

Climatology of the United States

No. 20

1971-2000

Station: LEAVENWORTH 3 S, WA

COOP ID: 454572

Climate Division: WA 6

NWS Call Sign:

Elevation: 1,128 Feet Lat: 47° 33N

Lon: 120° 41W

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	33.9	17.2	25.6	64	1971	30	34.4	1981	-25	1950	30	12.4	1979	1223	0	.0	.0	.7	12.0	30.5	2.9
Feb	42.0	21.6	31.8	64	1988	22	37.7	1991	-25	1950	1	23.9	1989	930	0	.0	.0	4.5	3.5	26.5	1.3
Mar	52.4	27.3	39.9	76	1994	29	46.1	1992	-6	1955	4	34.6	1971	780	0	.0	.0	20.1	.2	25.5	.0
Apr	62.4	33.4	47.9	88	1987	28	52.7	1994	19+	1972	3	42.3	1972	513	0	.0	.0	28.7	.0	13.7	.0
May	71.4	40.1	55.8	101+	1986	31	60.4	1993	26+	1959	5	51.4	1977	293	6	.1	1.0	31.0	.0	2.7	.0
Jun	78.7	46.3	62.5	105	1992	25	69.4	1992	31+	1954	18	58.2	1976	125	50	.3	3.3	30.0	.0	@	.0
Jul	87.1	50.6	68.9	107	1979	20	75.3	1985	34	1963	23	62.8	1993	40	160	2.6	12.6	31.0	.0	.0	.0
Aug	87.6	50.2	68.9	108+	1967	16	73.4	1986	30	1980	29	64.1	1995	36	157	2.2	13.2	31.0	.0	@	.0
Sep	78.5	41.7	60.1	102	1988	3	65.9	1998	24+	1983	30	54.9	1978	195	48	.2	3.8	30.0	.0	1.8	.0
Oct	64.2	32.8	48.5	91	1958	4	54.2	1988	17+	1991	29	45.7	1977	512	0	.0	.0	28.9	@	14.2	.0
Nov	44.0	27.4	35.7	68	1989	9	40.4	1999	-10	1959	16	24.0	1985	879	0	.0	.0	6.9	2.2	22.9	.1
Dec	33.7	19.5	26.6	60	1967	27	33.6	1999	-36	1968	30	17.4	1983	1191	0	.0	.0	.4	12.4	30.2	1.2
Ann	61.3	34.0	47.7	108+	Aug 1967	16	75.3	Jul 1985	-36	Dec 1968	30	12.4	Jan 1979	6717	421	5.4	33.9	243.2	30.3	168.0	5.5

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

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Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1)											
														Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
Means/Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels												
													These values were determined from the incomplete gamma distribution												
Month	Mean	Med-ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	4.40	4.11	3.60	1990	9	10.59	1990	.13	1985	15.4	10.2	2.6	.8	.69	1.06	1.70	2.31	2.93	3.62	4.41	5.37	6.66	8.75	10.75	
Feb	3.23	3.11	2.40	1963	3	8.03	1972	.20	1993	12.8	8.2	1.7	.5	.64	.93	1.40	1.84	2.28	2.75	3.29	3.93	4.78	6.15	7.45	
Mar	2.09	1.80	1.70	1972	5	4.53	1972	.37	1973	11.2	5.2	1.1	.1	.54	.74	1.04	1.31	1.57	1.85	2.16	2.52	3.00	3.75	4.45	
Apr	1.10	1.11	1.27	1992	17	2.45	1996	.08	1999	7.1	3.3	.4	.1	.15	.24	.39	.55	.71	.88	1.09	1.34	1.68	2.24	2.77	
May	.85	.58	1.68	1991	18	3.67	1998	.00	1992	6.6	2.5	.3	@	.04	.11	.23	.36	.49	.64	.82	1.04	1.35	1.86	2.36	
Jun	.84	.70	1.51	1984	21	2.92	1992	.11	1989	6.1	2.6	.3	@	.12	.19	.31	.42	.55	.68	.84	1.03	1.29	1.71	2.12	
Jul	.39	.31	.65	1948	6	1.04	1978	.00+	1984	3.5	1.2	.1	.0	.00	.00	.07	.13	.20	.28	.37	.48	.64	.90	1.17	
Aug	.58	.33	1.37	1990	21	2.98	1976	.00+	2000	3.7	1.2	.1	@	.00	.00	.01	.07	.16	.28	.44	.67	.99	1.58	2.19	
Sep	.75	.59	1.25	1984	23	2.43	1977	.00+	1998	4.6	1.9	.3	@	.00	.00	.05	.19	.33	.50	.69	.94	1.29	1.85	2.44	
Oct	1.74	1.29	2.05	1982	22	5.02	1997	.00	1987	8.8	3.7	1.0	.2	.04	.15	.37	.61	.89	1.22	1.61	2.12	2.82	4.02	5.22	
Nov	4.27	3.82	2.54	1959	22	8.75	1983	.67	1976	15.2	9.9	2.3	.5	1.10	1.51	2.13	2.67	3.21	3.78	4.41	5.16	6.13	7.67	9.11	
Dec	4.83	4.49	2.70	1999	14	10.06	1987	1.24	1997	15.5	10.6	3.1	.9	1.13	1.58	2.29	2.92	3.55	4.22	4.97	5.86	7.03	8.89	10.64	
Ann	25.07	25.43	3.60	Jan 1990	9	10.59	Jan 1990	.00+	Aug 2000	110.5	60.5	13.3	3.1	14.30	16.21	18.75	20.75	22.56	24.35	26.23	28.35	30.97	34.85	38.29	

+ 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

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Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	27.9	24.2	18	17	24.0	1982	23	61.3	1972	52	1997	1	43	1997	9.2	7.0	3.5	1.8	.4	29.0	28.0	27.3	25.0
Feb	15.3	10.9	17	17	21.0	2000	1	43.5	1979	44	1997	12	38	1972	5.1	3.4	1.8	.8	.2	24.1	23.5	22.7	16.8
Mar	5.1	3.8	6	5	7.5	1971	7	25.5	1971	38	1972	3	25	1972	2.0	1.6	.7	.1	.0	7.4	6.1	4.6	2.6
Apr	.3	.0	#	0	4.5	1972	8	4.5	1972	8	1971	1	1	1971	.1	.1	@	.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	.4	.0	#	0	2.0	1973	31	3.3	1996	2	1994	31	#+	1996	.2	.2	.0	.0	.0	.1	.0	.0	.0
Nov	9.8	7.5	1	#	16.0	1973	9	47.5	1973	17	1973	27	5	1985	3.8	2.9	1.4	.7	.1	6.1	4.5	3.1	.8
Dec	31.3	27.1	10	10	18.0	1979	2	92.3	1996	59	1996	30	30	1971	9.1	7.5	4.3	2.3	.5	22.3	20.9	18.6	12.8
Ann	90.1	73.5	N/A	N/A	24.0	Jan 1982	23	92.3	Dec 1996	59	Dec 1996	30	43	Jan 1997	29.5	22.7	11.7	5.7	1.2	89.0	83.0	76.3	58.0

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

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-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	6/23	6/16	6/11	6/06	6/02	5/29	5/24	5/19	5/12
32	5/28	5/22	5/18	5/15	5/12	5/09	5/05	5/02	4/26
28	5/06	5/01	4/27	4/24	4/21	4/18	4/15	4/12	4/07
24	4/18	4/11	4/05	4/01	3/28	3/24	3/19	3/14	3/07
20	3/25	3/18	3/13	3/09	3/05	3/01	2/24	2/19	2/12
16	3/15	3/06	2/28	2/23	2/18	2/13	2/08	2/02	1/24
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	9/10	9/13	9/16	9/19	9/21	9/24	9/27	10/01
32	9/15	9/20	9/23	9/26	9/29	10/01	10/04	10/08	10/12
28	9/26	10/01	10/05	10/09	10/12	10/15	10/18	10/22	10/28
24	10/14	10/19	10/23	10/26	10/29	11/01	11/04	11/08	11/13
20	10/26	11/03	11/09	11/14	11/19	11/23	11/28	12/04	12/12
16	11/13	11/21	11/26	12/01	12/05	12/10	12/14	12/20	12/27
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	135	126	119	113	108	102	97	90	81
32	160	153	148	143	139	135	131	125	118
28	197	188	182	177	173	168	163	157	149
24	239	230	224	219	215	210	205	199	190
20	288	277	270	264	258	252	246	239	228
16	320	308	300	293	288	282	276	268	259

* 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	1223	930	780	513	293	125	40	36	195	512	879	1191	6717
60	1068	790	625	365	164	50	10	9	105	360	729	1036	5311
57	975	706	532	280	104	23	3	3	65	272	639	943	4545
55	913	650	470	226	72	12	1	1	44	218	579	881	4067
50	758	510	320	115	21	1	0	0	14	104	434	726	3003
32	270	103	14	0	0	0	0	0	0	0	73	242	702

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	70	97	257	477	736	915	1142	1144	842	511	184	75	6450
55	0	0	0	13	95	237	430	432	197	16	0	0	1420
57	0	0	0	6	65	187	370	371	157	8	0	0	1164
60	0	0	0	2	32	124	284	285	107	3	0	0	837
65	0	0	0	0	6	50	160	157	48	0	0	0	421
70	0	0	0	0	0	13	73	68	16	0	0	0	170

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	2	64	247	494	671	910	897	600	274	29	0	0	2	66	313	807	1478	2388	3285	3885	4159	4188	4188
45	0	0	13	128	342	521	755	742	450	147	5	0	0	0	13	141	483	1004	1759	2501	2951	3098	3103	3103
50	0	0	1	52	204	371	600	587	303	60	0	0	0	0	1	53	257	628	1228	1815	2118	2178	2178	2178
55	0	0	0	16	102	231	445	432	177	20	0	0	0	0	0	16	118	349	794	1226	1403	1423	1423	1423
60	0	0	0	0	40	121	298	279	86	3	0	0	0	0	0	0	40	161	459	738	824	827	827	827
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	10	73	192	327	418	562	550	402	214	13	0	0	10	83	275	602	1020	1582	2132	2534	2748	2761	2761

(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:

www.ncdc.noaa.gov/oa/climate/normal/usnormals.html

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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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.

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|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

- U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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