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: HATTON 9 SE, WA **COOP ID: 453546**

Climate Division: WA 8 **NWS Call Sign:** **Elevation: 1,510 Feet** **Lat: 46˚43N** **Lon: 118˚39W**

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	36.8	25.3	31.1	63	1971	31	43.0	1994	-28	1950	31	13.6	1979	1052	0	.0	.0	3.5	10.2	23.8	1.4
Feb	44.4	29.8	37.1	69	1995	20	43.5	1991	-30	1950	1	25.2	1989	781	0	.0	.0	8.8	3.7	18.4	.4
Mar	54.2	34.5	44.4	77	1960	25	49.3	1992	6	1989	3	40.1	1971	640	0	.0	.0	23.9	.3	14.3	.0
Apr	63.0	39.3	51.2	94	1977	24	55.9	1977	13	1968	13	46.1	1975	417	1	.0	.1	29.5	.0	7.4	.0
May	71.9	45.9	58.9	100+	1986	29	63.4	1993	22	1964	14	54.3	1984	210	20	.1	1.2	31.0	.0	1.5	.0
Jun	80.2	52.1	66.2	104+	1992	24	72.0	1992	29	1949	30	61.7	1991	69	105	.4	5.4	30.0	.0	@	.0
Jul	88.1	57.8	73.0	110	1960	18	78.9	1985	31	1971	7	67.4	1993	14	261	3.1	15.7	31.0	.0	@	.0
Aug	87.2	57.3	72.3	114	1961	4	76.8	1986	31	1969	29	67.0	1980	17	242	3.0	13.3	31.0	.0	.0	.0
Sep	77.6	49.3	63.5	102	1950	2	69.5	1990	21	1958	24	56.7	1985	135	88	.2	3.3	30.0	.0	.7	.0
Oct	63.3	39.4	51.4	90	1980	5	57.4	1988	7	1971	29	48.1	1984	425	1	.0	@	29.4	.0	7.3	.0
Nov	45.7	32.7	39.2	73+	1999	12	45.2	1987	-12	1985	23	24.4	1985	774	0	.0	.0	10.8	2.6	15.9	.1
Dec	36.4	25.8	31.1	63	1993	10	37.4	1979	-20	1964	17	17.5	1985	1050	0	.0	.0	3.2	10.4	24.4	1.1
Ann	62.4	40.8	51.6	114	Aug 1961	4	78.9	Jul 1985	-30	Feb 1950	1	13.6	Jan 1979	5584	718	6.8	39.0	262.1	27.2	113.7	3.0

\+ 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: 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	1.09	.98	5.13	1998	23	2.25	1986	.26	1977
Feb	.96	.96	.96	1956	21	1.83	1999	.05	1988
Mar	1.10	.97	.76	1986	24	2.54	1989	.12	1994
Apr	.81	.73	.70	1970	19	1.85	1992	.10	1977
May	.92	.94	1.11	1994	15	2.06	1980	.16	1985
Jun	.57	.48	.98	1948	20	2.10	1995	.00	1986
Jul	.38	.33	.64	1966	2	1.24	1992	.01	1973
Aug	.43	.34	.99	1977	30	1.78	1977	.00+	1997
Sep	.54	.58	1.05	1995	7	1.25	1980	.00+	1999
Oct	.81	.65	1.05	1982	29	2.15	1996	.00	1987
Nov	1.36	1.13	.89	1966	20	3.28	1973	.17	1993
Dec	1.44	1.24	1.17	1977	13	3.84	1973	.08	2000
Ann	10.41	10.10	5.13	Jan 1998	23	3.84	Dec 1973	.00+	Sep 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.7	4.2	.1	@
Feb	9.1	3.6	.1	.0
Mar	9.7	3.8	.2	.0
Apr	7.0	2.7	.1	.0
May	7.0	2.7	.4	@
Jun	5.3	2.0	@	.0
Jul	3.5	1.3	.1	.0
Aug	3.2	1.3	.1	.0
Sep	4.2	1.7	.1	@
Oct	6.5	2.5	.2	@
Nov	12.2	4.6	.2	.0
Dec	11.2	5.3	.2	@
Ann	88.6	35.7	1.8	@

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	.35	.45	.60	.73	.86	.99	1.14	1.31	1.53	1.86	2.18
Feb	.18	.27	.41	.54	.67	.81	.98	1.17	1.43	1.84	2.23
Mar	.25	.35	.51	.66	.80	.95	1.12	1.33	1.60	2.02	2.42
Apr	.13	.20	.31	.43	.54	.67	.82	.99	1.23	1.62	1.99
May	.21	.30	.43	.55	.67	.80	.94	1.11	1.34	1.70	2.03
Jun	.06	.13	.22	.31	.39	.48	.58	.71	.87	1.13	1.38
Jul	.03	.05	.10	.16	.22	.28	.36	.46	.60	.84	1.07
Aug	.00	.00	.00	.08	.17	.27	.38	.53	.74	1.09	1.44
Sep	.00	.00	.05	.16	.26	.38	.52	.69	.92	1.29	1.67
Oct	.02	.08	.19	.30	.43	.58	.76	.99	1.31	1.86	2.39
Nov	.32	.45	.64	.82	1.00	1.19	1.40	1.65	1.97	2.50	2.99
Dec	.25	.38	.59	.79	.99	1.21	1.46	1.76	2.16	2.81	3.43
Ann	6.85	7.52	8.39	9.05	9.65	10.24	10.84	11.52	12.34	13.55	14.60

\+ 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:
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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	4.5	3.3	1	#
Feb	2.1	.3	1	#
Mar	.4	.0	#	0
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	.0	.0	#	0
Nov	1.3	.0	#	0
Dec	5.5	4.2	1	#
Ann	13.8	7.8	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	6.0	1996	24	16.6	1996	11	1979	31	10	1979
Feb	5.2	1993	19	13.0	1989	12	1979	4	3	1989
Mar	2.0	1989	2	3.6	1993	8	1993	1	1	1993
Apr	.5	1982	6	.5	1982	#	1993	29	#	1993
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	.5	1971	30	.5	1971	1	1971	30	#+	1973
Nov	5.0	1978	20	10.5	1996	10	1978	27	4	1978
Dec	6.8	1971	8	18.3	1996	12	1996	29	3	1996
Ann	6.8	Dec 1971	8	18.3	Dec 1996	12+	Dec 1996	29	10	Jan 1979

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.2	1.5	.4	.1	.0
Feb	1.4	.6	.3	@	.0
Mar	.5	.2	.0	.0	.0
Apr	@	.0	.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	.0
Nov	.9	.3	.2	@	.0
Dec	3.6	1.8	.4	.1	.0
Ann	9.7	4.4	1.3	.2	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	7.2	4.3	3.1	.7
Feb	2.7	1.8	1.3	.2
Mar	.4	.2	.1	.0
Apr	.0	.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	@	.0	.0	.0
Nov	1.3	.6	.5	.3
Dec	7.2	2.7	1.3	.2
Ann	18.8	9.6	6.3	1.4

+ 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	6/21	6/12	6/06	5/31	5/26	5/21	5/15	5/09	4/30
32	6/02	5/23	5/16	5/10	5/05	4/29	4/23	4/16	4/06
28	5/06	4/27	4/21	4/16	4/11	4/06	3/31	3/25	3/17
24	4/24	4/12	4/03	3/26	3/19	3/12	3/05	2/24	2/12
20	3/31	3/18	3/08	2/28	2/20	2/12	2/04	1/25	1/11
16	2/27	2/18	2/11	2/05	1/31	1/25	1/19	1/11	12/27

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	9/06	9/12	9/17	9/20	9/24	9/27	10/01	10/06	10/12
32	9/23	9/28	10/01	10/04	10/07	10/10	10/13	10/17	10/22
28	9/27	10/04	10/09	10/13	10/17	10/21	10/25	10/30	11/06
24	10/06	10/14	10/20	10/25	10/30	11/03	11/08	11/14	11/22
20	10/19	10/31	11/08	11/15	11/22	11/28	12/05	12/14	12/25
16	11/01	11/12	11/20	11/27	12/04	12/11	12/19	12/29	1/16

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	158	145	136	128	120	113	105	95	82
32	192	180	170	162	155	147	140	130	117
28	228	215	205	197	189	181	173	163	149
24	273	256	244	233	223	214	203	191	173
20	334	311	296	284	273	262	250	236	217
16	>365	344	327	317	307	299	290	280	266

***** 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	1052	781	640	417	210	69	14	17	135	425	774	1050	5584
60	897	641	485	276	104	21	2	3	63	275	624	895	4286
57	811	557	392	199	60	8	0	1	35	193	541	802	3599
55	753	503	332	155	38	4	0	0	22	145	485	740	3177
50	609	372	193	70	9	0	0	0	5	57	352	595	2262
32	210	58	2	0	0	0	0	0	0	0	58	176	504

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	181	201	385	574	833	1026	1270	1248	943	599	274	149	7683
55	11	2	2	39	158	339	557	535	275	31	11	0	1960
57	7	0	1	23	118	284	495	474	228	17	7	0	1654
60	0	0	0	10	70	206	403	383	166	6	0	0	1244
65	0	0	0	1	20	105	261	242	88	1	0	0	718
70	0	0	0	0	3	40	143	128	38	0	0	0	352

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	27	59	156	324	576	776	1018	994	700	352	77	24	27	86	242	566	1142	1918	2936	3930	4630	4982	5059	5083
45	2	13	58	193	421	626	863	839	550	215	29	2	2	15	73	266	687	1313	2176	3015	3565	3780	3809	3811
50	0	0	14	95	273	476	708	684	405	108	7	0	0	0	14	109	382	858	1566	2250	2655	2763	2770	2770
55	0	0	0	39	154	329	553	529	265	41	0	0	0	0	0	39	193	522	1075	1604	1869	1910	1910	1910
60	0	0	0	7	73	200	398	376	149	13	0	0	0	0	0	7	80	280	678	1054	1203	1216	1216	1216
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	2	23	90	212	367	490	638	626	446	225	29	0	2	25	115	327	694	1184	1822	2448	2894	3119	3148	3148

(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