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: N WILLAMETTE EXP STN, OR **COOP ID: 356151**

Climate Division: OR 2 **NWS Call Sign:** **Elevation: 150 Feet** **Lat: 45˚17N** **Lon: 122˚45W**

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	46.9	33.0	40.0	63	1981	22	44.3	1995	8	1974	10	31.3	1979	777	0	.0	.0	12.1	.7	14.1	.0
Feb	51.0	34.5	42.8	72	1968	29	47.6	1991	8+	1989	5	35.0	1989	623	0	.0	.0	17.5	.3	10.1	.0
Mar	55.9	36.8	46.4	78	1994	28	51.0	1992	20	1971	1	42.3	1971	578	0	.0	.0	26.4	.0	6.3	.0
Apr	60.5	39.7	50.1	86+	1998	30	54.3	1989	19	2001	10	45.5	1972	448	0	.0	.0	28.9	.0	2.4	.0
May	66.9	44.5	55.7	101	1983	29	61.0	1997	29+	1985	11	52.0	1977	293	5	@	.6	31.0	.0	.2	.0
Jun	73.0	49.3	61.2	104	1992	23	65.7	1992	34	1966	1	57.3	1971	141	26	.1	1.3	30.0	.0	.0	.0
Jul	80.1	52.8	66.5	103	1979	17	70.4	1996	41+	1970	13	62.5	1993	47	92	.7	5.2	31.0	.0	.0	.0
Aug	80.4	52.7	66.6	105+	1981	11	70.0	1997	37	1965	29	62.3	1973	48	96	.7	5.2	31.0	.0	.0	.0
Sep	75.3	48.7	62.0	105	1988	3	66.8	1974	30+	1972	28	58.1	1985	132	42	.1	2.5	30.0	.0	.1	.0
Oct	64.1	41.8	53.0	95	1988	2	56.8	1988	25	1971	28	49.6	1971	374	0	.0	.2	30.4	.0	1.5	.0
Nov	52.3	37.6	45.0	72	1969	2	50.7	1995	14	1985	24	37.6	1985	601	0	.0	.0	21.5	.1	7.6	.0
Dec	46.2	33.1	39.7	67	1993	10	43.9	1979	-15	1998	23	33.1	1990	785	0	.0	.0	10.4	1.4	14.2	.2
Ann	62.7	42.0	52.4	105+	Sep 1988	3	70.4	Jul 1996	-15	Dec 1998	23	31.3	Jan 1979	4847	261	1.6	15.0	300.2	2.5	56.5	.2

\+ 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: 1963-2001

(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	5.94	6.28	2.02	1997	31	9.99	1980	.45	1985
Feb	5.07	4.74	2.70	1996	6	12.04	1996	.26	1993
Mar	4.28	4.09	1.97	1963	29	8.59	1997	1.46	1992
Apr	3.14	2.89	1.58	1971	9	6.76	1996	.64	1977
May	2.50	2.25	1.78	1991	17	5.57	1998	.19	1992
Jun	1.75	1.49	1.59	1984	21	5.35	1984	.30	1987
Jul	.73	.53	1.76	1987	18	2.68	1983	.00	1984
Aug	.83	.57	1.40	1983	29	2.69	1977	.00	2000
Sep	1.77	1.61	1.53	1969	18	3.61	1982	.00+	1993
Oct	3.36	3.19	4.80	1994	27	6.94	1994	.20	1988
Nov	6.48	5.94	3.71	1996	19	13.04	1973	1.39	1993
Dec	6.75	6.69	2.30	1964	22	15.72	1996	1.48	1976
Ann	42.60	41.03	4.80	Oct 1994	27	15.72	Dec 1996	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	18.1	12.8	3.9	1.1
Feb	16.7	11.9	3.2	.7
Mar	17.9	12.2	2.4	.3
Apr	16.1	9.4	1.3	.1
May	12.6	7.4	1.0	.1
Jun	8.4	4.9	.8	.2
Jul	3.7	1.9	.4	.1
Aug	4.1	2.2	.3	.1
Sep	7.2	4.7	.9	.2
Oct	12.1	7.4	2.1	.5
Nov	19.5	13.6	4.2	1.2
Dec	18.3	12.5	4.8	1.5
Ann	154.7	100.9	25.3	6.1

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	1.71	2.27	3.12	3.86	4.58	5.33	6.16	7.14	8.41	10.39	12.24
Feb	1.41	1.89	2.62	3.26	3.88	4.53	5.25	6.11	7.22	8.96	10.58
Mar	1.92	2.30	2.83	3.26	3.66	4.06	4.49	4.98	5.60	6.54	7.39
Apr	.98	1.27	1.72	2.10	2.46	2.84	3.26	3.75	4.39	5.37	6.29
May	.68	.92	1.28	1.59	1.90	2.23	2.59	3.02	3.57	4.44	5.26
Jun	.35	.50	.76	1.00	1.24	1.49	1.78	2.13	2.59	3.34	4.04
Jul	.01	.03	.11	.20	.32	.46	.63	.87	1.20	1.79	2.39
Aug	.00	.02	.09	.18	.31	.47	.68	.96	1.38	2.13	2.91
Sep	.00	.20	.52	.80	1.09	1.41	1.77	2.21	2.80	3.78	4.72
Oct	.46	.74	1.22	1.69	2.18	2.71	3.34	4.10	5.13	6.81	8.44
Nov	2.09	2.71	3.62	4.39	5.14	5.91	6.76	7.75	9.02	11.00	12.83
Dec	2.17	2.81	3.76	4.57	5.35	6.15	7.04	8.07	9.40	11.47	13.39
Ann	28.66	31.30	34.72	37.33	39.67	41.94	44.30	46.92	50.11	54.77	58.82

\+ 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: 1963-2001
(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	.9	.0	#	0
Feb	.5	.0	#	0
Mar	.0	.0	#	0
Apr	.0	.0	0	0
May	#	.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	0
Nov	.1	.0	0	0
Dec	1.1	.4	#	0
Ann	2.6	.4	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	4.0	1971	13	9.0	1971	7	1971	14	1	1971
Feb	3.0	1986	17	3.2	1986	2	1971	28	#+	1985
Mar	.5	1971	4	.5	1971	1	1971	4	#	1971
Apr	.0	0	0	.0	0	0	0	0	0	0
May	#	1978	5	#	1978	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	.0	0	0	.0	0	0	0	0	0	0
Nov	1.2	1978	20	1.2	1978	0	0	0	0	0
Dec	3.5	1972	12	4.0	1971	4	1972	14	1	1972
Ann	4.0	Jan 1971	13	9.0	Jan 1971	7	Jan 1971	14	1+	Dec 1972

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	.6	.4	.1	.0	.0
Feb	.4	.1	.1	.0	.0
Mar	.1	.0	.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	.0
Nov	.2	.1	.0	.0	.0
Dec	.9	.5	.1	.0	.0
Ann	2.2	1.1	.3	.0	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	.3	.1	.1	.0
Feb	.1	.0	.0	.0
Mar	@	.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	.0
Nov	.0	.0	.0	.0
Dec	.1	.0	.0	.0
Ann	.5	.1	.1	.0

+ 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	6/02	5/25	5/20	5/16	5/11	5/07	5/02	4/27	4/20
32	5/09	5/01	4/25	4/20	4/15	4/10	4/05	3/30	3/21
28	4/02	3/22	3/14	3/07	3/01	2/22	2/15	2/07	1/27
24	2/25	2/16	2/09	2/03	1/28	1/22	1/15	1/05	0/00
20	2/17	2/06	1/28	1/21	1/13	1/03	12/16	0/00	0/00
16	1/30	1/17	1/06	12/24	0/00	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	9/23	9/29	10/04	10/08	10/11	10/15	10/19	10/23	10/30
32	10/07	10/15	10/20	10/25	10/29	11/02	11/07	11/12	11/20
28	11/02	11/09	11/14	11/18	11/22	11/27	12/01	12/06	12/13
24	11/21	12/04	12/13	12/21	12/29	1/06	1/15	1/27	0/00
20	11/30	12/14	12/24	1/03	1/14	1/27	0/00	0/00	0/00
16	12/15	12/28	1/08	1/21	0/00	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	180	171	164	158	152	147	141	134	125
32	230	219	210	203	197	190	183	175	163
28	308	294	283	274	266	258	249	238	224
24	>365	>365	>365	353	338	327	318	307	294
20	>365	>365	>365	>365	>365	>365	346	329	314
16	>365	>365	>365	>365	>365	>365	>365	>365	353

***** 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	777	623	578	448	293	141	47	48	132	374	601	785	4847
60	622	483	423	299	161	55	9	9	52	224	451	630	3418
57	529	399	331	216	101	24	2	2	23	146	366	537	2676
55	467	343	273	164	69	12	0	0	12	102	311	476	2229
50	323	214	143	68	18	1	0	0	1	31	187	330	1316
32	19	3	0	0	0	0	0	0	0	0	5	19	46

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	265	304	445	542	735	875	1067	1071	901	650	394	257	7506
55	0	0	6	17	91	197	355	358	223	39	10	1	1297
57	0	0	1	8	61	149	294	298	174	21	5	0	1011
60	0	0	0	2	28	90	208	212	112	6	0	0	658
65	0	0	0	0	5	26	92	96	42	0	0	0	261
70	0	0	0	0	0	4	24	26	10	0	0	0	64

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	93	129	218	323	505	656	840	843	676	417	182	79	93	222	440	763	1268	1924	2764	3607	4283	4700	4882	4961
45	30	46	96	181	350	506	685	688	526	265	80	25	30	76	172	353	703	1209	1894	2582	3108	3373	3453	3478
50	0	7	29	79	205	356	530	533	377	136	21	0	0	7	36	115	320	676	1206	1739	2116	2252	2273	2273
55	0	0	0	28	98	211	375	378	236	46	0	0	0	0	0	28	126	337	712	1090	1326	1372	1372	1372
60	0	0	0	5	42	97	224	225	116	12	0	0	0	0	0	5	47	144	368	593	709	721	721	721
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	29	54	110	166	280	377	512	524	407	237	67	22	29	83	193	359	639	1016	1528	2052	2459	2696	2763	2785

(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