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: LANDSBURG, WA **COOP ID: 454486**

Climate Division: WA 4 **NWS Call Sign:** **Elevation: 535 Feet** **Lat: 47˚23N** **Lon: 121˚59W**

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	43.7	32.0	37.9	68	1935	31	43.3	1981	1+	1950	31	31.9	1979	842	0	.0	.0	5.1	1.1	15.0	.0
Feb	48.0	32.9	40.5	74	1968	28	45.3	1983	0	1989	5	32.1	1989	688	0	.0	.0	11.0	.4	12.6	@
Mar	52.5	34.6	43.6	80	1947	15	46.9	1978	12+	1989	3	39.1	1971	664	0	.0	.0	21.0	.0	10.4	.0
Apr	57.9	37.7	47.8	88	1934	19	51.7	1992	23	1935	3	41.5	1975	516	0	.0	.0	26.7	.0	5.4	.0
May	64.3	42.7	53.5	102	1983	28	59.6	1993	23	1965	12	50.0	1996	359	2	@	.2	30.6	.0	.6	.0
Jun	69.3	47.4	58.4	101	1942	30	63.3	1978	31	1933	1	54.3	1971	210	9	.0	.5	30.0	.0	.0	.0
Jul	75.2	50.7	63.0	101+	1941	16	66.7	1990	34	1946	2	59.3	1986	97	33	.0	1.4	31.0	.0	.0	.0
Aug	75.5	50.4	63.0	102	1981	9	66.6	1990	32	1941	20	57.8	1973	109	46	.1	1.4	31.0	.0	.0	.0
Sep	69.7	45.6	57.7	95+	1988	2	61.2	1974	28	1970	13	53.7	1996	230	9	.0	.3	30.0	.0	.2	.0
Oct	58.8	39.6	49.2	84+	1980	5	54.3	1980	22	1938	16	45.9	1996	490	0	.0	.0	28.7	.0	3.9	.0
Nov	48.5	35.5	42.0	76	1949	2	46.1	1997	4	1955	15	32.2	1985	689	0	.0	.0	13.3	.5	9.2	.0
Dec	43.0	31.8	37.4	72	1937	28	42.5	1979	0	1968	30	30.6	1985	856	0	.0	.0	4.4	1.4	15.8	.0
Ann	58.9	40.1	49.5	102+	May 1983	28	66.7	Jul 1990	0+	Feb 1989	5	30.6	Dec 1985	5750	99	.1	3.8	262.8	3.4	73.1	@

+ 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: 1931-2001

(3) Derived from 1971-2000 serially complete daily data

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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	7.44	7.80	2.80	1984	24	13.72	1975	.83	1985
Feb	6.09	5.68	4.23	1996	8	12.11	1981	.49	1993
Mar	5.59	5.39	2.63	1972	5	9.93	1997	2.27	1992
Apr	4.49	4.06	3.20	1991	4	8.62	1991	1.60	1983
May	3.63	3.74	2.35	1969	29	7.83	1984	.89	1992
Jun	3.11	3.12	2.38	1968	1	6.66	1990	.57	1979
Jul	1.69	1.48	1.70	1979	1	3.93	1983	.04	1984
Aug	1.58	1.09	2.18	1968	14	5.05	1975	.28	1998
Sep	2.70	2.90	2.70	1945	20	7.48	1978	.04	1993
Oct	4.70	4.31	2.96	1942	31	11.19	1975	.39	1987
Nov	8.47	8.39	3.83	1998	25	17.79	1980	1.50	1979
Dec	7.63	6.86	2.81	1980	2	16.00	1979	2.03	1985
Ann	57.12	55.78	4.23	Feb 1996	8	17.79	Nov 1980	.04+	Sep 1993

Mean Number of Days (3)

Month	Daily Precipitation >= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	19.9	14.4	4.8	1.6
Feb	18.0	12.8	3.8	1.1
Mar	19.4	13.1	3.7	.7
Apr	17.2	11.3	2.7	.3
May	15.7	9.7	1.9	.3
Jun	12.5	7.0	2.0	.6
Jul	7.5	4.0	.9	.2
Aug	7.3	4.1	.8	.2
Sep	10.6	6.4	1.5	.3
Oct	14.9	9.6	3.2	.9
Nov	21.0	15.4	5.9	1.8
Dec	21.1	14.9	5.2	1.5
Ann	185.1	122.7	36.4	9.5

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	2.73	3.43	4.44	5.28	6.07	6.89	7.78	8.81	10.13	12.16	14.02
Feb	1.75	2.33	3.20	3.96	4.70	5.47	6.32	7.32	8.63	10.67	12.57
Mar	2.67	3.15	3.81	4.34	4.84	5.33	5.86	6.46	7.21	8.35	9.37
Apr	1.78	2.20	2.78	3.27	3.73	4.19	4.70	5.28	6.02	7.15	8.18
May	1.37	1.71	2.20	2.60	2.99	3.38	3.80	4.29	4.92	5.88	6.76
Jun	.78	1.07	1.53	1.93	2.33	2.74	3.21	3.77	4.49	5.64	6.71
Jul	.20	.33	.56	.80	1.05	1.33	1.66	2.07	2.62	3.54	4.43
Aug	.22	.35	.58	.80	1.03	1.28	1.57	1.93	2.41	3.20	3.96
Sep	.16	.32	.65	1.01	1.43	1.91	2.51	3.26	4.33	6.13	7.93
Oct	1.16	1.60	2.29	2.89	3.50	4.13	4.85	5.69	6.80	8.55	10.19
Nov	2.58	3.39	4.59	5.62	6.62	7.66	8.81	10.15	11.89	14.61	17.12
Dec	3.07	3.78	4.77	5.59	6.36	7.15	7.99	8.97	10.21	12.11	13.84
Ann	41.25	44.34	48.29	51.29	53.94	56.51	59.15	62.07	65.60	70.72	75.14

\+ 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: 1931-2001
(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	1.5	.0	#	#
Feb	.5	.0	#	0
Mar	.1	.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	1.6	.0	#	0
Dec	.9	.0	#	#
Ann	4.6	.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	7.1	1980	8	7.1	1980	13	1980	10	2	1982
Feb	8.8	1985	1	8.8	1985	9	1990	16	3	1985
Mar	1.0	1976	1	1.0	1976	6	1971	4	1	1971
Apr	#	1985	24	#+	1985	0	0	0	0	0
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	.6	1971	26	.6	1971	1	1971	26	#	1971
Nov	7.1	1985	21	21.4	1985	14	1985	22	5	1985
Dec	5.0	1974	27	5.4	1984	6	1996	29	2	1985
Ann	8.8	Feb 1985	1	21.4	Nov 1985	14	Nov 1985	22	5	Nov 1985

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.4	.7	.3	.1	.0
Feb	.8	.5	.2	.1	.0
Mar	.3	.1	.0	.0	.0
Apr	.0	.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	@	.0	.0	.0	.0
Nov	.8	.5	.2	.1	.0
Dec	1.2	.7	.2	@	.0
Ann	4.5	2.5	.9	.3	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	2.2	.6	.2	.2
Feb	.8	.3	.3	.0
Mar	.1	.0	.0	.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	.7	.5	.4	.3
Dec	2.4	.5	.2	.0
Ann	6.2	1.9	1.1	.5

+ 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	6/11	6/03	5/28	5/23	5/18	5/14	5/09	5/03	4/24
32	5/16	5/08	5/02	4/27	4/22	4/17	4/12	4/06	3/28
28	5/03	4/19	4/09	3/31	3/23	3/15	3/07	2/25	2/11
24	3/18	3/05	2/24	2/16	2/08	2/01	1/23	1/13	12/28
20	2/25	2/12	2/03	1/26	1/18	1/10	12/30	12/10	0/00
16	2/12	1/28	1/15	1/03	12/21	11/27	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	9/12	9/19	9/24	9/28	10/02	10/06	10/10	10/15	10/22
32	10/01	10/07	10/11	10/15	10/18	10/21	10/25	10/29	11/04
28	10/22	10/29	11/04	11/08	11/13	11/17	11/21	11/27	12/04
24	11/02	11/14	11/23	11/30	12/07	12/15	12/22	1/01	1/15
20	11/28	12/09	12/17	12/24	12/31	1/08	1/18	2/04	0/00
16	12/06	12/20	12/31	1/11	1/25	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	173	160	151	143	136	129	121	112	99
32	217	204	194	186	179	171	163	154	141
28	282	265	253	243	233	224	214	202	185
24	>365	341	324	312	301	290	279	267	249
20	>365	>365	>365	>365	350	335	323	311	296
16	>365	>365	>365	>365	>365	>365	>365	333	312

***** 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	842	688	664	516	359	210	97	109	230	490	689	856	5750
60	687	548	509	366	216	97	24	35	113	336	539	701	4171
57	594	464	416	279	144	52	7	13	63	249	449	608	3338
55	532	408	354	224	105	30	2	7	38	195	392	546	2833
50	383	275	210	108	35	5	0	0	7	88	256	392	1759
32	31	11	1	0	0	0	0	0	0	0	10	29	82

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	212	247	359	474	666	789	959	960	769	533	312	196	6476
55	0	0	0	8	58	129	248	254	117	15	3	0	832
57	0	0	0	3	35	91	191	198	82	7	0	0	607
60	0	0	0	0	14	46	115	127	42	1	0	0	345
65	0	0	0	0	2	9	33	46	9	0	0	0	99
70	0	0	0	0	0	0	4	9	1	0	0	0	14

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	47	80	135	245	429	557	721	723	538	299	110	41	47	127	262	507	936	1493	2214	2937	3475	3774	3884	3925
45	2	23	42	112	274	407	566	568	388	160	36	2	2	25	67	179	453	860	1426	1994	2382	2542	2578	2580
50	0	0	2	42	143	259	411	413	241	58	1	0	0	0	2	44	187	446	857	1270	1511	1569	1570	1570
55	0	0	0	11	59	126	258	259	115	12	0	0	0	0	0	11	70	196	454	713	828	840	840	840
60	0	0	0	0	19	47	127	122	38	0	0	0	0	0	0	0	19	66	193	315	353	353	353	353
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	2	29	65	133	231	306	428	433	311	151	28	1	2	31	96	229	460	766	1194	1627	1938	2089	2117	2118

(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