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: BOUNDARY DAM, WA **COOP ID: 450844**

Climate Division: WA 9 **NWS Call Sign:** **Elevation: 1,800 Feet** **Lat: 48˚59N** **Lon: 117˚22W**

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	31.4	17.1	24.3	48+	1989	31	31.5	1994	-20	1979	1	9.9	1979	1264	0	.0	.0	.0	14.3	30.5	3.6
Feb	38.2	20.7	29.5	57	1986	26	35.8	1991	-11+	1996	1	21.0	1989	995	0	.0	.0	.5	5.1	27.3	2.0
Mar	47.8	26.2	37.0	72	1994	31	43.6	1992	-2+	1989	3	31.4	1976	868	0	.0	.0	9.7	.9	26.4	.1
Apr	58.7	32.6	45.7	90+	1977	26	49.5	1987	15+	1985	24	41.7	1997	581	0	.0	.1	25.1	.0	15.3	.0
May	66.3	40.4	53.4	96+	1993	13	59.4	1993	28+	2001	6	47.3	1984	364	4	.0	.4	30.2	.0	2.2	.0
Jun	72.0	47.0	59.5	99	1992	24	66.9	1992	31	1982	8	54.3	1984	196	31	.0	.9	29.9	.0	@	.0
Jul	81.3	50.5	65.9	104	1994	24	72.0	1998	37	1980	3	60.5	1993	78	105	.4	7.0	31.0	.0	.0	.0
Aug	82.9	48.9	65.9	101+	1994	3	70.2	1971	32	1984	29	61.4	1995	66	94	.1	7.6	31.0	.0	.1	.0
Sep	71.8	41.7	56.8	98	1988	3	63.3	1998	22+	1984	29	51.5	1985	270	22	.0	.6	29.9	.0	2.1	.0
Oct	56.3	33.6	45.0	80+	1992	3	49.0	1988	9	1984	31	41.6	1985	622	0	.0	.0	24.0	.0	13.3	.0
Nov	39.9	27.0	33.5	61	1975	4	39.0	1987	-19	1985	29	21.9	1985	946	0	.0	.0	2.7	3.5	22.8	.4
Dec	31.7	19.3	25.5	53	1968	12	31.8	1979	-28+	1968	31	16.6	1983	1223	0	.0	.0	.1	14.6	29.6	1.9
Ann	56.5	33.8	45.2	104	Jul 1994	24	72.0	Jul 1998	-28+	Dec 1968	31	9.9	Jan 1979	7473	256	.5	16.6	214.1	38.4	169.6	8.0

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1965-2001

(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	2.78	2.83	1.16	1992	28	4.61	1992	.29	1985
Feb	2.27	1.93	1.02	1996	7	5.57	1979	.36	1993
Mar	2.21	2.15	1.35	1967	23	5.06	1995	.49	1985
Apr	2.12	2.11	1.45	1996	24	4.42	1996	.51	1977
May	2.80	2.52	2.02	1998	27	6.40	1998	.88	1983
Jun	2.76	2.60	1.60	1992	13	4.67+	1981	.81	1974
Jul	1.82	1.78	2.01	1997	21	5.23	1997	.02	1985
Aug	1.57	1.36	1.68	1983	24	4.45	1976	.07	1992
Sep	1.50	1.28	1.22	1977	17	3.92	1997	.07	1990
Oct	1.86	1.79	.76	1975	30	3.94+	1996	.04	1974
Nov	3.24	3.13	1.46	1983	4	7.18	1973	.72	1979
Dec	3.46	3.74	1.47	1995	13	6.33	1998	.65	1985
Ann	28.39	27.09	2.02	May 1998	27	7.18	Nov 1973	.02	Jul 1985

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	13.9	8.7	1.1	.1
Feb	11.8	7.4	.8	.1
Mar	11.7	6.9	.9	@
Apr	12.0	6.5	.6	.1
May	13.8	7.8	1.3	.1
Jun	13.5	7.9	1.4	.2
Jul	9.3	5.7	.6	.1
Aug	7.2	4.3	.6	.1
Sep	8.3	4.0	.7	.1
Oct	10.3	5.8	.7	.0
Nov	14.6	9.2	1.4	.2
Dec	15.6	9.8	1.6	.2
Ann	142.0	84.0	11.7	1.3

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	.90	1.16	1.55	1.88	2.20	2.54	2.90	3.32	3.87	4.72	5.50
Feb	.61	.83	1.16	1.44	1.72	2.02	2.35	2.73	3.24	4.03	4.77
Mar	.58	.79	1.11	1.40	1.67	1.96	2.29	2.67	3.17	3.96	4.69
Apr	.82	1.02	1.30	1.53	1.75	1.98	2.22	2.50	2.85	3.40	3.90
May	1.04	1.30	1.67	1.99	2.29	2.59	2.92	3.31	3.80	4.56	5.25
Jun	1.02	1.28	1.65	1.96	2.26	2.56	2.89	3.27	3.75	4.50	5.19
Jul	.16	.28	.52	.77	1.05	1.37	1.74	2.21	2.86	3.94	5.01
Aug	.12	.22	.43	.64	.88	1.16	1.49	1.91	2.49	3.47	4.44
Sep	.16	.27	.48	.69	.91	1.17	1.46	1.84	2.34	3.18	4.00
Oct	.25	.41	.67	.93	1.20	1.50	1.85	2.28	2.85	3.79	4.70
Nov	.91	1.22	1.68	2.09	2.48	2.90	3.36	3.90	4.60	5.70	6.72
Dec	1.16	1.48	1.96	2.37	2.76	3.16	3.61	4.12	4.78	5.81	6.75
Ann	20.86	22.34	24.22	25.64	26.89	28.10	29.35	30.73	32.39	34.79	36.86

\+ 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: 1965-2001
(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	19.9	19.9	14	12
Feb	10.0	9.0	13	13
Mar	2.9	2.0	5	4
Apr	.1	.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	.1	.0	#	0
Nov	5.6	4.3	1	#
Dec	21.4	19.8	7	7
Ann	60.0	55.0	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	11.0	1993	4	42.4	1982	33	1997	19	28	1997
Feb	10.0	1986	15	26.8	1990	31	1975	20	27	1997
Mar	5.0	1975	22	14.3	1997	25	1975	1	19	1997
Apr	2.0	1982	3	2.0	1982	9	1997	1	2	1975
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	1.0	1996	22	1.0	1996	1+	1996	22	#+	1996
Nov	14.0	1984	2	34.1	1996	22	1996	28	6	1996
Dec	12.0	1974	27	52.1	1984	52	1996	30	28	1996
Ann	14.0	Nov 1984	2	52.1	Dec 1984	52	Dec 1996	30	28+	Jan 1997

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	8.9	6.7	2.6	.8	@
Feb	5.5	3.6	1.4	.3	@
Mar	1.9	1.3	.3	@	.0
Apr	.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	.1	@	.0	.0	.0
Nov	3.6	2.3	.9	.4	@
Dec	10.0	7.2	2.8	.7	.1
Ann	30.1	21.1	8.0	2.2	.1

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	29.3	24.7	23.4	17.3
Feb	24.7	21.3	19.6	14.3
Mar	12.3	9.5	6.7	3.3
Apr	.5	.3	.2	.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	.1	.0	.0	.0
Nov	5.5	3.2	1.4	.5
Dec	23.7	16.4	13.3	5.4
Ann	96.1	75.4	64.6	40.8

+ 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	6/18	6/11	6/06	6/02	5/30	5/26	5/22	5/17	5/10
32	5/24	5/18	5/15	5/11	5/08	5/05	5/02	4/28	4/23
28	5/02	4/28	4/24	4/21	4/18	4/16	4/13	4/09	4/04
24	4/22	4/17	4/13	4/09	4/06	4/03	3/30	3/26	3/21
20	4/07	3/30	3/24	3/19	3/14	3/09	3/04	2/26	2/18
16	3/30	3/20	3/13	3/07	3/02	2/24	2/18	2/12	2/02

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	9/04	9/09	9/12	9/15	9/18	9/21	9/24	9/27	10/02
32	9/09	9/16	9/20	9/25	9/28	10/02	10/06	10/11	10/18
28	9/22	9/29	10/04	10/08	10/12	10/16	10/20	10/24	10/31
24	10/08	10/16	10/21	10/25	10/30	11/03	11/07	11/12	11/20
20	10/26	11/03	11/08	11/13	11/18	11/22	11/27	12/02	12/10
16	11/04	11/12	11/18	11/23	11/27	12/02	12/06	12/12	12/20

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	139	129	122	116	111	105	99	92	82
32	170	161	154	148	142	137	131	124	114
28	201	192	186	181	176	171	165	159	151
24	234	224	217	211	206	200	194	187	177
20	285	272	263	255	248	240	232	223	210
16	311	297	287	278	270	261	252	242	228

***** 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	1264	995	868	581	364	196	78	66	270	622	946	1223	7473
60	1109	855	713	432	226	101	25	18	159	467	796	1068	5969
57	1016	771	620	344	156	60	11	6	106	375	706	975	5146
55	954	715	558	287	118	39	5	3	77	314	646	913	4629
50	799	575	405	160	45	11	0	0	28	174	498	758	3453
32	300	141	33	0	0	0	0	0	0	1	99	255	829

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	58	70	188	409	663	825	1051	1051	742	402	143	55	5657
55	0	0	0	5	67	173	343	341	129	3	0	0	1061
57	0	0	0	2	44	135	287	282	98	1	0	0	849
60	0	0	0	0	20	86	208	201	61	0	0	0	576
65	0	0	0	0	4	31	105	94	22	0	0	0	256
70	0	0	0	0	0	8	38	28	6	0	0	0	80

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	0	0	21	178	405	578	800	801	504	181	17	0	0	0	21	199	604	1182	1982	2783	3287	3468	3485	3485
45	0	0	1	78	257	428	645	646	356	77	0	0	0	0	1	79	336	764	1409	2055	2411	2488	2488	2488
50	0	0	0	24	136	281	490	491	219	21	0	0	0	0	0	24	160	441	931	1422	1641	1662	1662	1662
55	0	0	0	5	62	151	337	338	111	3	0	0	0	0	0	5	67	218	555	893	1004	1007	1007	1007
60	0	0	0	0	20	66	199	197	35	0	0	0	0	0	0	0	20	86	285	482	517	517	517	517
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	0	25	135	246	331	484	497	329	116	2	0	0	0	25	160	406	737	1221	1718	2047	2163	2165	2165

(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