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: LONG BEACH EXP STN, WA **COOP ID: 454748**

Climate Division: WA 1 **NWS Call Sign:** **Elevation: 30 Feet** **Lat: 46˚22N** **Lon: 124˚02W**

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	47.9	35.2	41.6	65	1981	13	47.9	1995	8+	1980	30	34.0	1979	727	0	.0	.0	15.2	.2	10.4	.0
Feb	50.2	36.5	43.4	74	1968	28	47.9	1992	9	1989	4	36.1	1989	606	0	.0	.0	17.2	.2	8.1	.0
Mar	52.8	38.2	45.5	72+	2001	7	49.3	1992	25+	1995	7	41.3	1971	605	0	.0	.0	24.3	.0	5.6	.0
Apr	55.6	40.6	48.1	82	1987	27	51.2	1996	26	1975	5	43.4	1975	507	0	.0	.0	28.1	.0	2.1	.0
May	59.5	44.9	52.2	91	1997	12	56.6	1993	30+	1985	12	49.7	1974	397	0	.0	@	31.0	.0	.1	.0
Jun	62.6	49.0	55.8	93	1982	19	58.3	1978	33	1977	5	53.3	1976	276	0	.0	.1	30.0	.0	.0	.0
Jul	65.6	51.7	58.7	95	1988	20	61.9	1995	38	1984	19	56.5	1971	197	0	.0	.1	31.0	.0	.0	.0
Aug	66.7	51.5	59.1	99	1981	10	62.4	1997	36+	1980	29	54.9	1973	186	3	.0	@	31.0	.0	.0	.0
Sep	67.0	47.6	57.3	92+	1975	6	62.0	1995	29	1972	27	54.0	1972	236	5	.0	.2	30.0	.0	.2	.0
Oct	60.9	41.9	51.4	90	1991	11	54.2	1988	21	1971	28	48.5	1971	422	0	.0	@	30.7	.0	2.0	.0
Nov	52.9	38.9	45.9	72	1969	1	50.6	1995	15	1985	24	38.7	1985	573	0	.0	.0	24.6	.1	6.8	.0
Dec	48.4	35.7	42.1	64+	1995	11	46.4	1995	0	1972	8	36.6	1990	711	0	.0	.0	16.5	.7	10.3	@
Ann	57.5	42.6	50.1	99	Aug 1981	10	62.4	Aug 1997	0	Dec 1972	8	34.0	Jan 1979	5443	8	.0	.4	309.6	1.2	45.6	@

\+ 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: 1967-2001

(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	11.61	11.69	8.85	2000	9	18.50	1998	.78	1985
Feb	9.91	9.86	3.72	1990	10	21.19	1999	1.44	1993
Mar	9.02	8.56	3.65	1983	29	16.15	1997	1.74	1992
Apr	6.02	5.33	2.60	1996	23	12.88	1996	2.17	1977
May	3.92	3.83	2.61	1968	31	7.18	1978	.81	1982
Jun	2.99	2.74	2.68	2000	12	6.76	1981	.82	1986
Jul	1.69	1.30	1.95	1976	8	6.43	1983	.44	1992
Aug	1.79	1.37	1.95	1976	16	5.33	1991	.19	1998
Sep	3.29	2.78	2.74	1997	17	10.74	1978	.18	1991
Oct	6.76	5.94	3.93	1982	29	16.16	1975	.57	1987
Nov	11.82	10.80	4.98	1990	24	20.22	1983	2.96	1976
Dec	12.37	13.25	3.75	1968	31	20.26	1998	3.07	1985
Ann	81.19	83.98	8.85	Jan 2000	9	21.19	Feb 1999	.18	Sep 1991

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	22.5	17.3	8.3	3.3
Feb	20.1	15.7	7.2	2.9
Mar	22.8	16.5	6.3	2.2
Apr	20.2	12.8	4.1	1.1
May	17.3	9.7	2.2	.6
Jun	14.6	7.0	1.8	.3
Jul	11.6	3.8	.9	.2
Aug	11.0	3.8	1.0	.3
Sep	12.5	6.7	2.3	.7
Oct	17.8	11.5	4.7	1.6
Nov	23.3	17.8	8.8	3.3
Dec	23.0	17.5	8.8	4.0
Ann	216.7	140.1	56.4	20.5

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	3.46	4.57	6.22	7.65	9.03	10.47	12.06	13.93	16.35	20.13	23.63
Feb	3.54	4.47	5.82	6.95	8.04	9.15	10.36	11.76	13.56	16.33	18.88
Mar	3.88	4.69	5.83	6.76	7.63	8.51	9.46	10.55	11.92	14.00	15.89
Apr	2.46	3.01	3.79	4.43	5.03	5.65	6.31	7.07	8.03	9.51	10.84
May	1.44	1.81	2.34	2.78	3.20	3.64	4.10	4.65	5.34	6.41	7.39
Jun	.96	1.25	1.67	2.03	2.37	2.73	3.12	3.58	4.17	5.08	5.93
Jul	.30	.45	.70	.93	1.17	1.42	1.71	2.07	2.53	3.29	4.01
Aug	.25	.40	.66	.90	1.16	1.45	1.78	2.19	2.73	3.62	4.49
Sep	.24	.45	.87	1.32	1.83	2.41	3.11	3.99	5.22	7.30	9.34
Oct	1.29	1.90	2.89	3.81	4.73	5.73	6.87	8.24	10.05	12.97	15.74
Nov	4.86	5.94	7.46	8.72	9.90	11.09	12.38	13.87	15.75	18.63	21.24
Dec	5.12	6.25	7.84	9.14	10.37	11.62	12.96	14.51	16.47	19.45	22.17
Ann	59.19	63.49	68.98	73.13	76.81	80.36	84.01	88.04	92.92	99.98	106.06

\+ 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: 1967-2001
(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	.8	.0	#	0	6.0	1971	11	11.5	1971	11	1971	12	1	1971	.3	.2	.1	.1	.0	.3	.2	.1	@
Feb	.6	.0	#	0	3.1	1980	15	3.5	1989	4	1989	2	#+	1990	.4	.3	.1	.0	.0	.1	.0	.0	.0
Mar	.1	.0	#	0	2.0	1974	8	2.0	1974	1	1974	8	#+	1974	.1	.1	.0	.0	.0	@	.0	.0	.0
Apr	.0	.0	0	0	.0	0	0	.0	0	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	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Nov	.1	.0	#	0	1.0	1985	30	1.0	1985	#	1978	20	#	1978	.1	.1	.0	.0	.0	.0	.0	.0	.0
Dec	.6	.0	#	0	4.0	1972	6	7.3	1972	5	1972	12	1	1972	.4	.2	.1	.0	.0	.4	.3	@	.0
Ann	2.2	.0	N/A	N/A	6.0	Jan 1971	11	11.5	Jan 1971	11	Jan 1971	12	1+	Dec 1972	1.3	.9	.3	.1	.0	.8	.5	.1	@

+ Also occurred on an earlier date(s) #Denotes trace amounts

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	6/02	5/26	5/21	5/16	5/12	5/08	5/03	4/28	4/21
32	5/03	4/25	4/20	4/15	4/11	4/07	4/02	3/28	3/20
28	3/22	3/13	3/07	3/02	2/25	2/20	2/14	2/08	1/31
24	2/20	2/10	2/02	1/27	1/20	1/14	1/07	12/27	0/00
20	2/09	1/27	1/17	1/07	12/26	0/00	0/00	0/00	0/00
16	1/23	1/09	12/27	12/07	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	9/14	9/22	9/28	10/02	10/07	10/11	10/16	10/22	10/30
32	10/03	10/11	10/18	10/23	10/28	11/02	11/08	11/14	11/23
28	10/28	11/06	11/13	11/19	11/24	11/29	12/05	12/12	12/21
24	11/11	11/25	12/05	12/13	12/22	12/30	1/09	1/23	0/00
20	12/04	12/18	12/29	1/09	1/23	0/00	0/00	0/00	0/00
16	12/18	12/31	1/12	1/31	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	185	172	163	155	147	140	132	122	109
32	237	224	215	207	199	192	184	174	161
28	306	294	286	278	272	265	258	249	238
24	>365	>365	>365	357	333	320	308	296	280
20	>365	>365	>365	>365	>365	>365	>365	342	313
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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	727	606	605	507	397	276	197	186	236	422	573	711	5443
60	572	466	450	357	243	132	66	64	114	268	423	556	3711
57	479	382	357	267	157	64	21	21	63	182	337	463	2793
55	423	326	298	211	108	33	7	8	37	131	281	402	2265
50	282	199	161	91	28	2	0	0	6	41	158	260	1228
32	16	2	0	0	0	0	0	0	0	0	1	7	26

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	312	320	418	483	626	714	826	840	759	601	418	319	6636
55	6	0	4	4	21	57	120	135	106	19	8	1	481
57	0	0	0	0	9	28	72	86	72	8	4	0	279
60	0	0	0	0	1	6	24	35	33	1	0	0	100
65	0	0	0	0	0	0	0	3	5	0	0	0	8
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	125	144	194	255	386	481	588	601	530	371	211	128	125	269	463	718	1104	1585	2173	2774	3304	3675	3886	4014
45	39	53	73	118	233	331	433	446	381	220	90	39	39	92	165	283	516	847	1280	1726	2107	2327	2417	2456
50	0	9	15	38	96	182	278	291	232	95	23	0	0	9	24	62	158	340	618	909	1141	1236	1259	1259
55	0	0	0	4	29	60	129	141	106	24	0	0	0	0	0	4	33	93	222	363	469	493	493	493
60	0	0	0	0	4	7	23	33	30	3	0	0	0	0	0	0	4	11	34	67	97	100	100	100
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	31	43	68	99	161	216	294	315	289	187	68	32	31	74	142	241	402	618	912	1227	1516	1703	1771	1803

(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