

Climatology of the United States

No. 20

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801
www.ncdc.noaa.gov

Station: BITTER LAKES WL REFUGE, NM

1971-2000

COOP ID: 290992

Climate Division: NM 7

NWS Call Sign:

Elevation: 3,664 Feet Lat: 33° 28N

Lon: 104° 24W

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	55.4	20.8	38.1	85	1969	8	42.8	1999	-22+	1962	11	32.8	1979	834	0	.0	.0	22.1	1.5	29.5	.6
Feb	61.4	25.2	43.3	89	1986	21	50.7	2000	-12+	1951	1	39.2	1978	608	0	.0	.0	23.5	1.0	23.4	.1
Mar	69.6	32.1	50.9	95	1971	28	55.8	1974	5	1971	3	47.1	1996	439	0	.0	.3	29.8	.1	16.3	.0
Apr	77.4	40.2	58.8	100	1965	22	63.4	2000	16	1979	4	52.8	1983	214	28	.0	2.8	29.5	.0	6.0	.0
May	85.8	50.2	68.0	110	2000	25	75.7	1996	24	1959	6	62.2	1975	63	155	1.7	11.5	31.0	.0	.3	.0
Jun	93.6	59.2	76.4	114	1994	28	83.7	1990	39	1964	1	72.3	1979	4	347	7.7	23.0	30.0	.0	.0	.0
Jul	94.9	63.7	79.3	112+	1958	13	83.2	1980	40	1988	4	73.2	1975	0	444	7.5	26.3	31.0	.0	.0	.0
Aug	92.9	61.9	77.4	107+	1966	1	80.6	1995	40	1988	29	73.1	1974	1	385	3.4	23.7	31.0	.0	.0	.0
Sep	86.1	54.2	70.2	106	1983	6	76.6	1998	30	1999	30	63.0	1974	32	186	.9	12.6	29.9	.0	.1	.0
Oct	77.0	41.1	59.1	101	2000	3	62.1	1998	10	1991	31	52.3	1976	202	17	@	2.2	30.3	.0	4.8	.0
Nov	65.1	28.9	47.0	89+	1973	2	52.1	1999	-3	1961	15	40.8	1976	541	0	.0	.0	27.4	.2	20.8	.0
Dec	56.2	20.7	38.5	85	1958	4	42.9	1994	-11+	1978	9	32.3	1989	824	0	.0	.0	22.6	1.6	28.9	.6
Ann	76.3	41.5	58.9	114	Jun 1994	28	83.7	Jun 1990	-22+	Jan 1962	11	32.3	Dec 1989	3762	1562	21.2	102.4	338.1	4.4	130.1	1.3

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1950-2001

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

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Lon: 104°24W

Precipitation (inches)																								
	Precipitation Totals									Mean Number of Days (3)				Precipitation Probabilities (1) Probability that the monthly/annual precipitation will be equal to or less than the indicated amount										
	Means/ Medians(1)		Extremes							Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels 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	.41	.32	.95	1968	21	1.46	1973	.00+	2000	2.5	1.1	.2	.0	.00	.02	.07	.13	.19	.28	.37	.50	.68	.99	1.30
Feb	.45	.25	1.43	1988	5	1.96	1997	.00+	2000	2.3	1.4	.1	.1	.00	.00	.04	.11	.18	.28	.40	.55	.76	1.13	1.50
Mar	.35	.20	2.04	2001	8	1.72	1999	.00+	1988	2.2	1.1	.1	.1	.00	.00	.03	.08	.14	.22	.31	.42	.59	.87	1.15
Apr	.51	.30	1.53	1997	25	3.06	1997	.00+	1998	2.6	1.4	.2	.1	.00	.00	.05	.13	.22	.33	.46	.62	.86	1.25	1.65
May	1.25	.68	3.14	1992	22	7.71	1992	.00+	1998	4.0	2.2	.8	.3	.00	.03	.17	.33	.53	.78	1.09	1.49	2.07	3.07	4.09
Jun	1.72	1.22	3.00	1967	4	5.96	1978	.00	1994	5.1	3.0	1.3	.5	.01	.06	.21	.41	.67	1.00	1.43	2.01	2.85	4.35	5.89
Jul	2.14	1.86	3.90	1999	10	7.75	1991	.14	1995	6.3	3.5	1.2	.7	.18	.32	.61	.90	1.23	1.60	2.05	2.61	3.38	4.67	5.95
Aug	2.52	1.73	2.80+	1977	12	7.19	1977	.03	1973	7.2	4.3	1.4	.8	.13	.26	.55	.89	1.28	1.74	2.30	3.03	4.06	5.83	7.59
Sep	1.96	1.61	4.11	1955	26	5.68	1974	.09	2000	6.8	4.1	1.6	.3	.30	.47	.75	1.02	1.30	1.61	1.96	2.39	2.96	3.90	4.79
Oct	1.34	.76	3.93	1954	7	5.61	1983	.00	1995	4.8	2.7	.7	.4	.01	.05	.17	.33	.54	.79	1.13	1.57	2.22	3.37	4.54
Nov	.68	.48	1.24	1991	16	2.08	2000	.00+	1999	3.4	1.4	.4	@	.00	.00	.08	.18	.29	.43	.60	.83	1.14	1.69	2.24
Dec	.57	.46	.97	1969	6	2.53	1991	.00+	1994	2.8	1.7	.2	.0	.00	.00	.04	.14	.24	.37	.52	.71	.97	1.41	1.87
Ann	13.90	12.79	4.11	Sep 1955	26	7.75	Jul 1991	.00+	Feb 2000	50.0	27.9	8.2	3.3	7.63	8.72	10.19	11.35	12.41	13.45	14.56	15.80	17.35	19.65	21.70

+ 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: 1950-2001

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

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Elevation: 3,664 Feet

Lat: 33°28N

Lon: 104°24W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										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	1.9	1.0	#	#	10.0	1982	13	10.0	1982	9	1980	22	1+	1999	.9	.7	.2	.1	@	1.0	.3	.1	.0
Feb	2.2	.0	#	0	16.0	1988	5	16.0	1988	16	1988	5	2	1988	.7	.6	.3	@	@	.7	.4	.2	.1
Mar	.4	.0	#	0	3.0	1974	21	3.0+	1989	2	1984	5	#+	1999	.3	.2	.1	.0	.0	.1	.0	.0	.0
Apr	#	.0	#	0	#	1984	30	#	1984	1	1980	12	#	1980	.0	.0	.0	.0	.0	.0	.0	.0	.0
May	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.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	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Oct	.1	.0	#	0	2.0	1991	31	2.0	1991	2	1991	31	#+	1991	@	@	.0	.0	.0	@	.0	.0	.0
Nov	.7	.0	#	0	5.0	2000	7	11.8	1976	5	1982	27	1	1980	.3	.2	.2	@	.0	.2	.1	@	.0
Dec	1.7	.0	#	0	9.0	1987	14	13.0	1987	10	1987	15	1	1987	.7	.6	.4	.1	.0	.7	.3	.0	.0
Ann	7.0	1.0	N/A	N/A	16.0	Feb 1988	5	16.0	Feb 1988	16	Feb 1988	5	2	Feb 1988	2.9	2.3	1.2	.2	@	2.7	1.1	.3	.1

+ 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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Elevation: 3,664 Feet

Lat: 33°28N

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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	5/19	5/14	5/11	5/08	5/05	5/02	4/29	4/26	4/21
32	5/09	5/03	4/29	4/25	4/22	4/19	4/15	4/11	4/05
28	4/25	4/20	4/17	4/15	4/12	4/10	4/07	4/04	3/31
24	4/13	4/08	4/04	4/01	3/29	3/27	3/23	3/20	3/15
20	4/03	3/28	3/23	3/19	3/15	3/11	3/07	3/02	2/24
16	3/26	3/16	3/10	3/04	2/27	2/21	2/16	2/09	1/31
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	9/25	9/29	10/02	10/05	10/07	10/10	10/12	10/15	10/20
32	10/03	10/08	10/12	10/15	10/18	10/21	10/24	10/27	11/01
28	10/13	10/17	10/21	10/24	10/27	10/29	11/01	11/05	11/10
24	10/21	10/26	10/29	11/02	11/04	11/07	11/10	11/14	11/19
20	10/26	11/01	11/06	11/10	11/14	11/17	11/21	11/26	12/03
16	11/04	11/11	11/16	11/21	11/25	11/29	12/04	12/09	12/16
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	175	168	163	159	155	151	147	142	135
32	200	192	187	182	178	174	169	164	157
28	213	207	203	200	197	193	190	186	180
24	238	232	227	223	219	216	212	207	201
20	273	263	255	249	243	237	230	223	212
16	307	295	286	278	271	263	255	246	234

* 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	834	608	439	214	63	4	0	1	32	202	541	824	3762
60	679	468	289	114	21	0	0	0	7	93	395	669	2735
57	586	385	208	69	9	0	0	0	2	51	313	576	2199
55	524	332	160	46	5	0	0	0	0	32	262	515	1876
50	371	207	68	13	0	0	0	0	0	7	154	364	1184
32	16	5	0	0	0	0	0	0	0	0	4	20	45

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	205	321	584	804	1115	1333	1467	1407	1144	838	453	219	9890
55	0	4	31	160	407	643	754	694	454	156	22	0	3325
57	0	1	17	123	350	583	692	632	396	113	13	0	2920
60	0	0	6	77	269	493	599	539	311	63	5	0	2362
65	0	0	0	28	155	347	444	385	186	17	0	0	1562
70	0	0	0	7	74	213	291	236	93	3	0	0	917

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	77	176	366	579	883	1111	1229	1166	915	601	251	88	77	253	619	1198	2081	3192	4421	5587	6502	7103	7354	7442
45	25	90	232	438	728	961	1074	1011	765	452	142	32	25	115	347	785	1513	2474	3548	4559	5324	5776	5918	5950
50	3	33	123	297	576	811	919	856	616	311	65	5	3	36	159	456	1032	1843	2762	3618	4234	4545	4610	4615
55	0	10	52	181	424	661	764	701	472	180	20	0	0	10	62	243	667	1328	2092	2793	3265	3445	3465	3465
60	0	0	15	87	279	511	609	546	330	80	1	0	0	0	15	102	381	892	1501	2047	2377	2457	2458	2458
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	138	201	322	420	559	680	772	740	580	429	246	143	138	339	661	1081	1640	2320	3092	3832	4412	4841	5087	5230

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

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.
Complete documentation for the 1971-2000 Normals is available on the internet from:
www.ncdc.noaa.gov/oa/climate/normal/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 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.

- | | |
|---|---|
| <ol style="list-style-type: none">a. Temperature/ Precipitation Tables<ol style="list-style-type: none">1. 1971-2000 Monthly Normals2. Cooperative Summary of the Day3. National Weather Service station records4. 1971-2000 serially complete daily datab. Degree Day Table<ol style="list-style-type: none">1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data | <ol style="list-style-type: none">c. Snow Tables<ol style="list-style-type: none">1. Snow Climatology2. Cooperative Summary of the Dayd. Freeze Data Table
1971-2000 serially complete daily data |
|---|---|

References

U.S. Climate Normals 1971-2000, www.ncdc.noaa.gov/normal.html
U.S. Climate Normals 1971-2000-Products Clim20, www.ncdc.noaa.gov/oa/climate/normal/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