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CLIMATOGRAPHY OF THE UNITED STATES NO. 81-39

DECENNIAL CENSUS OF UNITED STATES CLIMATE—

MONTHLY NORMALS OF TEMPERATURE, PRECIPITATION, AND HEATING DEGREE DAYS

WASHINGTON

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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

WASHINGTON

STATION		JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	ANNUAL
OLYMPIA AP G 194 T 5														
	MAX TEMP	45.1	49.6	54.4*	62.3	68.6	72.6*	79.7*	78.9	72.6*	62.3	52.4	47.5	62.2
	MIN TEMP	31.1	32.2	34.0*	37.6*	41.6	45.5	48.0	47.8*	44.4	40.5	35.2*	33.9	39.3
	AVG TEMP	38.1	40.9	44.2*	50.0*	55.1	59.1*	63.9*	63.4*	58.5*	51.4	43.8*	40.7	50.8
	DEG DAYS	834	675	645*	450*	307	177*	68*	71*	198*	422	636*	753	5236
	PRECIP	7.85*	6.62	5.40	2.96	2.01	1.79	.76	.89	2.09	5.28*	7.67	9.05	52.37
SEATTLE TACOMA AP H 386 T 6														
	MAX TEMP	43.6	47.0	51.3*	58.2	64.6	68.9*	74.6*	73.6*	68.3	59.3	49.6	45.9	58.7
	MIN TEMP	33.0*	34.5	36.2*	40.1	45.3	49.7	53.1	52.6*	49.5	44.4	38.1	35.7*	42.7
	AVG TEMP	38.3*	40.8	43.8*	49.2	55.0	59.3*	63.9	63.1*	58.9	51.9	43.9	40.8*	50.7
	DEG DAYS	828*	678	657*	474	310	174*	74*	81*	186	406	633	750*	5251
	PRECIP	5.73*	4.24	3.79	2.40	1.73	1.58	.81	.95	2.05	4.02	5.35	6.29	38.94
SEATTLE BOEING AP H 14 T 6														
	MAX TEMP	45.2	49.5	54.3*	61.8	68.5	73.1*	78.4	77.1*	71.5	62.3	52.4	47.3	61.8
	MIN TEMP	31.1	33.6	36.4	40.7	46.2*	51.2	54.9*	54.0	49.4*	42.9*	35.9	33.5	42.5
	AVG TEMP	38.2	41.6	45.4*	51.3	57.4*	62.2*	66.7*	65.6*	60.5*	52.6*	44.2	40.4	52.2
	DEG DAYS	831	655	608*	411	242*	99*	34*	40*	147*	384*	624	763	4838
	PRECIP	5.46*	4.21	3.53	2.15	1.58	1.43	.66	.81	1.83	3.50	5.22	5.73	36.11
#SEATTLE CO H 14 T 90														
	MAX TEMP	45.6	48.8	52.7*	59.4	65.7	69.6*	75.1	73.9	69.0	60.4	51.8	48.0	60.0
	MIN TEMP	36.8	38.3	40.1*	44.1	49.0	53.1	56.1	56.1	53.3*	48.3	41.9	39.5	46.4
	AVG TEMP	41.2	43.6	46.4*	51.8	57.4	61.4*	65.6	65.0	61.2*	54.4	46.9	43.8	53.2
	DEG DAYS	738	599	577*	396	242	117*	50	47	129*	329	543	657	4424
	PRECIP	5.19*	3.90	3.32	1.97	1.59	1.41	.63	.74	1.65	3.28	5.00	5.42	34.10
SPOKANE AP H2357 T 7														
	MAX TEMP	31.4	37.4	47.0	58.6	68.3*	73.5	83.6*	81.0	72.7*	59.1	41.9	34.9	57.6
	MIN TEMP	19.2	22.5	29.1*	35.9	43.1	49.3*	55.4*	53.9	47.0	38.0	28.5*	24.2	37.2
	AVG TEMP	25.3	30.0	38.1	47.3	55.7*	61.4	69.5*	67.5	59.9*	48.6	35.2*	29.6	47.3
	DEG DAYS	1231	980	834	531	298*	147*	19*	34	189*	508	894*	1097	6762
	PRECIP	2.44*	1.86	1.50	.91	1.21	1.49	.38	.41	.75	1.57	2.24	2.43	17.19
STAMPEDE PASS WB H3958 T 12														
	MAX TEMP	27.5	31.1	34.8*	42.6*	51.0	56.7*	65.4*	64.5*	59.8	48.1*	35.7*	30.9	45.7
	MIN TEMP	19.5	22.1	25.1	30.3	36.7	41.0*	47.0	46.7	44.0*	36.6	27.1	23.0	33.3
	AVG TEMP	23.5	26.6	30.0*	36.5*	43.9	48.9*	56.2*	55.6*	51.9*	42.4	31.4*	27.0	39.5
	DEG DAYS	1287	1075	1085*	855*	654	483*	273*	291*	393*	701	1008*	1178	9283
	PRECIP	12.03	10.15	10.60	5.60	4.25	4.09	1.46	2.04	4.39	8.81	12.58	16.19	92.19
#TATOOSH ISLAND WB H 101 T 5														
	MAX TEMP	45.2	46.6	47.9*	51.6	55.2	57.8	59.5	60.1	59.2*	55.8	50.5	47.6	53.1
	MIN TEMP	38.8	39.5	40.4*	43.3*	47.0	50.0*	51.5	51.8*	50.4*	48.0	43.9	41.1	45.5
	AVG TEMP	42.0	43.1	44.2*	47.5	51.1	53.9*	55.5	56.0*	54.8*	51.9	47.2	44.4	49.3
	DEG DAYS	713	613	645*	525	431	333*	295	279*	306*	406	534	639	5719
	PRECIP	10.82	8.70	8.34	5.23	3.00	2.84	2.34	1.98	3.55	8.22	10.51	12.16	77.69
#WALLA WALLA CO H 949 T 58														
	MAX TEMP	39.0	44.9	54.4*	63.8	72.0	78.7*	89.2	86.6*	77.9	64.6	48.8	43.8	63.6
	MIN TEMP	27.4	31.8	37.6*	43.7	49.9	55.6	62.7	61.0	54.1	45.6	35.7	31.7	44.7
	AVG TEMP	33.2	38.4	46.0*	53.8	61.0	67.2*	76.0	73.8*	66.0	55.1	42.3	37.8	54.2
	DEG DAYS	986	745	589*	342	177	45*	0	0	87	310	681	843	4805
	PRECIP	1.89*	1.52	1.59	1.40	1.49	1.22	.21*	.30	.78	1.53	1.72	1.85	15.50
YAKIMA AP H1061 T 6														
	MAX TEMP	36.5	44.7	55.3*	65.8*	74.1*	80.0*	88.9*	86.5*	78.8	65.6*	48.1*	39.7	63.7
	MIN TEMP	18.5	23.2	28.7*	35.2	42.8	48.8	53.1	50.6	43.8	35.4	26.7	23.3	35.8
	AVG TEMP	27.5	34.0	42.0*	50.5*	58.5*	64.4*	71.0*	68.6*	61.3	50.5*	37.4*	31.5	49.8
	DEG DAYS	1163	868	713*	435*	220*	69*	0	12*	144	450*	828*	1039	5941
	PRECIP	1.19*	.87	.62*	.47	.54	.81	.13*	.20	.35	.60	.96	1.12	7.86

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
WEST OLYMPIC COASTAL																										
ABERDEEN	39.7	41.8	44.1	48.7	53.3	57.1	60.1	60.6	58.7	52.7	45.2	41.9	50.3	12.70	10.23	9.19	5.56	3.43	2.70	1.51	1.79	3.71	8.13	11.09	14.50	84.54
#ABERDEEN 2 NNE	•	•	•	•	•	•	•	•	•	•	•	•	•	19.14	15.17	14.41	8.90	5.38	3.98	2.37	2.49	5.88	12.93	16.59	21.84	129.08
AMANDA PARK	•	•	•	•	•	•	•	•	•	•	•	•	•	19.95	15.94	14.22	9.18	5.90	4.31	2.60	2.79	6.00	13.27	17.52	22.75	134.43
CLALLAM BAY 1 NNE	38.3	39.7	42.0	46.4	50.5	54.0	56.3	56.5	54.5	49.7	43.4	40.7	47.7	13.55	9.81	8.43	5.25	3.15	2.44	1.65	1.52	3.15	7.85	11.16	14.29	82.25
#CUSHMAN DAM	37.1	39.6	42.8	49.0	55.6	59.8	64.7	64.4	60.4	52.6	43.6	39.7	50.8	16.65	12.31	10.41	6.07	3.33	2.44	1.28	1.38	3.74	9.73	14.73	18.18	100.25
#FORKS 1 E	38.7	40.3	42.5	46.9	52.1	56.0	59.7	60.0	57.6	51.5	44.1	40.6	49.2	17.49	14.12	12.69	8.33	4.89	3.69	2.50	2.25	5.11	11.70	15.08	19.25	117.10
#NASELLE	•	•	•	•	•	•	•	•	•	•	•	•	•	17.18	14.28	13.60	7.01	4.32	3.59	1.62	2.03	4.55	11.10	15.03	20.14	114.45
#SPRUCE	•	•	•	•	•	•	•	•	•	•	•	•	•	18.70	14.90	13.08	8.76	5.29	4.17	2.46	2.53	5.32	12.86	16.77	21.74	126.58
#TATOOSH ISLAND WB	42.0	43.1	44.2	47.5	51.1	53.9	55.5	56.0	54.8	51.9	47.2	44.4	49.3	10.82	8.70	8.34	5.23	3.00	2.84	2.34	1.98	3.55	8.22	10.51	12.16	77.69
#WILLAPA HARBOR	40.5	42.9	45.1	49.6	54.2	57.8	61.4	61.8	59.6	53.7	46.3	42.8	51.3	12.37	10.43	9.89	5.94	3.68	3.17	1.46	1.73	3.55	8.50	11.25	14.59	86.56
DIVISION	39.5	41.3	43.6	48.1	52.8	56.4	59.7	59.9	57.7	52.6	45.1	41.8	49.9	14.21	11.11	10.08	6.26	3.83	3.02	1.84	1.91	4.06	9.30	12.53	15.77	93.92
NE OLYMPIC-SAN JUAN																										
ANACORTES	39.7	42.1	45.3	50.6	55.5	59.4	62.4	62.1	58.7	52.7	45.5	42.5	51.4	3.40	2.53	2.39	1.52	1.27	1.51	.78	.87	1.45	2.68	3.48	3.82	25.70
CHIMACUM 4 S	•	•	•	•	•	•	•	•	•	•	•	•	•	3.63	3.26	2.40	2.03	1.83	1.92	.76	.93	1.17	2.32	3.41	4.19	27.85
#COUPEVILLE 1 S	38.3	40.4	43.7	48.7	53.5	57.5	60.9	60.9	57.0	50.5	43.7	40.8	49.7	2.01	1.59	1.62	1.12	1.25	1.31	.67	.69	1.19	1.73	2.25	2.30	17.73
#OLGA 2 SE	38.6	40.7	43.7	48.6	53.3	57.0	59.6	59.7	56.7	50.9	44.2	41.2	49.5	4.04	2.94	2.51	1.65	1.35	1.51	.88	.95	1.61	3.04	3.91	4.39	28.78
#PORT ANGELES	38.6	40.3	42.6	47.2	52.0	55.7	58.8	58.7	56.1	50.1	43.7	41.0	48.7	3.87	3.06	1.99	1.08	.89	.96	.48	.58	1.10	2.48	3.77	4.35	24.61
PORT TOWNSEND	39.4	41.5	44.5	49.4	54.4	58.1	61.3	61.3	57.9	51.6	45.1	42.0	50.5	2.20	1.66	1.57	1.12	1.36	1.42	.68	.73	1.11	1.68	2.41	2.40	18.34
SEQUIM	37.9	40.1	42.8	47.8	53.1	57.2	60.4	60.8	57.4	50.6	43.6	40.2	49.3	2.18	1.73	1.30	.93	.97	1.15	.47	.59	.95	1.57	2.31	2.66	16.81
DIVISION	38.8	40.9	43.7	48.6	53.5	57.3	60.3	60.4	57.1	51.4	44.3	41.3	49.8	3.09	2.35	1.92	1.23	1.16	1.28	.65	.73	1.25	2.30	3.14	3.47	22.57
PUGET SOUND LOWLANDS																										
#BELLINGHAM 2 N	36.8	39.5	43.0	48.0	53.2	57.8	61.0	60.6	56.7	50.1	43.1	39.6	49.1	4.14	3.22	3.11	2.26	1.82	1.93	.99	1.10	1.98	3.64	4.51	4.89	33.59
BLAINE 1 E	36.7	39.2	43.1	48.4	54.3	59.0	62.4	61.5	56.9	50.1	42.7	39.4	49.5	5.72	4.30	3.68	2.52	2.03	1.97	1.16	1.22	2.24	4.54	5.33	6.17	40.88
BREMERTON	•	•	•	•	•	•	•	•	•	•	•	•	•	6.36	4.79	3.65	2.27	1.38	1.35	.58	.68	1.45	3.60	5.85	6.70	38.66
CENTRALIA	39.2	42.1	45.4	51.0	56.5	60.5	65.1	64.4	60.6	53.0	44.8	41.6	52.0	6.36	5.45	4.66	2.68	1.91	1.92	.73	1.02	1.86	4.50	6.69	7.75	45.53
#CLEARBROOK	35.1	38.5	43.1	48.8	54.3	58.8	62.1	61.4	57.6	50.3	42.3	38.4	49.2	5.75	4.52	4.47	3.18	2.63	2.58	1.46	1.58	2.92	5.27	5.72	6.74	46.82
EVERETT	38.6	41.0	44.6	49.6	54.7	58.9	62.4	61.8	57.9	51.8	44.4	41.2	50.6	4.45	3.58	3.33	2.39	2.26	2.25	.93	1.12	1.98	3.54	4.55	4.86	35.24
#MONROE	38.0	40.9	44.7	50.3	55.9	60.2	64.1	63.6	59.2	52.2	44.2	40.7	51.2	6.03	5.01	4.59	3.21	3.01	2.53	1.04	1.34	2.49	4.65	6.32	6.54	46.76
OLYMPIA AP	38.1	40.9	44.2	50.0	55.1	59.1	63.9	63.4	58.5	51.4	43.8	40.7	50.8	7.85	6.62	5.40	2.96	2.01	1.79	.76	.89	2.09	5.28	7.67	9.05	52.37
#PUYALLUP 2 W EXP STA	38.6	41.3	44.5	50.0	55.5	59.8	63.7	63.1	58.8	51.9	43.8	40.8	51.0	5.63	4.66	4.14	2.64	2.02	1.81	.81	.96	2.03	3.95	5.45	6.40	40.50
SEATTLE NAVAL AIR STA	•	•	•	•	•	•	•	•	•	•	•	•	•	4.85	3.73	3.20	2.09	1.80	1.59	.65	.89	1.86	3.44	4.75	5.24	34.09
SEATTLE TACOMA AP	38.3	40.8	43.8	49.2	55.0	59.3	63.9	63.1	58.9	51.9	43.9	40.8	50.7	5.73	4.24	3.79	2.40	1.73	1.58	.81	.95	2.05	4.02	5.35	6.29	38.94
SEATTLE U OF W	40.1	42.0	45.9	51.3	57.0	61.4	65.7	65.2	61.1	54.1	46.0	42.7	52.8	5.02	3.93	3.28	2.16	1.84	1.62	.74	.75	1.72	3.42	5.01	5.47	34.96
SEATTLE BOEING AP	38.2	41.6	45.4	51.3	57.4	62.2	66.7	65.6	60.5	52.6	44.2	40.4	52.2	5.46	4.21	3.53	2.15	1.58	1.43	.66	.81	1.83	3.50	5.22	5.73	36.11
#SEATTLE CO	41.2	43.6	46.4	51.8	57.4	61.4	65.6	65.0	61.2	54.4	46.9	43.8	53.2	5.19	3.90	3.32	1.97	1.59	1.41	.63	.74	1.65	3.28	5.00	5.42	34.10
SEDRO WOOLLEY 1 E	38.0	41.0	44.7	50.1	55.4	59.3	62.5	62.3	58.4	51.8	44.0	40.4	50.7	5.57	4.33	4.65	3.30	2.56	2.78	1.33	1.38	3.01	4.91	5.87	6.38	46.07
DIVISION	38.3	40.9	44.4	49.8	55.4	59.7	63.6	63.0	58.9	52.0	44.2	41.0	50.9	5.59	4.44	3.96	2.54	2.00	1.89	.89	1.01	2.06	4.11	5.58	6.32	40.39

TABLE II - NORMALS BY CLIMATOLOGICAL DIVISIONS

WASHINGTON

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
E OLYMPIC-CASCADE FTHILLS																										
BROOKLYN	.	.	.	.	.	.	.	.	.	.	.	.	.	11.14	9.47	8.59	5.11	3.18	2.53	.93	1.43	3.12	7.86	10.21	13.25	76.82
#BUCKLEY 1 NE	37.8	40.4	43.8	49.0	54.6	58.7	63.1	62.6	58.3	50.8	43.2	40.3	50.2	5.59	4.71	4.94	3.86	3.13	3.36	1.25	1.41	2.77	5.15	6.23	6.91	49.31
#CONCRETE	36.7	40.1	44.5	51.3	57.3	61.1	65.4	65.2	61.2	53.3	43.7	39.2	51.6	8.80	7.03	6.76	4.12	2.87	2.75	1.30	1.50	3.57	7.03	9.10	10.38	65.21
#DARRINGTON RS	.	.	.	.	.	.	.	.	.	.	.	.	.	11.79	9.37	8.13	5.30	3.43	3.20	1.36	1.50	3.92	8.23	11.14	13.14	80.51
#GRAPEVIEW	39.5	41.7	45.1	50.7	56.6	60.7	64.8	64.8	60.4	52.9	45.2	42.0	52.0	8.33	6.56	5.51	3.24	1.96	1.62	.75	.94	2.04	5.16	7.61	9.29	53.01
KALAMA 5 ENE	.	.	.	.	.	.	.	.	.	.	.	.	.	9.08	6.99	7.58	4.35	3.25	2.73	.93	1.51	2.54	5.94	8.59	10.48	63.97
#LANDSBURG	36.9	39.8	43.3	48.4	53.8	57.9	61.9	61.3	57.4	50.3	42.6	39.3	49.4	6.97	5.63	5.76	4.02	3.23	3.31	1.34	1.64	3.39	5.80	7.26	8.13	56.48
LONGVIEW	38.1	41.2	44.6	50.0	55.3	59.7	64.1	64.0	60.7	53.1	44.5	40.7	51.3	5.81	4.87	4.85	2.72	2.30	2.14	.75	1.26	2.01	4.40	6.43	7.56	45.10
#NEWHALEM	33.8	37.5	42.0	49.5	56.4	60.4	65.5	65.1	60.7	51.6	41.9	36.9	50.1	10.88	8.77	7.45	4.75	2.94	2.70	1.50	1.76	4.14	8.96	11.04	13.33	78.22
OAKVILLE	38.4	41.0	44.1	49.5	54.7	59.1	63.7	63.5	59.6	52.2	44.0	40.8	50.9	8.49	6.56	5.70	3.34	2.28	1.86	.65	1.10	2.25	5.46	7.42	9.44	54.55
#PALMER 3 SE	35.9	38.6	41.9	47.8	53.9	57.9	63.1	62.6	58.6	51.2	42.9	38.7	49.4	11.23	9.38	10.33	7.54	5.81	5.35	2.20	2.49	5.21	9.30	11.95	13.75	94.54
QUILCENE 2 SW	36.8	39.8	43.5	49.3	55.0	59.2	63.5	62.8	58.5	50.9	42.6	39.0	50.1	8.09	6.51	4.40	3.07	2.52	2.40	.98	1.01	1.49	3.84	7.26	9.41	50.98
RAINBOW FALLS PARK 2 E	.	.	.	.	.	.	.	.	.	.	.	.	.	7.74	6.67	5.90	3.36	2.18	1.91	.60	.97	1.98	5.02	7.48	8.87	52.68
RANDLE 1 E	.	.	.	.	.	.	.	.	.	.	.	.	.	8.38	6.98	6.36	3.98	2.97	2.75	.72	1.33	2.67	6.32	8.73	10.60	61.79
#SHELTON	38.4	40.8	44.0	49.7	55.7	59.9	64.3	63.9	59.6	51.9	43.9	40.6	51.1	10.37	8.06	6.83	3.89	2.21	1.73	.80	1.06	2.32	6.09	9.26	11.67	64.29
SNOQUALMIE FALLS	37.7	40.2	43.5	49.2	54.5	58.6	63.0	62.4	57.7	50.7	43.3	40.3	50.1	7.85	6.35	6.14	4.00	3.20	3.21	1.29	1.43	3.18	6.15	8.38	9.12	60.30
STARTUP 1 E	.	.	.	.	.	.	.	.	.	.	.	.	.	7.59	6.31	6.26	4.74	4.32	3.89	1.70	1.77	3.72	6.72	8.40	8.73	64.15
#VANCOUVER	38.8	42.4	46.7	52.6	58.2	62.6	67.5	67.2	63.5	55.2	45.7	41.7	53.5	5.63	4.43	4.00	2.31	2.02	1.88	.46	.74	1.64	3.58	5.64	6.67	39.00
DIVISION	36.4	39.3	43.0	49.0	54.8	59.0	63.6	63.2	59.0	51.3	42.8	39.1	50.0	8.24	6.74	6.25	4.15	3.10	2.91	1.13	1.40	2.96	6.22	8.46	9.96	61.52
CASCADE MOUNTAINS-WEST																										
#CEDAR LAKE	34.4	37.0	39.9	45.8	51.7	55.6	60.7	60.2	56.7	49.9	41.7	37.6	47.6	13.11	10.52	11.17	7.69	6.00	5.53	2.17	2.57	5.54	10.52	13.80	15.61	104.23
#LAKE KEECHELUS	25.8	28.6	33.0	39.8	47.4	53.6	60.4	59.9	54.4	45.4	34.9	30.0	42.8	9.86	8.04	6.96	3.78	2.70	2.35	.77	.93	2.83	6.94	10.54	12.46	68.16
#RAINIER LONGMIRE	30.3	32.8	35.8	42.1	49.5	54.6	61.2	60.3	56.0	47.6	37.8	33.4	45.1	10.92	8.98	8.32	5.11	4.12	3.63	1.35	1.75	3.92	8.63	11.91	13.79	82.43
#SCENIC	.	.	.	.	.	.	.	.	.	.	.	.	.	11.19	9.89	8.84	5.42	4.00	3.27	1.21	1.21	3.82	8.35	11.92	13.84	82.96
STAMPEDE PASS WB	23.5	26.6	30.0	36.5	43.9	48.9	56.2	55.6	51.9	42.4	31.4	27.0	39.5	12.03	10.15	10.60	5.60	4.25	4.09	1.46	2.04	4.39	8.81	12.58	16.19	92.19
#WIND RIVER	32.0	35.5	40.2	46.6	53.2	58.1	63.5	62.5	58.0	49.4	39.7	35.0	47.8	16.05	12.53	11.49	6.26	3.74	2.54	1.01	1.12	2.96	8.74	14.68	18.39	99.51
DIVISION	28.5	31.2	34.7	40.9	47.6	52.6	59.2	58.5	54.2	46.1	36.2	31.7	43.5	12.61	10.16	9.67	5.80	4.26	3.92	1.47	1.81	4.22	9.09	12.99	15.00	91.00
EAST SLOPE CASCADES																										
#BUMPING LAKE	23.1	26.5	30.9	38.1	45.6	50.9	58.2	57.7	51.9	43.0	32.3	26.6	40.4	7.85	6.03	4.82	2.29	1.77	1.59	.53	.64	1.52	4.28	7.25	9.25	47.82
LAKE CLE ELUM	26.0	29.9	35.7	43.6	51.2	57.1	64.3	63.4	56.9	46.8	35.5	30.3	45.1	5.87	4.31	3.67	1.57	1.31	1.09	.36	.42	1.32	3.61	6.00	6.96	36.49
#LAKE KACHESS	25.7	29.6	35.1	42.7	50.3	56.1	63.4	62.7	56.3	46.2	34.9	29.8	44.4	8.36	6.67	5.77	2.86	2.12	1.88	.61	.71	2.10	5.28	8.21	10.37	54.94
#LAKE WENATCHEE	.	.	.	.	.	.	.	.	.	.	.	.	.	6.90	5.32	3.61	1.50	1.20	1.31	.38	.51	1.30	3.88	6.77	7.99	40.67
LEAVENWORTH 3 S	.	.	.	.	.	.	.	.	.	.	.	.	.	3.97	2.81	2.10	.87	.91	1.01	.20	.44	.75	2.21	4.05	4.59	23.91
#MOUNT ADAMS RS	28.4	32.5	38.0	45.4	52.9	58.7	65.2	63.4	57.4	47.5	36.6	32.1	46.5	8.49	6.05	5.07	2.45	1.67	1.29	.19	.42	1.26	4.14	7.25	9.14	47.42
#RIMROCK TIETON DAM	25.6	29.8	35.3	43.4	50.5	56.1	63.0	61.7	56.1	46.3	35.1	29.8	44.4	4.21	2.89	2.41	1.16	.96	1.02	.34	.50	.76	2.36	4.21	5.30	26.12
#STEHEKIN 3 NW	.	.	.	.	.	.	.	.	.	.	.	.	.	5.28	4.34	3.01	1.19	1.00	.90	.39	.46	1.22	3.38	5.88	6.75	33.80
#STOCKDILL RANCH	18.1	23.2	32.4	43.7	51.3	56.9	63.1	60.4	55.0	44.2	30.8	21.7	41.7	2.50	2.02	1.63	.81	1.09	1.38	.47	.55	.80	1.47	2.71	3.37	18.80
#TIETON INTAKE	.	.	.	.	.	.	.	.	.	.	.	.	.	3.02	2.11	1.77	1.04	.89	1.10	.33	.45	.53	1.53	2.56	3.84	19.17
WINTHROP 1 WSW	18.4	24.4	35.3	47.2	55.2	61.3	68.2	66.3	58.6	47.2	32.6	22.9	44.8	2.04	1.59	.89	.67	1.01	1.23	.52	.48	.66	1.02	1.94	2.50	14.55
DIVISION	24.6	29.1	35.8	44.3	52.1	57.7	64.7	63.3	56.9	46.6	34.6	28.5	44.9	5.08	3.85	3.06	1.42	1.24	1.23	.39	.49	1.10	2.91	4.92	6.14	31.83
OKANOGAN BIG BEND																										
CHELAN	25.5	30.4	40.6	50.6	59.4	65.6	72.9	71.2	62.8	50.9	37.3	30.3	49.8	1.40	1.10	.89	.72	.86	1.07	.24	.31	.56	.98	1.50	1.60	11.23
CONCONULLY	20.7	26.2	35.4	46.0	54.3	60.0	66.8	65.2	58.2	46.6	32.5	25.2	44.8	1.49	1.31	1.18	1.07	1.37	1.87	.57	.75	.75	1.16	1.75	1.75	15.02
#DAVENPORT	24.3	29.0	37.8	46.7	54.5	59.9	67.4	65.6	58.8	47.6	34.6	28.5	46.2	2.11	1.58	1.50	1.07	1.41	1.42	.53	.54	.92	1.42	2.02	2.20	16.72
HARRINGTON 5 S	.	.	.	.	.	.	.	.	.	.	.	.	.	1.51	1.03	1.06	.81	1.12	1.29	.40	.36	.82	1.37	1.52	1.65	12.74
#MANSFIELD	.	.	.	.	.	.	.	.	.	.	.	.	.	1.36	1.09	.79	.77	.97	1.36	.30	.41	.60	.85	1.33	1.43	11.26
#NESPELEM 2 S	23.9	28.8	38.5	48.0	56.0	61.9	69.1	67.2	60.1	48.7	34.7	28.8	47.1	1.58	1.11	1.05	1.05	1.23	1.54	.51	.48	.73	1.19	1.55	1.55	13.57
ODESSA	27.2	32.4	41.1	49.3	57.3	63.5	70.9	68.6	61.1	50.2	37.1	31.1	49.2	1.35	.96	.97	.66	.96	1.11	.42	.26	.60	.97	1.26	1.29	10.81
SPRAGUE	.	.	.	.	.	.	.	.	.	.	.	.	.	1.81	1.32	1.32	.94	1.16	1.14	.33	.42	.83	1.55	1.84	2.04	14.70
WATERVILLE	22.2	27.3	35.9	46.0	53.7	59.0	66.6	65.2	58.4	47.4	33.6	26.3	45.1	1.33	1.15	.87	.68	1.04	1.37	.22	.44	.63	.88	1.42	1.54	11.57
#WILBUR	24.5	29.2	38.2	47.0	55.0	60.6	67.6	65.6	58.6	47.9	35.3	29.1	46.6	1.66	1.13	1.03	.83	1.21	1.20	.41	.35	.70	1.25	1.57	1.59	12.93
DIVISION	24.4	29.4	39.0	48.6	56.8	62.6	70.0	68.0	60.6	49.2	35.4	28.8	47.7	1.51	1.16	1.01	.87	1.11	1.35	.41	.46	.67	1.13	1.54	1.64	12.86
CENTRAL BASIN																										
BICKLETON	.	.	.	.	.	.	.	.	.	.	.	.	.	1.83	1.57	1.15	.72	.75	.88	.18	.17	.36	1.03	1.81	2.18	12.63
#EPHRATA	.	.	.	.	.	.	.	.	.	.	.	.	.	1.05	.74	.67	.56	.72	.92	.20	.25	.46	.77	.98	1.10	8.42
GOLDENDALE	29.4	34.6	41.1	48.0	54.7	60.2	66.9	65.1	59.4	49.7	38.5	33.2	48.4	2.93	2.03	1.70	.85	.79	.91	.15	.21	.62	1.64	2.53	3.05	17.41
HATTON 8 E	28.1	33.6	41.9	49.8	57.7	64.0	71.9	69.6	62.1	50.7	37.8	32.1	49.9	1.22	.92	.87	.70	.79	.86	.21	.22	.49	1.13	1.22	1.31	9.94
KAHLOTUS 5 SSW	.	.	.	.	.	.	.	.	.	.	.	.	.	1.27	1.06	.89	.72	.83	.93	.16	.22	.46	1.08	1.23	1.52	10.37
KENNEWICK	31.8	37.5	46.1	54.5	62.3	68.3	75.1	72.4	64.6	53.7	41.2	36.0	53.6	1.05	.82	.56	.48	.54	.63	.17	.14	.33	.73	.95	1.09	7.49
#LIND 3 NE	27.8	33.2	41.5	49.6	57.7	63.8	71.8	69.8	62.3	51.0	37.5	31.7	49.8	1.13	.97	.81	.67	.85	1.04	.26	.30	.57	1.11	1.12	1.28	10.11
#MILL CREEK	.	.	.	.	.	.	.	.	.	.	.	.	.	4.68	3.84	4.52	3.56	3.16	2.78	.68	.62	1.66	3.96	4.85	5.25	39.56
#PROSSER	31.2	37.1	45.1	53.2	60.8	66.7	72.9	70.5	63.8	52.8	40.2	35.0	52.4	1.19	.87	.68	.59	.61	.83	.16	.23	.36	.93	1.02	1.06	8.53
#PROSSER 4 NE	29.8	35.7	43.6	51.5	58.8	64.6	70.8	68.9	62.6	52.2	39.4	33.8	51.0	.94	.75	.61	.55	.57	.76	.17	.19	.37	.92	.94	1.00	7.77
#RITZVILLE	27.0	32.1	40.6	48.8	56.8	63.1	71.1	69.3	62.1	50.6	36.9	31.2	49.1	1.44	1.04	1.01	.74	.94	1.15	.29	.33	.65	1.19	1.38	1.51	11.67
#SUNNYSIDE	30.2	36.0	44.2	52.6	60.5	66.2	72.1	69.7	63.2	52.6	39.7	33.8	51.7	.89	.66	.48	.42	.51	.84	.18	.21	.35	.72	.76	.88	6.90
TRINIDAD 2 SSE	28.2	34.2	44.6	54.0	62.6	68.8	76.3	74.5	66.8	54.4	39.7	32.8	53.1	1.04	.83	.70	.53	.70	.90	.14	.20	.39	.61	1.03	1.17	8.24
#WALLA WALLA CO	33.2	38.4	46.0	53.8	61.0	67.2	76.0	73.8	66.0	55.1	42.3	37.8	54.2	1.89	1.52	1.59	1.40	1.49	1.22	.21	.30	.78	1.53	1.72	1.85	15.50
#WAPATO	30.2	36.6	44.9	53.8	62.0	67.8	74.8	72.5	64.7	53.3	39.7	34.0	52.9	1.04	.73	.53	.45	.45	.76	.15	.21	.33	.57	.87	1.02	7.11
#WENATCHEE	26.2	31.5	42.3	52.2	60.5	66.5	73.4	71.5	63.5	51.1	37.7	31.1	50.6	1.16	.98	.67	.47	.65	.91	.11	.37	.47	.73	1.14	1.34	9.00
#WILSON CREEK	.	.	.	.	.	.	.	.	.	.	.	.	.	1.09	.78	.69	.54	.82	1.08	.28	.20	.52	.88	1.12	1.17	9.17
YAKIMA AP	27.5	34.0	42.0	50.5	58.5	64.4	71.0	68.6	61.3	50.5	37.4	31.5	49.8	1.19	.87	.62	.47	.54	.81	.13	.20	.35	.60	.96	1.12	7.86
DIVISION	29.1	34.8	43.3	51.7	59.6	65.7	72.9	70.9	63.6	52.3	39.0	33.1	51.3	1.29	.99	.83	.63	.71	.88	.19	.23	.45	.92	1.18	1.33	9.63
NORTHEASTERN																										
CHEWELAH 2 S	23.3	28.5	38.2	47.2	55.2	60.7	66.6	64.4	57.3	46.7	34.6	28.4	45.9	2.52	1.83	1.70	1.29	1.67	1.58	.64	.59	1.08	1.85	2.34	2.73	19.82
DEER PARK 2 E	23.8	28.4	36.3	45.9	53.8	59.4	65.9	63.7	56.5	46.1	33.8	28.4	45.2	2.90	2.11	1.86	1.53	1.67	1.52	.47	.58	1.18	2.22	2.79	3.24	22.03
#IRENE MT WAUCONDA	.	.	.	.	.	.	.	.	.	.	.	.	.	1.10	.83	.80	1.05	1.75	2.47	.97	.93	.97	1.41	1.20	1.15	14.63
#LAURIER	22.7	27.6	36.9	47.9	56.8	62.4	69.4	67.4	59.2	46.6	33.6	26.9	46.5	2.11	1.52	1.35	1.32	1.68	2.28	.98	.95	1.11	1.79	1.95	2.22	19.26
NEWPORT	24.0	28.5	36.0	45.2	53.1	59.0	65.4	63.1	56.0	45.8	33.8	28.5	44.9	3.50	2.65	2.48	1.71	1.99	1.89	.61	.80	1.47	2.76	3.51	3.79	27.16
NORTHPORT	25.1	29.5	39.0	49.4	58.0	63.6	70.2	67.9	59.9	48.7	35.6	29.4	48.0	2.16	1.55	1.43	1.27	1.69	2.19	.80	.84	1.23	2.04	1.99	2.27	19.46
SPOKANE AP	25.3	30.0	38.1	47.3	55.7	61.4	69.5	67.5	59.9	48.6	35.2	29.6	47.3	2.44	1.86	1.50	.91	1.21	1.49	.38	.41	.75	1.57	2.24	2.43	17.19
#WELLPINIT	.	.	.	.	.	.	.	.	.	.	.	.	.	2.57	1.90	1.80	1.45	1.68	1.67	.49	.63	1.10	1.79	2.34	2.75	20.17
DIVISION	23.4	28.2	36.7	46.5	54.6	60.2	66.9	64.7	57.3	46.5	33.7	27.7	45.5	2.40	1.77	1.65	1.34	1.66	1.86	.71	.79	1.16	1.99	2.33	2.58	20.24
PALOUSE BLUE MOUNTAINS																										
COLFAX 1 NW	29.2	33.4	40.2	48.2	55.3	60.8	67.8	65.9	59.0	49.4	37.9	33.1	48.4	2.55	1.93	2.14	1.54	1.41	1.64	.46	.47	1.12	2.01	2.66	3.04	20.97
DAYTON 1 WSW	31.6	36.2	43.0	50.3	57.3	63.1	70.7	68.8	62.0	52.0	40.2	35.3	50.9	2.43	1.90	2.12	1.56	1.46	1.51	.40	.36	.82	1.89	2.38	2.70	19.53
LACROSSE 3 ESE	29.7	34.7	42.2	49.4	56.4	62.7	70.4	68.0	60.7	50.3	38.4	33.5	49.7	1.84	1.37	1.33	.96	.96	1.13	.28	.36	.68	1.35	1.74	2.05	14.05
POMEROY	31.4	35.8	42.4	49.5	56.4	62.3	69.7	67.8	61.2	51.4	39.8	35.0	50.2	2.02	1.63	1.66	1.27	1.29	1.49	.32	.38	.85	1.50	1.91	2.26	16.58
#PULLMAN 2 NW	.	.	.	.	.	.	.	.	.	.	.	.	.	2.67	2.10	2.12	1.49	1.46	1.54	.39	.52	1.08	1.91	2.47	2.74	20.49
ROSALIA	27.2	31.5	38.8	47.1	54.6	60.1	68.0	66.3	58.8	48.5	36.8	31.3	47.4	2.20	1.64	1.66	1.26	1.49	1.53	.40	.52	1.13	1.82	2.20	2.46	18.31
DIVISION	29.8	34.3	41.2	49.1	56.3	61.9	69.7	67.8	60.7	50.6	38.7	33.6	49.5	2.18	1.73	1.80	1.34	1.43	1.57	.39	.46	.95	1.69	2.13	2.40	18.07

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1963 REVISIONS AND ADDITIONS TO CLIMATOGRAPHY OF THE UNITED STATES NO. 81-39 WASHINGTON

TABLE I — NORMALS FOR FIRST ORDER STATIONS

STATION	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
SEATTLE TACOMA AP													
G 400 T 6													
MAX TEMP	43.6	47.0	51.3	58.2	65.6	69.9	75.6	74.6	69.3	60.3	49.6	45.9	59.2
MIN TEMP	33.0	34.5	36.2	40.1	45.3	49.7	54.1	53.6	50.5	44.4	38.1	35.7	42.9
AVG TEMP	38.3	40.8	43.8	49.2	55.5	59.8	64.9	64.1	59.9	52.4	43.9	40.8	51.1
DEG DAYS	828	678	657	474	295	159	56	62	162	391	633	750	5145
SPOKANE AP													
G2357 T 5													
MAX TEMP	31.4	37.4	47.0	58.6	69.3	74.5	85.6	83.0	74.7	60.1	42.9	35.9	58.4
MIN TEMP	19.2	22.5	29.1	35.9	43.1	49.3	55.4	52.9	47.0	38.0	28.5	24.2	37.1
AVG TEMP	25.3	30.0	38.1	47.3	56.2	61.9	70.5	68.0	60.9	49.1	35.7	30.1	47.8
DEG DAYS	1231	980	834	531	288	135	9	25	168	493	879	1082	6655

TABLE II — NORMALS BY CLIMATOLOGICAL DIVISIONS

WEST OLYMPIC COASTAL													
ABERDEEN 20 NNE													
(CORRECTION TO NAME ONLY)													

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

USCOMM-WB-Asheville, N. C. -3/31/64- 2200

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