

Climatology of the United States

No. 20

1971-2000

Station: LEWISTOWN MUNICIPAL AP, MT

COOP ID: 244985

Climate Division: MT 4

NWS Call Sign: LWT

Elevation: 4,145 Feet

Lat: 47° 03N

Lon: 109° 28W

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	31.9	10.6	21.3	73	1981	22	33.5	1983	-46	1929	28	3.5	1979	1355	0	.0	.0	2.4	14.2	28.8	8.3
Feb	36.3	14.7	25.5	70	1932	27	38.4	1991	-42	1936	17	9.3	1989	1105	0	.0	.0	5.0	8.5	25.7	5.1
Mar	42.9	21.3	32.1	88	1902	29	41.4	1986	-28+	1945	5	22.7	1996	1020	0	.0	.0	8.8	5.4	27.7	1.6
Apr	53.2	29.2	41.2	89	1939	29	47.8	1987	-17	1936	2	28.2	1975	715	0	.0	.0	17.8	1.5	19.6	.3
May	62.6	37.6	50.1	98	1931	14	55.4	1985	11+	1946	10	45.4	1996	462	0	.0	.0	27.3	.1	7.0	.0
Jun	71.5	44.9	58.2	105	1900	21	67.2	1988	21	1914	15	52.9	1998	226	22	.0	.9	29.7	.0	.4	.0
Jul	79.5	49.5	64.5	105	1900	31	69.1	1985	27	1903	9	56.4	1993	106	90	.0	3.5	31.0	.0	.0	.0
Aug	79.9	49.2	64.6	103	1961	5	73.3	1971	27	1910	25	58.4	1977	135	121	.1	4.5	30.9	.0	.1	.0
Sep	68.7	40.4	54.6	99	1909	9	61.7	1998	6	1926	24	46.9	1985	335	22	.0	.7	27.7	.1	4.1	.0
Oct	57.3	31.1	44.2	92	1905	4	48.4	1974	-10	1935	30	38.4	1984	645	0	.0	.0	23.3	1.1	16.4	.3
Nov	42.0	20.1	31.1	81+	1908	3	41.9	1999	-30	1985	23	10.5	1985	1018	0	.0	.0	9.2	6.4	25.7	2.4
Dec	34.2	12.6	23.4	74	1939	5	31.8	1999	-42	1983	24	6.1	1983	1291	0	.0	.0	3.3	11.7	28.7	5.9
Ann	55.0	30.1	42.6	105+	Jul 1900	31	73.3	Aug 1971	-46	Jan 1929	28	3.5	Jan 1979	8413	255	.1	9.6	216.4	49.0	184.2	23.9

+ 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/normal/usnormals.html

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1896-2001

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

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Lon: 109°28W

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	Median	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	.89	.73	.87	1978	25	2.75	1978	.10	1983	8.9	2.9	.1	.0	.17	.25	.38	.50	.62	.75	.90	1.08	1.32	1.70	2.07
Feb	.57	.56	2.02	1914	22	1.97	1979	.09	1987	7.0	2.0	.1	.0	.13	.18	.26	.34	.42	.50	.59	.69	.83	1.06	1.27
Mar	1.16	1.05	1.25	1995	25	2.62	1975	.35	1978	9.8	4.1	.3	.1	.40	.51	.67	.80	.93	1.06	1.21	1.37	1.59	1.92	2.23
Apr	1.38	1.27	4.50	1900	23	2.92	1994	.36	1985	9.4	4.3	.4	.1	.38	.51	.71	.88	1.05	1.23	1.43	1.66	1.96	2.43	2.88
May	2.92	2.68	2.81	1962	20	9.16	1981	.82	1984	12.7	7.1	1.6	.7	.81	1.08	1.50	1.87	2.23	2.60	3.02	3.51	4.15	5.15	6.09
Jun	2.93	2.66	3.10	1906	6	6.47	1973	.99	1974	12.7	7.3	1.7	.3	1.01	1.29	1.69	2.03	2.36	2.69	3.05	3.48	4.02	4.87	5.64
Jul	2.10	1.92	2.80	1907	13	5.46	1993	.11	1984	10.1	5.8	1.1	.2	.26	.43	.73	1.02	1.33	1.67	2.07	2.57	3.23	4.33	5.39
Aug	1.89	1.65	2.67	1964	20	5.54	1985	.20	2000	9.8	4.6	1.0	.3	.26	.42	.69	.95	1.23	1.53	1.88	2.31	2.90	3.85	4.76
Sep	1.38	1.31	1.76	1959	21	3.77	1978	.00	1990	8.2	4.0	.5	.1	.18	.35	.58	.78	.98	1.19	1.42	1.70	2.07	2.66	3.21
Oct	1.06	.89	3.80	1908	21	2.43	1981	.16	1987	6.8	3.2	.4	@	.28	.38	.54	.67	.81	.94	1.10	1.28	1.52	1.90	2.25
Nov	.74	.70	1.80	1896	24	1.57	1991	.07+	1988	7.4	2.6	.1	.0	.13	.20	.31	.41	.51	.62	.75	.90	1.11	1.44	1.76
Dec	.83	.69	1.50	1949	10	2.36	1977	.17	1986	9.2	3.0	.1	.0	.15	.22	.34	.45	.57	.69	.84	1.01	1.23	1.60	1.95
Ann	17.85	18.14	4.50	Apr 1900	23	9.16	May 1981	.00	Sep 1990	112.0	50.9	7.4	1.8	11.29	12.50	14.08	15.30	16.40	17.47	18.59	19.84	21.37	23.62	25.59

+ 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: 1896-2001

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Lat: 47°03N

Lon: 109°28W

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	11.1	9.4	5	3	9.0	1999	6	33.0	1971	32+	1978	31	24	1979	8.0	3.4	1.1	.4	.0	23.4	15.9	11.2	3.6
Feb	6.4	6.6	4	2	7.0	1982	22	14.4	1979	33+	1978	2	27	1978	6.7	2.4	.3	.1	.0	16.9	11.6	7.7	3.0
Mar	11.6	10.9	3	2	12.5	1995	25	25.7+	1995	28+	1978	7	18	1978	8.3	4.0	1.0	.3	.1	15.8	10.4	6.4	2.5
Apr	8.1	6.5	1	2	16.4	1973	20	26.5	1973	21	1973	21	6	1975	5.1	2.6	.9	.3	@	6.6	3.9	2.5	1.0
May	4.7	1.8	#	1	21.1	1982	29	29.5	1982	24+	1982	31	2+	1983	1.8	1.0	.6	.3	@	1.2	.7	.4	.2
Jun	.0	.0	#	0	1.0	1981	14	1.0	1981	10	1982	1	#	2000	.1	.0	.0	.0	.0	@	@	@	@
Jul	.0	.0	#	0	.0	0	0	.0	0	0	0	0	#	1982	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	#	.0	0	0	#	1992	23	#	1992	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	1.3	.1	#	0	5.2	1973	14	9.2	1983	6	1983	19	#	2000	.9	.5	.2	@	.0	.3	.1	@	.0
Oct	4.5	2.9	#	0	10.3	1981	12	18.6	1975	12	1981	13	2	1980	2.9	1.5	.4	.2	@	2.6	1.2	.6	@
Nov	7.2	6.6	1	1	9.0	1994	26	16.2	1996	13+	1978	22	6	1978	6.1	2.8	.5	.1	.0	10.7	5.9	2.6	.3
Dec	9.9	7.7	3	2	11.6	1971	26	30.0	1971	21+	1978	31	14	1978	8.2	3.5	.8	.2	@	19.1	11.1	7.1	2.0
Ann	64.8	52.5	N/A	N/A	21.1	May 1982	29	33.0	Jan 1971	33+	Feb 1978	2	27	Feb 1978	48.1	21.7	5.8	1.9	.1	96.6	60.8	38.5	12.6

+ 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	7/06	6/29	6/23	6/19	6/15	6/11	6/06	6/01	5/25
32	6/10	6/04	6/01	5/28	5/25	5/22	5/19	5/15	5/10
28	5/21	5/17	5/14	5/11	5/09	5/06	5/04	4/30	4/26
24	5/07	5/02	4/28	4/25	4/23	4/20	4/17	4/13	4/09
20	4/25	4/20	4/17	4/14	4/11	4/09	4/06	4/03	3/29
16	4/17	4/12	4/09	4/06	4/03	3/31	3/28	3/25	3/20
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	8/17	8/23	8/27	8/31	9/04	9/07	9/11	9/16	9/22
32	9/02	9/06	9/10	9/12	9/15	9/18	9/20	9/24	9/28
28	9/12	9/17	9/21	9/24	9/26	9/29	10/02	10/05	10/10
24	9/22	9/28	10/02	10/06	10/09	10/13	10/16	10/20	10/26
20	9/28	10/04	10/09	10/13	10/16	10/20	10/24	10/28	11/03
16	10/10	10/16	10/20	10/24	10/27	10/30	11/03	11/07	11/13
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	107	98	91	86	80	75	70	63	54
32	133	126	121	116	112	108	103	98	91
28	156	151	147	143	140	137	133	129	123
24	191	184	178	173	169	164	160	154	146
20	210	202	196	192	187	183	178	172	164
16	226	219	215	210	206	202	198	193	186

* 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
65	1355	1105	1020	715	462	226	106	135	335	645	1018	1291	8413
60	1200	965	865	568	314	122	40	67	217	490	869	1136	6853
57	1109	887	772	483	231	75	19	40	158	398	787	1043	6002
55	1051	835	710	427	183	51	11	27	124	338	731	982	5470
50	907	704	564	299	89	14	1	9	57	202	593	838	4277
32	438	307	148	34	0	0	0	0	0	9	215	367	1518

Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	106	126	151	309	562	786	1007	1009	676	387	187	100	5406
55	6	9	0	13	32	147	305	324	110	3	13	1	963
57	2	5	0	8	18	111	250	274	84	1	9	0	762
60	0	0	0	3	7	68	179	208	54	0	1	0	520
65	0	0	0	0	0	22	90	121	22	0	0	0	255
70	0	0	0	0	0	5	32	56	7	0	0	0	100

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	9	19	36	136	339	560	771	777	455	209	46	10	9	28	64	200	539	1099	1870	2647	3102	3311	3357	3367
45	0	3	11	72	204	413	616	622	318	116	17	1	0	3	14	86	290	703	1319	1941	2259	2375	2392	2393
50	0	0	0	28	104	269	461	468	200	53	6	0	0	0	0	28	132	401	862	1330	1530	1583	1589	1589
55	0	0	0	7	40	151	309	316	106	16	1	0	0	0	0	7	47	198	507	823	929	945	946	946
60	0	0	0	0	11	67	173	184	39	2	0	0	0	0	0	0	11	78	251	435	474	476	476	476
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	3	15	34	106	216	341	483	481	296	159	33	4	3	18	52	158	374	715	1198	1679	1975	2134	2167	2171

(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/normal/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 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/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