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: ODESSA, WA **COOP ID: 456039**

Climate Division: WA 7 **NWS Call Sign:** **Elevation: 1,530 Feet** **Lat: 47˚20N** **Lon: 118˚42W**

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	35.2	21.2	28.2	62	1971	31	37.3	1981	-29	1982	6	12.6	1979	1140	0	.0	.0	1.5	10.6	28.1	2.3
Feb	42.3	25.0	33.7	67	1995	20	40.9	1992	-27	1950	1	24.0	1989	879	0	.0	.0	6.6	4.3	23.8	1.1
Mar	52.8	29.4	41.1	77	1960	20	46.6	1992	4+	1989	3	35.8	1991	740	0	.0	.0	21.5	.3	21.6	.0
Apr	62.8	34.0	48.4	91+	1987	28	54.2	1987	11	1982	8	40.1	1982	499	1	.0	.1	29.3	.0	12.7	.0
May	70.7	40.2	55.5	100	1986	31	63.4	1993	20	1972	1	49.0	1989	314	18	@	1.0	30.9	.0	4.3	.0
Jun	78.1	46.8	62.5	106	1961	17	68.7	1992	27	1991	4	55.1	1991	131	55	.2	2.8	30.0	.0	.5	.0
Jul	85.6	51.5	68.6	109	1960	18	76.2	1998	32	1981	8	63.6	1989	53	162	1.7	11.0	31.0	.0	@	.0
Aug	85.5	50.7	68.1	112	1961	4	74.1	1971	32	1980	29	61.1	1989	64	160	1.5	11.1	31.0	.0	@	.0
Sep	76.5	42.5	59.5	102	1950	3	65.9	1998	21	1981	24	55.2	1977	204	39	.1	2.1	30.0	.0	2.5	.0
Oct	62.5	32.9	47.7	91	1961	15	53.1	1988	7	1991	30	42.6	1991	537	0	.0	.0	29.1	.1	16.0	.0
Nov	44.7	27.5	36.1	71	1975	5	43.5	1999	-16	1985	24	23.2	1985	866	0	.0	.0	10.1	2.0	21.5	.4
Dec	34.8	20.7	27.8	58+	1980	27	34.9	1999	-24	1990	29	18.3	1985	1155	0	.0	.0	1.5	10.0	28.4	2.1
Ann	61.0	35.2	48.1	112	Aug 1961	4	76.2	Jul 1998	-29	Jan 1982	6	12.6	Jan 1979	6582	435	3.5	28.1	252.5	27.3	159.4	5.9

\+ 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	1.20	1.08	.75	1961	30	2.63	1995	.35	1977
Feb	1.06	.98	.81	1995	7	2.39	1999	.04	1988
Mar	1.04	.95	.67	1995	9	2.10	1983	.16	1994
Apr	.77	.66	.82	1989	26	2.17	1993	.07	1977
May	.92	.83	1.10	1994	15	1.93	1980	.05	1992
Jun	.63	.59	.89	1957	2	1.39	1998	.02	1989
Jul	.52	.47	1.00	1950	19	1.94	1992	.00+	1994
Aug	.36	.22	1.17	1987	14	1.61	1990	.00+	2000
Sep	.52	.47	1.14	1954	17	1.40	1986	.00+	1999
Oct	.68	.62	.69	1979	19	2.42	1996	.00	1987
Nov	1.42	1.29	.85	1968	11	3.41	1973	.04	1976
Dec	1.68	1.72	.82	1966	13	4.36	1996	.26	1976
Ann	10.80	10.38	1.17	Aug 1987	14	4.36	Dec 1996	.00+	Aug 2000

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	9.2	4.6	.2	.0
Feb	9.0	4.0	.1	.0
Mar	9.1	3.9	.2	.0
Apr	7.0	2.3	.2	.0
May	7.0	2.9	.2	@
Jun	5.4	1.8	.1	.0
Jul	4.1	1.8	.2	.0
Aug	3.2	1.0	.1	@
Sep	4.4	2.0	.1	.0
Oct	5.7	2.2	.1	.0
Nov	10.8	4.9	.3	.0
Dec	11.0	6.1	.4	.0
Ann	85.9	37.5	2.2	.0

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	.41	.53	.69	.83	.96	1.10	1.25	1.42	1.65	1.99	2.31
Feb	.21	.30	.46	.60	.75	.90	1.08	1.30	1.58	2.04	2.47
Mar	.26	.36	.51	.65	.78	.92	1.07	1.26	1.50	1.88	2.24
Apr	.11	.18	.29	.40	.51	.63	.77	.94	1.18	1.55	1.92
May	.20	.29	.42	.54	.66	.79	.94	1.11	1.34	1.70	2.04
Jun	.09	.14	.23	.32	.41	.51	.62	.76	.95	1.26	1.55
Jul	.00	.02	.08	.15	.24	.34	.47	.63	.87	1.27	1.68
Aug	.00	.00	.00	.05	.11	.19	.29	.42	.61	.95	1.28
Sep	.00	.00	.05	.13	.23	.34	.47	.64	.87	1.27	1.66
Oct	.02	.07	.17	.27	.38	.50	.65	.84	1.10	1.53	1.96
Nov	.22	.34	.55	.74	.94	1.17	1.42	1.73	2.14	2.82	3.47
Dec	.44	.60	.84	1.05	1.27	1.49	1.74	2.03	2.41	3.02	3.58
Ann	7.00	7.71	8.63	9.34	9.97	10.59	11.24	11.96	12.84	14.12	15.25

\+ 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

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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	4.8	4.9	1	1
Feb	1.7	.5	#	0
Mar	.5	.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	1.3	.0	#	0
Dec	6.3	4.5	1	#
Ann	14.6	9.9	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	5.0	1976	5	13.0	1996	9	1991	10	3	1991
Feb	6.0	1990	16	11.0	1993	7	1989	19	3	1975
Mar	4.0	1996	5	4.0	1996	2	1989	2	#+	1997
Apr	.5	1995	8	.5	1995	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	.8	1971	31	.8	1971	#	1991	31	#	1991
Nov	4.0	1996	24	8.7	1973	6	1985	30	2	1985
Dec	6.0	1996	26	20.8	1971	13	1971	13	4	1971
Ann	6.0+	Dec 1996	26	20.8	Dec 1971	13	Dec 1971	13	4	Dec 1971

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	3.4	2.2	.4	@	.0
Feb	1.2	.8	.2	.1	.0
Mar	.3	.2	.1	.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	@	.0	.0	.0	.0
Nov	1.1	.5	.1	.0	.0
Dec	4.1	2.6	.6	.1	.0
Ann	10.1	6.3	1.4	.2	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	7.3	3.1	1.1	.0
Feb	2.1	.8	.4	.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	.0
Nov	1.0	.5	.1	.0
Dec	10.2	3.2	1.9	.0
Ann	20.7	7.6	3.5	.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	7/08	6/29	6/23	6/17	6/12	6/07	6/02	5/26	5/17
32	6/12	6/04	5/29	5/24	5/19	5/14	5/09	5/03	4/25
28	5/23	5/16	5/11	5/07	5/03	4/29	4/25	4/20	4/13
24	5/11	5/02	4/25	4/20	4/14	4/09	4/03	3/28	3/18
20	4/22	4/09	4/01	3/24	3/17	3/10	3/02	2/21	2/09
16	3/22	3/11	3/03	2/24	2/17	2/10	2/03	1/26	1/15

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	8/19	8/25	8/30	9/03	9/07	9/11	9/15	9/19	9/26
32	9/08	9/13	9/17	9/20	9/23	9/25	9/28	10/02	10/07
28	9/21	9/25	9/29	10/01	10/04	10/07	10/10	10/13	10/18
24	9/29	10/04	10/08	10/11	10/14	10/16	10/19	10/23	10/28
20	10/07	10/15	10/20	10/25	10/30	11/03	11/08	11/14	11/22
16	10/24	11/01	11/08	11/13	11/18	11/23	11/28	12/04	12/13

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	122	110	101	93	86	79	71	62	50
32	157	146	139	132	126	120	113	106	95
28	180	171	164	159	153	148	143	136	127
24	217	205	196	188	182	175	167	158	146
20	272	256	245	235	226	217	207	196	181
16	318	302	291	282	273	264	255	244	229

***** 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	1140	879	740	499	314	131	53	64	204	537	866	1155	6582
60	985	739	585	356	194	56	16	22	109	386	716	1000	5164
57	892	655	492	275	138	28	7	10	67	300	626	907	4397
55	830	599	432	225	106	17	2	5	46	247	568	845	3922
50	686	468	289	124	45	3	0	0	14	136	429	691	2885
32	244	109	16	0	0	0	0	0	0	2	80	232	683

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	127	154	299	492	727	914	1133	1119	825	488	203	100	6581
55	0	0	2	27	120	241	422	412	181	20	2	0	1427
57	0	0	0	17	90	192	365	355	142	11	0	0	1172
60	0	0	0	7	53	131	280	273	94	4	0	0	842
65	0	0	0	1	18	55	162	160	39	0	0	0	435
70	0	0	0	0	4	16	80	80	12	0	0	0	192

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	3	23	98	264	493	687	902	883	596	275	46	1	3	26	124	388	881	1568	2470	3353	3949	4224	4270	4271
45	0	1	29	148	340	537	747	728	446	147	11	0	0	1	30	178	518	1055	1802	2530	2976	3123	3134	3134
50	0	0	1	68	207	389	592	573	302	63	0	0	0	0	1	69	276	665	1257	1830	2132	2195	2195	2195
55	0	0	0	25	109	245	439	420	175	21	0	0	0	0	0	25	134	379	818	1238	1413	1434	1434	1434
60	0	0	0	5	48	131	290	276	86	4	0	0	0	0	0	5	53	184	474	750	836	840	840	840
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	1	17	81	202	335	440	566	555	408	219	22	0	1	18	99	301	636	1076	1642	2197	2605	2824	2846	2846

(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

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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