0	4	17	48

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	245	274	392	491	648	735	852	865	743	564	359	259	6427
55	0	0	0	4	27	73	141	153	80	6	4	0	488
57	0	0	0	1	11	40	87	98	46	1	0	0	284
60	0	0	0	0	2	10	30	37	15	0	0	0	94
65	0	0	0	0	0	0	0	1	0	0	0	0	1
70	0	0	0	0	0	0	0	0	0	0	0	0	0

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	89	110	180	280	441	530	636	648	534	354	160	86	89	199	379	659	1100	1630	2266	2914	3448	3802	3962	4048
45	26	32	60	137	286	380	481	493	384	201	58	24	26	58	118	255	541	921	1402	1895	2279	2480	2538	2562
50	0	0	1	42	137	230	326	338	237	78	8	0	0	0	1	43	180	410	736	1074	1311	1389	1397	1397
55	0	0	0	5	35	89	171	183	97	11	0	0	0	0	0	5	40	129	300	483	580	591	591	591
60	0	0	0	0	2	14	44	47	18	0	0	0	0	0	0	0	2	16	60	107	125	125	125	125
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	11	27	55	119	210	263	339	347	269	136	36	6	11	38	93	212	422	685	1024	1371	1640	1776	1812	1818

(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