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: CHEWELAH, WA **COOP ID: 451395**

Climate Division: WA 9 **NWS Call Sign:** **Elevation: 1,670 Feet** **Lat: 48˚17N** **Lon: 117˚43W**

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	33.7	18.6	26.2	55	1953	10	34.1	1990	-38+	1950	30	9.2	1979	1204	0	.0	.0	.3	11.6	29.0	3.4
Feb	41.0	22.7	31.9	62+	1995	21	39.4	1992	-36	1950	1	23.3	1975	928	0	.0	.0	4.0	4.0	24.8	1.4
Mar	51.6	28.0	39.8	75+	1994	30	46.5	1992	-12	1951	11	33.1	1975	783	0	.0	.0	18.5	.3	23.9	.2
Apr	61.4	33.2	47.3	91	1987	28	52.0	1987	17+	1979	1	42.1	1972	532	0	.0	.1	28.2	.0	15.4	.0
May	70.0	40.3	55.2	100	1986	31	61.8	1993	16	1954	1	50.2	1974	315	10	@	1.2	30.9	.0	3.8	.0
Jun	77.4	46.0	61.7	106	1992	24	69.2	1992	26	1952	13	56.5	1976	152	53	.2	3.1	30.0	.0	.2	.0
Jul	85.1	49.1	67.1	105	1994	24	73.6	1998	31	1962	2	61.4	1993	69	135	1.4	11.4	31.0	.0	.0	.0
Aug	86.3	47.7	67.0	110	1961	5	72.5	1986	29+	1973	18	61.5	1975	65	127	1.9	12.5	31.0	.0	.1	.0
Sep	76.3	39.3	57.8	104	1988	2	64.7+	1998	19	1950	28	52.3	1971	251	35	.1	2.9	30.0	.0	4.1	.0
Oct	61.4	30.9	46.2	92	1992	2	51.7	1988	10	1984	31	42.8	1984	585	0	.0	@	27.6	.0	19.1	.0
Nov	42.6	27.1	34.9	69	1949	27	40.3	1998	-19	1985	24	22.1	1985	905	0	.0	.0	5.8	2.4	22.6	.2
Dec	33.8	20.3	27.1	58+	1980	27	33.7	1979	-29	1978	31	17.2	1978	1176	0	.0	.0	.4	11.7	28.0	2.3
Ann	60.1	33.6	46.9	110	Aug 1961	5	73.6	Jul 1998	-38+	Jan 1950	30	9.2	Jan 1979	6965	360	3.6	31.2	237.7	30.0	171.0	7.5

\+ 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: 1948-2001

(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	2.28	1.98	4.25	1983	3	5.81	1983	.45	1985
Feb	1.97	1.65	1.50	1990	14	4.92	1999	.46	1988
Mar	2.05	1.74	1.22	2000	4	4.21	1995	.53	1992
Apr	1.62	1.58	1.30	1983	8	3.24	1993	.13	1977
May	2.14	1.92	2.35	1998	26	6.42	1990	.62	1985
Jun	1.76	1.60	1.60	1992	13	4.06	1991	.30	1974
Jul	1.20	1.01	1.70	1955	1	4.73	1993	.00+	1994
Aug	1.01	.85	1.44	1980	18	3.79	1976	.00	1986
Sep	1.02	.86	.88	1988	17	2.76	1982	.00+	1990
Oct	1.21	1.17	.99	1968	12	3.05	1996	.00	1978
Nov	2.72	2.19	1.96	1973	16	8.32	1973	.29	1976
Dec	2.92	3.07	1.93	2001	2	5.64	1973	.50	1985
Ann	21.90	21.46	4.25	Jan 1983	3	8.32	Nov 1973	.00+	Jul 1994

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.3	7.2	.9	.1
Feb	9.6	5.8	.9	.1
Mar	11.4	6.0	1.0	.1
Apr	10.1	4.8	.6	.1
May	11.3	6.3	1.0	.1
Jun	9.6	5.3	.8	.1
Jul	6.3	3.4	.7	.1
Aug	5.3	2.7	.6	.1
Sep	6.0	3.1	.5	.0
Oct	7.3	3.9	.4	.0
Nov	13.8	7.9	1.3	.2
Dec	12.2	8.0	1.6	.3
Ann	114.2	64.4	10.3	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	.69	.91	1.23	1.51	1.78	2.06	2.37	2.73	3.20	3.94	4.62
Feb	.55	.74	1.02	1.27	1.51	1.76	2.04	2.36	2.79	3.46	4.08
Mar	.70	.89	1.18	1.41	1.64	1.88	2.14	2.44	2.83	3.42	3.97
Apr	.41	.56	.80	1.01	1.21	1.43	1.67	1.95	2.33	2.92	3.47
May	.68	.89	1.19	1.44	1.69	1.95	2.23	2.56	2.99	3.65	4.27
Jun	.46	.63	.88	1.11	1.33	1.56	1.82	2.12	2.52	3.14	3.73
Jul	.00	.08	.27	.45	.65	.88	1.15	1.48	1.94	2.72	3.49
Aug	.02	.08	.20	.34	.50	.69	.92	1.22	1.63	2.34	3.05
Sep	.00	.10	.28	.44	.61	.80	1.02	1.28	1.63	2.22	2.79
Oct	.10	.23	.43	.60	.79	.99	1.21	1.49	1.87	2.47	3.05
Nov	.57	.81	1.21	1.58	1.94	2.33	2.77	3.30	4.00	5.12	6.18
Dec	.74	1.01	1.44	1.82	2.19	2.58	3.02	3.54	4.21	5.28	6.29
Ann	14.72	16.08	17.83	19.18	20.38	21.55	22.76	24.10	25.74	28.14	30.22

\+ 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

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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	11.1	10.0	7	6
Feb	5.4	5.0	5	2
Mar	1.5	.3	1	#
Apr	.1	.0	#	0
May	#	.0	#	0
Jun	.0	.0	0	0
Jul	.0	.0	0	0
Aug	.0	.0	0	0
Sep	.0	.0	0	0
Oct	.2	.0	#	0
Nov	3.8	1.9	1	#
Dec	11.8	10.5	4	2
Ann	33.9	27.7	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	1998	14	25.3	1982	28	1993	21	22	1993
Feb	9.0	1993	20	19.0	1975	21+	1997	11	17	1997
Mar	6.0	1978	1	7.0	1971	16	1997	4	9	1985
Apr	2.0	1975	5	2.0	1975	2	1975	5	#	1975
May	#	1977	5	#+	1977	#	1999	8	#	1999
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	1.7	1971	31	2.3	1972	2	1972	28	#+	1996
Nov	8.0	1973	5	35.0	1973	15	1996	28	5	1973
Dec	8.5	1977	30	32.7	1971	27	1996	28	19	1996
Ann	11.0	Jan 1998	14	35.0	Nov 1973	28	Jan 1993	21	22	Jan 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	5.3	3.8	1.1	.4	@
Feb	3.3	2.1	.4	.2	.0
Mar	1.2	.8	.1	@	.0
Apr	@	@	.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	.1	.0	.0	.0
Nov	2.5	1.6	.5	.2	.0
Dec	5.7	3.8	1.1	.4	.0
Ann	18.1	12.2	3.2	1.2	@

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	20.1	18.2	14.4	6.6
Feb	10.9	8.1	5.1	2.6
Mar	3.3	2.0	1.2	.4
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	.1	.0	.0	.0
Nov	3.2	1.8	1.3	.2
Dec	12.2	7.7	4.9	1.0
Ann	49.8	37.8	26.9	10.8

+ 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	7/10	7/01	6/24	6/19	6/14	6/08	6/03	5/27	5/18
32	6/03	5/28	5/24	5/20	5/16	5/13	5/09	5/05	4/28
28	5/17	5/11	5/07	5/03	4/29	4/26	4/22	4/17	4/11
24	4/28	4/22	4/17	4/13	4/10	4/06	4/02	3/29	3/22
20	4/07	3/30	3/25	3/20	3/16	3/11	3/07	3/01	2/22
16	3/15	3/08	3/02	2/26	2/21	2/17	2/12	2/07	1/30

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	8/23	8/27	8/31	9/03	9/06	9/09	9/12	9/15	9/20
32	9/03	9/08	9/11	9/14	9/17	9/20	9/23	9/27	10/02
28	9/14	9/19	9/23	9/26	9/29	10/02	10/06	10/09	10/15
24	9/24	9/30	10/04	10/08	10/12	10/15	10/19	10/23	10/29
20	10/05	10/11	10/15	10/18	10/22	10/25	10/29	11/02	11/08
16	10/22	10/30	11/05	11/11	11/16	11/21	11/26	12/02	12/11

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	116	105	97	90	84	77	70	62	51
32	150	141	134	129	123	118	112	105	96
28	180	170	163	158	152	147	141	134	125
24	213	203	196	190	184	178	172	165	155
20	251	240	232	226	219	213	206	199	188
16	300	288	280	273	267	260	253	245	234

***** 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	1204	928	783	532	315	152	69	65	251	585	905	1176	6965
60	1049	788	628	385	187	72	22	20	149	431	755	1021	5507
57	956	704	535	300	127	39	10	9	101	340	665	928	4714
55	894	648	474	248	94	24	5	4	75	282	605	866	4219
50	745	509	329	136	34	6	0	0	29	154	462	711	3115
32	279	123	24	0	0	0	0	0	0	1	87	239	753

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	98	120	265	458	718	891	1089	1086	774	439	171	85	6194
55	0	0	1	15	98	225	381	377	158	7	0	0	1262
57	0	0	0	8	70	180	324	320	125	4	0	0	1031
60	0	0	0	2	37	123	243	238	83	1	0	0	727
65	0	0	0	0	10	53	135	127	35	0	0	0	360
70	0	0	0	0	1	16	59	52	12	0	0	0	140

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	11	69	232	475	656	849	845	544	213	30	1	0	11	80	312	787	1443	2292	3137	3681	3894	3924	3925
45	0	0	17	115	324	506	694	690	394	105	6	0	0	0	17	132	456	962	1656	2346	2740	2845	2851	2851
50	0	0	0	49	189	358	539	535	255	36	0	0	0	0	0	49	238	596	1135	1670	1925	1961	1961	1961
55	0	0	0	10	92	219	388	382	140	10	0	0	0	0	0	10	102	321	709	1091	1231	1241	1241	1241
60	0	0	0	1	35	112	240	237	57	0	0	0	0	0	0	1	36	148	388	625	682	682	682	682
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	8	65	180	315	419	531	530	391	194	12	0	0	8	73	253	568	987	1518	2048	2439	2633	2645	2645

(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