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: UNION EXPERIMENT STN, OR **COOP ID: 358746**

Climate Division: OR 8 **NWS Call Sign:** **Elevation: 2,765 Feet** **Lat: 45˚12N** **Lon: 117˚53W**

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	37.6	23.2	30.4	61+	1971	31	37.5	1994	-27	1943	18	17.3	1979	1073	0	.0	.0	1.9	8.4	24.4	1.2
Feb	43.8	26.6	35.2	67	1950	26	42.7	1992	-21	1933	9	23.3	1989	835	0	.0	.0	7.0	3.1	19.9	.6
Mar	51.9	29.7	40.8	77	1960	26	45.6	1986	-10	1955	5	35.5	1975	751	0	.0	.0	17.3	.3	19.2	.0
Apr	59.0	33.8	46.4	90	1977	25	53.2	1987	9	1936	1	38.4	1975	558	0	.0	@	24.1	@	11.8	.0
May	66.5	39.9	53.2	95	2001	24	58.5	1993	20	1954	1	49.2	1975	368	1	.0	.3	29.6	.0	3.3	.0
Jun	74.1	45.7	59.9	99	1940	12	65.1	1992	29+	1962	4	55.9	1980	179	26	.0	1.8	29.9	.0	.1	.0
Jul	83.6	49.4	66.5	104+	1994	23	71.8	1998	34+	1981	8	59.7	1993	62	108	.2	9.1	31.0	.0	.0	.0
Aug	84.8	48.5	66.7	108	1961	5	71.1	1971	29	1980	29	61.7	1980	69	119	.4	10.1	31.0	.0	.1	.0
Sep	75.4	40.4	57.9	101	1950	2	63.7	1998	21	1991	22	51.6	1985	243	30	.0	1.8	29.9	.0	2.8	.0
Oct	63.1	33.0	48.1	89+	2001	2	55.3	1988	12	1971	29	43.3	1971	525	0	.0	.0	27.8	.1	13.1	.0
Nov	46.8	29.6	38.2	74	1999	13	47.2	1999	-12	1955	15	25.6	1985	803	0	.0	.0	10.7	1.6	17.0	.2
Dec	38.4	24.1	31.3	62+	1946	4	36.9	1979	-24	1964	17	22.6	1990	1047	0	.0	.0	2.4	6.0	24.2	.8
Ann	60.4	35.3	47.9	108	Aug 1961	5	71.8	Jul 1998	-27	Jan 1943	18	17.3	Jan 1979	6513	284	.6	23.1	242.6	19.5	135.9	2.8

\+ 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: 1928-2001

(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	1.15	1.11	1.45	1965	28	2.53	1975	.24	1977
Feb	.97	.79	1.25	1986	23	3.03	1986	.21	1973
Mar	1.20	1.08	.89	1940	25	2.88	1983	.27	1994
Apr	1.52	1.41	1.10	1969	6	3.69	1978	.14	1973
May	2.02	1.69	1.90	1952	8	6.45	1998	.50	1992
Jun	1.47	1.42	1.72	1934	26	3.34	1984	.33	1986
Jul	.71	.55	1.06	1982	1	2.88	1982	.03	1988
Aug	.84	.54	1.59	1984	31	2.82	1976	.00	2000
Sep	.84	.61	1.00	1980	13	2.41	1980	.00+	1999
Oct	.97	1.01	1.49	1930	7	2.32	2000	.00	1987
Nov	1.53	1.49	1.35	1995	28	3.59	1995	.31	1993
Dec	1.19	1.20	1.10	1957	7	3.12	1983	.13	1976
Ann	14.41	14.45	1.90	May 1952	8	6.45	May 1998	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	11.6	3.8	.3	@
Feb	9.9	3.3	.1	.1
Mar	11.9	4.5	.2	.0
Apr	11.8	4.9	.6	@
May	11.6	5.7	1.1	.1
Jun	8.5	4.8	.6	.1
Jul	5.0	2.5	.3	@
Aug	4.9	2.2	.4	.1
Sep	5.8	2.9	.3	@
Oct	7.5	3.2	.3	.0
Nov	13.0	5.1	.4	.1
Dec	11.3	3.9	.3	.0
Ann	112.8	46.8	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	.36	.46	.63	.77	.90	1.04	1.20	1.38	1.61	1.98	2.32
Feb	.27	.36	.50	.62	.74	.86	1.00	1.16	1.38	1.71	2.02
Mar	.35	.47	.64	.78	.93	1.08	1.24	1.44	1.69	2.08	2.45
Apr	.31	.45	.67	.87	1.08	1.30	1.55	1.85	2.24	2.87	3.47
May	.52	.71	1.00	1.26	1.52	1.79	2.09	2.44	2.91	3.64	4.32
Jun	.45	.59	.80	.98	1.15	1.33	1.53	1.76	2.07	2.54	2.98
Jul	.03	.07	.15	.25	.36	.49	.64	.85	1.14	1.64	2.14
Aug	.01	.05	.14	.25	.38	.54	.74	1.01	1.38	2.04	2.70
Sep	.00	.06	.20	.33	.47	.63	.81	1.04	1.36	1.88	2.40
Oct	.14	.27	.43	.57	.70	.84	1.00	1.19	1.44	1.83	2.20
Nov	.46	.61	.83	1.01	1.20	1.39	1.59	1.84	2.16	2.65	3.11
Dec	.20	.31	.48	.64	.81	.99	1.20	1.45	1.78	2.33	2.84
Ann	10.03	10.87	11.95	12.77	13.50	14.21	14.94	15.76	16.74	18.17	19.42

+ 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: 1928-2001
(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	6.8	5.5	2	1	11.5	1989	10	25.1	1989	18	1989	10	6	1989	5.8	2.4	.6	.2	.1	12.4	8.5	4.2	.3
Feb	3.2	3.0	1	#	4.5	1994	24	15.6	1999	8	1979	5	4	1989	3.1	1.2	.2	.0	.0	5.5	2.0	.6	.0
Mar	1.5	.8	#	#	3.5	1975	25	5.6	1980	4	1975	25	#+	2000	1.7	.7	.1	.0	.0	1.3	.1	.0	.0
Apr	.5	.0	#	#	2.0	1984	29	3.5	1975	2	1997	4	#+	1999	.6	.3	.0	.0	.0	.4	.0	.0	.0
May	.1	.0	#	0	1.0	1974	16	1.0+	1981	1	1981	4	#+	1988	.1	.1	.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	#	1986	16	#	1986	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.1	.0	#	0	1.3	1975	23	1.3+	1975	1+	1991	29	#+	1991	.2	@	.0	.0	.0	.1	.0	.0	.0
Nov	2.7	1.0	#	#	7.0	1985	11	14.5	1985	9	1985	11	4	1985	2.6	1.2	.2	.1	.0	3.4	1.1	.6	.0
Dec	3.8	3.4	1	1	5.0	1971	26	8.6	1992	10	1985	2	4	1984	4.9	2.1	.4	@	.0	9.4	3.5	1.1	@
Ann	18.7	13.7	N/A	N/A	11.5	Jan 1989	10	25.1	Jan 1989	18	Jan 1989	10	6	Jan 1989	19.0	8.0	1.5	.3	.1	32.5	15.2	6.5	.3

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

(1) Derived from Snow Climatology and 1971-2000 daily data

@ Denotes mean number of days greater than 0 but less than .05

(2) Derived from 1971-2000 daily data

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

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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	7/08	7/01	6/25	6/21	6/16	6/12	6/07	6/02	5/25
32	6/06	5/31	5/26	5/22	5/19	5/15	5/11	5/07	5/01
28	5/20	5/13	5/09	5/05	5/01	4/28	4/24	4/19	4/13
24	4/27	4/20	4/15	4/11	4/07	4/03	3/29	3/24	3/18
20	4/10	4/01	3/25	3/19	3/14	3/09	3/03	2/25	2/16
16	3/10	3/01	2/22	2/16	2/11	2/05	1/30	1/22	1/11

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	8/26	8/30	9/03	9/06	9/09	9/12	9/15	9/18	9/23
32	9/06	9/11	9/14	9/17	9/20	9/23	9/26	9/29	10/04
28	9/18	9/23	9/27	9/30	10/03	10/06	10/10	10/13	10/18
24	10/01	10/07	10/10	10/13	10/16	10/19	10/23	10/26	10/31
20	10/12	10/19	10/25	10/29	11/02	11/07	11/11	11/17	11/24
16	11/03	11/12	11/18	11/23	11/28	12/03	12/09	12/16	12/26

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	112	103	96	89	84	78	72	65	55
32	143	137	132	127	124	120	115	111	104
28	178	170	164	159	154	149	144	138	130
24	219	210	203	197	192	187	181	174	165
20	267	255	246	239	232	226	218	210	198
16	346	322	310	300	291	283	274	264	249

***** 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

Complete documentation available from:
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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	1073	835	751	558	368	179	62	69	243	525	803	1047	6513
60	918	695	596	412	227	84	16	22	140	372	653	892	5027
57	825	611	503	328	154	45	6	10	92	284	564	799	4221
55	763	555	441	275	115	27	2	5	66	230	509	737	3725
50	617	426	294	161	44	5	0	0	23	116	371	585	2642
32	187	87	11	2	0	0	0	0	0	1	57	156	501

Base — Cooling Degree Days (1)

Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	138	175	284	434	656	837	1069	1073	777	498	244	132	6317
55	0	0	0	17	58	174	358	364	153	15	6	0	1145
57	0	0	0	10	35	132	301	308	119	7	1	0	913
60	0	0	0	4	15	81	217	227	77	2	0	0	623
65	0	0	0	0	1	26	108	119	30	0	0	0	284
70	0	0	0	0	0	5	38	47	9	0	0	0	99

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	8	43	102	217	419	604	830	837	551	280	76	13	8	51	153	370	789	1393	2223	3060	3611	3891	3967	3980
45	1	10	38	114	271	455	675	682	401	156	31	1	1	11	49	163	434	889	1564	2246	2647	2803	2834	2835
50	0	0	7	53	155	314	521	527	268	72	10	0	0	0	7	60	215	529	1050	1577	1845	1917	1927	1927
55	0	0	0	17	73	187	371	373	151	21	0	0	0	0	0	17	90	277	648	1021	1172	1193	1193	1193
60	0	0	0	0	30	94	230	236	70	3	0	0	0	0	0	0	30	124	354	590	660	663	663	663
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	20	64	146	258	373	522	526	376	213	33	1	0	20	84	230	488	861	1383	1909	2285	2498	2531	2532

(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