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: FORT PECK POWER PLANT, MT **COOP ID: 243176**

Climate Division: MT 6 **NWS Call Sign:** **Elevation: 2,070 Feet** **Lat: 48˚01N** **Lon: 106˚25W**

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	25.7	4.7	15.2	55+	1973	24	28.5	1992	-42	1969	25	-1.2	1982	1543	0	.0	.0	.8	19.1	30.1	12.6
Feb	33.6	12.1	22.9	69+	1992	28	35.1	1984	-38+	1996	3	6.3	1979	1181	0	.0	.0	3.6	12.1	26.9	7.0
Mar	45.7	22.2	34.0	79	1993	23	43.0	1986	-28	1996	6	24.2	1996	963	0	.0	.0	12.3	5.3	26.0	1.8
Apr	60.1	33.2	46.7	91	1980	20	53.7	1987	-1	1975	1	37.7	1975	553	2	.0	@	24.1	.6	13.5	@
May	71.7	43.9	57.8	100	1980	22	62.5+	1988	20	1984	1	51.4	1996	253	30	@	.8	30.2	.0	2.3	.0
Jun	81.3	52.7	67.0	107	1988	26	77.6	1988	34+	1998	4	62.6	1998	69	129	.3	4.7	30.0	.0	.0	.0
Jul	87.8	56.9	72.4	105	1985	22	76.6	1989	41+	1986	5	65.3	1993	16	244	1.0	11.9	31.0	.0	.0	.0
Aug	87.3	56.0	71.7	107	1983	6	78.5	1983	33	1994	31	65.2	1977	40	246	1.1	12.2	31.0	.0	.0	.0
Sep	74.8	45.5	60.2	103	1983	1	68.0	1998	15	1995	21	54.2	1984	206	60	@	2.1	29.3	.0	1.6	.0
Oct	61.7	36.3	49.0	89	1997	2	51.7	1992	-4	1991	30	44.9	1984	496	0	.0	.0	26.4	.4	9.5	@
Nov	42.7	22.2	32.5	78	1999	12	42.9	1999	-24	1985	27	14.6	1985	977	0	.0	.0	10.0	6.8	23.8	1.9
Dec	31.0	9.9	20.5	63	1979	4	33.6	1999	-38	1990	22	1.6	1983	1381	0	.0	.0	2.1	15.0	29.8	8.0
Ann	58.6	33.0	45.8	107+	Jun 1988	26	78.5	Aug 1983	-42	Jan 1969	25	-1.2	Jan 1982	7678	711	2.4	31.7	230.8	59.3	163.5	31.3

\+ 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/normals/usnormals.html

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1956-2001

(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	.29	.25	.40	1959	19	1.13	1971	.00	1973
Feb	.19	.14	1.14	1966	23	.69	1979	.00+	1985
Mar	.40	.32	1.13	1987	22	2.42	1987	.07	1978
Apr	.93	.62	1.98	1969	26	2.94	1991	.03	1977
May	1.80	1.44	2.83	1965	6	6.77	1978	.24	1998
Jun	2.18	1.91	3.99	1964	18	6.42	1976	.12	1979
Jul	2.16	2.00	2.64	1981	14	8.77	1993	.27	1971
Aug	1.23	.84	2.70	1993	22	4.34	1993	.04	1996
Sep	1.13	.87	2.06	1978	12	6.07	1978	.08	1981
Oct	.81	.64	1.76	1981	12	2.36	1994	.04	1987
Nov	.30	.28	.48	1993	23	.77	1992	.00+	1976
Dec	.29	.26	.52	1982	2	1.14	1982	.00+	1997
Ann	11.71	10.81	3.99	Jun 1964	18	8.77	Jul 1993	.00+	Dec 1997

Mean Number of Days (3)

Daily Precipitation

Month	>= 0.01	>= 0.10	>= 0.50	>= 1.00
Jan	4.9	1.0	.0	.0
Feb	3.3	.6	.0	.0
Mar	4.5	1.2	.1	@
Apr	6.1	2.3	.5	.1
May	9.3	4.5	.9	.3
Jun	9.5	5.1	1.4	.4
Jul	7.5	4.1	1.5	.6
Aug	5.9	2.8	.6	.2
Sep	6.3	2.8	.6	.2
Oct	4.7	2.2	.4	.1
Nov	4.0	1.0	.0	.0
Dec	5.2	.7	@	.0
Ann	71.2	28.3	6.0	1.9

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	.01	.02	.06	.10	.14	.20	.26	.35	.47	.68	.88
Feb	.00	.00	.04	.07	.11	.14	.19	.24	.31	.43	.54
Mar	.05	.08	.14	.20	.25	.32	.40	.49	.62	.83	1.03
Apr	.08	.15	.27	.40	.54	.70	.89	1.13	1.45	1.99	2.53
May	.26	.41	.67	.92	1.18	1.46	1.79	2.20	2.74	3.63	4.48
Jun	.42	.61	.93	1.23	1.53	1.85	2.21	2.65	3.24	4.18	5.07
Jul	.27	.44	.75	1.05	1.37	1.72	2.13	2.64	3.32	4.45	5.55
Aug	.13	.22	.39	.56	.74	.95	1.20	1.50	1.92	2.61	3.29
Sep	.07	.13	.27	.43	.60	.80	1.05	1.36	1.80	2.55	3.29
Oct	.05	.10	.21	.32	.44	.58	.76	.98	1.29	1.81	2.33
Nov	.00	.00	.08	.14	.19	.24	.31	.38	.48	.65	.81
Dec	.00	.05	.10	.15	.20	.24	.30	.36	.44	.58	.71
Ann	6.24	7.19	8.45	9.46	10.38	11.29	12.25	13.35	14.70	16.73	18.53

+ 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: 1956-2001
(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:
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Climate Division: MT 6 **NWS Call Sign:** **Elevation: 2,070 Feet** **Lat: 48°01N** **Lon: 106°25W**

Snow (inches)

Snow Totals

Means/Medians (1)

Extremes (2)

Mean Number of Days (1)

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	21.5	-99.9	0	0	21.5	1992	99	21.5	1992	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Feb	21.5	-99.9	0	0	21.5	1992	99	21.5	1992	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Mar	.3	-99.9	0	0	.9	1983	14	.9	1983	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Apr	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
May	.0	.0	#	0	.0	0	0	.0	0	#	1997	18	#	1997	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Sep	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Oct	#	#	0	0	#	1977	10	#+	1977	0	0	0	0	0	-9.9	-9.9	-9.9	-9.9	-9.9	.0	.0	.0	.0
Nov	-99.9	-99.9	#	0	#	1976	30	#	1976	#	1991	25	#	1991	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Dec	-99.9	-99.9	#	0	#	1990	28	#	1990	#	1990	29	#	1990	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Ann	-9.9	-9.9	N/A	N/A	21.5+	Feb 1992	99	21.5+	Feb 1992	#+	May 1997	18	#+	May 1997	-9.9	-9.9	-9.9	-9.9	-9.9	-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	6/02	5/28	5/24	5/21	5/19	5/16	5/13	5/09	5/05
32	5/21	5/16	5/13	5/10	5/08	5/05	5/02	4/29	4/25
28	5/07	5/03	5/01	4/28	4/26	4/24	4/22	4/19	4/15
24	5/04	4/29	4/25	4/22	4/19	4/17	4/13	4/10	4/05
20	4/21	4/16	4/12	4/08	4/05	4/02	3/29	3/25	3/20
16	4/13	4/08	4/04	3/31	3/28	3/25	3/22	3/18	3/12

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	9/13	9/15	9/17	9/20	9/22	9/26
32	9/14	9/19	9/22	9/24	9/26	9/29	10/01	10/04	10/08
28	9/18	9/24	9/29	10/02	10/06	10/09	10/13	10/17	10/23
24	9/28	10/04	10/09	10/13	10/17	10/21	10/25	10/30	11/06
20	10/07	10/14	10/19	10/23	10/27	10/31	11/04	11/09	11/16
16	10/14	10/21	10/27	11/01	11/06	11/10	11/15	11/21	11/28

Freeze Free Period

Temp (F)	Probability of longer than indicated freeze free period (Days)								
	.10	.20	.30	.40	.50	.60	.70	.80	.90
36	137	131	126	123	119	115	111	107	101
32	162	155	150	145	141	137	132	127	119
28	184	176	171	166	162	158	153	148	140
24	202	194	189	184	180	176	171	166	158
20	228	220	214	209	204	200	195	189	181
16	248	239	232	227	222	216	211	204	195

***** 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)

Heating Degree Days (1)

Base Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
65	1543	1181	963	553	253	69	16	40	206	496	977	1381	7678
60	1388	1050	808	411	147	24	2	14	114	342	830	1226	6356
57	1297	972	718	332	98	11	0	6	73	253	747	1134	5641
55	1237	919	661	283	72	6	0	4	51	200	691	1074	5198
50	1094	789	517	178	28	0	0	0	17	93	554	931	4201
32	603	396	144	9	0	0	0	0	0	2	193	455	1802

Cooling Degree Days (1)

Base Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann
32	83	138	204	448	800	1050	1251	1229	844	529	206	97	6879
55	4	17	9	32	159	366	538	520	205	14	14	3	1881
57	2	14	3	21	123	311	476	461	167	6	11	1	1596
60	0	8	0	10	79	234	384	376	118	1	3	0	1213
65	0	0	0	2	30	129	244	246	60	0	0	0	711
70	0	0	0	0	8	57	131	145	25	0	0	0	366

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	9	52	233	550	806	997	980	604	303	55	4	0	9	61	294	844	1650	2647	3627	4231	4534	4589	4593
45	0	1	15	132	402	656	842	825	457	182	19	0	0	1	16	148	550	1206	2048	2873	3330	3512	3531	3531
50	0	0	1	65	263	506	687	670	319	93	3	0	0	0	1	66	329	835	1522	2192	2511	2604	2607	2607
55	0	0	0	22	149	361	532	516	196	39	0	0	0	0	0	22	171	532	1064	1580	1776	1815	1815	1815
60	0	0	0	5	65	220	378	364	103	9	0	0	0	0	0	5	70	290	668	1032	1135	1144	1144	1144
Base	**Growing Degree Units for Corn (Monthly)**												**Growing Degree Units for Corn (Accumulated Monthly)**											
50/86	0	9	49	172	342	505	637	625	384	199	32	0	0	9	58	230	572	1077	1714	2339	2723	2922	2954	2954

(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.
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