

# Climatology of the United States

No. 20

1971-2000

Station: ELMA, WA

COOP ID: 452531

Climate Division: WA 4

NWS Call Sign:

Elevation: 70 Feet

Lat: 47°00N

Lon: 123°24W

## 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	46.9	33.0	40.0	63	1961	20	45.1	1994	0	1950	31	33.8	1979	777	0	.0	.0	10.6	.3	13.4	.0
Feb	50.8	34.1	42.5	73	1992	26	47.4	1991	4	1950	2	35.3	1989	631	0	.0	.0	16.4	.2	11.0	.0
Mar	55.7	35.7	45.7	80	1994	27	50.6	1992	15	1955	5	40.9	1971	598	0	.0	.0	26.4	.0	10.2	.0
Apr	61.2	38.0	49.6	89	1998	30	52.9	1989	25+	1997	5	44.5	1972	463	0	.0	.0	29.2	.0	6.0	.0
May	67.3	42.6	55.0	99	1983	28	59.6	1993	25	1954	1	50.8	1974	315	2	.0	.3	30.9	.0	1.0	.0
Jun	71.8	46.4	59.1	100	1955	10	63.0	1992	31	1971	5	54.4	1971	187	9	.0	1.1	30.0	.0	.1	.0
Jul	77.1	49.1	63.1	105	1956	20	67.2	1985	37+	1955	2	59.6	1986	97	38	.2	3.1	31.0	.0	.0	.0
Aug	78.4	49.5	64.0	103	1981	9	67.7	1986	33	1951	6	58.3	1973	89	56	.2	3.1	31.0	.0	.0	.0
Sep	74.0	44.9	59.5	100+	1988	3	63.7	1995	28+	1985	29	54.4	1972	189	22	.1	1.1	30.0	.0	.5	.0
Oct	63.4	39.1	51.3	91	1987	1	55.2	1988	20	1971	28	47.8	1984	427	0	.0	@	30.5	.0	3.7	.0
Nov	51.6	35.0	43.3	74+	1980	4	47.6	1997	4	1985	24	34.5	1985	651	0	.0	.0	20.1	.2	8.5	.0
Dec	46.0	32.5	39.3	65	1958	30	42.7	1999	2	1972	8	33.3	1990	798	0	.0	.0	9.5	.9	13.1	.0
Ann	62.0	40.0	51.0	105	Jul 1956	20	67.7	Aug 1986	0	Jan 1950	31	33.3	Dec 1990	5222	127	.5	8.7	295.6	1.6	67.5	.0

+ 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/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(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

032-A

# 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: ELMA, WA

COOP ID: 452531

Climate Division: WA 4

NWS Call Sign:

Elevation: 70 Feet

Lat: 47°00N

Lon: 123°24W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels These values were determined from the incomplete gamma distribution										
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95
Jan	10.07	10.77	3.51	1968	19	16.63	1990	.34	1985	20.7	15.8	7.1	2.8	2.72	3.67	5.13	6.40	7.65	8.96	10.42	12.14	14.39	17.90	21.19
Feb	8.53	7.65	4.25	1982	13	19.51	1999	.57	1993	18.7	14.4	5.8	2.1	2.47	3.28	4.50	5.56	6.59	7.66	8.85	10.25	12.06	14.90	17.54
Mar	7.36	6.71	3.85	1997	18	18.40	1997	1.21	1992	19.9	14.7	4.9	1.4	2.82	3.50	4.48	5.29	6.06	6.85	7.70	8.69	9.94	11.87	13.62
Apr	4.92	4.51	3.06	1996	23	10.47	1996	1.90	1998	16.5	11.2	3.2	.7	1.80	2.26	2.93	3.48	4.01	4.55	5.14	5.83	6.70	8.04	9.27
May	3.17	3.18	1.47	1975	3	6.36	1984	.35	1992	13.9	8.5	2.0	.1	.90	1.20	1.65	2.05	2.43	2.84	3.28	3.81	4.49	5.56	6.56
Jun	2.27	2.34	1.72	1968	1	4.28	1981	.50	1987	10.8	6.3	1.1	.2	.72	.94	1.26	1.53	1.79	2.06	2.36	2.71	3.16	3.86	4.50
Jul	1.19	.87	1.62	1983	13	4.93	1983	.02	1984	6.1	3.0	.8	.1	.09	.17	.33	.49	.67	.88	1.13	1.45	1.89	2.62	3.34
Aug	1.40	1.04	2.14	2001	22	5.40	1977	.00	1998	6.8	3.5	.9	.1	.05	.16	.36	.56	.79	1.04	1.34	1.71	2.23	3.10	3.95
Sep	2.87	2.74	3.12	1997	17	8.82	1997	.02	1993	9.4	5.9	1.9	.5	.09	.21	.50	.86	1.30	1.84	2.51	3.40	4.69	6.92	9.19
Oct	5.68	5.11	3.20	1957	23	14.01	1975	.56	1987	14.3	10.3	4.2	1.5	1.05	1.56	2.39	3.16	3.95	4.80	5.76	6.93	8.47	10.96	13.34
Nov	10.16	9.80	4.52	2001	14	18.97	1983	2.39	1976	21.3	16.9	7.6	2.6	3.69	4.64	6.02	7.17	8.27	9.39	10.62	12.04	13.85	16.65	19.22
Dec	11.18	11.72	4.00	1994	20	20.49	1994	2.33	1985	22.1	16.5	7.6	3.4	3.86	4.92	6.45	7.75	9.00	10.28	11.67	13.30	15.39	18.62	21.58
Ann	68.80	71.29	4.52	Nov 2001	14	20.49	Dec 1994	.00	Aug 1998	180.5	127.0	47.1	15.5	48.84	52.70	57.64	61.39	64.73	67.96	71.29	74.97	79.44	85.91	91.52

+ 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

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Federal Building  
151 Patton Avenue  
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Station: ELMA, WA

COOP ID: 452531

Climate Division: WA 4

NWS Call Sign:

Elevation: 70 Feet

Lat: 47°00N

Lon: 123°24W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	3.7	.5	#	0	9.8	1972	25	17.8	1972	12	1971	14	2	1972	1.8	1.1	.4	.2	.0	1.4	.8	.5	.2
Feb	1.5	.0	#	0	6.5	1971	27	11.0	1971	5	1990	15	1	1972	.7	.5	.2	.1	.0	.3	.2	.0	.0
Mar	.5	.0	#	0	3.0	1971	2	7.0	1971	2	1971	1	#+	1989	.3	.2	@	.0	.0	.1	.0	.0	.0
Apr	.0	.0	0	0	.5	1972	9	.5	1972	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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.5	.0	#	0	5.0	1978	19	5.0	1978	6	1985	25	2	1985	.3	.2	.1	@	.0	.2	.1	.0	.0
Dec	1.7	.0	#	0	6.0	1974	27	9.5	1971	5+	1998	24	1	1974	1.1	.6	.1	@	.0	1.0	.4	@	.0
Ann	7.9	.5	N/A	N/A	9.8	Jan 1972	25	17.8	Jan 1972	12	Jan 1971	14	2+	Nov 1985	4.2	2.6	.8	.3	.0	3.0	1.5	.5	.2

+ 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:

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**Elevation: 70 Feet**

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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	6/15	6/09	6/04	5/31	5/28	5/24	5/20	5/16	5/09
32	5/26	5/19	5/14	5/10	5/06	5/02	4/28	4/24	4/17
28	5/04	4/26	4/20	4/15	4/10	4/06	4/01	3/26	3/18
24	3/17	3/06	2/25	2/18	2/12	2/05	1/29	1/20	1/09
20	2/23	2/11	2/02	1/25	1/17	1/08	12/29	12/09	0/00
16	2/05	1/22	1/10	12/28	12/06	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	9/12	9/18	9/22	9/26	9/29	10/02	10/06	10/10	10/16
32	9/24	9/30	10/05	10/09	10/12	10/16	10/19	10/24	10/30
28	10/11	10/20	10/26	10/31	11/05	11/10	11/16	11/22	12/01
24	11/02	11/14	11/23	12/01	12/08	12/15	12/23	1/01	1/13
20	11/14	11/28	12/09	12/18	12/27	1/06	1/18	2/10	0/00
16	12/11	12/25	1/06	1/20	2/10	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	148	140	134	128	124	119	113	107	99
32	186	177	170	164	158	153	147	140	130
28	248	235	225	216	208	200	192	182	168
24	347	329	316	306	297	288	278	267	251
20	>365	>365	>365	>365	354	333	318	303	285
16	>365	>365	>365	>365	>365	>365	>365	360	326

\* 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:  
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No. 20  
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Station: ELMA, WA

COOP ID: 452531

Climate Division: WA 4      NWS Call Sign:      Elevation: 70 Feet      Lat: 47°00N      Lon: 123°24W

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	777	631	598	463	315	187	97	89	189	427	651	798	5222
60	622	491	443	314	176	79	25	24	90	275	501	643	3683
57	529	407	352	230	110	37	8	9	49	193	412	550	2886
55	467	351	294	177	76	19	3	3	29	144	356	488	2407
50	321	221	162	76	19	2	0	0	6	54	223	340	1424
32	16	4	0	0	0	0	0	0	0	0	7	18	45

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	262	296	425	527	711	813	964	989	823	597	345	244	6996
55	0	0	6	14	73	142	254	280	163	27	5	0	964
57	0	0	2	7	46	100	197	223	122	14	1	0	712
60	0	0	0	1	18	52	121	145	74	4	0	0	415
65	0	0	0	0	2	9	38	56	22	0	0	0	127
70	0	0	0	0	0	0	6	11	4	0	0	0	21

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	90	122	200	305	483	597	748	777	620	396	159	84	90	212	412	717	1200	1797	2545	3322	3942	4338	4497	4581
45	28	39	77	164	330	447	593	622	470	244	67	27	28	67	144	308	638	1085	1678	2300	2770	3014	3081	3108
50	0	4	21	65	183	298	438	467	321	115	12	0	0	4	25	90	273	571	1009	1476	1797	1912	1924	1924
55	0	0	0	23	83	154	283	312	185	36	0	0	0	0	0	23	106	260	543	855	1040	1076	1076	1076
60	0	0	0	1	30	60	144	164	73	8	0	0	0	0	0	1	31	91	235	399	472	480	480	480
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	18	42	104	180	279	347	453	479	386	220	55	13	18	60	164	344	623	970	1423	1902	2288	2508	2563	2576

(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](http://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.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/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 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/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://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](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)