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, WY **COOP ID: 489770**

Climate Division: WY 4 **NWS Call Sign:** **Elevation: 4,060 Feet** **Lat: 44˚01N** **Lon: 107˚58W**

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	27.9	2.4	15.2	63	1966	9	31.3	1981	-51	1930	17	-5.2	1979	1545	0	.0	.0	.9	17.1	30.9	12.1
Feb	37.6	9.9	23.8	72	1982	22	34.2	1991	-51	1933	9	10.6	1989	1155	0	.0	.0	4.6	7.1	28.2	5.5
Mar	49.8	22.0	35.9	81	1986	29	44.2	1986	-26	1922	1	26.3	1996	902	0	.0	.0	16.9	2.5	28.2	.9
Apr	60.2	31.4	45.8	89	1987	29	52.1	1987	-18	1936	2	36.5	1975	575	0	.0	.0	24.3	.3	15.7	.0
May	70.0	41.9	56.0	96	1987	16	61.1	1994	18	1954	1	50.6	1975	294	13	.0	.6	29.6	.0	2.5	.0
Jun	81.3	50.6	66.0	104+	1970	28	74.3	1988	29	1951	3	60.1	1993	88	117	.6	7.1	29.9	.0	.0	.0
Jul	89.8	55.1	72.5	106+	1989	6	76.5	1998	36+	1972	19	64.0	1993	19	248	2.4	17.8	31.0	.0	.0	.0
Aug	88.6	52.3	70.5	105	1983	8	76.6	1983	17	1924	17	65.6	1993	32	201	.9	15.6	31.0	.0	.0	.0
Sep	75.9	40.8	58.4	102	1931	7	65.9	1998	12	1926	25	53.3	1985	234	34	.1	3.3	29.0	@	3.2	.0
Oct	61.7	30.5	46.1	90	1980	1	50.1	1979	-3	1991	31	41.4	1971	586	0	.0	@	26.2	.5	17.1	@
Nov	42.8	17.2	30.0	79	1916	1	40.0	1999	-28	1955	16	14.9	1985	1051	0	.0	.0	10.2	5.6	29.1	2.3
Dec	30.6	6.0	18.3	68+	1999	1	29.0	1980	-44	1978	31	4.4+	1983	1447	0	.0	.0	1.7	15.0	31.0	8.1
Ann	59.7	30.0	44.9	106+	Jul 1989	6	76.6	Aug 1983	-51+	Feb 1933	9	-5.2	Jan 1979	7928	613	4.0	44.4	235.3	48.1	185.9	28.9

\+ 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: 1915-2001

(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	.27	.24	1.12	1995	16	1.27	1995	.00+	1992
Feb	.19	.15	.46	1928	16	.60	1978	.00+	1999
Mar	.42	.35	1.47	1918	27	1.16	1990	.00	1979
Apr	.86	.86	2.10	1944	28	1.92	1991	.05	1987
May	1.62	1.26	2.30	1978	18	4.93	1978	.10	1994
Jun	1.15	1.12	2.05	1945	23	2.32	1998	.23	1974
Jul	.70	.63	1.80+	1931	29	2.50	1992	.00+	1996
Aug	.58	.49	1.22	1922	2	1.86	1989	.02	1995
Sep	.87	.80	1.35	1915	26	1.97	1995	.00	1979
Oct	.75	.56	1.25	1993	8	3.11	1971	.13	1987
Nov	.37	.30	.65	1991	14	1.11	1991	.03	1981
Dec	.25	.21	.45	1979	23	.73	1989	.00+	1994
Ann	8.03	7.71	2.30	May 1978	18	4.93	May 1978	.00+	Feb 1999

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.2	.7	@	@
Feb	3.4	.6	.0	.0
Mar	4.8	1.5	.1	.0
Apr	5.7	2.5	.3	@
May	8.9	4.3	.8	.2
Jun	8.2	3.5	.6	.0
Jul	5.3	2.3	.3	@
Aug	5.1	1.7	.3	.0
Sep	5.5	2.6	.3	.1
Oct	5.2	2.4	.2	.1
Nov	4.3	1.4	.1	.0
Dec	3.7	.9	.0	.0
Ann	64.3	24.4	3.0	.4

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	.00	.02	.06	.10	.15	.20	.26	.33	.43	.60	.76
Feb	.00	.00	.03	.06	.10	.13	.18	.24	.32	.46	.59
Mar	.03	.07	.13	.20	.26	.33	.42	.52	.66	.88	1.10
Apr	.13	.20	.32	.44	.57	.70	.86	1.05	1.31	1.73	2.14
May	.21	.35	.58	.80	1.04	1.30	1.60	1.98	2.48	3.31	4.11
Jun	.29	.39	.56	.71	.86	1.01	1.18	1.39	1.65	2.08	2.47
Jul	.00	.00	.15	.27	.39	.53	.69	.88	1.15	1.59	2.02
Aug	.05	.10	.17	.25	.34	.44	.56	.71	.91	1.25	1.58
Sep	.08	.18	.33	.46	.59	.73	.89	1.08	1.34	1.75	2.15
Oct	.08	.14	.24	.35	.46	.58	.73	.91	1.16	1.57	1.98
Nov	.04	.07	.13	.18	.23	.29	.36	.45	.57	.77	.96
Dec	.00	.00	.06	.10	.15	.19	.25	.32	.41	.56	.70
Ann	5.12	5.66	6.36	6.91	7.40	7.87	8.37	8.93	9.60	10.60	11.48

\+ 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: 1915-2001
(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	3.7	4.0	2	#
Feb	2.6	1.1	1	#
Mar	3.5	3.5	#	0
Apr	.9	.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
Oct	#	.0	#	0
Nov	1.3	.4	#	0
Dec	3.6	1.5	1	0
Ann	15.6	10.5	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	8.0	1995	16	9.8	1976	12	1993	27	10	1993
Feb	5.0	1978	12	10.0	1978	12	1993	27	9	1993
Mar	5.6	1996	6	15.9	1996	9	1993	3	3	1993
Apr	4.0	1979	1	7.0	1980	12	1975	7	1	1975
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	#	1985	28	#+	1985	0	0	0	0	0
Oct	#	1972	5	#	1972	4	1971	28	#	1971
Nov	4.0	1976	29	5.0	1976	6	1975	29	1	1993
Dec	5.0	1982	7	14.0	1982	10	1978	3	10	1978
Ann	8.0	Jan 1995	16	15.9	Mar 1996	12+	Feb 1993	27	10+	Jan 1993

Mean Number of Days (1)

Snow Fall >= Thresholds

Month	0.1	1.0	3.0	5.0	10.0
Jan	1.8	1.4	.6	.1	.0
Feb	1.6	1.1	.3	.1	.0
Mar	2.1	1.4	.4	.1	.0
Apr	.3	.2	.2	.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	.6	.3	.1	.0	.0
Dec	1.7	.9	.5	.1	.0
Ann	8.1	5.3	2.1	.4	.0

Snow Depth >= Thresholds

Month	1	3	5	10
Jan	-9.9	-9.9	-9.9	-9.9
Feb	4.7	1.5	.0	.0
Mar	1.3	.5	.3	.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	.3	.2	.0	.0
Dec	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	-9.9	-9.9

+ 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	6/13	6/05	5/31	5/26	5/22	5/18	5/13	5/08	4/30
32	5/23	5/18	5/14	5/11	5/09	5/06	5/03	4/29	4/24
28	5/09	5/04	5/01	4/28	4/25	4/23	4/20	4/17	4/12
24	4/24	4/19	4/16	4/13	4/11	4/08	4/05	4/02	3/28
20	4/15	4/10	4/06	4/04	4/01	3/29	3/26	3/23	3/18
16	4/11	4/03	3/29	3/25	3/21	3/17	3/12	3/07	2/28

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	9/04	9/08	9/11	9/14	9/16	9/18	9/21	9/24	9/28
32	9/11	9/15	9/19	9/22	9/24	9/27	9/30	10/03	10/08
28	9/18	9/24	9/28	10/02	10/06	10/09	10/13	10/17	10/23
24	10/01	10/06	10/10	10/13	10/16	10/19	10/22	10/26	10/31
20	10/11	10/16	10/19	10/22	10/25	10/28	10/31	11/04	11/09
16	10/24	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	141	132	126	121	116	111	106	100	92
32	160	152	147	142	138	134	129	124	116
28	187	178	172	167	162	158	152	146	138
24	210	202	197	192	188	184	179	174	166
20	226	219	215	210	207	203	199	194	188
16	255	246	240	235	230	225	220	214	206

***** 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	1545	1155	902	575	294	88	19	32	234	586	1051	1447	7928
60	1390	1015	747	429	172	34	4	8	131	431	901	1292	6554
57	1297	931	654	345	114	17	1	3	84	340	811	1199	5796
55	1235	875	592	292	83	10	0	1	59	280	751	1137	5315
50	1081	743	447	178	31	1	0	0	18	152	613	983	4247
32	570	321	81	5	0	0	0	0	0	4	208	480	1669

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	48	90	202	420	742	1018	1253	1191	790	441	147	55	6397
55	0	0	0	17	112	338	540	480	159	5	0	0	1651
57	0	0	0	10	81	285	478	419	123	2	0	0	1398
60	0	0	0	4	46	212	388	331	81	0	0	0	1062
65	0	0	0	0	13	117	248	201	34	0	0	0	613
70	0	0	0	0	2	51	136	101	11	0	0	0	301

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	7	73	235	517	794	1014	952	572	250	29	1	0	7	80	315	832	1626	2640	3592	4164	4414	4443	4444
45	0	0	25	132	372	644	859	797	427	139	7	0	0	0	25	157	529	1173	2032	2829	3256	3395	3402	3402
50	0	0	4	65	242	495	704	642	294	58	0	0	0	0	4	69	311	806	1510	2152	2446	2504	2504	2504
55	0	0	0	23	136	354	549	488	178	16	0	0	0	0	0	23	159	513	1062	1550	1728	1744	1744	1744
60	0	0	0	6	58	222	396	337	88	3	0	0	0	0	0	6	64	286	682	1019	1107	1110	1110	1110
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	14	85	188	328	494	627	590	383	215	43	4	0	14	99	287	615	1109	1736	2326	2709	2924	2967	2971

(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