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: MUD MOUNTAIN DAM, WA **COOP ID: 455704**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 1,308 Feet** **Lat: 47˚09N** **Lon: 121˚56W**

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	43.8	31.4	37.6	74	1940	28	44.7	1981	-2	1950	14	31.4	1980	850	0	.0	.0	8.5	1.6	16.5	.0
Feb	46.8	32.3	39.6	71	1992	27	45.3	1992	2+	1989	4	31.4	1989	712	0	.0	.0	10.2	.6	13.9	.0
Mar	50.4	34.2	42.3	74+	1947	17	46.8	1992	11+	1955	6	37.4	1971	704	0	.0	.0	16.4	.1	11.5	.0
Apr	54.8	37.1	46.0	83	1987	28	49.2+	1992	24	1982	5	40.1	1975	571	0	.0	.0	21.9	.0	5.5	.0
May	60.2	42.0	51.1	92	1983	29	55.9	1997	29+	2001	6	47.2	1999	431	0	.0	.1	28.7	.0	.6	.0
Jun	65.2	46.5	55.9	93+	1982	19	59.9	1982	33	1976	3	51.2	1971	278	3	.0	.2	29.8	.0	.0	.0
Jul	71.6	50.3	61.0	99	1942	3	65.7	1985	37	1962	2	56.5	2000	154	29	.0	1.0	31.0	.0	.0	.0
Aug	72.9	50.5	61.7	98	1981	10	65.6	1981	39+	2000	28	57.6	1973	137	34	.0	.9	31.0	.0	.0	.0
Sep	68.0	46.3	57.2	94	1979	15	61.9	1974	31	1972	27	53.2	2000	248	12	.0	.2	29.9	.0	.1	.0
Oct	58.5	39.9	49.2	90	1987	2	53.1	1987	24+	1971	29	45.2	1984	491	0	.0	@	28.0	.0	2.6	.0
Nov	48.3	34.7	41.5	74	1949	3	47.4	1997	7	1985	23	31.1	1985	705	0	.0	.0	14.4	.7	10.2	.0
Dec	43.6	31.3	37.5	66	1993	10	42.2	1979	1	1968	30	30.6	1990	854	0	.0	.0	7.5	1.5	17.2	.0
Ann	57.0	39.7	48.4	99	Jul 1942	3	65.7	Jul 1985	-2	Jan 1950	14	30.6	Dec 1990	6135	78	.0	2.4	257.3	4.5	78.1	.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: 1939-2001

(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	6.65	6.32	3.46	1965	29	12.87	1990	1.12	1985
Feb	5.36	4.98	2.91	1991	20	10.42	1996	.36	1993
Mar	5.44	5.25	2.52	1968	28	9.58	1988	2.52	1992
Apr	5.11	5.07	2.51	1991	5	8.66	1993	2.42	1998
May	4.48	4.08	2.55	1969	30	7.89	1984	1.32	1982
Jun	3.90	3.64	2.55	1968	2	6.89	1993	1.26	1979
Jul	2.17	1.79	1.70	1983	13	7.09	1983	.03	1984
Aug	2.13	1.72	3.39	1975	18	8.28	1975	.29	1998
Sep	2.97	3.36	2.12	1959	27	8.39	1978	.12	1993
Oct	4.60	4.03	2.06	1966	20	9.26	1975	.41	1987
Nov	8.18	8.48	4.67	1986	24	14.54	1990	2.41	1979
Dec	6.76	6.08	3.14	1941	19	12.51	1975	1.07	1985
Ann	57.75	56.18	4.67	Nov 1986	24	14.54	Nov 1990	.03	Jul 1984

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	18.1	12.8	4.4	1.4
Feb	16.4	11.8	3.7	1.1
Mar	19.6	13.7	3.4	.6
Apr	18.6	12.7	2.8	.4
May	17.0	11.5	2.5	.3
Jun	14.0	8.8	2.5	.6
Jul	9.0	4.8	1.4	.3
Aug	8.3	4.6	1.3	.4
Sep	10.9	6.8	2.0	.4
Oct	14.2	9.7	2.7	.6
Nov	19.6	15.1	5.4	1.7
Dec	18.8	13.2	4.4	1.3
Ann	184.5	125.5	36.5	9.1

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	2.06	2.69	3.63	4.44	5.22	6.03	6.92	7.97	9.32	11.43	13.38
Feb	1.64	2.15	2.91	3.56	4.19	4.85	5.57	6.42	7.51	9.22	10.80
Mar	2.83	3.27	3.88	4.36	4.80	5.23	5.70	6.22	6.88	7.86	8.73
Apr	2.47	2.91	3.51	3.99	4.44	4.88	5.36	5.91	6.59	7.61	8.53
May	1.96	2.36	2.92	3.38	3.81	4.24	4.70	5.23	5.90	6.91	7.83
Jun	1.41	1.78	2.31	2.75	3.17	3.61	4.08	4.63	5.33	6.41	7.41
Jul	.20	.35	.64	.95	1.28	1.65	2.09	2.65	3.41	4.69	5.94
Aug	.30	.47	.78	1.07	1.38	1.73	2.12	2.60	3.26	4.33	5.36
Sep	.40	.64	1.06	1.47	1.91	2.39	2.94	3.62	4.55	6.06	7.52
Oct	1.19	1.62	2.29	2.88	3.46	4.07	4.75	5.56	6.61	8.28	9.83
Nov	3.01	3.78	4.88	5.80	6.68	7.58	8.56	9.69	11.14	13.37	15.41
Dec	2.40	3.04	3.96	4.73	5.47	6.23	7.06	8.02	9.25	11.15	12.89
Ann	45.04	47.59	50.81	53.22	55.34	57.37	59.45	61.73	64.48	68.41	71.78

+ 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: 1939-2001
(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	3.7	.0	1	0	7.0	1972	25	20.0	1972	15	1980	11	3	1980	1.7	.9	.5	.3	.0	2.2	1.4	.8	.0
Feb	2.8	.5	#	0	7.0	1975	16	16.5	1985	12	1985	10	3	1985	1.1	.9	.4	.2	.0	1.9	1.3	.8	.1
Mar	1.6	.5	#	0	5.0	1971	6	17.0	1971	9	1971	6	1	1971	.9	.7	.2	@	.0	.7	.3	.1	.0
Apr	.1	.0	#	0	1.0	1980	6	1.5	1980	1+	1999	3	#+	1999	.2	@	.0	.0	.0	.1	.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	2.0	1971	27	2.0	1971	2	1971	27	#	1971	@	@	.0	.0	.0	@	.0	.0	.0
Nov	.6	.0	#	0	3.5	1977	18	4.1	1973	14	1985	22	4	1985	.5	.3	@	.0	.0	.4	.0	.0	.0
Dec	4.6	.3	#	0	13.0	1974	27	25.2	1971	13	1974	27	2	1971	1.8	1.4	.5	.3	@	1.7	1.0	.6	.1
Ann	13.5	1.3	N/A	N/A	13.0	Dec 1974	27	25.2	Dec 1971	15	Jan 1980	11	4	Nov 1985	6.2	4.2	1.6	.8	@	7.0	4.0	2.3	.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

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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	6/07	5/31	5/26	5/22	5/18	5/14	5/10	5/05	4/28
32	5/13	5/07	5/02	4/28	4/24	4/20	4/16	4/11	4/04
28	4/18	4/09	4/02	3/27	3/21	3/15	3/09	3/02	2/21
24	3/19	3/05	2/23	2/15	2/07	1/30	1/21	1/11	12/28
20	3/02	2/20	2/12	2/05	1/29	1/23	1/15	1/06	12/19
16	2/16	2/02	1/22	1/11	12/28	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	9/24	9/29	10/02	10/06	10/09	10/12	10/15	10/18	10/23
32	10/06	10/11	10/15	10/18	10/22	10/25	10/28	11/01	11/06
28	10/24	11/01	11/07	11/13	11/17	11/22	11/27	12/03	12/12
24	11/06	11/16	11/24	12/01	12/07	12/13	12/19	12/27	1/07
20	11/24	12/05	12/13	12/20	12/27	1/03	1/12	1/23	0/00
16	12/10	12/25	1/06	1/19	2/05	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	171	161	154	148	143	137	131	124	114
32	210	200	192	186	180	174	168	161	150
28	280	267	257	249	241	233	224	215	201
24	353	333	321	310	301	291	281	270	254
20	>365	>365	351	339	330	321	313	304	291
16	>365	>365	>365	>365	>365	>365	>365	338	317

***** 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	850	712	704	571	431	278	154	137	248	491	705	854	6135
60	695	572	549	421	283	149	65	54	133	337	555	699	4512
57	602	488	456	332	202	90	30	23	81	247	465	606	3622
55	540	432	394	274	155	60	16	12	54	193	409	544	3083
50	395	300	250	144	67	14	2	1	14	84	273	394	1938
32	45	18	5	0	0	0	0	0	0	0	16	33	117

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	218	230	323	419	592	715	898	921	754	532	301	202	6105
55	0	0	0	3	34	85	201	220	118	13	5	0	679
57	0	0	0	1	19	55	153	168	85	5	0	0	486
60	0	0	0	0	7	24	95	106	47	1	0	0	280
65	0	0	0	0	0	3	29	34	12	0	0	0	78
70	0	0	0	0	0	0	6	7	2	0	0	0	15

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	64	83	119	208	372	503	675	697	535	313	113	59	64	147	266	474	846	1349	2024	2721	3256	3569	3682	3741
45	19	28	42	99	225	354	520	542	386	173	40	14	19	47	89	188	413	767	1287	1829	2215	2388	2428	2442
50	0	2	7	39	113	209	366	387	240	72	8	0	0	2	9	48	161	370	736	1123	1363	1435	1443	1443
55	0	0	0	7	46	99	219	234	122	21	0	0	0	0	0	7	53	152	371	605	727	748	748	748
60	0	0	0	1	16	36	103	110	48	3	0	0	0	0	0	1	17	53	156	266	314	317	317	317
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	21	32	53	100	185	255	377	401	293	153	40	15	21	53	106	206	391	646	1023	1424	1717	1870	1910	1925

(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

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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