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: CHURCH BUTTES GAS PLT, WY 1971-2000 COOP ID: 481736

Climate Division: WY 3 NWS Call Sign: Elevation: 7,075 Feet Lat: 41°24N Lon: 110°05W

									ŗ	Гетр	eratur	e (°F)											
	Mea	n (1)						Extr	emes					Degree Base To	-	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	28.5	8.7	18.6	54	1969	6	26.3	1994	-35	1985	31	8.8	1973	1439	0	.0	.0	.3	17.6	30.8	6.3		
Feb	32.2	11.5	21.9	58	1977	20	31.6	1995	-35+	1989	8	10.9	1989	1208	0	.0	.0	1.2	12.4	27.8	4.2		
Mar	40.3	18.4	29.4	71	1966	28	37.7	1986	-16	1993	2	20.2	1985	1106	0	.0	.0	6.9	5.0	29.2	.8		
Apr	50.1	26.5	38.3	80	1989	23	46.3	1992	-2	1985	1	30.4	1984	802	0	.0	.0	17.4	1.2	23.4	@		
May	61.4	35.0	48.2	89	1967	24	54.2	1994	14	1982	5	42.6	1978	521	1	.0	.0	27.7	.1	12.1	.0		
Jun	73.1	44.0	58.6	97	1988	26	65.7	1988	22	1975	1	52.7	1975	225	32	.0	.6	29.9	.0	1.7	.0		
Jul	81.1	51.0	66.1	97	1998	17	71.0	1988	30	1987	19	59.0	1993	71	103	.0	2.2	31.0	.0	@	.0		
Aug	79.1	50.0	64.6	98	1981	5	69.1	2000	29	1964	29	60.5	1977	91	77	.0	.8	31.0	.0	.2	.0		
Sep	68.6	40.3	54.5	92	1967	5	59.4	1998	5	1965	18	49.1	1989	323	7	.0	.0	29.0	.1	5.1	.0		
Oct	55.8	29.9	42.9	82	1974	1	49.3	1999	-9	1972	31	36.4	1984	687	0	.0	.0	23.3	.8	17.4	.0		
Nov	38.6	17.6	28.1	66+	1967	18	38.1	1999	-16	1979	29	19.5	2000	1107	0	.0	.0	6.3	7.8	27.9	1.3		
Dec	30.8	10.4	20.6	62	1958	7	32.0	1980	-40	1990	21	10.3	1983	1377	0	.0	.0	.7	15.6	30.6	5.2		
Ann	53.3	28.6	41.0	98	Aug 1981	5	71.0	Jul 1988	-40	Dec 1990	21	8.8	Jan 1973	8957	220	.0	3.6	204.7	60.6	206.2	17.8		

⁺ Also occurred on an earlier date(s)

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Issue Date: February 2004 022-A

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

⁽¹⁾ From the 1971-2000 Monthly Normals

⁽²⁾ Derived from station's available digital record: 1891-2001

⁽³⁾ Derived from 1971-2000 serially complete daily data

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COOP ID: 481736

Station: CHURCH BUTTES GAS PLT, WY

Climate Division: WY 3 NWS Call Sign: Elevation: 7,075 Feet Lat: 41°24N Lon: 110°05W

										Pı	recipi	tation	(incl	nes)													
	Me	ans/	P	recip	itatio	on Total						ays (3	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													
	Medi	ans(1)				Extremes	i			P	aily Pre	стриацю	n	These values were determined from the incomplete gamma distribution													
Month	Mean	Med- ian	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95			
Jan	.53	.43	1.13	1969	7	1.92	1988	.00	1989	3.9	2.0	.2	@	.03	.09	.17	.25	.33	.42	.53	.66	.83	1.12	1.40			
Feb	.31	.25	.72	1993	21	1.22	1993	.00+	1991	2.7	1.3	.1	.0	.00	.00	.07	.13	.18	.24	.31	.39	.50	.67	.84			
Mar	.63	.50	1.60	1983	4	2.86	1983	.06	1989	3.8	2.1	.2	@	.06	.11	.19	.28	.38	.48	.61	.77	.98	1.34	1.69			
Apr	.90	.55	1.12	1971	19	2.65	1999	.00	1985	5.1	2.8	.4	.1	.01	.05	.15	.27	.41	.58	.79	1.07	1.47	2.16	2.85			
May	1.15	.94	1.20	1981	3	2.99	1980	.00	1994	5.2	2.7	.8	.1	.05	.15	.33	.49	.67	.88	1.11	1.41	1.82	2.49	3.14			
Jun	.71	.31	2.11	1984	3	2.76	1998	.00+	2000	3.6	2.1	.3	.1	.00	.00	.02	.12	.24	.39	.59	.85	1.22	1.87	2.54			
Jul	.59	.34	1.64	1973	20	3.54	1973	.00+	2000	3.7	1.4	.2	.1	.00	.00	.08	.18	.29	.41	.55	.73	.99	1.40	1.81			
Aug	.67	.48	1.65	2000	31	2.22	2000	.00+	1982	4.2	2.0	.3	@	.00	.00	.11	.22	.33	.46	.62	.83	1.10	1.58	2.04			
Sep	.85	.70	1.40+	1986	24	2.49	1986	.00+	1979	3.6	2.3	.5	.1	.00	.00	.14	.27	.42	.59	.79	1.05	1.41	2.01	2.61			
Oct	.68	.39	.88	1991	27	2.13	1971	.00+	1999	3.4	2.1	.4	.0	.00	.00	.08	.18	.29	.43	.60	.82	1.13	1.67	2.21			
Nov	.64	.61	1.14	1983	26	2.52	1983	.00+	1999	4.3	2.3	.2	@	.00	.06	.17	.27	.37	.49	.63	.79	1.02	1.40	1.77			
Dec	.42	.36	1.30	1969	26	1.22	1987	.00	1986	2.6	1.1	.2	.0	.01	.04	.10	.16	.22	.30	.39	.51	.68	.95	1.23			
Ann	8.08	8.06	2.11	Jun 1984	3	3.54	Jul 1973	.00+	Jul 2000	46.1	24.2	3.8	.5	3.35	4.09	5.12	5.97	6.77	7.58	8.45	9.45	10.72	12.66	14.42			

⁺ Also occurred on an earlier date(s)

Complete documentation available from:

www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

[#] 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: 1891-2001

⁽³⁾ Derived from 1971-2000 serially complete daily data

Climatography of the United States No. 20 1971-2000

Elevation: 7,075 Feet

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COOP ID: 481736

Lon: 110°05W

Station: CHURCH BUTTES GAS PLT, WY

Climate Division: WY 3 NWS Call Sign:

										Snov	w (inc	hes)														
						Sn	ow To	tals							Mean Number of Days (1)											
	Mean	s/Medi	ans (1))					Extre	mes (2)							ow Fa		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	6.4	6.0	2	1	8.0	1999	27	14.0	1999	12	1993	10	9	1993	2.6	2.1	1.1	.2	.0	-9.9	-9.9	-9.9	-9.9			
Feb	3.6	3.0	1	#	9.0	1989	2	14.5	1989	12	1993	28	11	1993	2.2	1.1	.4	.2	.0	-9.9	-9.9	-9.9	-9.9			
Mar	3.1	2.0	1	#	8.6	1988	10	10.0	1973	12+	1993	1	12	1983	2.2	1.4	.2	.1	.0	1.8	.7	.5	.0			
Apr	4.1	.8	#	#	12.0	1972	14	19.1	1991	12	1972	14	2	1991	1.5	1.0	.6	.4	.2	1.2	.9	.6	.2			
May	.8	.0	#	0	10.0	1988	2	10.0	1988	2+	1999	13	#+	1999	.2	.2	@	@	@	.1	.0	.0	.0			
Jun	.0	.0	#	0	.5	1995	9	.5	1995	#	1995	9	#	1995	@	.0	.0	.0	.0	.0	.0	.0	.0			
Jul	.0	.0	#	0	.0	0	0	.0	0	#	1989	13	#	1989	.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	.4	.0	0	0	6.0	2000	23	6.5	2000	0	0	0	0	0	.2	@	@	@	.0	.0	.0	.0	.0			
Oct	1.9	.1	#	0	7.0	1971	28	16.0	1971	12	1971	29	1	1991	1.0	.6	.3	.1	.0	.6	.4	.1	.1			
Nov	4.6	3.8	#	#	4.8	1991	28	12.0	2000	5	1996	5	1+	1997	2.4	1.6	.7	.0	.0	2.8	1.4	.0	.0			
Dec	6.4	3.7	1	#	10.0	1972	29	15.0+	1999	12	1996	15	5+	1997	1.9	1.2	.7	.3	.1	-9.9	-9.9	-9.9	-9.9			
Ann	31.3	19.4	N/A	N/A	12.0	Apr 1972	14	19.1	Apr 1991	12+	Dec 1996	15	12	Mar 1983	14.2	9.2	4.0	1.3	.3	-9.9	-9.9	-9.9	-9.9			

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

Complete documentation available from: www.ncdc.noaa.gov/oa/climate/normals/usnormals.html

Lat: 41°24N

[@] 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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COOP ID: 481736

Lon: 110°05W

Lat: 41°24N

Elevation: 7.075 Feet

Station: CHURCH BUTTES GAS PLT, WY

Climate Division: WY 3 NWS Call Sign:

Freeze Data Spring Freeze Dates (Month/Day) Probability of later date in spring (thru Jul 31) than indicated(*) Temp (F) .10 .20 .30 .40 .60 .70 .80 .90 36 7/09 7/03 6/28 6/24 6/20 6/16 6/12 6/07 5/31 32 6/24 6/17 6/12 6/08 6/04 5/31 5/27 5/22 5/15 28 6/07 6/01 5/28 5/24 5/20 5/17 5/13 5/08 5/02 4/23 24 5/25 5/19 5/15 5/12 5/09 5/06 5/02 4/28 20 5/15 5/08 5/03 4/29 4/24 4/20 4/16 4/10 4/03 4/25 16 5/02 4/19 4/15 4/10 4/06 4/01 3/26 3/19 Fall Freeze Dates (Month/Day) Probability of earlier date in fall (beginning Aug 1) than indicated(*) Temp (F) .20 .30 .40 .50 .70 .10 .60 .80 .90 9/03 36 8/24 8/30 9/07 9/10 9/13 9/17 9/21 9/27 32 9/01 9/06 9/10 9/13 9/16 9/18 9/22 9/25 9/30 28 9/12 9/17 9/21 9/24 9/27 9/30 10/03 10/07 10/12 24 9/19 9/25 9/29 10/02 10/06 10/09 10/13 10/17 10/23 20 9/25 10/01 10/06 10/10 10/14 10/18 10/22 10/27 11/03 10/22 10/29 11/01 11/04 16 10/17 10/26 11/07 11/11 11/16 Freeze Free Period **Probability of longer than indicated freeze free period (Days)** Temp (F) .10 .20 .30 .40 .50 .60 .70 .80 .90 92 99 87 81 76 70 64 54 36 108 32 129 120 114 108 103 97 92 85 76 28 157 147 140 134 129 123 117 111 101 24 177 167 160 155 149 144 138 132 122

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210

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

185

216

Derived from 1971-2000 serially complete daily data

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Complete documentation available from:

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^{*} Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

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	Degree Days to Selected Base Temperatures (°F)														
Base						Heatin	g Degree	Days (1)							
Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann		
65	1439	1208	1106	802	521	225	71	91	323	687	1107	1377	8957		
60	1284	1068	951	652	372	126	21	30	197	533	957	1222	7413		
57	1191	984	858	565	290	81	9	13	136	444	867	1129	6567		
55	1129	928	796	509	239	57	4	6	101	386	807	1067	6029		
50	974	788	644	373	134	19	0	0	41	254	657	912	4796		
32	444	324	193	58	2	0	0	0	0	17	204	393	1635		

Base						Coolin	g Degree l	Days (1)					
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	28	39	110	246	504	798	1055	1009	674	353	87	39	4942
55	0	0	0	7	28	165	345	302	85	8	0	0	940
57	0	0	0	3	17	128	288	247	59	4	0	0	746
60	0	0	0	0	7	83	207	171	31	1	0	0	500
65	0	0	0	0	1	32	103	77	7	0	0	0	220
70	0	0	0	0	0	9	35	22	1	0	0	0	67

	Growing Degree Uni																												
Base		Growing Degree Units (Monthly)														Growing Degree Units (Accumulated Monthly)													
	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec .													Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
40	0	0	20	105	299	590	836	795	467	193	19	0	0	0	20	125	424	1014	1850	2645	3112	3305	3324	3324					
45	0	0	0	47	176	443	681	640	327	101	3	0	0	0	0	47	223	666	1347	1987	2314	2415	2418	2418					
50	0	0	0	14	87	302	526	485	204	40	0	0	0	0	0	14	101	403	929	1414	1618	1658	1658	1658					
55	0	0	0	0	30	180	372	331	103	10	0	0	0	0	0	0	30	210	582	913	1016	1026	1026	1026					
60	0	0	0	0	2	87	220	181	33	0	0	0	0	0	0	0	2	89	309	490	523	523	523	523					
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)																
50/86	0	0	17	92	219	382	539	514	312	148	18	0	0	0	17	109	328	710	1249	1763	2075	2223	2241	2241					

(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

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

- c. Snow Tables
 - 1. Snow Climatology
 - 2. Cooperative Summary of the Day
- d. Freeze Data Table

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

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