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: WORLAND MUNICIPAL AP, WY **COOP ID: 489785**

Climate Division: WY 4 **NWS Call Sign: WRL** **Elevation: 4,172 Feet** **Lat: 43˚58N** **Lon: 107˚57W**

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	30.5	3.5	17.0	62	1966	8	32.7	1981	-38+	1963	12	-2.6	1979	1488	0	.0	.0	1.2	16.8	31.0	11.6
Feb	40.0	11.8	25.9	70	1982	21	36.2	1991	-37	1996	2	12.5	1989	1096	0	.0	.0	5.1	7.0	28.2	5.1
Mar	52.2	23.9	38.1	81	1986	28	46.8	1986	-28	1989	4	28.4	1996	836	0	.0	.0	17.4	2.2	27.1	.9
Apr	62.6	33.0	47.8	88+	2000	28	55.0	1987	9	1975	2	39.5	1975	518	2	.0	.0	24.7	.3	14.6	.0
May	72.3	42.8	57.6	98	1969	27	63.0	1994	21	1967	4	53.0	1983	251	20	.0	1.0	29.7	.0	2.1	.0
Jun	83.5	51.2	67.4	107+	1990	30	76.8	1988	32	1969	12	60.5	1998	73	144	.8	8.1	29.9	.0	.0	.0
Jul	90.5	56.9	73.7	106+	1975	28	77.7	1988	37	1968	1	65.5	1993	13	282	2.5	17.9	31.0	.0	.0	.0
Aug	88.8	55.0	71.9	106+	1983	8	77.6	1971	34	1964	30	67.0	1993	23	236	1.2	15.8	31.0	.0	.0	.0
Sep	76.2	44.3	60.3	100+	1983	1	67.0	1998	15	1984	25	54.5	1985	193	49	.1	3.5	28.9	@	2.1	.0
Oct	63.0	32.8	47.9	90	1997	1	52.2	1988	-3	1991	31	43.8	1971	530	0	.0	@	26.3	.4	14.4	@
Nov	44.9	18.7	31.8	77	1999	6	41.9	1999	-26	1985	23	16.2	1985	996	0	.0	.0	10.6	5.2	28.6	2.4
Dec	32.8	6.3	19.6	67	1995	1	30.9	1980	-50	1990	21	3.6	1983	1409	0	.0	.0	2.1	14.4	30.8	8.0
Ann	61.4	31.7	46.6	107+	Jun 1990	30	77.7	Jul 1988	-50	Dec 1990	21	-2.6	Jan 1979	7426	733	4.6	46.3	237.9	46.3	178.9	28.0

\+ 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: 1960-2001

(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	.28	.22	.50+	1995	16	1.09	1995	.00	1992
Feb	.19	.18	.33	1961	3	.51	1978	.00+	1999
Mar	.46	.34	.83	1998	17	2.19	1998	.03	1988
Apr	.84	.77	1.09	1978	28	2.06	1978	.00	1987
May	1.62	1.48	2.12	1993	5	4.10	1978	.13	1994
Jun	1.11	1.03	.92	1960	9	3.00	1997	.15	1971
Jul	.70	.58	.96	1973	22	2.72	1992	.00+	1996
Aug	.55	.46	1.12	1968	23	1.59	1976	.01	1975
Sep	.85	.83	2.06	1967	18	1.88	1982	.00	1979
Oct	.73	.64	1.22	1993	7	2.54	1971	.09+	1987
Nov	.39	.31	.64	1987	2	1.06	1991	.04	1989
Dec	.25	.25	.49	1981	30	.88	1989	.01+	1994
Ann	7.97	7.72	2.12	May 1993	5	4.10	May 1978	.00+	Feb 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	5.0	.7	@	.0
Feb	4.2	.7	.0	.0
Mar	5.3	1.5	.1	.0
Apr	6.2	2.5	.3	@
May	9.2	4.4	.7	.2
Jun	7.4	3.3	.4	.0
Jul	5.4	1.8	.4	.0
Aug	4.8	1.5	.2	.0
Sep	5.6	2.5	.3	@
Oct	5.2	2.1	.3	.1
Nov	4.6	1.3	.1	.0
Dec	4.3	.7	.0	.0
Ann	67.2	23.0	2.8	.3

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	.01	.04	.08	.12	.16	.21	.27	.34	.44	.60	.75
Feb	.00	.02	.05	.08	.11	.15	.19	.24	.31	.42	.53
Mar	.04	.08	.14	.20	.27	.35	.44	.56	.72	.98	1.24
Apr	.09	.20	.34	.46	.58	.71	.86	1.03	1.27	1.65	2.00
May	.31	.45	.69	.91	1.13	1.37	1.64	1.97	2.41	3.10	3.77
Jun	.24	.34	.51	.65	.80	.96	1.13	1.34	1.62	2.06	2.48
Jul	.00	.03	.12	.23	.34	.48	.64	.85	1.14	1.64	2.14
Aug	.05	.09	.17	.24	.33	.42	.53	.67	.86	1.18	1.48
Sep	.06	.14	.28	.40	.54	.68	.85	1.05	1.33	1.78	2.22
Oct	.06	.11	.21	.31	.42	.55	.70	.89	1.15	1.59	2.01
Nov	.04	.07	.12	.17	.23	.30	.37	.47	.60	.82	1.04
Dec	.02	.04	.07	.10	.14	.19	.24	.31	.40	.56	.72
Ann	5.11	5.64	6.33	6.86	7.34	7.81	8.29	8.83	9.50	10.47	11.32

+ 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: 1960-2001
(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	4.6	4.0	3	3	6.3	1997	10	11.0	1972	15	1979	5	13	1979	4.7	1.9	.3	.2	.0	24.4	15.8	8.2	1.8
Feb	3.2	2.8	2	2	5.2	1978	19	10.7	1978	15	1979	23	13	1979	3.7	1.4	.2	@	.0	17.5	8.8	4.2	1.5
Mar	4.3	2.8	1	1	7.4	1977	25	20.6	1998	13+	1993	2	4+	1993	3.8	1.7	.4	.1	.0	5.6	2.7	1.2	.3
Apr	2.6	.9	#	0	11.0	1975	7	15.1	1975	12	1975	8	1	1975	1.5	1.0	.3	.1	@	1.3	.3	.1	.1
May	.5	.0	#	0	5.0	1983	11	6.0	1983	3+	1983	12	#	2000	.3	.2	.1	@	.0	.2	.1	.0	.0
Jun	#	.0	#	0	#	1976	14	#	1976	0	0	0	#	1995	.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	.9	.0	#	0	10.6	1984	23	12.3	1984	9	1984	24	1	1984	.3	.2	.1	.1	@	.3	.1	.1	.0
Oct	2.4	1.7	#	0	9.4	1993	8	13.3	1971	7	1993	9	1	1991	1.6	.9	.2	.1	.0	.7	.4	.2	.0
Nov	4.4	2.4	1	0	6.5	1986	6	14.1	1985	10+	1978	15	4	1978	3.2	1.6	.5	.1	.0	8.2	4.0	1.9	.1
Dec	5.4	5.7	2	1	9.0	1981	30	13.1	1989	14+	1978	31	11	1978	4.6	2.0	.3	.1	.0	16.1	9.2	4.9	1.2
Ann	28.3	20.3	N/A	N/A	11.0	Apr 1975	7	20.6	Mar 1998	15+	Feb 1979	23	13+	Feb 1979	23.7	10.9	2.4	.8	@	74.3	41.4	20.8	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	6/08	6/02	5/29	5/25	5/22	5/19	5/15	5/11	5/05
32	5/23	5/18	5/14	5/11	5/08	5/06	5/03	4/29	4/24
28	5/07	5/03	4/30	4/27	4/24	4/22	4/19	4/16	4/12
24	4/25	4/21	4/17	4/15	4/12	4/09	4/07	4/03	3/30
20	4/18	4/13	4/10	4/07	4/04	4/02	3/30	3/26	3/22
16	4/13	4/06	4/01	3/28	3/24	3/20	3/15	3/10	3/03

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	9/15	9/18	9/20	9/23	9/26	9/30
32	9/14	9/19	9/22	9/25	9/28	10/01	10/04	10/07	10/12
28	9/20	9/25	9/29	10/02	10/06	10/09	10/12	10/16	10/21
24	10/01	10/06	10/10	10/13	10/16	10/19	10/22	10/25	10/31
20	10/14	10/18	10/22	10/24	10/27	10/29	11/01	11/04	11/08
16	10/23	10/28	11/01	11/04	11/07	11/10	11/13	11/16	11/21

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	142	134	128	123	118	113	108	102	94
32	165	157	151	147	142	137	132	127	119
28	186	179	173	168	163	159	154	148	140
24	207	200	195	190	186	182	177	172	165
20	225	218	213	209	205	201	197	192	185
16	252	244	237	232	227	222	217	211	202

***** 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	1488	1096	836	518	251	73	13	23	193	530	996	1409	7426
60	1333	956	681	378	138	26	2	5	102	377	846	1254	6098
57	1240	872	588	299	88	13	0	2	62	289	756	1161	5370
55	1178	816	528	251	62	7	0	1	42	233	696	1099	4913
50	1024	687	386	151	20	0	0	0	12	120	559	948	3907
32	520	280	57	5	0	0	0	0	0	2	169	456	1489

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	55	108	244	478	792	1061	1292	1236	846	495	164	70	6841
55	0	0	2	35	141	378	579	524	198	13	0	0	1870
57	0	0	1	23	105	324	517	463	158	6	0	0	1597
60	0	0	0	11	62	248	426	373	108	2	0	0	1230
65	0	0	0	2	20	144	282	236	49	0	0	0	733
70	0	0	0	0	4	70	159	126	17	0	0	0	376

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	8	78	250	536	811	1034	985	606	274	34	1	0	8	86	336	872	1683	2717	3702	4308	4582	4616	4617
45	0	0	28	146	386	661	879	830	464	154	9	0	0	0	28	174	560	1221	2100	2930	3394	3548	3557	3557
50	0	0	7	71	250	514	724	675	326	73	0	0	0	0	7	78	328	842	1566	2241	2567	2640	2640	2640
55	0	0	0	26	137	367	569	520	204	24	0	0	0	0	0	26	163	530	1099	1619	1823	1847	1847	1847
60	0	0	0	8	61	236	417	367	108	3	0	0	0	0	0	8	69	305	722	1089	1197	1200	1200	1200
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	15	88	194	342	502	648	615	394	219	46	4	0	15	103	297	639	1141	1789	2404	2798	3017	3063	3067

(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