

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: BUTTE 5 SE, ND

1971-2000

COOP ID: 321225

Climate Division: ND 4

NWS Call Sign:

Elevation: 1,720 Feet Lat: 47°48N

Lon: 100°35W

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	17.0	-3.1	7.0	53	1990	10	21.1	1990	-35	1954	20	-10.2	1982	1802	0	.0	.0	.1	24.0	30.8	15.8
Feb	24.1	4.2	14.2	64+	1988	27	26.8	1984	-38	1996	1	-3.6	1979	1424	0	.0	.0	.8	17.2	27.7	9.6
Mar	36.6	16.4	26.5	76	1963	24	37.6	1986	-31	1962	1	17.9	1996	1193	0	.0	.0	5.8	9.9	28.3	3.2
Apr	54.7	29.6	42.2	93	1980	21	52.3	1987	-8	1997	9	31.5	1979	689	3	.0	.1	20.6	1.4	17.4	.3
May	69.4	42.7	56.1	98+	1980	22	64.1	1977	14	1967	2	48.2	1979	306	28	.0	1.3	29.7	.0	3.5	.0
Jun	77.7	52.2	65.0	103+	1988	28	76.4	1988	30	1969	2	59.9	1993	108	106	.2	3.5	30.0	.0	.0	.0
Jul	83.2	56.9	70.1	104+	1988	28	76.6	1989	41+	1967	3	63.2	1993	35	192	.9	7.0	31.0	.0	.0	.0
Aug	82.5	55.2	68.9	104	1964	6	74.9	1984	31	1956	20	62.1	1977	63	182	.8	8.3	31.0	.0	.0	.0
Sep	70.9	45.1	58.0	103	1978	5	64.1	1998	17	1965	26	53.0	1984	246	34	.1	1.8	28.7	.0	1.7	.0
Oct	56.6	32.8	44.7	95	1963	5	48.5	1973	-1	1991	31	39.4	1972	629	0	.0	.1	22.8	1.0	13.6	.1
Nov	34.6	16.6	25.6	76+	1999	13	38.5	1999	-22	1985	26	13.0	1985	1183	0	.0	.0	5.0	12.2	27.2	2.6
Dec	21.7	2.6	12.2	57+	1979	4	24.9	1999	-36	1983	23	-1.1	1983	1638	0	.0	.0	.4	21.7	30.7	11.7
Ann	52.4	29.3	40.9	104+	Jul 1988	28	76.6	Jul 1989	-38	Feb 1996	1	-10.2	Jan 1982	9316	545	2.0	22.1	205.9	87.4	180.9	43.3

+ 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: 1948-2001

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

010-A

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Station: BUTTE 5 SE, ND

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Climate Division: ND 4

NWS Call Sign:

Elevation: 1,720 Feet Lat: 47° 48N

Lon: 100° 35W

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	.46	.38	.52	1980	6	1.06	1980	.00+	1990	4.0	1.6	@	.0	.00	.11	.20	.27	.34	.41	.49	.58	.69	.87	1.05
Feb	.44	.27	1.20	2000	23	3.07	1998	.00	1988	3.8	1.5	.1	@	.01	.03	.08	.14	.21	.30	.40	.53	.72	1.04	1.37
Mar	.72	.81	.96	1985	28	1.77	1995	.03	1991	4.6	2.3	.3	.0	.08	.14	.24	.34	.44	.56	.70	.88	1.11	1.50	1.88
Apr	1.42	1.06	1.78	1986	18	4.82	1984	.00+	1988	5.7	3.4	.8	.2	.00	.00	.36	.61	.86	1.12	1.43	1.80	2.29	3.10	3.89
May	2.37	2.17	2.33	1960	26	6.46	1999	.36	1976	7.5	4.7	1.7	.5	.43	.64	.99	1.31	1.64	2.00	2.40	2.89	3.54	4.59	5.59
Jun	2.89	2.60	4.00	2000	14	6.45	2000	.60	1974	9.6	5.9	1.7	.4	1.02	1.29	1.69	2.02	2.34	2.66	3.02	3.44	3.97	4.79	5.54
Jul	2.65	2.36	3.11	1965	23	8.64	1993	.33	1988	7.8	5.2	1.7	.6	.52	.76	1.15	1.51	1.87	2.25	2.69	3.22	3.92	5.05	6.11
Aug	1.67	1.46	2.12	1991	5	4.39	1980	.16	1988	7.2	4.4	.9	.2	.28	.42	.66	.89	1.13	1.39	1.68	2.04	2.52	3.29	4.04
Sep	1.56	1.35	1.85	1954	14	4.61	1977	.13	1993	6.4	3.9	.8	.2	.28	.42	.64	.86	1.08	1.31	1.58	1.91	2.34	3.04	3.70
Oct	1.39	.89	2.25	1994	18	6.99	1994	.00+	1993	4.6	2.8	.9	.2	.00	.04	.19	.38	.60	.88	1.22	1.67	2.31	3.42	4.54
Nov	.70	.65	.74	1950	15	2.45	2000	.00+	1999	4.1	2.2	.2	.0	.00	.07	.20	.31	.43	.55	.70	.88	1.12	1.51	1.90
Dec	.38	.32	.70	1988	26	1.34	1977	.00+	2000	3.5	1.3	.1	.0	.00	.00	.10	.18	.25	.32	.40	.50	.62	.82	1.01
Ann	16.65	16.73	4.00	Jun 2000	14	8.64	Jul 1993	.00+	Dec 2000	68.8	39.2	9.2	2.3	10.60	11.73	13.20	14.33	15.35	16.34	17.38	18.54	19.95	22.03	23.85

+ 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: 1948-2001

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

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

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Station: BUTTE 5 SE, ND

COOP ID: 321225

Climate Division: ND 4

NWS Call Sign:

Elevation: 1,720 Feet

Lat: 47°48N

Lon: 100°35W

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	6.0	5.2	5	5	8.0	1980	6	13.0	1995	15+	1995	17	12	1994	4.4	2.5	.8	.1	.0	22.9	19.2	12.7	3.6
Feb	5.5	4.6	4	2	6.0	1998	25	18.0	1998	24	1979	28	16	1979	3.3	1.9	.6	.1	.0	13.7	10.0	4.8	1.9
Mar	4.7	3.4	3	1	8.0	1996	23	15.2	1976	26	1979	5	18	1979	2.6	1.7	.4	.2	.0	8.8	5.5	3.7	1.7
Apr	1.3	.5	1	#	12.0	1984	27	12.0	1984	20	1984	28	7	1979	.9	.6	.3	.2	@	1.8	1.4	1.2	.5
May	#	.0	#	0	#	1989	5	#+	1989	6	1991	4	#+	1991	.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	1.0	1995	21	1.0	1995	4	1984	24	#+	1995	@	@	.0	.0	.0	@	.0	.0	.0
Oct	2.4	.0	#	#	9.0	1991	29	15.0	1991	14	1985	8	1	1991	.7	.6	.3	.1	.0	.9	.5	.3	.0
Nov	5.3	3.9	1	1	7.5	1986	8	16.0	1996	16	1993	27	8	1996	3.0	2.0	.9	.4	.0	7.4	4.4	3.3	.6
Dec	5.0	4.5	3	2	6.0	1978	28	11.0	1993	13	1996	1	12	1985	3.5	2.0	.6	.2	.0	15.9	8.9	5.3	1.1
Ann	30.2	22.1	N/A	N/A	12.0	Apr 1984	27	18.0	Feb 1998	26	Mar 1979	5	18	Mar 1979	18.4	11.3	3.9	1.3	@	71.4	49.9	31.3	9.4

+ 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

Complete documentation available from:

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1971-2000**

Station: BUTTE 5 SE, ND

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Climate Division: ND 4

NWS Call Sign:

Elevation: 1,720 Feet

Lat: 47° 48N

Lon: 100° 35W

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	6/02	5/29	5/26	5/23	5/21	5/18	5/16	5/13	5/09
32	5/21	5/18	5/15	5/13	5/12	5/10	5/08	5/05	5/02
28	5/18	5/13	5/09	5/07	5/04	5/01	4/28	4/24	4/20
24	5/10	5/04	4/30	4/26	4/23	4/19	4/16	4/11	4/06
20	5/03	4/27	4/22	4/19	4/15	4/12	4/08	4/04	3/29
16	4/22	4/16	4/12	4/09	4/06	4/03	3/31	3/27	3/21
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	9/01	9/05	9/08	9/11	9/14	9/16	9/19	9/22	9/26
32	9/12	9/16	9/19	9/22	9/24	9/26	9/29	10/02	10/06
28	9/20	9/25	9/29	10/02	10/05	10/08	10/11	10/14	10/19
24	9/29	10/05	10/09	10/12	10/15	10/18	10/22	10/25	10/31
20	10/05	10/11	10/15	10/18	10/22	10/25	10/28	11/01	11/07
16	10/11	10/17	10/22	10/25	10/29	11/01	11/05	11/10	11/16
Freeze Free Period									
Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	133	127	122	119	115	112	108	104	98
32	151	145	141	138	135	131	128	124	118
28	174	167	162	157	153	149	145	140	133
24	197	190	184	179	175	170	166	160	152
20	214	205	199	194	189	184	178	172	163
16	231	222	216	210	205	200	195	188	180

* 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

Complete documentation available from:

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COOP ID: 321225

Climate Division: ND 4 NWS Call Sign: Elevation: 1,720 Feet Lat: 47° 48N Lon: 100° 35W

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	1802	1424	1193	689	306	108	35	63	246	629	1183	1638	9316
60	1647	1284	1038	548	194	46	10	23	142	475	1033	1483	7923
57	1554	1200	945	467	140	24	2	12	93	384	943	1390	7154
55	1492	1144	884	416	110	15	0	6	67	325	883	1328	6670
50	1337	1004	735	300	53	3	0	1	23	196	738	1173	5563
32	817	551	283	50	0	0	0	0	0	9	290	652	2652

Base	Cooling Degree Days (1)												
Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	38	51	112	355	746	989	1180	1143	779	403	97	38	5931
55	0	0	1	31	142	314	467	436	155	6	0	0	1552
57	0	0	0	22	111	263	407	379	121	3	0	0	1306
60	0	0	0	12	71	195	321	298	80	1	0	0	978
65	0	0	0	3	28	106	192	182	34	0	0	0	545
70	0	0	0	0	8	45	99	98	12	0	0	0	262

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	1	21	188	539	773	956	925	560	237	27	0	0	1	22	210	749	1522	2478	3403	3963	4200	4227	4227
45	0	0	2	109	393	623	801	770	415	138	8	0	0	0	2	111	504	1127	1928	2698	3113	3251	3259	3259
50	0	0	0	58	259	473	646	615	284	71	1	0	0	0	0	58	317	790	1436	2051	2335	2406	2407	2407
55	0	0	0	22	153	332	491	464	175	27	0	0	0	0	0	22	175	507	998	1462	1637	1664	1664	1664
60	0	0	0	8	77	204	338	316	96	5	0	0	0	0	0	8	85	289	627	943	1039	1044	1044	1044
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	1	20	140	337	486	620	594	342	156	16	0	0	1	21	161	498	984	1604	2198	2540	2696	2712	2712

(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 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