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CLIMATOGRAPHY OF THE UNITED STATES NO. 81-19

DECENNIAL CENSUS OF UNITED STATES CLIMATE—

MONTHLY NORMALS OF TEMPERATURE, PRECIPITATION, AND HEATING DEGREE DAYS

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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
BALTIMORE AP-INTL	H 146 T 6													
MAX TEMP		44.2	45.5*	53.6	65.8*	75.9*	83.5	87.2*	85.0	78.6	68.4	56.5	45.7	65.8
MIN TEMP		25.3	25.8*	32.5	42.6*	52.8	61.4	66.4*	65.0*	57.6	45.6	34.4	25.9	44.6
AVG TEMP		34.8	35.7*	43.1	54.2*	64.4*	72.5	76.8*	75.0*	68.1	57.0	45.5	35.8	55.2
DEG DAYS		936	820*	679	327*	90*	0	0	0	48	264	585	905	4654
PRECIP		3.43*	2.89	3.82	3.60	3.98	3.29	4.22	5.19	3.33	3.18	3.13	2.99	43.05
BALTIMORE CO	H 14 T100													
MAX TEMP		44.1	45.3*	52.9	64.7*	75.1	83.4	87.6*	85.3	78.8	68.4	56.4	45.7	65.6
MIN TEMP		30.4	30.3*	36.5	46.6*	57.1*	66.0	70.7*	69.2*	62.4	51.6	41.2	32.2	49.5
AVG TEMP		37.3	37.8*	44.7	55.7*	66.1*	74.7	79.1*	77.3*	70.6	60.0	48.8	39.0	57.6
DEG DAYS		859	762*	629	288*	65*	0	0	0	27	189	486	806	4111
PRECIP		3.43*	2.98	3.94	3.71	4.15	3.87*	4.39	4.60	3.63	3.25	3.10	3.16	44.21
FREDERICK AP	H 294 T 6													
MAX TEMP		41.5	43.3	51.5*	64.2	74.6*	82.7*	86.6	84.8*	78.1*	67.2	54.7*	43.0	64.4
MIN TEMP		24.3	24.1	30.7	40.2	50.5*	59.9*	64.5*	63.0	55.4*	44.0*	33.6*	25.4	43.0
AVG TEMP		32.9	33.7	41.1*	52.2	62.6*	71.3*	75.6*	73.9*	66.8*	55.6*	44.2*	34.2	53.7
DEG DAYS		995	876	741*	384	127*	12*	0	0	66*	307*	624*	955	5087
PRECIP		2.98	2.55	3.53	3.67	3.91	3.60	3.92	4.30	3.42*	3.13	2.93	2.89	40.83

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
SOUTHERN EASTERN SHORE																										
#CRISFIELD HAMMOCK PT	39.3	39.9	46.5	56.9	66.9	75.3	79.4	78.0	72.6	62.2	51.2	41.2	59.1	3.56	3.15	4.01	3.66	3.69	3.31	5.05	5.05	3.83	3.37	3.24	2.92	44.84
#SALISBURY	.	.	.	.	.	.	.	.	.	.	.	.	.	3.66	3.21	4.13	3.34	3.62	3.49	4.39	6.01	4.44	3.50	3.21	3.13	46.13
SNOW HILL	38.1	38.7	44.7	54.2	64.1	72.6	76.7	75.2	69.2	58.8	48.4	39.3	56.7	3.94	3.43	4.62	3.61	3.61	3.80	5.12	5.67	4.50	3.91	3.55	3.41	49.17
DIVISION	38.3	38.8	45.0	54.8	64.6	73.1	77.3	75.9	70.0	59.6	49.1	39.6	57.2	3.63	3.19	4.14	3.41	3.52	3.45	4.81	5.43	4.23	3.53	3.31	3.12	45.77
CENTRAL EASTERN SHORE																										
EASTON AIRPORT	36.6	37.2	44.3	54.6	64.7	73.2	77.3	75.6	69.2	58.3	47.9	37.9	56.4	3.47	2.95	3.95	3.48	3.88	3.36	4.74	5.03	3.95	3.18	3.53	3.13	44.65
DIVISION	36.9	37.4	44.3	54.8	64.8	73.2	77.2	75.7	69.5	58.8	48.3	38.3	56.6	3.54	2.91	3.90	3.40	3.95	3.52	4.85	5.18	4.08	3.23	3.54	3.13	45.23
LOWER SOUTHERN																										
#OWINGS FERRY LANDING	37.0	37.6	44.6	55.2	64.8	73.0	76.9	75.1	68.9	58.6	48.2	38.3	56.5	3.48	2.62	3.49	3.48	4.10	3.26	4.27	5.31	4.17	3.29	3.23	3.05	43.75
#SOLOMONS	38.5	39.0	45.3	55.5	66.0	74.6	78.8	77.8	72.1	61.2	50.4	40.3	58.3	3.55	2.78	3.61	3.50	3.76	3.45	5.57	5.00	3.59	3.11	3.33	2.97	44.22
DIVISION	37.3	38.0	44.8	55.2	64.9	73.1	77.1	75.5	69.4	58.8	48.3	38.5	56.7	3.57	2.77	3.66	3.50	3.93	3.50	5.01	5.27	3.95	3.37	3.23	3.10	44.86
UPPER SOUTHERN																										
#ANNAPOLIS U S N ACADEMY	36.1	36.4	43.1	53.8	64.1	73.2	77.5	76.0	69.9	59.2	48.1	38.1	56.3	3.14	2.57	3.62	3.31	3.83	3.51	4.14	4.50	3.46	2.63	2.78	2.85	40.34
BALTIMORE AP-INTL	34.8	35.7	43.1	54.2	64.4	72.5	76.8	75.0	68.1	57.0	45.5	35.8	55.2	3.43	2.89	3.82	3.60	3.98	3.29	4.22	5.19	3.33	3.18	3.13	2.99	43.05
#COLLEGE PARK	36.0	36.8	44.0	54.6	64.6	72.7	76.8	75.1	68.6	57.6	46.6	37.0	55.9	3.25	2.70	3.73	3.39	4.21	3.81	4.14	5.15	3.80	3.16	3.09	3.04	43.47
#GLENN DALE BELL STA	35.1	35.9	43.2	53.7	63.8	72.0	75.9	74.3	67.8	56.8	45.9	36.0	55.0	3.43	2.83	3.84	3.54	4.23	4.00	5.02	5.07	3.86	3.36	3.22	2.97	45.37
DIVISION	35.6	36.3	43.4	54.0	64.2	72.5	76.7	75.1	68.5	57.7	46.7	36.9	55.6	3.32	2.72	3.70	3.45	4.07	3.72	4.33	5.01	3.76	3.14	3.06	2.97	43.25
NORTHERN EASTERN SHORE																										
#COLEMAN 3 WNW	35.3	36.1	41.2	54.4	63.5	73.1	77.5	76.0	70.0	59.3	48.0	37.3	56.0	3.61	2.93	3.86	3.43	4.17	3.64	4.29	4.97	3.71	3.08	3.41	3.18	44.28
#MILLINGTON	35.4	36.0	43.4	54.0	63.9	72.2	76.4	74.7	68.6	57.8	47.1	36.8	55.5	3.65	2.93	3.86	3.28	3.93	3.16	4.24	4.89	3.62	2.98	3.50	3.12	43.16
ROCK HALL 3 SE	35.4	36.0	43.2	53.9	64.2	72.7	77.1	75.2	69.0	58.2	47.3	37.0	55.8	3.43	2.76	3.76	3.37	3.96	3.40	4.53	4.69	3.71	2.97	3.13	3.11	42.82
DIVISION	35.5	36.1	42.8	54.0	64.2	72.8	77.2	75.5	69.3	58.6	47.6	37.3	55.9	3.60	2.91	3.89	3.43	4.11	3.40	4.48	4.75	3.58	3.00	3.34	3.14	43.63
NORTHERN CENTRAL																										
BALTIMORE CO	37.3	37.8	44.7	55.7	66.1	74.7	79.1	77.3	70.6	60.0	48.8	39.0	57.6	3.43	2.98	3.94	3.71	4.15	3.87	4.39	4.60	3.63	3.25	3.10	3.16	44.21
#ELKTON	33.8	34.6	42.1	52.8	63.3	71.8	76.2	74.5	67.8	56.5	45.4	35.3	54.5	3.46	2.99	4.19	3.60	4.25	3.96	4.35	5.02	3.56	3.23	3.55	3.19	45.35
FREDERICK AP	32.9	33.7	41.1	52.2	62.6	71.3	75.6	73.9	66.8	55.6	44.2	34.2	53.7	2.98	2.55	3.53	3.67	3.91	3.60	3.92	4.30	3.42	3.13	2.93	2.89	40.83
TOWSON	.	.	.	.	.	.	.	.	.	.	.	.	.	3.53	2.98	4.13	3.82	4.18	3.67	4.17	4.50	3.76	3.49	3.41	3.43	45.07
#WESTMINSTER	33.1	33.9	41.3	52.3	62.5	70.7	74.9	73.2	66.5	55.7	44.7	34.4	53.6	3.36	2.82	4.05	3.61	3.95	4.13	4.34	4.79	3.71	3.46	3.29	3.31	44.82
#WOODSTOCK	33.8	34.4	41.8	52.7	63.0	71.0	75.1	73.4	66.5	55.6	44.5	34.7	53.9	3.22	2.77	3.62	3.53	4.06	3.80	4.20	4.21	3.97	3.27	3.09	3.02	42.76
DIVISION	33.7	34.5	41.8	52.8	63.1	71.2	75.4	73.8	67.1	56.3	45.1	35.0	54.2	3.30	2.75	3.86	3.58	4.18	3.87	4.29	4.60	3.71	3.32	3.23	3.19	43.88
APPALACHIAN MOUNTAIN																										
CHEWSVILLE BRIDGEPORT	32.4	33.4	40.6	51.5	61.9	70.3	74.4	72.5	65.7	54.8	43.6	33.7	52.9	2.50	2.01	3.08	3.05	4.01	3.55	3.60	4.00	3.03	3.02	2.62	2.61	37.08
FROSTBURG	30.8	31.4	38.1	49.8	60.0	67.8	71.3	69.9	63.5	53.4	41.7	31.9	50.8	3.16	2.50	3.95	3.57	4.33	4.35	3.71	4.08	3.19	3.33	2.61	2.86	41.64
HANCOCK FRUIT LAB	.	.	.	.	.	.	.	.	.	.	.	.	.	2.73	2.10	3.44	3.08	3.88	3.80	3.52	3.41	2.90	3.28	2.55	2.50	37.19
#WESTERNPORT	33.9	35.0	41.9	53.0	62.7	70.3	74.0	72.8	66.5	56.0	44.5	34.9	53.8	3.04	2.53	3.77	3.37	4.17	4.10	3.59	4.18	3.12	2.96	2.28	2.63	39.74
DIVISION	32.8	33.8	40.9	52.1	62.2	70.3	74.2	72.5	65.7	55.1	43.6	33.8	53.1	2.80	2.24	3.51	3.25	3.98	3.83	3.66	3.89	3.08	3.07	2.56	2.68	38.55
ALLEGHENY PLATEAU																										
#OAKLAND 1 SE	29.2	29.8	36.1	47.2	56.9	64.9	68.0	67.0	60.8	50.6	3 .3	30.2	48.3	4.38	3.46	4.55	4.14	4.71	4.68	4.84	4.50	3.28	3.12	3.14	3.71	48.51
#SINES DEEP CREEK	28.2	28.5	34.8	46.2	56.3	64.2	67.7	66.1	59.6	49.3	38.1	29.3	47.4	4.34	3.65	4.53	4.15	4.67	4.82	4.86	4.49	3.41	3.10	3.07	3.76	48.85
DIVISION	28.3	28.7	35.1	46.6	56.6	64.6	67.9	66.6	60.2	50.0	38.6	29.4	47.7	4.05	3.29	4.31	4.00	4.54	4.55	4.57	4.37	3.25	3.12	2.98	3.49	46.52

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
NORTHWEST PRAIRIE DIV																										
BETHANY	26.2	30.0	39.6	52.6	62.7	72.5	77.6	75.9	67.7	56.8	41.3	30.8	52.8	1.26	1.07	2.04	2.98	4.16	5.80	2.91	4.19	3.58	2.41	1.86	1.28	33.54
#BRUNSWICK	29.2	32.6	41.7	54.6	64.8	74.6	79.5	77.8	69.7	58.6	43.2	33.2	55.0	1.69	1.66	2.59	3.39	4.79	5.35	3.64	3.83	3.47	2.88	2.17	1.78	37.24
#CHILLICOTHE 2 S	•	•	•	•	•	•	•	•	•	•	•	•	•	1.31	1.16	2.23	2.92	4.05	5.42	3.74	3.61	3.47	2.49	1.89	1.52	33.81
CHILLICOTHE RADIO KCHI	27.2	31.0	40.1	53.4	63.8	73.5	78.4	76.4	68.3	57.3	41.7	31.5	53.6	1.40	1.26	2.39	3.09	4.40	5.45	3.84	3.78	3.69	2.50	2.00	1.68	35.48
#CONCEPTION	25.8	30.0	39.7	53.3	63.7	73.4	78.7	76.8	68.9	58.0	41.6	30.9	53.4	1.18	1.16	2.19	3.33	4.67	5.65	3.05	4.61	3.50	2.11	1.63	1.25	34.33
FAYETTE	30.2	34.0	42.3	54.6	64.2	73.7	78.3	76.9	69.1	58.4	43.4	33.6	54.9	1.61	1.73	2.58	3.39	4.60	4.47	3.47	3.72	3.11	2.99	2.21	1.78	35.66
GALLATIN	•	•	•	•	•	•	•	•	•	•	•	•	•	1.40	1.18	2.27	3.08	4.30	5.69	3.38	4.29	3.60	2.48	2.13	1.57	35.37
GRANT CITY	25.1	29.1	38.7	52.2	62.7	72.0	77.3	75.5	67.3	56.6	40.3	30.0	52.2	1.11	.99	1.86	3.03	4.26	5.80	3.20	4.58	3.60	2.51	1.84	1.12	33.90
KANSAS CITY AP	30.7	34.8	42.8	55.2	65.1	75.4	81.0	79.3	70.8	59.7	44.1	34.8	56.1	1.41	1.24	2.49	3.56	4.40	4.57	3.19	3.77	3.25	2.86	1.80	1.53	34.07
LEXINGTON	29.2	32.8	41.5	54.9	65.5	75.5	80.7	79.0	70.6	59.2	43.3	33.1	55.4	1.47	1.55	2.71	3.44	4.50	5.40	3.81	3.83	3.49	2.95	2.00	1.69	36.84
LUCERNE	•	•	•	•	•	•	•	•	•	•	•	•	•	1.23	1.02	2.21	3.03	4.10	5.32	3.44	4.06	3.36	2.38	1.84	1.51	33.50
MARYVILLE 2 E	24.9	29.0	38.5	52.2	62.8	72.3	77.5	75.5	67.2	56.1	39.9	29.6	52.1	1.13	1.11	2.23	3.31	4.98	5.89	3.13	4.65	3.55	2.28	1.90	1.19	35.35
MILAN	•	•	•	•	•	•	•	•	•	•	•	•	•	1.65	1.42	2.50	3.38	4.32	5.60	3.24	4.13	3.65	2.89	2.03	1.77	36.58
OREGON	27.3	31.7	40.8	54.2	64.5	74.0	79.2	77.5	69.2	58.3	42.3	32.0	54.3	1.11	1.02	2.13	3.22	4.56	5.52	2.99	3.97	3.73	2.28	1.74	1.35	33.62
ST JOSEPH AP	27.2	31.1	40.2	53.6	64.1	74.0	79.4	77.5	68.6	57.4	41.4	31.5	53.8	1.20	1.09	2.33	3.15	4.39	5.93	3.22	4.21	3.44	2.18	1.68	1.36	34.18
TARKIO	24.5	28.8	38.4	52.3	63.0	72.6	77.7	75.7	66.9	56.1	39.8	29.3	52.1	1.01	.98	2.16	2.93	4.67	5.90	3.27	4.66	3.51	2.46	1.69	1.01	34.25
TRENTON	27.7	31.6	40.9	54.1	64.5	74.0	78.8	77.0	68.9	58.1	42.6	32.2	54.2	1.41	1.19	2.34	2.92	4.38	5.49	3.38	4.25	3.44	2.62	1.96	1.63	35.01
UNIONVILLE	24.8	28.1	37.5	51.4	62.5	72.2	77.1	75.4	67.0	56.1	39.8	29.1	51.8	1.53	1.20	2.34	3.28	3.89	5.06	3.72	3.82	3.66	2.43	2.03	1.52	34.48
WAVERLY	•	•	•	•	•	•	•	•	•	•	•	•	•	1.49	1.53	2.53	3.22	4.39	5.14	3.37	3.93	3.47	2.83	1.95	1.67	35.52
DIVISION	27.6	31.7	40.5	53.8	63.9	73.5	78.5	76.8	68.6	57.8	42.1	31.9	53.9	1.40	1.37	2.42	3.21	4.50	5.58	3.49	4.13	3.43	2.67	1.80	1.50	35.50
NORTHEAST PRAIRIE DIV																										
BOWLING GREEN	•	•	•	•	•	•	•	•	•	•	•	•	•	1.74	1.46	2.46	3.37	4.07	4.30	3.41	3.28	2.97	3.03	2.42	1.78	34.29
COLUMBIA AP	30.3	33.8	41.9	54.6	64.4	74.0	78.7	77.2	69.3	58.7	43.3	33.8	55.0	1.71	1.81	2.65	3.30	4.70	4.34	3.41	3.81	3.88	3.12	2.27	1.96	36.96
EDINA	•	•	•	•	•	•	•	•	•	•	•	•	•	1.60	1.45	2.54	3.46	3.99	5.29	3.53	3.81	3.61	2.76	2.14	1.64	35.82
ELSBERRY 1 S	30.5	33.4	42.0	54.2	64.1	73.9	77.7	75.9	68.3	57.5	43.0	33.1	54.5	1.84	1.98	2.87	3.41	3.69	4.15	3.25	3.40	2.89	3.05	2.56	1.93	35.02
FULTON 4 SW	29.8	32.8	41.5	54.1	64.2	73.9	78.5	77.0	69.1	58.0	42.9	33.2	54.6	•	•	•	•	•	•	•	•	•	•	•	•	•
HANNIBAL WATERWORKS	•	•	•	•	•	•	•	•	•	•	•	•	•	1.77	1.56	2.56	3.50	4.21	4.47	3.46	3.55	3.01	2.80	2.28	1.92	35.09
HERMANN	•	•	•	•	•	•	•	•	•	•	•	•	•	1.89	1.81	2.75	3.76	4.76	4.87	3.24	3.27	3.50	3.20	2.79	1.76	37.60
#KAHOKA	•	•	•	•	•	•	•	•	•	•	•	•	•	1.57	1.26	2.43	3.49	4.13	5.02	2.99	3.71	3.74	2.89	2.12	1.53	34.88
KIRKSVILLE RADIO KIRX	26.8	30.4	39.5	52.6	63.2	72.6	77.4	75.5	67.5	56.9	41.3	30.7	52.9	1.52	1.41	2.55	3.31	4.28	5.35	3.92	3.88	3.85	2.83	2.03	1.79	36.72
LA BELLE	•	•	•	•	•	•	•	•	•	•	•	•	•	1.62	1.47	2.61	3.39	4.12	5.22	3.08	3.78	3.40	2.82	2.26	1.67	35.42
#LOUISIANA STARKS NUR	29.8	33.2	41.7	54.1	64.0	73.7	77.7	76.1	68.4	57.6	43.2	33.2	54.4	1.84	1.69	2.86	3.63	4.37	4.54	3.29	3.21	2.99	3.25	2.60	1.97	36.24
MACON	26.6	29.9	38.9	52.0	63.1	72.9	77.8	76.0	67.7	56.7	41.0	30.4	52.8	1.60	1.51	2.67	3.14	4.25	5.15	3.91	3.85	3.37	2.84	2.22	1.77	36.28
MEXICO	28.9	31.8	40.5	53.6	64.1	74.0	78.7	77.1	69.0	57.6	42.3	32.4	54.2	1.96	1.86	3.07	3.76	4.68	4.86	3.66	3.66	3.56	3.34	2.58	2.22	39.21
#MONROE CITY	•	•	•	•	•	•	•	•	•	•	•	•	•	1.68	1.52	2.69	3.54	4.54	5.34	3.75	3.82	3.21	2.78	2.25	1.92	37.04
SAINT CHARLES	•	•	•	•	•	•	•	•	•	•	•	•	•	2.09	2.11	3.06	3.78	3.97	4.02	3.41	3.13	2.98	2.82	2.79	2.02	36.18
ST LOUIS AP	31.9	35.2	43.1	55.4	65.7	75.6	79.6	77.8	70.0	58.9	44.1	34.8	56.0	1.98	2.04	3.08	3.71	3.73	4.29	3.30	3.02	2.76	2.86	2.57	1.97	35.31
ST LOUIS CO	33.5	36.4	44.3	56.5	66.6	76.6	80.7	79.2	71.7	60.8	45.8	36.5	57.4	2.16	2.21	3.19	3.58	3.85	3.92	3.31	3.62	2.99	2.77	2.69	2.17	36.46
#SAINT LOUIS UNIVERSITY	33.6	36.5	44.5	56.8	66.8	76.5	80.7	79.0	71.6	60.7	45.8	36.5	57.4	2.10	2.34	3.30	3.63	3.76	3.89	3.41	3.47	2.76	2.64	2.57	2.10	35.97
SHELBINA	•	•	•	•	•	•	•	•	•	•	•	•	•	1.70	1.59	2.67	3.27	4.41	4.92	3.71	3.86	3.13	2.92	2.10	1.87	36.15
STEFFENVILLE 1 E	27.9	31.6	40.4	53.1	63.5	73.1	77.8	76.1	68.1	57.4	42.3	31.8	53.6	1.74	1.53	2.76	3.49	4.38	4.79	3.51	3.98	3.35	3.00	2.39	1.75	36.67
TROY	•	•	•	•	•	•	•	•	•	•	•	•	•	1.79	1.77	2.77	3.57	4.06	4.05	3.60	3.42	3.17	3.15	2.70	1.86	35.91
UNION 1 SE	•	•	•	•	•	•	•	•	•	•	•	•	•	1.97	2.08	2.96	3.68	4.63	4.77	3.72	3.16	3.21	3.01	2.62	2.10	37.91
WARRENTON 1 N	32.3	35.5	43.5	55.8	65.1	74.5	78.7	77.2	69.8	59.2	44.8	35.3	56.0	1.92	2.02	3.15	3.58	4.09	4.76	3.33	2.92	3.70	3.13	2.87	2.09	37.56
DIVISION	29.6	33.2	41.5	54.3	64.3	73.9	78.1	76.7	68.9	58.2	42.9	33.0	54.6	1.83	1.85	2.88	3.58	4.10	4.72	3.56	3.51	3.17	2.96	2.35	1.85	36.36
WEST CENTRAL PLAINS DIV																										
APPLETON CITY	32.6	36.5	44.3	56.3	65.5	75.0	79.6	78.8	70.7	59.9	45.0	36.1	56.7	1.68	1.82	2.47	3.57	4.96	4.69	3.07	3.64	3.77	3.43	2.26	1.75	37.11
CAPLINGER MILLS	•	•	•	•	•	•	•	•	•	•	•	•	•	1.63	1.88	2.62	3.40	4.84	4.62	3.36	3.59	3.95	3.40	2.36	1.91	37.56
CLINTON 3 NW	31.2	34.9	42.8	55.4	65.0	74.6	79.4	78.4	69.9	59.2	43.8	34.6	55.8	1.65	1.91	2.55	3.76	5.15	5.53	3.37	3.82	3.85	3.35	2.37	1.86	39.17
ELDON	32.7	35.6	43.4	55.6	65.1	74.5	79.0	77.8	70.0	59.3	44.7	35.8	56.1	1.83	2.07	2.68	3.57	4.80	5.23	3.44	3.79	4.04	3.51	2.68	2.10	39.74
HARRISONVILLE	29.7	33.6	42.1	54.6	64.5	74.2	79.3	78.1	70.0	59.1	43.4	34.0	55.2	1.48	1.60	2.61	3.67	4.79	5.38	3.41	3.67	3.88	2.95	2.00	1.51	36.95
JEFF CITY LINCOLN UNIV	31.6	34.9	42.9	55.3	64.7	74.0	78.6	77.2	69.5	58.4	44.0	34.8	55.5	1.89	1.95	2.39	3.58	4.85	4.71	3.38	3.98	3.94	3.58	2.62	1.98	38.85
NEVADA SEWAGE PLANT	34.3	38.3	46.1	57.8	66.6	75.9	80.4	79.7	71.9	61.1	46.4	37.7	58.0	1.69	1.86	2.72	3.79	5.03	4.90	3.62	3.69	4.13	3.21	2.44	1.77	38.85
STOVER	•	•	•	•	•	•	•	•	•	•	•	•	•	1.67	1.74	2.46	3.28	4.71	4.92	2.97	3.61	3.80	3.20	2.26	1.92	36.54
WARRENSBURG	31.9	35.9	44.1	56.4	66.0	75.5	80.5	79.4	71.5	60.5	45.3	35.8	56.9	•	•	•	•	•	•	•	•	•	•	•	•	•
WARSAW NO 1	33.7	37.5	45.4	57.3	66.3	75.9	80.5	79.4	71.3	60.4	46.0	36.9	57.6	1.83	1.89	2.58	3.79	5.01	5.54	3.48	4.06	4.43	3.65	2.41	2.02	40.69
DIVISION	32.2	36.0	43.7	56.0	65.3	74.9	79.4	78.3	70.3	59.6	44.6	35.7	56.3	1.72	1.95	2.61	3.64	4.86	5.05	3.48	3.96	3.88	3.41	2.27	1.86	38.69
WEST OZARKS DIVISION																										
BUFFALO 3 S	•	•	•	•	•	•	•	•	•	•	•	•	•	1.86	2.12	2.79	3.89	5.13	5.28	3.58	3.97	3.99	3.51	2.60	2.17	40.89
GALENA	•	•	•	•	•	•	•	•	•	•	•	•	•	2.06	2.40	3.08	4.20	5.50	4.85	3.33	2.89	3.38	3.59	3.01	2.28	40.57
HAILEY 3 WSW	•	•	•	•	•	•	•	•	•	•	•	•	•	2.44	2.81	3.64	4.25	5.88	5.46	3.68	3.43	3.82	3.81	3.21	2.53	44.96
LAMAR	32.8	36.1	43.7	55.7	65.0	74.6	79.1	78.2	70.2	59.4	44.4	36.2	56.3	1.74	1.89	2.53	3.80	4.94	5.23	3.71	3.32	4.07	3.52	2.60	1.83	39.18
LEBANON	33.8	36.8	44.1	55.3	64.3	73.7	78.1	77.2	69.6	59.4	45.2	36.8	56.2	1.98	2.36	3.29	4.12	5.40	4.66	3.31	3.98	3.74	3.55	2.69	2.42	41.50
LOCKWOOD	35.3	39.1	46.2	57.4	66.4	75.5	80.0	79.3	71.6	61.1	46.8	38.5	58.1	1.90	2.11	2.73	3.99	5.20	5.14	3.56	3.60	3.96	3.57	2.52	1.98	40.26
#MOUNTAIN GROVE 2 N	34.9	38.1	45.1	56.7	64.9	73.7	78.1	77.4	70.4	60.0	45.9	37.6	56.9	2.56	2.72	3.27	4.04	5.17	4.36	3.56	2.81	3.18	3.44	3.18	2.55	40.84
#NEOSHO	36.8	40.4	47.4	58.4	66.3	75.2	79.2	78.6	71.1	60.6	47.1	39.2	58.4	2.00	2.25	3.11	4.72	5.75	5.36	3.47	3.32	4.54	3.79	2.64	2.23	43.18
#SELIGMAN	36.5	39.9	46.6	57.5	65.1	73.7	77.8	77.3	70.4	60.3	47.1	39.3	57.6	2.31	2.77	3.31	4.31	5.79	4.87	3.48	2.97	4.07	3.62	3.20	2.22	42.92
SPRINGFIELD AP	33.6	37.1	44.0	55.6	64.5	74.2	78.8	78.0	70.4	59.7	45.0	36.7	56.5	1.96	2.12	2.84	4.09	5.28	5.02	3.89	3.32	3.85	3.76	2.76	2.19	41.08
DIVISION	35.1	38.7	45.5	57.1	65.4	74.4	78.6	78.0	70.5	60.2	46.2	38.0	57.3	2.10	2.46	3.05	4.17	5.42	4.96	3.60	3.22	3.83	3.62	2.73	2.22	41.38
EAST OZARKS DIVISION																										
#ARCADIA	33.5	36.5	44.0	55.7	64.1	73.0	77.0	76.1	68.5	57.8	44.7	36.1	55.6	2.94	2.60	3.81	4.43	5.04	4.82	3.56	3.20	3.32	3.44	3.82	2.62	43.60
BIRCH TREE	35.5	38.6	46.0	57.2	65.0	73.9	78.0	77.1	69.8	59.2	46.0	37.8	57.0	3.13	3.17	3.73	4.42	5.59	4.19	3.28	3.38	3.37	3.33	3.69	2.90	44.18
CAPE GIRARDEAU	•	•	•	•	•	•	•	•	•	•	•	•	•	3.85	3.19	4.23	4.39	4.80	3.81	2.85	3.73	3.73	3.07	3.61	3.07	44.33
DONIPHAN	37.5	40.5	48.2	59.1	67.3	76.1	79.9	79.1	71.2	60.0	47.3	39.0	58.8	3.46	3.61	4.32	4.65	4.84	4.64	3.72	3.61	3.53	3.48	3.81	3.34	47.01
FARMINGTON 1 E	34.5	37.5	44.9	56.4	65.1	74.2	78.0	76.8	69.3	58.5	45.3	36.9	56.5	2.77	2.66	3.58	4.47	4.97	4.38	3.80	3.14	3.58	3.22	3.46	2.43	42.46
FREDERICKTOWN	•	•	•	•	•	•	•	•	•	•	•	•	•	3.23	2.78	3.64	4.33	4.86	4.53	3.71	3.07	3.60	3.36	3.39	2.58	43.08
GREENVILLE 4 NNW	36.0	39.0	46.3	57.4	65.4	74.3	78.2	77.3	69.7	58.7	45.8	37.7	57.2	3.60	2.93	4.11	4.26	5.00	4.41	3.46	3.53	3.37	3.36	3.78	3.05	44.86
JACKSON	35.7	39.0	46.8	58.3	67.3	76.4	79.7	78.7	71.1	60.0	46.3	37.6	58.1	3.92	3.44	4.67	4.64	4.69	4.25	2.68	4.10	3.67	3.25	3.81	3.42	46.54
MARBLE HILL	35.6	38.8	46.4	57.7	66.0	74.9	78.6	77.7	70.1	59.1	45.8	37.1	57.3	3.78	2.96	4.10	4.51	5.06	4.54	3.17	3.91	3.38	3.36	3.48	3.11	45.36
ROLLA SCHOOL OF MINES	33.1	36.2	43.9	56.2	65.1	74.0	78.3	77.3	69.8	59.4	45.0	35.9	56.2	2.07	2.30	3.10	3.73	5.26	5.29	3.48	3.80	3.46	3.49	2.76	2.31	41.05
SALEM	33.4	36.6	44.0	55.4	64.4	73.5	77.6	76.4	68.6	58.3	44.6	36.0	55.7	2.18	2.58	3.60	4.24	5.15	4.51	3.16	3.39	3.70	3.46	3.24	2.74	41.95
WILLIAMSVILLE	•	•	•	•	•	•	•	•	•	•	•	•	•	3.93	3.32	4.09	4.54	4.72	4.37	3.35	3.93	3.30	3.65	3.85	3.30	46.35
WILLOW SPRINGS	•	•	•	•	•	•	•	•	•	•	•	•	•	3.02	3.10	3.55	4.21	5.43	4.46	3.62	3.03	3.62	3.36	3.59	2.81	43.80
DIVISION	34.8	38.1	45.4	57.0	65.3	74.3	78.1	77.2	69.6	59.0	45.3	36.9	56.8	3.01	2.93	3.76	4.30	5.04	4.46	3.39	3.37	3.34	3.32	3.41	2.75	43.08
BOOTHEEL DIVISION																										
CARUTHERSVILLE	39.5	42.3	49.5	60.5	69.6	78.0	80.9	80.0	73.2	62.6	49.6	41.5	60.6	4.66	4.08	5.05	4.02	4.24	3.36	3.56	3.04	3.03	3.13	3.87	4.03	46.07
DEXTER	•	•	•	•	•	•	•	•	•	•	•	•	•	4.47	3.84	4.83	4.34	4.59	4.35	3.22	3.44	3.74	3.25	3.87	3.62	47.56
FISK	•	•	•	•	•	•	•	•	•	•	•	•	•	4.19	3.54	4.57	4.36	4.36	4.32	3.29	2.87	3.35	3.01	3.78	3.45	45.09
MOREHOUSE	•	•	•	•	•	•	•	•	•	•	•	•	•	4.48	3.55	4.73	4.28	4.42	4.19	2.86	3.13	3.43	3.15	4.06	3.62	45.90
NEW MADRID	•	•	•	•	•	•	•	•	•	•	•	•	•	4.56	4.24	5.05	4.14	4.90	3.99	3.79	3.09	3.42	3.07	4.28	3.93	48.46
PARMA	•	•	•	•	•	•	•	•	•	•	•	•	•	4.65	3.98	4.85	4.07	4.70	4.06	3.45	3.30	3.36	2.78	4.16	3.67	47.03
POPLAR BLUFF	37.5	40.4	48.2	59.1	67.6	76.4	79.9	79.0	71.7	60.9	47.6	39.2	59.0	3.84	3.45	4.50	4.49	4.83	4.16	3.33	3.12	3.45	3.26	3.78	3.40	45.61
SIKESTON SE MO RESEARCH	36.8	39.4	47.2	58.4	67.9	77.1	80.2	79.0	71.8	61.0	47.1	38.5	58.7	4.67	3.86	4.99	4.40	4.44	4.16	3.12	2.92	3.79	3.00	4.18	3.71	47.24
DIVISION	37.3	40.5	48.0	59.2	68.1	77.1	80.3	79.1	71.9	61.0	47.7	39.1	59.1	4.20	3.77	4.79	4.31	4.51	3.96	3.22	3.11	3.20	3.09	3.79	3.60	45.55

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1963 REVISIONS AND ADDITIONS TO CLIMATOGRAPHY OF THE UNITED STATES NO. 81-19 MISSOURI

TABLE I — NORMALS FOR FIRST ORDER STATIONS

STATION	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
KANSAS CITY AP													
G 742 T 5													
MAX TEMP	39.9	44.8	52.6	65.6	75.1	85.2	91.9	90.3	82.7	71.6	54.5	43.7	66.5
MIN TEMP	23.4	26.7	34.0	45.8	56.0	66.5	71.0	69.2	59.9	48.7	34.6	27.9	47.0
AVG TEMP	31.7	35.8	43.3	55.7	65.6	75.9	81.5	79.8	71.3	60.2	44.6	35.8	56.8
DEG DAYS	1032	818	682	294	109	0	0	0	39	220	612	905	4711
ST LOUIS AP													
G 535 T 6													
MAX TEMP	40.2	44.0	52.8	65.9	75.1	85.1	89.2	87.3	81.3	70.1	53.7	43.0	65.6
MIN TEMP	23.5	25.3	32.4	43.8	53.3	63.1	66.9	66.3	57.6	46.6	34.5	26.5	45.0
AVG TEMP	31.9	34.7	42.6	54.9	64.2	74.1	78.1	76.8	69.5	58.4	44.1	34.8	55.3
DEG DAYS	1026	848	704	312	121	15	0	0	60	251	627	936	4900

TABLE II — NORMALS BY CLIMATOLOGICAL DIVISIONS

TEMPERATURE (°F.)

NORTHWEST PRAIRIE DIV	27.7	31.6	40.6		64.0	73.7	78.7	76.9	68.7				54.0
NORTHEAST PRAIRIE DIV	29.8	33.0		54.2	64.4	74.1	78.5	76.8	69.0	58.1	43.1	33.1	
WEST CENTRAL PLAINS DIV		35.7		55.9		74.8	79.5				44.8	35.6	
WEST OZARKS DIVISION		38.5	45.6	56.9		74.5	78.8	78.1	70.6	60.1			
EAST OZARKS DIVISION		37.9		56.9	65.4		78.2	77.3	69.7		45.5	37.0	
BOOTHEEL DIVISION	37.5	40.3		59.1	68.2	77.0				61.2	47.8	39.3	

PRECIPITATION (In.)

NORTHWEST PRAIRIE DIV		1.33	2.37			5.43	3.43	4.06	3.53	2.63	1.93	1.54	35.36
NORTHEAST PRAIRIE DIV		1.79	2.83	3.51	4.20	4.61	3.47	3.50	3.29	2.95	2.47	1.92	36.37
WEST CENTRAL PLAINS DIV	1.76	1.89		3.66	4.93	5.08	3.38	3.84	4.01	3.40	2.41	1.91	38.88
WEST OZARKS DIVISION	2.15	2.39		4.14	5.41	4.95	3.56	3.19	3.91	3.65	2.82	2.27	41.49
EAST OZARKS DIVISION	2.98	2.85		4.32	5.01	4.43	3.35	3.42	3.42		3.44	2.83	43.13
BOOTHEEL DIVISION	4.33	3.71	4.86	4.29	4.46	3.94	3.34	3.19	3.41	3.12	3.89	3.67	46.21

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

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