U. S. DEPARTMENT OF COMMERCE
LUTHER H. HODGES, Secretary
WEATHER BUREAU
F. W. REICHELDERFER, Chief

CLIMATOGRAPHY OF THE UNITED STATES NO. 81-20

DECENNIAL CENSUS OF UNITED STATES CLIMATE—

MONTHLY NORMALS OF TEMPERATURE, PRECIPITATION, AND HEATING DEGREE DAYS

MONTANA

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PREFACE

The climatological standard normals presented in this publication are based on records for the 30-year period 1931-1960 inclusive. For the first time, normals have been computed for substations and divisions using a base period identical to that used for first-order stations.

Previous normals were published in Weather Bureau Technical Paper No. 31, "Monthly Normal Temperatures, Precipitation, and Degree Days," and were based on records for the period 1921-1950. Earlier sets of normals are described in [1].

This is the first series of publications resulting from the project "The Decennial Census of United States Climate, 1960." The project is a continuation of earlier censuses of the climate of the United States that date back to the early 19th Century and are described in [2]. Future publications of this project will be listings of daily normals of temperature, and degree days; summaries of hourly observations; and listings of monthly divisional averages of temperature and precipitation.

Units used in this publication are degrees F. for temperatures, and inches for precipitation. The heating degree day normals are derived from the monthly normal temperatures, and are computed on the standard base of 65°F. Monthly normals of less than 5 degree days are shown as zero.

Standard Normals for Weather Bureau First Order Stations

A normal of a climatological element is an arithmetic mean for a specific period of record which estimates the true mean of the element at the current exposure of the meteorological instrument measuring the element. The true mean is the mean of all possible observations (population) at the current exposure. It is from this population that future observations will come, not from values in the past record. This is what makes it important to obtain an estimate of this mean. The true mean can never be known exactly but must be estimated from a sample of the past record ([3] p. 53 section 4. 3). The normals presented here are estimates of the true mean obtained from the 30-year sample record 1931-1960. They are called standard normals because they conform to the World Meteorological Organization standard for climatological normals.

If no exposure changes have occurred at a station the normal is estimated by simply averaging the 30 values from the 1931-1960 record. Since it is next to impossible to maintain a multiple purpose network of meteorological stations without having exposure changes, it is first necessary to find and evaluate these changes and then make adjustments for them if necessary.

Heterogeneities in record due to exposure changes are found in two ways: by determining them from the station histories and by use of statistical tests. The statistical test when standardized for the purpose is easy to apply and will often find heterogeneities which are not defined by the station histories as well as those which have been so determined. Two statistical tests were employed: one for temperature and the other for precipitation. These are described in [4].

After the periods of heterogeneity have been determined, adjustments are applied to remove the heterogeneities introduced into the mean. This is done by comparing the record at the base station, for which the normal is desired, to the record at a supplementary station with a homogeneous period which covers the heterogeneous period at the base station. The difference method is applied to the monthly average maximum and minimum temperatures and the ratio method to the monthly total precipitation. A weighted average of the various partial means of the adjusted and unadjusted record is then prepared to give the normal. Brief discussions of the methods of adjustment are found in [3] (p. 49, section 4. 24).

Normal heating degree days are derived by the method described in [5].

Normals for Substations and Divisions

Normals for substations were computed somewhat differently than those for first-order stations. Monthly substation normals are the simple arithmetic averages of the monthly values of temperature and precipitation for the period 1931-1960. These were computed for only those substations that were active during the entire period and no attempt was made to adjust for minor changes in location of the observing site, or for changes in the time of observation. Normals were not computed for substations that were moved a significant distance during the 1931-1960 period. Missing values in the data series were estimated by methods described in [6]. Substations whose locations were essentially unchanged during the 1931-1960 period are identified in the tables.

Monthly divisional normals are the means of the monthly divisional averages of temperature and precipitation for the period 1931-1960. In calculating the monthly divisional averages, all of the stations in the division that furnished both temperature and precipitation data during the particular month were used. The averages therefore were obtained from a variable station sample. As a result, the divisional normals often differ from the averages of the normals for stations in the division.

Annual substation and divisional normals are the averages of the 12 monthly temperature normals and the sums of the 12 monthly precipitation normals.

References

1. U. S. Weather Bureau, "History of Climatological Publications," Key to Meteorological Records Documentation No. 4. 1, Washington, D. C., 1958.

2. H. E. Landsberg, "The Decennial United States Census of Climate 1960 and Its Antecedents," Key to Meteorological Records Documentation No. 6. 2, U. S. Weather Bureau, Washington, D. C., 1960.

3. U. S. Weather Bureau, Climatology at Work, Gerald L. Barger, ed., Washington, D. C., 1960.

4. H. C. S. Thom, "Tests of Significance for Temperature and Precipitation Normals," U. S. Weather Bureau Manuscript, 1961.

5. H. C. S. Thom, "The Rational Relationship Between Heating Degree Days and Temperature," Monthly Weather Review, Vol. 82, No. 1, January 1954.

6. U. S. Weather Bureau, Administrative Manual, Vol. III, Chap. C-05, paras. C-0509 and C-0510.

NOTES

1. Station Names

In Table I, "AP" after the city name indicates "airport station" "CO" indicates "city office station." Figures and letters following the station name indicate a rural location, and refer to the distance and direction of the station from the nearest post office.

# indicates a station whose location has been essentially unchanged during the period 1931-1960.

H indicates the ground elevation of the station in feet above sea level, as of December 31, 1960.

G indicates the elevation at hygrothermometer site (where different from "H").

T indicates the height of the thermometer in feet above the ground as of December 31, 1960.

/NO TEST/ indicates that significant difference tests were not made.

2. Table Content

* indicates that the departure of the 1951-60 record from the 1921-50 normal is statistically significant, but through the adjustments for changes in location and exposure the absolute difference between old and new normals may even in these cases be very small.

T in the data tables indicates a monthly precipitation amount of only a trace.

February monthly normals are for a 28-day month.

TABLE I - NORMALS FOR FIRST ORDER STATIONS

STATION		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
BILLINGS AP	H3567 T 4													
MAX TEMP		33.2	36.0	43.4	57.4*	68.1	76.0	88.5*	86.2	74.5	62.6	46.0	38.6*	59.2
MIN TEMP		13.1	15.3	23.0	33.6*	43.4	51.1	57.8	55.6	46.3	37.3	26.2	19.2	35.2
AVG TEMP		23.2	25.7	33.2	45.5*	55.8	63.6	73.2*	70.9	60.4	50.0	36.1	28.9*	47.2
DEG DAYS		1296	1100	986	585*	310	126	12*	25	186	471	867	1119*	7083
PRECIP		.54	.60*	1.05	1.31*	1.88	2.55*	.90	.90	1.19	1.09	.63	.59	13.23
GLASGOW AP	H2277 T 5													
MAX TEMP		19.6	24.1	37.1	55.9	68.1	74.4	85.3	82.7	70.7	58.2	38.0	26.9*	53.4
MIN TEMP		- .1	3.0	16.2*	30.8*	42.1	50.1	56.1	52.9	42.6	32.5	18.3	8.4	29.4
AVG TEMP		9.8	13.6	26.7*	43.4*	55.1	62.3	70.7	67.8	56.7	45.4	28.2	17.7*	41.4
DEG DAYS		1711	1439	1187*	648*	335	150	31	47	270	608	1104	1466*	8996
PRECIP		.48*	.41*	.56	1.01	1.49	2.98*	1.33	1.49	.96*	.64*	.47	.45	12.27
GREAT FALLS AP	H3664 T 18													
MAX TEMP		31.6	34.0	41.1*	55.2*	65.7	71.9*	83.7*	80.8*	70.2	59.3	44.2	36.8*	56.2
MIN TEMP		13.5	14.6	21.2*	32.9	42.2	48.9	56.1	53.8	45.5	37.6	26.4	19.8*	34.4
AVG TEMP		22.6	24.3	31.2*	44.1*	54.0	60.4*	69.9*	67.3*	57.9	48.5	35.3	28.3*	45.3
DEG DAYS		1333	1140	1048*	627*	353	171*	22*	47*	249	512	891	1138*	7531
PRECIP		.61*	.74*	.92	.98*	2.10*	2.90	1.28	1.26	1.20*	.73	.75	.60	14.07
HAVRE CO	H2488 T 11													
MAX TEMP		25.8	29.2	39.7*	57.2*	69.0	74.8	85.9*	82.9	71.9	60.1	41.8	32.6*	55.9
MIN TEMP		5.6	7.5	18.2*	32.0*	42.9	50.4	56.7	53.5	43.6	35.0*	20.6	12.2*	31.5
AVG TEMP		15.7	18.4	29.0*	44.6*	56.0	62.6	71.3*	68.2	57.8	47.6*	31.2	22.4*	43.7
DEG DAYS		1528	1305	1116*	612*	304	135	19*	37	252	539*	1014	1321*	8182
PRECIP		.49	.43	.60*	.97*	1.53	2.73	1.27	1.10	1.01	.79	.50	.47	11.87
HAVRE AP	H2583 T 6	/NO TEST/												
MAX TEMP		25.2	28.4	38.8	56.4	68.6	74.8	86.3	83.5	71.4	60.3	41.7	32.2	55.6
MIN TEMP		2.6	4.1	14.9	28.7	39.7	47.2	53.6	50.5	40.7	32.3	18.2	9.6	28.5
AVG TEMP		13.9	16.3	26.9	42.6	54.2	61.0	70.0	67.0	56.1	46.3	30.0	20.9	42.1
DEG DAYS		1584	1364	1181	672	353	162	28	53	291	580	1050	1367	8685
PRECIP		.49	.43	.60	.97	1.53	2.73	1.27	1.10	1.01	.79	.50	.47	11.87
HELENA AP	H3893 T 6													
MAX TEMP		28.8	33.7	42.5*	56.1	65.8	72.3	84.4	82.2	70.8*	58.8	42.4	34.2	56.0
MIN TEMP		8.4	12.7	20.2*	30.5	39.9	46.6	52.3	50.1	41.2	32.3	20.8	14.2	30.8
AVG TEMP		18.6	23.2	31.4*	43.3	52.9	59.5	68.4	66.2	56.0*	45.6	31.6	24.2	43.4
DEG DAYS		1438	1170	1042*	651	381	195	31	59	294*	601	1002	1265	8129
PRECIP		.47	.43	.70	.83	1.56	2.23	1.03	.89	.95*	.66	.57	.53	10.85
KALISPELL AP	H2965 T 6													
MAX TEMP		25.6	32.0	40.2*	54.5	65.4	71.5	82.7*	80.2*	69.2	55.0	37.3	29.2	53.6
MIN TEMP		9.0	11.9	19.3*	29.9	38.9	45.7	48.6*	46.0	39.2	30.7*	20.7*	15.7	29.6
AVG TEMP		17.3	22.0	29.8*	42.2	52.2	58.6	65.7*	63.1*	54.2	42.9*	29.0*	22.5	41.6
DEG DAYS		1479	1204	1091*	684	397	207	50*	99*	336	685*	1080*	1318	8630
PRECIP		1.37	1.00	.96*	1.04	1.67	2.21	1.04	1.09	1.04	1.24	1.43	1.33	15.42
MILES CITY AP	H2629 T 5													
MAX TEMP		27.4	31.8	42.3	58.6	70.6	78.5	90.2	87.5	75.2	62.4	43.5	33.6*	58.5
MIN TEMP		5.6	8.7	19.4	32.8	44.1	52.6	60.4	57.7	46.7	35.5	21.7	12.8*	33.2
AVG TEMP		16.4	20.2	30.9	45.7	57.3	65.6	75.3	72.6	61.0	49.0	32.6	23.2*	45.8
DEG DAYS		1507	1254	1057	579	279	99	6	6	174	502	972	1296*	7731
PRECIP		.44	.37*	.65	1.06	1.73	2.71	1.34	1.24	.96*	.87	.43	.37*	12.17
MISSOULA AP	H3200 T 7													
MAX TEMP		28.0	34.0	43.8*	57.1*	66.6*	72.8*	85.0*	82.7*	71.5	57.5	39.9	31.6	55.9
MIN TEMP		10.3*	15.9	23.6	31.4	38.5	44.2	49.0	46.9	39.2	30.4	21.0	15.4*	30.5
AVG TEMP		19.2*	25.0	33.7*	44.3*	52.6*	58.5*	67.0*	64.8*	55.4	44.0	30.5	23.5*	43.2
DEG DAYS		1420*	1120	970*	621*	391*	219*	34*	74*	303	651	1035	1287*	8125
PRECIP		.92*	.87	.73	.97	1.87	1.91	.85	.72	1.02	.99	.90	1.08	12.83

TABLE II - NORMALS BY CLIMATOLOGICAL DIVISIONS

STATIONS (By Divisions)	TEMPERATURE (°F) JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	PRECIPITATION (In.) JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL
WESTERN																										
DARBY	25.3	29.6	35.6	44.5	51.8	57.6	65.1	63.0	55.4	46.7	34.8	29.1	44.9	1.29	1.29	1.13	1.01	1.75	1.86	.82	.78	1.23	1.24	1.67	1.62	15.69
#EAST ANACONDA	22.0	24.9	30.0	40.6	49.9	56.4	66.5	64.7	55.4	45.4	31.9	26.4	42.8	.72	.68	.92	.95	1.67	2.48	1.20	.96	1.17	.87	.84	.76	13.22
#FORTINE 1 NNE	19.9	24.5	32.9	42.8	50.9	56.7	63.0	60.2	52.8	43.1	30.7	24.7	41.9	1.46	1.11	1.15	1.23	1.82	2.42	1.13	1.27	1.32	1.57	1.55	1.60	17.63
#HAMILTON	24.8	29.3	36.9	46.7	54.6	60.3	68.2	66.1	57.7	47.4	34.5	28.5	46.3	.86	.88	.67	.74	1.61	1.85	.79	.64	1.04	1.02	1.08	1.04	12.22
HAUGAN	21.8	26.4	33.0	42.4	51.0	57.0	62.9	60.9	54.1	45.0	32.4	26.1	42.8	4.27	3.43	3.07	1.89	1.70	2.18	.78	.83	1.67	2.84	4.00	4.66	31.32
HERON 2 NW	24.2	28.2	34.4	44.1	52.2	57.5	64.0	61.8	54.8	44.9	33.4	28.4	44.0	4.47	3.77	3.29	2.00	2.23	2.58	.73	.92	1.78	3.18	4.41	4.98	34.34
KALISPELL AP	17.3	22.0	29.8	42.2	52.2	58.6	65.7	63.1	54.2	42.9	29.0	22.5	41.6	1.37	1.00	.96	1.04	1.67	2.21	1.04	1.09	1.04	1.24	1.43	1.33	15.42
LIBBY 1 NE RS	*	*	*	*	*	*	*	*	*	*	*	*	*	2.18	1.50	1.41	1.04	1.29	1.66	.62	.90	1.19	1.97	2.34	2.37	18.47
#LONEPINE 1 WNW	22.9	26.2	34.7	45.7	54.2	60.3	68.2	65.9	57.3	46.4	33.0	27.8	45.2	1.03	.82	.70	.72	1.12	1.62	.61	.62	.88	1.06	1.20	1.08	11.46
#MISSOULA 2 WNW	22.4	27.5	36.0	46.4	54.6	60.5	68.3	66.3	57.4	46.2	33.4	26.8	45.5	.89	.74	.65	.96	1.82	1.99	.91	.75	1.06	.96	.93	1.12	12.78
MISSOULA AP	19.2	25.0	33.7	44.3	52.6	58.5	67.0	64.8	55.4	44.0	30.5	23.5	43.2	.92	.87	.73	.97	1.87	1.91	.85	.72	1.02	.99	.90	1.08	12.83
#OVANDO 1 SW	15.2	20.4	28.0	41.0	48.6	54.6	61.7	59.3	51.2	42.4	28.6	20.4	39.3	1.50	1.18	1.09	.67	1.79	2.33	1.00	.88	1.13	1.21	1.44	1.73	15.95
PHILIPSBURG RS	*	*	*	*	*	*	*	*	*	*	*	*	*	.84	.82	1.03	1.17	2.07	2.93	1.26	1.09	1.22	.98	.82	.76	14.97
#PLEASANT VALLEY	19.5	23.6	30.1	40.2	48.4	54.2	60.1	57.9	50.9	42.2	30.1	24.2	40.1	1.91	1.52	1.30	1.19	1.54	2.08	1.02	.96	1.20	1.81	2.19	2.12	18.84
POLSON AIRPORT	25.1	27.7	35.1	45.1	53.1	59.7	67.4	65.7	56.9	46.3	34.6	29.7	45.5	1.02	.97	.89	1.16	1.93	2.27	1.00	.94	1.23	1.29	1.17	1.16	15.03
#SAINT IGNATIUS	25.1	28.4	36.2	46.3	54.3	60.2	67.6	65.6	57.2	46.9	34.7	29.7	46.0	.84	.85	.99	1.32	2.21	2.51	.98	1.04	1.25	1.20	1.01	.90	15.10
#SILVER LAKE	*	*	*	*	*	*	*	*	*	*	*	*	*	.98	1.10	1.52	1.76	2.49	3.18	1.48	1.29	1.61	1.29	1.08	.91	18.69
STEVENSVILLE	23.0	27.8	35.7	45.4	53.2	59.1	66.0	63.7	55.2	45.4	33.2	27.0	44.6	1.07	1.00	.83	.78	1.52	1.73	.93	.69	.92	.94	1.10	1.20	12.71
SUPERIOR	24.6	29.5	36.8	45.7	53.9	60.1	67.5	65.1	57.3	46.8	34.3	28.2	45.8	1.64	1.29	1.17	1.10	1.76	2.04	.78	.77	1.12	1.50	1.58	1.60	16.35
THOMPSON FALLS PH	26.6	30.8	38.1	47.2	55.3	61.3	69.2	67.6	59.8	48.7	36.0	30.9	47.6	2.11	1.70	1.88	1.52	1.79	1.96	.82	.80	1.29	2.07	2.41	2.45	20.80
WEST GLACIER	21.1	24.3	31.4	41.8	51.1	57.0	64.0	62.0	53.3	43.1	30.9	25.7	42.1	3.13	2.42	1.81	1.87	2.36	3.02	1.27	1.33	1.89	2.64	3.06	3.26	28.06
DIVISION	21.8	25.8	33.0	43.2	51.5	57.5	64.9	62.8	54.6	44.7	32.1	26.2	43.2	1.81	1.47	1.35	1.25	1.82	2.26	.99	.96	1.29	1.63	1.87	1.96	18.66
SOUTHWESTERN																										
BOZEMAN AGR COLLEGE	20.3	23.8	30.1	42.2	51.3	57.7	66.4	64.9	55.8	46.0	31.9	25.4	43.0	.90	.74	1.52	1.73	2.34	2.95	1.14	1.17	1.57	1.40	1.05	.87	17.38
BUTTE FAA AP	15.1	19.5	26.3	38.5	47.3	54.3	62.7	60.3	51.2	41.6	27.7	20.1	38.7	.42	.44	.65	.90	1.74	2.42	1.20	1.03	1.04	.67	.49	.48	11.48
DILLON WMCE	21.9	25.4	32.5	43.0	51.2	58.2	65.9	63.7	55.2	46.1	33.0	26.3	43.5	.44	.47	.71	1.12	1.81	2.14	1.16	.83	1.06	.76	.43	.41	11.34
#ENNIS	21.8	25.1	31.6	42.1	50.8	57.3	64.8	62.8	54.4	45.8	33.0	26.9	43.0	.25	.25	.46	.95	1.64	2.47	1.14	.94	1.15	.72	.31	.29	10.57
#HEBGEN DAM	11.4	15.4	22.6	34.8	45.8	53.3	61.3	60.0	51.3	40.7	25.0	16.0	36.5	2.76	2.41	2.39	1.67	2.49	2.85	1.53	1.32	1.45	1.86	2.38	2.73	25.84
#LIMA	16.0	19.1	26.8	38.7	47.5	54.5	63.1	61.4	53.0	43.2	28.2	20.4	39.3	.33	.29	.55	.93	1.77	2.11	1.08	.93	.96	.87	.35	.33	10.50
#NORRIS MADISON PH	25.5	28.4	34.5	45.2	54.4	61.4	70.8	69.2	59.9	49.7	36.5	30.3	47.2	.76	.76	1.34	2.01	2.55	3.14	1.38	1.13	1.66	1.38	.87	.73	17.71
#TRIDENT	22.5	27.8	35.4	46.8	55.5	62.3	70.2	68.0	58.5	48.7	34.8	27.8	46.5	*	*	*	*	*	*	*	*	*	*	*	*	*
VIRGINIA CITY	20.8	24.2	30.2	40.7	49.5	56.3	65.7	63.7	54.7	44.8	31.3	25.0	42.2	.65	.51	1.03	1.39	1.86	2.57	1.38	1.11	1.22	.87	.72	.64	13.95
WEST YELLOWSTONE	11.7	16.2	22.5	34.4	44.2	51.5	59.6	57.1	48.3	38.0	22.3	15.0	35.1	2.30	1.81	1.88	1.44	2.14	2.44	1.26	1.18	1.17	1.63	1.79	2.18	21.22
DIVISION	18.1	21.9	28.5	40.0	49.0	55.8	64.1	62.1	53.3	43.7	29.7	22.7	40.7	.83	.73	1.05	1.23	1.93	2.48	1.19	1.06	1.22	1.05	.81	.83	14.41

TABLE II - NORMALS BY CLIMATOLOGICAL DIVISIONS

MONTANA

STATIONS (By Divisions)	TEMPERATURE (°F) JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL	PRECIPITATION (In.) JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER	ANNUAL
NORTH CENTRAL																										
BABB 6 NE	19.5	20.9	26.8	38.3	47.6	53.2	60.3	58.5	50.9	42.8	31.3	25.1	39.6	.80	.91	1.06	1.56	2.58	4.04	1.63	1.74	1.98	1.26	1.06	.93	19.55
#BIG SANDY	16.2	19.7	30.0	45.4	56.0	62.5	71.3	68.7	58.1	47.2	31.6	22.3	44.1	.31	.35	.59	.80	1.84	3.07	1.30	1.23	1.00	.63	.47	.47	12.06
BROWNING	19.4	21.3	27.6	39.7	48.9	54.8	62.8	60.4	52.5	43.7	31.0	24.8	40.6	.75	.72	.75	1.08	1.93	3.25	1.37	1.18	1.36	.91	.80	.71	14.81
CHINOOK	13.6	16.9	28.2	44.5	55.7	62.4	70.3	67.2	57.0	46.3	30.1	20.4	42.7	.51	.43	.60	.91	1.68	3.04	1.33	1.23	1.06	.71	.51	.51	12.52
#CHOTEAU	22.0	24.1	30.6	42.2	52.0	58.4	66.4	64.0	54.9	46.4	33.9	27.4	43.5	.24	.32	.44	.74	2.00	3.07	1.32	1.14	1.07	.57	.31	.23	11.45
CONRAD	19.6	22.1	29.5	42.2	52.6	59.3	67.0	64.8	55.6	46.1	32.7	25.2	43.1	.31	.44	.61	.99	1.73	3.03	1.57	1.15	1.02	.59	.38	.36	12.18
CUT BANK AP	17.4	19.4	26.9	39.9	50.4	56.8	65.3	62.6	53.3	43.7	30.2	23.2	40.8	.37	.38	.46	.79	1.72	2.84	1.35	1.31	1.11	.52	.35	.33	11.53
DUNKIRK 14 NNE	15.1	18.6	27.4	40.8	51.6	58.2	66.6	63.8	54.0	43.4	28.6	20.9	40.8	.37	.45	.48	.82	1.53	2.77	1.39	1.34	1.03	.59	.40	.44	11.61
#FAIRFIELD	21.7	24.1	30.8	42.9	52.3	58.3	66.9	64.5	56.2	47.4	34.1	27.1	43.9	.30	.36	.50	.76	1.97	3.14	1.26	1.11	1.08	.64	.36	.24	11.72
#FORT ASSINNIBOINE	14.4	16.6	27.2	43.3	54.6	61.3	70.0	67.2	56.6	45.6	29.9	21.0	42.3	.37	.34	.49	.89	1.47	2.76	1.31	1.21	.92	.72	.40	.37	11.25
#HARLEM	12.2	15.7	27.3	43.6	55.2	61.7	69.8	66.5	56.2	45.6	29.2	19.3	41.9	.51	.51	.64	.79	1.54	3.10	1.46	1.13	.93	.68	.52	.49	12.30
HAVRE CO	15.7	18.4	29.0	44.6	56.0	62.6	71.3	68.2	57.8	47.6	31.2	22.4	43.7	.49	.43	.60	.97	1.53	2.73	1.27	1.10	1.01	.79	.50	.47	11.87
HAVRE AP	13.9	16.3	26.9	42.6	54.2	61.0	70.0	67.0	56.1	46.3	30.0	20.9	42.1	.49	.43	.60	.97	1.53	2.73	1.27	1.10	1.01	.79	.50	.47	11.87
#HALTA	12.0	15.2	27.7	44.8	56.3	63.2	71.5	68.6	57.9	46.8	30.0	19.4	42.8	.43	.41	.60	.78	1.57	2.91	1.33	1.26	.99	.74	.42	.40	11.84
SIMPSON 4 NNW	*	*	*	*	*	*	*	*	*	*	*	*	*	.32	.26	.36	.79	1.42	2.56	1.37	1.12	.90	.54	.31	.25	10.20
#TELEGRAPH CREEK	15.3	18.8	29.3	44.3	55.5	62.7	71.8	69.4	58.6	47.4	31.4	22.5	43.9	.38	.29	.47	.81	1.60	2.78	1.21	1.06	1.05	.76	.43	.43	11.27
#VALIER	19.8	21.8	28.6	41.3	51.7	57.9	66.3	64.1	55.5	46.0	32.5	25.4	42.6	.28	.35	.50	.93	1.89	3.51	1.57	1.21	1.15	.63	.40	.34	12.76
DIVISION	16.5	19.9	28.1	42.4	53.1	59.5	67.9	65.3	55.7	45.7	31.0	22.7	42.3	.41	.43	.58	.92	1.78	3.06	1.39	1.25	1.11	.70	.49	.44	12.56
CENTRAL																										
AUGUSTA	22.2	24.6	30.4	41.8	51.4	57.6	65.7	63.6	55.2	46.4	33.9	27.5	43.4	.50	.54	.82	1.05	2.05	3.16	1.33	1.24	1.24	.76	.64	.50	13.83
CASCADE 5 S	24.6	26.1	32.8	44.8	53.9	60.3	68.7	66.6	57.8	49.4	36.7	30.3	46.0	.46	.52	.81	1.17	2.39	3.33	1.20	1.00	1.36	.99	.60	.44	14.27
FLATWILLOW 4 ENE	20.8	23.6	30.9	44.2	54.6	61.9	71.5	69.2	58.9	48.0	34.2	26.7	45.4	.31	.38	.64	.85	1.94	3.17	1.40	1.19	.98	.88	.44	.39	12.57
#GIBSON DAM	22.7	24.5	29.6	39.7	48.2	54.2	62.4	60.5	52.7	44.8	33.2	27.8	41.7	.75	.63	.93	1.28	2.63	3.53	1.41	1.44	1.72	1.23	1.05	.89	17.49
GREAT FALLS AP	22.6	24.3	31.2	44.1	54.0	60.4	69.9	67.3	57.9	48.5	35.3	28.3	45.3	.61	.74	.92	.98	2.10	2.90	1.28	1.26	1.20	.73	.75	.60	14.07
#HELENA 6 N	*	*	*	*	*	*	*	*	*	*	*	*	*	.34	.29	.37	.72	1.51	2.37	1.07	.89	.88	.49	.39	.36	9.68
HELENA AP	18.6	23.2	31.4	43.3	52.9	59.5	68.4	66.2	56.0	45.6	31.6	24.2	43.4	.47	.43	.70	.83	1.56	2.23	1.03	.89	.95	.66	.57	.53	10.85
#HOLTER DAM	26.0	28.2	34.4	45.8	55.3	62.2	71.3	69.1	59.8	50.5	38.2	31.8	47.7	.54	.47	.68	1.00	2.08	2.89	1.12	.86	1.12	.73	.53	.47	12.49
LEWISTOWN AP	20.2	22.5	28.7	41.2	51.0	57.5	66.3	64.2	54.9	45.9	32.6	26.1	42.6	.57	.61	.85	1.00	2.60	3.87	1.58	1.53	1.44	1.07	.71	.69	16.52
#MELSTONE	21.5	24.9	33.0	45.7	56.2	64.0	73.0	70.3	60.1	49.0	35.2	27.5	46.7	.43	.40	.64	.88	1.74	2.93	1.22	.94	.89	.87	.47	.49	11.90
#MOCCASIN EXP STA	20.8	22.8	28.6	40.9	50.8	57.2	66.6	64.8	55.3	46.0	32.7	26.6	42.8	.42	.41	.60	.96	2.21	3.43	1.41	1.41	1.22	.73	.48	.45	13.73
ROUNDUP	23.7	26.5	33.7	45.7	55.8	63.2	72.1	69.8	59.6	49.2	36.1	29.0	47.0	.29	.32	.56	.75	1.80	2.53	1.21	.97	.96	.82	.36	.36	10.93
STANFORD 2 NE	22.1	23.6	29.5	41.2	51.0	57.3	66.5	64.5	55.5	46.1	33.6	27.6	43.2	.54	.56	.70	.99	2.38	3.39	1.65	1.51	1.27	.80	.60	.57	14.96
#WHITE SULPHUR SPRS	20.1	22.8	28.6	40.6	50.1	56.7	65.2	63.3	53.6	44.2	31.2	24.8	41.8	.95	1.17	1.68	1.40	2.32	3.28	1.36	1.45	1.38	1.17	1.19	1.11	18.46
#WINIFRED	18.4	21.3	29.9	43.7	54.2	60.8	69.8	67.1	56.9	46.2	32.2	24.3	43.7	.47	.42	.76	.77	1.76	3.00	1.46	1.04	1.12	.89	.57	.59	12.85
DIVISION	20.9	23.8	30.2	42.2	51.8	58.4	67.1	65.0	55.7	46.0	32.9	26.4	43.4	.57	.58	.83	1.05	2.08	3.05	1.32	1.17	1.23	.91	.70	.63	14.12
SOUTH CENTRAL																										
#BALLANTINE	21.8	25.5	34.3	46.9	57.3	64.7	73.0	70.6	60.3	49.5	35.1	27.0	47.2	.42	.48	.80	1.01	1.68	2.53	.84	.89	1.04	.89	.52	.48	11.58
#BIG TIMBER	27.1	29.7	35.1	45.8	54.9	61.9	70.7	68.7	59.7	50.0	37.9	31.7	47.8	.45	.51	1.05	1.49	2.54	2.55	.99	1.10	1.39	1.09	.69	.51	14.36
BILLINGS WATER PLANT	23.7	27.4	34.9	46.9	56.7	63.9	72.1	69.4	59.6	49.4	36.1	28.9	47.4	.46	.48	.78	1.34	2.12	2.80	.84	1.06	1.27	1.14	.59	.52	13.40
BILLINGS AP	23.2	25.7	33.2	45.5	55.8	63.6	73.2	70.9	60.4	50.0	36.1	28.9	47.2	.54	.60	1.05	1.31	1.88	2.55	.90	.90	1.19	1.09	.63	.59	13.23
#BUSBY	17.9	21.7	31.0	44.0	54.1	62.1	71.0	68.9	58.0	46.9	32.3	23.7	44.3	.36	.33	.62	1.15	1.99	2.42	1.07	1.10	1.08	.90	.57	.44	12.03
#COLUMBUS	22.6	26.3	33.7	45.4	55.2	62.0	70.3	68.5	59.0	48.5	34.7	27.3	46.1	.38	.36	.85	1.50	2.34	2.79	.89	.76	1.23	1.12	.60	.44	13.26
#CROW AGENCY	19.9	24.3	33.6	46.1	56.5	64.2	72.5	69.7	59.3	48.6	34.1	25.7	46.2	.62	.61	1.18	1.71	1.94	2.59	.84	.95	1.29	1.23	.74	.74	14.44
#HUNTLEY EXP STA	20.3	23.3	32.4	45.1	55.5	63.0	71.2	68.8	58.4	47.8	33.8	25.6	45.4	.38	.45	.77	1.06	1.77	2.47	.76	.86	1.04	.93	.52	.47	11.48
LIVINGSTON	25.5	28.0	33.3	43.7	52.6	59.4	68.6	66.6	57.4	48.2	35.6	30.0	45.7	.51	.49	.92	1.21	1.98	2.25	1.07	1.18	1.40	1.08	.66	.63	13.38
#MYSTIC LAKE	23.9	25.1	28.9	38.6	47.5	54.2	63.4	62.0	53.6	45.1	33.0	27.9	41.9	1.25	1.16	2.34	2.84	3.24	3.39	2.00	1.77	2.01	1.53	1.37	1.12	24.02
RAPELJE 4 S	23.5	25.9	32.1	43.4	53.2	60.5	69.9	68.2	58.4	48.0	34.7	28.6	45.5	.45	.47	.82	1.18	2.15	2.72	1.02	1.06	1.12	1.00	.58	.38	12.95
RED LODGE	21.7	23.4	28.4	39.3	48.9	55.8	64.7	62.5	53.7	44.7	32.0	26.7	41.8	.82	.79	1.71	2.85	3.07	3.21	1.39	1.16	1.71	1.42	1.20	.69	20.02
DIVISION	22.2	25.2	32.2	44.0	53.7	61.0	69.7	67.7	57.8	47.9	34.2	27.1	45.2	.59	.59	1.06	1.51	2.16	2.64	1.11	1.04	1.31	1.13	.73	.62	14.49
NORTHEASTERN																										
#CIRCLE 7 N	13.1	16.5	27.3	42.8	54.1	62.0	70.0	67.8	56.9	45.5	29.6	20.5	42.2	.27	.22	.34	.91	1.45	2.93	1.84	1.22	.93	.63	.34	.25	11.33
CULBERTSON	9.5	13.4	25.5	42.6	54.9	62.6	70.5	68.2	57.2	45.3	27.9	17.5	41.3	.34	.29	.42	.94	1.60	3.36	1.79	1.49	1.08	.76	.45	.32	12.84
#FRAZER	8.1	12.4	25.8	43.1	55.2	62.8	71.2	68.7	57.5	45.4	27.7	16.7	41.2	.47	.41	.69	1.09	1.48	3.19	1.59	1.35	1.04	.67	.46	.38	12.82
GLASGOW AP	9.8	13.6	26.7	43.4	55.1	62.3	70.7	67.8	56.7	45.4	28.2	17.7	41.4	.48	.41	.56	1.01	1.49	2.98	1.33	1.49	.96	.64	.47	.45	12.27
GLENDIVE	15.2	18.7	30.5	46.5	58.4	66.3	74.7	72.0	60.8	48.8	32.5	22.6	45.6	.39	.39	.62	1.03	1.60	3.17	1.73	1.48	.90	.71	.41	.30	12.73
HAXBY 18 SW	16.1	19.0	28.9	43.8	55.1	62.7	71.8	69.5	58.5	47.7	31.8	23.0	44.0	.43	.36	.67	1.12	1.62	3.26	1.32	1.37	1.10	.74	.50	.41	12.90
#JORDAN	*	*	*	*	*	*	*	*	*	*	*	*	*	.34	.29	.52	.91	1.38	2.46	1.22	1.05	.79	.64	.37	.34	10.31
LUSTRE 4 NNW	*	*	*	*	*	*	*	*	*	*	*	*	*	.28	.24	.37	.81	1.38	2.93	1.74	1.60	.99	.55	.31	.22	11.42
MEDICINE LAKE 3 SE	*	*	*	*	*	*	*	*	*	*	*	*	*	.31	.29	.36	.92	1.55	3.30	2.04	1.48	1.06	.69	.47	.30	12.77
POPLAR	9.4	13.8	26.5	44.2	56.2	63.9	71.6	69.2	58.4	46.3	28.7	17.6	42.2	.30	.30	.46	.87	1.47	3.19	2.21	1.54	.93	.64	.38	.29	12.58
#SAVAGE	12.8	16.6	28.2	44.4	56.3	64.3	72.0	69.5	58.7	47.0	30.3	20.4	43.4	.40	.31	.54	1.18	1.61	3.30	2.09	1.54	1.10	.66	.42	.26	13.41
VIDA	12.6	15.8	26.6	43.3	55.2	62.5	71.2	69.2	58.2	46.7	29.7	20.5	42.6	.75	.64	.85	1.32	1.70	3.42	1.91	1.36	1.10	.88	.71	.60	15.24
DIVISION	10.8	15.3	26.2	43.0	55.1	62.7	70.9	68.4	57.5	45.9	28.8	18.5	41.9	.40	.35	.52	.96	1.53	3.09	1.84	1.49	1.00	.68	.43	.35	12.64
SOUTHEASTERN																										
#BAKER	*	*	*	*	*	*	*	*	*	*	*	*	*	.38	.33	.59	1.04	1.67	3.24	1.81	1.37	1.04	.72	.37	.29	12.85
#COLSTRIP	21.6	24.5	32.4	44.8	55.1	63.5	72.6	70.5	59.8	48.6	34.4	26.8	46.2	.58	.60	1.00	1.64	2.26	2.94	1.23	1.22	1.19	1.22	.66	.59	15.13
#EKALAKA	17.9	20.8	28.8	43.1	54.4	62.8	71.6	69.8	58.7	47.0	31.1	23.7	44.1	.40	.35	.62	1.11	1.95	2.96	1.90	1.39	1.01	.74	.45	.34	13.22
MILDRED	15.5	19.0	29.8	44.8	56.4	64.7	73.5	71.1	59.6	47.7	31.7	22.4	44.7	.38	.31	.56	1.05	1.80	2.84	1.64	1.34	.89	.77	.45	.33	12.36
MILES CITY AP	16.4	20.2	30.9	45.7	57.3	65.6	75.3	72.6	61.0	49.0	32.6	23.2	45.8	.44	.37	.65	1.06	1.73	2.71	1.34	1.24	.96	.87	.43	.37	12.17
PLEVNA	14.7	17.4	27.2	42.7	54.3	62.6	71.5	69.7	58.4	46.4	30.0	21.1	43.0	.39	.39	.58	1.14	1.68	2.95	1.74	1.22	.97	.80	.41	.33	12.60
DIVISION	17.8	21.5	30.4	44.4	55.4	63.6	72.6	70.4	59.2	47.8	32.2	23.8	44.9	.43	.39	.70	1.17	1.88	2.81	1.48	1.17	.95	.88	.52	.41	12.79

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1963 REVISIONS AND ADDITIONS TO CLIMATOGRAPHY OF THE UNITED STATES NO. 81-20
MONTANA
TABLE I — NORMALS FOR FIRST ORDER STATIONS

STATION	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
BILLINGS AP													
G3567 T 4													
MAX TEMP	33.2	36.0	43.4	57.4	68.1	76.0	88.5	85.2	73.5	61.6	45.0	38.6	58.9
MIN TEMP	13.1	15.3	24.0	34.6	45.4	54.1	60.8	58.6	47.3	37.3	25.2	18.2	36.2
AVG TEMP	23.2	25.7	33.7	46.0	56.8	65.1	74.7	71.9	60.4	49.5	35.1	28.4	47.5
DEG DAYS	1296	1100	970	570	285	102	6	15	186	487	897	1135	7049
GREAT FALLS AP													
G3662 T 4													
MAX TEMP	31.6	34.0	41.1	55.2	65.7	72.9	84.7	81.8	71.2	59.3	44.2	35.8	56.5
MIN TEMP	12.5	13.6	20.2	31.9	40.2	46.9	54.1	51.8	43.5	35.6	24.4	18.8	32.8
AVG TEMP	22.1	23.8	30.7	43.6	53.0	59.9	69.4	66.8	57.4	47.5	34.3	27.3	44.7
DEG DAYS	1349	1154	1063	642	384	186	28	53	258	543	921	1169	7750
HAVRE AP													
H2582 T 5													
MAX TEMP	24.2	27.4	37.8	56.4	68.6	73.8	85.3	82.5	70.4	59.3	40.7	31.2	54.8
MIN TEMP	3.6	5.1	15.9	29.7	40.7	48.2	54.6	51.5	40.7	32.3	18.2	10.6	29.3
AVG TEMP	13.9	16.3	26.9	43.1	54.7	61.0	70.0	67.0	55.6	45.8	29.5	20.9	42.1
DEG DAYS	1584	1364	1181	657	338	162	28	53	306	595	1065	1367	8700
PRECIP	.49	.43	.60	.97	1.53	2.73	1.27	1.10	1.01	.79	.50	.47	11.89
KALISPELL AP													
H2965 T 5													
MAX TEMP	27.6	34.0	42.2	56.5	66.4	72.5	83.7	81.2	70.2	56.0	39.3	31.2	55.1
MIN TEMP	12.0	14.9	21.3	30.9	37.9	44.7	47.6	45.0	39.2	31.7	22.7	18.7	30.6
AVG TEMP	19.8	24.5	31.8	43.7	52.2	58.6	65.7	63.1	54.7	43.9	31.0	25.0	42.8
DEG DAYS	1401	1134	1029	639	397	207	50	99	321	654	1020	1240	8191
HAVRE CO H2488 T 11													
PRECIP													11.89
MILES CITY AP H2629 T 5													
AVG TEMP	16.5	20.3			57.4								
DEG DAYS	1504	1252			276								7723

TABLE II — NORMALS BY CLIMATOLOGICAL DIVISIONS

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
TEMPERATURE (°F.)													
SOUTHEASTERN MILES CITY AP	16.5	20.3			57.4								
PRECIPITATION (In.)													
NORTH CENTRAL HAVRE CO													11.89
CENTRAL DIVISION	.58												14.13

REVISIONS TO FIRST ORDER STATIONS IN TABLE I AFFECT THE SAME STATIONS IN TABLE II.

USCOMM-WB-Asheville, N. C. -3/31/64- 2000

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