TABLE 5.—*Anomalies of the variability of yearly precipitation for 384 places*—Continued

0°–10° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
			Meters	Feet	Millimeters	Inches	Millimeters	Inches		
1	2	3	4		5		6		7	8
	°	°								
Pontianak	0.0	109.3 E.	3	10	3,202	126.1	379	14.92	12	−2
Pasuruan	7.6	112.9 E.	5	16	1,299	51.1	271	10.67	21	+5
Kajoemas	7.9	114.2 E.	930	3,051	2,524	99.4	354	13.94	14	0
Amboina	3.7	128.2 E.	1	3	3,375	132.9	867	34.13	26	+12
Monokwari	0.9	134.3 E.	20	66	2,478	97.5	513	20.20	21	+6
Port Moresby	9.5	147.2 E.	38	125	1,037	40.8	211	8.31	20	+4

10°–20° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
Apia	13.8	171.8 W.	2	7	2,728	107.4	526	20.71	19	+5
Arequipa	16.4	71.6 W.	2,453	8,048	106	4.2	57	2.24	54	+20
Cuyaba	15.6	56.1 W.	165	541	1,388	54.6	178	7.01	13	−2
St. Helena	16.0	5.7 W.	604	1,971	1,019	40.1	114	4.49	11	−5
Salisbury	17.8	31.1 E.	1,481	1,578	811	31.9	127	5.00	16	−1
Antananarivo	18.9	47.5 E.	1,402	4,600	1,369	53.9	196	7.72	14	−1
Kupang	10.2	123.6 E.	15	49	1,486	58.5	294	11.57	20	+5
Darwin	12.5	130.8 E.	30	98	1,554	61.2	220	8.66	14	−1

20°–30° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
La Serena	29.9	71.3 W.	35	115	140	5.5	82	3.23	59	+29
Catamarca	28.4	65.8 W.	510	1,673	350	13.8	71	2.80	20	−2
Salta	24.8	65.5 W.	1,178	3,865	722	28.4	133	5.24	18	0
Tucuman	26.8	65.2 W.	447	1,467	975	38.4	169	6.65	17	+1
Goya	29.2	59.2 W.	26	85	1,036	40.8	274	10.79	26	+10
Corrientes	27.4	58.8 W.	54	177	1,197	47.1	224	8.82	19	+3
Mision Inglesa	23.4	58.4 W.	(?)	(?)	1,205	47.4	266	10.47	22	+6
Villa Rica	25.1	58.1 W.	(?)	(?)	1,490	58.7	280	11.02	19	+4
Asuncion	25.3	57.7W.	93	305	1,315	51.8	238	9.37	18	+3
Posadas	27.4	55.8 W.	138	453	1,507	59.3	315	12.40	21	+6
Curityba	25.4	49.3 W.	908	2,979	1,397	55.0	197	7.76	14	−1
Alto da Serra	23.8	46.6 W.	800	2,625	3,575	140.8	398	15.67	11	−3
Rio de Janeiro	22.9	43.2 W.	61	200	1,101	43.3	202	7.95	18	+2
Swakopmund	22.7	14.5 E.	8	26	16	0.6	9	0.35	54	−6
Windhuk	22.6	17.1 E.	1,665	5,462	389	15.3	121	4.76	31	+10
Bethanien	26.5	17.2 E.	935	3,067	105	4.1	42	1.65	40	+5
O'Okiep	29.6	17.9 E.	926	3,038	169	6.7	43	1.69	25	−4
Kimberley	28.7	24.8 E.	1,203	3,947	412	16.2	97	3.82	24	+3
Johannesburg	26.2	28.1 E.	1,807	5,928	844	33.2	146	5.75	17	0
Bulawayo	20.2	28.7 E.	1,354	4,442	600	23.6	137	5.39	23	+5
Durban	29.8	31.0 E.	15	49	1,082	42.6	195	7.68	18	+2
Alice Springs	23.6	133.6 E.	587	1,926	267	10.5	91	3.58	34	+10
Brisbane	27.5	153.0 E.	38	725	1,088	42.8	273	10.75	25	+9

30°–40° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
Valdivia	38.8	73.2 W.	15	49	2,664	104.9	364	14.33	14	0
Junin de los Andes	39.2	71.0 W.	(?)	(?)	532	20.9	210	8.27	39	+20

TABLE 5.—*Anomalies of the variability of yearly precipitation for 384 places*—Continued

30°–40° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
Santiago	33.4	70.7 W.	519	1,703	373	14.7	156	6.14	42	+20
Mendoza	32.9	68.8 W.	755	2,477	198	7.8	63	2.48	32	+6
S. Juan	31.5	68.7 W.	664	2,178	75	3.0	36	1.42	48	+8
Neuqueen	39.0	68.0 W.	271	889	131	5.2	46	1.81	35	+4
Cordoba	31.4	64.2 W.	423	1,388	697	27.4	119	4.68	17	−1
General Acha	37.1	64.1 W.	218	715	472	18.6	128	5.04	27	+8
Bahia Blanca	38.7	62.2 W.	25	82	550	21.7	160	6.30	29	+10
Buenos Aires	34.6	58.4 W.	25	82	988	38.9	225	8.86	23	+7
Concordia	31.4	58.0 W.	24	79	1,017	39.8	205	8.07	20	+4
Mar del Plata	38.0	57.1 W.	4	13	723	28.5	147	5.79	20	+2
Ajo-General Lavalle	36.5	56.8 W.	15	49	925	36.4	205	8.07	22	+5
Montevideo	34.9	56.2 W.	29	95	986	38.8	262	10.31	27	+11
Kapstadt	33.9	18.5 E.	12	39	663	26.1	96	3.78	14	−4
Port Elizabeth	34.0	25.6 E.	55	180	562	22.1	87	3.43	15	−3
Aliwal (N)	30.7	26.7 E.	1,327	4,354	518	20.4	113	4.45	22	+3
Adelaide	34.9	138.6 E.	43	141	523	20.6	102	4.02	20	+1
Sydney	33.9	151.2 E.	42	138	1,175	46.3	219	8.62	19	+3
Auckland	36.8	174.8 E.	38	125	1,099	43.3	181	7.13	16	0

40°–50° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
Punta Galera	40.0	73.7 W.	40	131	2,220	87.4	380	14.96	17	+2
Diez-y-seis de Octubre	42.2	71.1 W.	557	1,827	431	17.0	114	4.49	26	+5
Sarmiento	45.5	69.0 W.	274	899	135	5.3	49	1.93	36	+5
Puerto Madryn	42.8	64.9 W.	14	46	163	6.4	47	1.85	29	0
Hokitika	42.7	170.8 E.	3	10	2,896	114.0	277	10.91	10	−4
Christchurch	43.5	172.6 E.	8	26	653	25.7	105	4.13	16	−2
Wellington	41.3	174.8 E.	3	10	1,186	46.7	202	7.95	17	+1

50°–60° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
Islote de los Evangelistad	52.4	75.1 W.	55	180	3,075	121.1	287	11.30	9	−6
Punta Arenas	53.2	70.9 W.	28	92	388	15.3	68	2.68	17	−4
Santa Cruz	50.2	68.4 W.	12	39	150	5.9	31	1.22	21	−9
Año Nuevo	54.6	64.2 W.	53	174	610	24.0	47	1.85	8	−10
Stanley	51.7	57.8 W.	2	7	685	27.0	68	2.68	10	−8
South-Georgia (Grytviken)	54.2	36.6 W.	4	103	1,301	51.6	176	6.93	14	−1

60°–70° S.

Station	Latitude	Longitude	Elevation		$\bar{p}$		v_a		v_r (percent)	Δ (percent)
South-Orkneys (Laurie-Isld.)	60.7	44.6 W.	7	23	403	15.9	57	2.24	14	−7

METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JANUARY 1941

[Climate and Crop Weather Division, J. B. KINCER in charge]

AEROLOGICAL OBSERVATIONS

By EARL C. THOM

Mean surface temperatures for January were above normal over most of the country (chart I). Temperatures were slightly below normal, however, over New England, over the extreme eastern Great Lakes States, and over small areas along the Atlantic coast, and the eastern Gulf coast. The area having the largest positive departure for the month was in eastern Montana where mean temperatures slightly more than 8° F. above normal were recorded. This is the second successive month when temperatures were generally above normal.

At the 1,500 m.-level the directions of the 5 a. m. resultant winds for the month were to the north of directions of the corresponding 5 a. m. normals at most stations over the eastern half of the country, while the direction of these winds were generally south of normal to the westward. There were many stations in January at which less than 10 of the 5 a. m. pilot-balloon observations reached the 3,000 m.-level. With only one exception the 5 a. m. resultant winds for the month at 3,000 meters were from directions to the north of normal at all stations for which this comparison could be made over the eastern two-thirds of the country while these winds were from directions to the south of normal at the corresponding stations to the westward. At only seven of the pilot-balloon stations for which 5 a. m. normals are available did 10 or more of the 5 p. m. observations reach 5,000 meters. For this reason no comparison can be made between the directions of 5 p. m. resultant winds and the corresponding 5 a. m. normals for this level.

The 5 a. m. resultant veolcities for the month were below normal at the 1,500-meter level over about three-fourths of the country. Over Brownsville at this level and over the north-western and west-central States, however, the resultant velocities were above normal. The largest negative departure at this level, −3.2 m. p. s.,

occurred at Sault Ste. Marie, while the largest positive value +4.6 m. p. s., was noted at Seattle. At 3,000 meters five scattered stations had resultant velocities above normal, while velocities were below normal at all other stations, for which these values could be compared. Large negative departures at this level occurred over the Rocky Mountain Region, Cheyenne showing a resultant velocity of 4.6 m. p. s. below normal.

The directions of the 5 p. m. resultant winds were south of the corresponding 5 a. m. winds at 1,500 meters over somewhat more than one-half of the country, and were north of the morning winds over the remainder. At 3,000 meters the direction of the afternoon resultant winds were north of the direction of the corresponding morning winds over two irregular areas, one in the Rocky Mountain plateau region, the other in the Gulf States while the opposite turning during the day occurred at all other stations for which this comparison could be made. At 1,500 meters there were no well-defined tendencies, indicating areas of increase or decrease in the resultant velocity from 5 a. m. to 5 p. m. during the month. At 3,000 meters, however, only four stations, all situated in the north-central part of the country, had resultant velocities at 5 p. m. lower than those at 5 a. m., while an increase in velocity during the day was noted at all other stations at which these values were compared.

The upper-air data discussed above are based on 5 a. m. observations (charts VIII and IX) as well as on observations made at 5 p. m. (table 2, and charts X and XI).

In the United States proper the maximum mean pressure for the month at the 1,000-meter level was 907 mb. over Pensacola. The corresponding maximum at the 1,500-meter level, 854 mb., was recorded at three stations, Pensacola, Miami, and Brownsville, while the maximum mean pressure at the five next higher standard levels were observed over both Brownsville and Miami. At each of the levels from 6,000 to 12,000 meters the maximum pressure occurred over Miami. At 13,000, 14,000, and 15,000 meters the maximum was observed over Brownsville and Miami, while at 16,000 and 17,000 meters it was observed over Brownsville. The lowest mean monthly pressure for the month at the 1,000-meter, 1,500-meter, and 2,000-meter levels were observed over Portland, Maine, and were observed over both Portland, Maine, and Sault Ste. Marie, Mich., at 2,500 and 3,000 meters, while the minimum occurred over Sault Ste. Marie at each of the standard levels from 4,000 to 17,000 meters.

At each of the standard levels below 13,000 meters, mean pressures for the month at Alaska stations were lower than corresponding minima for stations in the United States proper, while at all standard levels below 18,000 meters the mean pressures at Swan Island were higher than the corresponding maxima for the United States.

Mean pressures were the same or higher in January than in the previous month at standard levels below 2,500 meters over most stations west of the Atlantic Coast region, while at these levels pressures at stations along the Atlantic were lower than last month. Pressures at 3,000 and 4,000 meters were lower than last month at many stations while, with but few exceptions, pressures at standard levels from 5,000 to 19,000 meters were lower than last month over all parts of the country.

There was a difference of 30 mb. between the highest and the lowest mean monthly pressures recorded at the 7,000-meter level over stations within the United States proper. This was the largest difference recorded between mean pressure values at any standard level. Steep pressure gradients appear on the mean pressure charts extending from north to south, across the eastern third of the country, particularly at the standard levels from 6,000 to 10,000 meters. At the 8,000-, 9,000-, and 10,000-meter levels a change of 1 mb. in mean pressure was recorded for each 37 miles of the horizontal distance between Buffalo, N. Y., and Washington, D. C.

At all standard levels below 12,000 meters, temperatures were generally lower than in December. At the higher levels from 13,000 to 19,000 meters temperatures were also lower than last month over the extreme Northwest, the North Central States, and the upper Great Lakes, but were generally higher than in December over the rest of the country.

Mean temperatures for all standard levels below 2,500 meters were considerably higher for January 1941 than for the corresponding month of 1940 over most of the United States. Temperatures were lower than last year at most of these levels, however, along the Pacific coast and over the extreme Southwest. At standard levels from 2,500 to 6,000 meters the mean temperatures were also higher than last year over most of the country. The area at which temperatures at these levels were lower than last year was larger than at the lower levels, having extended over the West-Central States, all of the southwest and over the Gulf coast. At levels above 12,000 meters, temperatures were higher than last year over the extreme West, and over the South Central States, and generally lower over the rest of the country. The temperatures were considerably higher than last year over the Central States, for example, at Omaha the average mean temperatures for the surface and the four next higher standard levels were 8° C. higher than the corresponding average for the month of January 1940.

Except along the Pacific coast the January mean surface temperatures as recorded by radiosonde observations were 0° C. or lower over the northern half of the country. At Spokane, where the mean surface temperature was −1.4° C. inversions recorded during the month resulted in an average of 0° being recorded between the surface and 1,000 meters and again at 1,600 meters (m. s. l.). Over the rest of the United States, the altitude at which a mean temperature of 0° C. was recorded during January varied from only about 150 meters above the surface at St. Louis, Mo., to 3,200 meters (m. s. l.) over both Brownsville and Miami. Average freezing temperature occurred at lower levels than last month at all stations in the United States, occurring 200 or 300 meters lower than last month along the Gulf coast and 1,200 meters lower over Norfolk.

The lowest temperature recorded in the free air over the United States during the month was −87.9° C. (−126.2° F.) recorded on January 2, at a height of 16,900 meters (about 12 miles) above sea-level over Miami, Fla. Only two Weather Bureau radiosonde stations in the United States reported the lowest observed air temperature for the month higher than −70° C.

Table 3 shows the maximum free-air wind velocities and their direction for various sections of the United States during January as determined by pilot-balloon observations. The highest wind reported for the month was 76.8 meters per second (149.4 miles per hour) observed over Greensboro, N. C., on January 6. This high wind was blowing from the WSW. at an altitude of 9,840 meters (about 6 miles) above sea-level. Pilot-balloon data showing maximum winds now extend over the 5-year period, 1937 to 1941. In the free-air layer below 2,500 meters the highest wind velocity in January during this period was 50.2 m. p. s., over Wichita, Kans. in 1939. In the free-air layer from 2,500 to 5,000 meters the maximum for

the month was 74.6 m. p. s. over Abilene, Tex., in 1938, while at levels above 5,000 meters the corresponding extreme was 95.5 m. p. s. over Albuquerque, N. Mex., in 1939.

Tropopause data for January showing the mean altitude and temperature of the tropopauses at various stations are shown in table 4 and on chart XIII.

The mean monthly isentropic chart (chart XII) is temporarily discontinued with this issue of the MONTHLY WEATHER REVIEW. This action has been taken because the value of this chart during the winter months is considered questionable.

CORRECTION

Temperature data for Oakland, Calif. shown in table 1 for January 1940 (MONTHLY WEATHER REVIEW, January 1940), have been found to be in error for the levels, 9,000 to 19,000 meters, inclusive. The correct values for these levels are respectively: −44.6, −52.2, −57.9, −59.8, −59.7, −60.2, −61.7, −63.5, −64.5, −64.1, and −64.1.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during January 1941*

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Anchorage, Alaska (41 m.)				Atlantic Station No. 1 (3 m.) [3]				Atlantic Station No. 2 (3 m.) [4]				Barrow, Alaska (6 m.)				Bethel, Alaska (7 m.)				Bismarck, N. Dak. (505 m.)				Brownsville, Tex. (6 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	997	−9.3	80	16	1,016	13.5	76	27	1,016	14.7	80	31	1,020	−25.3	90	31	1,003	−20.2	72	31	960	−11.7	88	31	1,018	15.5	89
500	31	940	−4.9	74	16	958	9.3	80	27	957	10.0	86	31	954	−21.4	86	31	940	−10.4	66					31	961	15.2	83
1,000	31	882	−4.4	69	16	902	5.8	85	27	902	6.3	90	31	891	−19.2	81	31	881	−8.9	60	30	901	−7.5	86	31	906	12.7	80
1,500	31	827	−7.3	68	16	848	2.3	89	26	848	3.8	87	31	833	−18.1	76	31	826	−9.9	52	30	845	−5.5	78	31	854	10.8	69
2,000	31	776	−10.5	68	15	797	−.6	87	25	797	1.7	79	31	779	−19.0	73	31	774	−12.4	48	30	792	−5.3	73	31	804	9.3	56
2,500	31	726	−13.6	67	15	748	−2.3	78	24	749	−.5	72	31	728	−20.7	69	31	724	−14.9	43	30	744	−7.1	70	31	757	7.2	51
3,000	31	680	−17.0	67	15	702	−4.7	70	23	703	−3.5	70	31	680	−22.7	67	31	677	−18.0	41	30	697	−9.3	67	31	712	4.7	46
4,000	31	594	−24.1	65	14	618	−9.9	60	21	618	−9.6	66	31	592	−28.3	65	31	592	−24.5	39	30	612	−15.1	63	31	629	−1.5	41
5,000	31	517	−31.1	61	13	542	−16.3	54	20	542	−16.0	62	30	514	−35.0	63	31	515	−31.1	38	30	536	−21.5	60	31	554	−8.5	39
6,000	30	448	−38.1	61	10	473	−22.9	54	19	474	−23.1	60	29	445	−42.0		29	446	−38.2	38	31	467	−28.8	56	31	486	−15.5	36
7,000	30	387	−44.9		9	412	−29.9	53	17	412	−30.6	59	28	383	−48.9		28	385	−44.8		30	405	−36.3	55	31	425	−22.7	36
8,000	30	332	−51.0		7	356	−37.4		13	357	−38.1	57	27	328	−55.2		28	331	−50.7		30	350	−43.6		31	370	−29.6	36
9,000	30	285	−54.5		6	307	−43.8		10	307	−45.6		27	280	−59.8		28	284	−53.9		30	300	−50.8		31	321	−37.0	36
10,000	30	244	−53.1		5	264	−49.3		10	264	−52.4		26	239	−60.8		27	242	−53.2		30	257	−55.9		31	277	−44.1	
11,000	30	209	−51.1						9	226	−58.6		24	204	−59.2		27	208	−50.9		28	220	−59.7		30	238	−49.6	
12,000	30	179	−49.8						9	191	−60.4		24	174	−57.6		27	178	−49.1		28	187	−59.3		30	204	−53.9	
13,000	26	154	−49.7						9	163	−60.4		21	148	−57.9		25	153	−47.9		27	160	−58.2		29	175	−57.9	
14,000	25	132	−49.5						7	138	−60.2		16	126	−57.8		23	131	−47.9		27	136	−57.2		29	149	−62.2	
15,000	22	113	−49.7						6	117	−62.9		10	108	−57.8		20	113	−47.4		23	116	−58.3		26	126	−66.5	
16,000	18	97	−50.1						5	99	−64.4		5	92	−57.6		18	97	−47.2		17	99	−59.6		23	107	−69.7	
17,000	11	83	−50.7														14	83	−47.6		7	84	−60.2		21	90	−71.9	
18,000																	6	71	−48.5						15	76	−70.7	
19,000																									5	65	−67.8	
20,000																									5	55	−65.3	

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Buffalo, N. Y. (221 m.)				Charleston, S. C. (14 m.)				Coco Solo, C. Z. (15 m.) [1 2]				Denver, Colo. (1616 m.)				El Paso, Tex. (1193 m.)				Ely, Nev. (1908 m.)				Fairbanks, Alaska (153 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	15	992	−4.9	89	31	1,019	6.6	82	23	1,013	25.8	87	31	838	−3.5	68	31	884	6.4	63	31	810	−3.9	86	31	991	−21.6	69
500	15	959	−5.4	88	31	961	8.8	66	23	957	23.2	92													31	947	−16.6	72
1,000	15	898	−7.5	89	31	904	6.8	61	23	904	19.8	92													30	886	−13.7	71
1,500	15	843	−8.3	86	31	851	4.9	54	23	853	17.0	75					31	852	6.8	63					30	830	−12.1	68
2,000	15	789	−9.1	82	31	800	3.1	48	23	804	14.4	70	31	799	−.3	66	31	801	4.2	61	31	800	−3.1	85	30	777	−13.2	65
2,500	15	740	−10.4	79	31	752	.6	46	23	757	13.3	46	30	750	−2.3	58	31	753	1.7	58	31	752	−3.8	78	30	727	−15.7	64
3,000	15	693	−12.4	75	31	706	−1.8	44	21	714	11.1	31	30	704	−5.7	55	31	708	−1.4	54	31	705	−6.4	75	30	680	−18.8	64
4,000	15	607	−17.6	70	31	622	−7.0	38	19	632	5.2	21	30	618	−12.3	56	31	623	−8.1	49	31	620	−11.8	71	29	594	−25.6	63
5,000	15	531	−23.9	66	31	547	−12.7	39					30	542	−19.1	55	30	548	−14.4	47	31	543	−18.5	62	29	516	−32.7	62
6,000	15	462	−30.9	62	30	479	−20.0	41					30	473	−26.1	53	29	479	−21.5	44	31	474	−25.6	57	28	447	−39.9	61
7,000	15	400	−38.5	60	29	418	−27.0	41					30	410	−33.7	52	28	417	−28.8	42	31	412	−32.9	54	27	385	−46.9	
8,000	14	345	−46.8		29	363	−34.5	41					30	355	−42.1		27	362	−36.8	41	31	357	−40.6		26	330	−52.5	
9,000	14	296	−52.4		29	313	−42.3						29	305	−49.8		26	312	−44.3		31	307	−48.8		24	282	−56.3	
10,000	14	253	−56.8		28	270	−49.8						27	261	−56.3		25	268	−51.1		31	263	−55.7		24	241	−56.0	
11,000	12	216	−57.8		27	231	−55.7						27	223	−58.6		25	230	−56.3		30	225	−59.3		24	206	−53.8	
12,000	12	185	−55.9		27	197	−57.2						25	190	−59.1		22	196	−57.0		30	192	−58.2		22	176	−52.7	
13,000	11	157	−56.4		27	168	−57.6						24	162	−58.0		20	167	−57.4		30	164	−56.8		20	150	−52.5	
14,000	11	134	−57.3		26	144	−59.9						22	138	−58.7		17	142	−61.3		29	140	−58.0		16	128	−52.3	
15,000	8	115	−59.1		24	122	−63.4						19	118	−60.8		17	120	−64.8		27	119	−60.0		7	110	−51.8	
16,000	7	98	−60.0		24	104	−66.1						12	100	−62.3		17	102	−67.2		26	101	−61.6		5	93	−51.7	
17,000					23	88	−67.6						10	85	−63.4		16	86	−67.5		22	86	−62.6					
18,000					23	75	−67.1						5	73	−63.8		13	73	−65.8		13	73	−63.0					
19,000					17	63	−65.3										5	61	−64.7									
20,000					10	53	−64.3																					

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during January 1941*—Continued

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Great Falls, Mont. (1,117 m.)				Joliet, Ill. (178 m.)				Juneau, Alaska (49 m.)				Ketchikan, Alaska (26 m.)				Lakehurst, N. J.[1] (39 m.)[3]				Medford, Oreg. (401 m.)				Miami, Fla. (4 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	887	−2.1	64	31	1,000	−3.3	91	28	1,001	0.0	75	31	1,004	3.7	77	31	1,016	−3.2	80	31	967	4.6	86	31	1,019	15.8	9[illegible]
500					31	959	−4.9	92	28	946	−2.3	73	31	947	1.3	78	31	957	−3.7	72	31	956	5.4	82	31	962	15.8	82
1,000					31	900	−5.2	86	28	888	−4.4	73	31	890	−1.7	79	31	899	−3.9	69	31	899	5.2	69	31	906	12.9	80
1,500	31	846	−.8	65	31	845	−4.5	77	27	833	−6.8	72	29	834	−4.2	81	31	844	−4.5	63	31	845	3.0	65	31	854	10.7	72
2,000	31	795	−2.3	65	31	793	−5.5	74	26	781	−9.0	72	29	783	−6.9	81	31	792	−6.1	62	31	794	.2	65	31	804	9.1	57
2,500	31	746	−4.5	65	31	744	−7.6	71	25	731	−11.9	72	29	734	−10.0	78	31	743	−7.6	60	31	746	−2.7	65	31	757	7.0	48
3,000	31	700	−7.8	65	31	697	−10.2	69	24	685	−14.7	70	28	688	−13.0	75	31	696	−10.2	57	31	700	−5.5	64	31	712	4.6	42
4,000	31	615	−14.1	64	29	612	−15.7	62	22	599	−21.6	66	28	602	−19.8	69	30	610	−15.5	51	31	615	−11.8	61	30	629	−1.2	36
5,000	31	538	−20.9	61	29	535	−21.6	58	17	522	−28.3	63	27	525	−26.7	66	29	534	−21.6	53	31	539	−18.5	61	30	554	−7.4	33
6,000	30	469	−27.8	58	29	466	−28.2	55	14	453	−35.4	63	26	456	−34.1	63	24	465	−28.3	52	31	471	−25.4	59	30	487	−14.5	33
7,000	30	407	−35.4	58	29	404	−35.4	53	12	391	−42.6		22	394	−41.2		24	404	−35.2	53	31	409	−33.0	56	29	426	−21.6	32
8,000	30	352	−42.7		29	350	−43.1		11	336	−49.2		20	338	−48.4		24	350	−42.1		31	354	−41.3		29	371	−28.5	32
9,000	30	302	−50.3		28	301	−50.5		11	288	−53.6		18	290	−53.6		24	301	−48.1		31	304	−49.3		29	322	−35.5	32
10,000	30	259	−56.7		28	257	−56.0		10	246	−53.1		16	248	−56.2		22	259	−51.9		31	261	−56.0		29	279	−42.7	
11,000	30	221	−60.2		28	220	−58.4		9	211	−50.4		14	212	−53.3		22	222	−53.6		31	223	−59.9		28	240	−49.4	
12,000	30	188	−61.5		28	187	−56.6		8	181	−48.4		13	181	−50.9		22	190	−54.5		31	190	−58.7		28	205	−55.4	
13,000	30	160	−59.1		27	160	−56.3		8	154	−48.0		9	155	−50.2		21	162	−55.1		31	162	−56.8		27	175	−60.3	
14,000	29	137	−57.5		27	136	−57.7		8	132	−48.4		7	133	−50.5		18	139	−56.9		31	138	−57.7		26	149	−66.1	
15,000	29	117	−58.0		27	116	−59.0		5	114	−47.6		5	114	−50.2		15	119	−59.1		29	118	−58.8		26	126	−71.8	
16,000	26	99	−59.5		27	99	−60.3						5	97	−51.1		14	101	−60.3		27	101	−59.9		25	106	−75.7	
17,000	18	84	−60.0		24	85	−61.2										9	86	−61.5		26	86	−60.1		21	89	−75.2	
18,000	10	72	−61.1		13	72	−62.0														23	73	−60.1		18	76	−71.9	
19,000																					13	62	−59.8		13	64	−68.3	

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Nashville, Tenn. (180 m.)				Nome, Alaska (14 m.)				Norfolk, Va.[1 2] (10 m.)				Oakland, Calif. (2 m.)				Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				Pearl Harbor[1 2] (6 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,000	3.1	78	31	1,009	−14.2	68	24	1,024	1.5	74	31	1,017	9.8	86	31	974	3.3	87	31	986	−4.3	87	31	1,016	20.4	85
500	31	961	3.0	76	31	947	−13.6	70	24	963	.5	63	31	958	9.5	75	31	962	3.8	85	31	962	−4.2	85	31	960	19.7	79
1,000	31	904	2.1	71	31	887	−13.3	68	24	905	.3	55	31	902	7.0	69	31	904	1.1	73	31	903	−2.5	75	31	906	16.9	76
1,500	31	850	1.0	66	31	830	−13.4	64	24	850	−.9	50	31	849	4.5	64	31	850	3.9	64	31	848	−2.1	67	31	854	14.6	68
2,000	31	798	−.5	62	31	777	−14.9	59	24	798	−2.9	45	31	798	2.1	60	31	799	2.4	58	31	795	−3.0	62	31	805	13.8	45
2,500	31	749	−2.4	60	31	727	−17.0	56	24	748	−4.6	37	31	750	−.7	57	31	751	−.5	56	31	747	−5.2	59	31	759	12.5	25
3,000	31	703	−4.6	55	31	680	−19.7	54	24	702	−6.8	32	31	704	−3.5	53	30	705	−3.3	53	31	700	−7.3	58	31	715	10.2	19
4,000	30	619	−9.9	48	30	593	−25.8	53	24	617	−11.8	32	31	620	−9.5	50	30	621	−9.3	49	31	615	−12.5	54	31	633	4.4	14
5,000	30	543	−16.2	46	30	516	−32.5	52	21	541	−17.8	33	31	544	−15.6	51	29	545	−16.0	47	31	539	−19.1	51				
6,000	29	475	−23.0	44	29	447	−39.8	51					31	476	−22.9	51	28	476	−23.4	45	30	470	−26.5	49				
7,000	28	413	−30.3	43	27	385	−47.0						31	414	−30.6	49	28	414	−31.3	44	29	409	−34.4	47				
8,000	28	358	−38.3	41	26	330	−52.9						31	359	−38.8	48	28	359	−39.7	43	28	354	−42.3					
9,000	28	309	−45.9		26	283	−56.4						30	309	−46.6		27	310	−46.4		28	304	−49.7					
10,000	28	265	−52.6		26	242	−57.1						29	265	−52.9		25	266	−52.2		28	260	−55.1					
11,000	28	227	−57.1		25	207	−54.8						28	227	−56.6		23	228	−55.6		26	222	−58.4					
12,000	28	194	−57.7		25	177	−52.5						28	194	−56.8		21	194	−57.1		24	190	−58.1					
13,000	27	166	−56.7		24	152	−51.5						27	165	−55.9		21	166	−57.7		23	162	−57.3					
14,000	26	141	−58.3		24	130	−51.1						26	141	−57.4		20	141	−59.3		22	139	−58.2					
15,000	24	120	−61.1		22	112	−50.9						24	120	−59.8		16	120	−61.1		19	118	−59.7					
16,000	21	102	−62.9		17	95	−50.6						23	102	−61.9		13	102	−63.0		18	101	−61.0					
17,000	16	87	−63.2		10	82	−50.5						21	87	−62.6		5	87	−62.8		13	86	−61.4					
18,000	6	74	−62.9		6	70	−50.4						16	74	−62.4						7	74	−62.1					
19,000													7	62	−61.6													

See footnotes at end of table.

TABLE 1.—*Mean free-air barometric pressure in millibars, temperature in degrees Centigrade, and relative humidities in percent, obtained by airplanes and radiosondes during January 1941*—Continued

Altitude (meters), m. s. l.	Stations with elevations in meters above sea level																							
	Pensacola, Fla.[1] (24 m.)				Phoenix, Ariz. (339 m.)				Portland, Maine (9 m.)				San Diego, Calif.[1] (19 m)				St. Louis, Mo. (171 m.)				St. Paul, Minn. (214 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	29	1,019	10.7	73	31	978	9.8	83	30	1,016	−9.4	77	30	1,015	13.4	85	18	999	0.6	85	30	995	−8.2	85
500	29	963	10.4	62	31	960	12.3	70	30	955	−7.3	77	30	958	12.3	69	18	959	−0.5	87	30	960	−9.7	87
1,000	29	907	9.0	52	31	904	10.4	60	30	896	−8.3	76	30	902	9.5	64	18	901	−1.0	82	30	900	−7.6	84
1,500	29	854	7.1	46	31	851	7.1	61	30	840	−8.5	73	30	850	6.5	60	18	847	−1.3	76	30	844	−6.3	76
2,000	29	803	5.6	40	31	800	3.8	60	30	787	−9.4	72	30	800	4.4	49	18	795	−2.1	68	30	791	−7.5	72
2,500	29	755	3.2	39	31	752	0.8	58	30	738	−10.9	70	30	751	2.1	42	18	746	−3.7	64	30	742	−9.5	71
3,000	29	709	0.5	37	31	706	−2.2	55	30	691	−13.2	69	30	706	−0.6	41	18	700	−6.4	62	30	695	−12.0	68
4,000	27	626	−4.9	34	31	622	−8.4	46	30	606	−18.3	66	28	622	−7.1	46	18	616	−12.5	58	28	609	−17.1	63
5,000	25	550	−11.8	36	31	546	−15.3	42	30	529	−23.8	64	28	546	−13.5	46	18	539	−19.1	54	25	532	−23.3	60
6,000	24	482	−18.9	38	31	478	−22.6	39	30	461	−30.4	64	28	478	−20.7	47	18	471	−25.7	52	25	464	−29.9	57
7,000	24	421	−26.1	41	30	416	−30.1	38	30	399	−37.8	62	28	417	−28.2	46	16	409	−33.2	49	25	402	−37.1	56
8,000	22	365	−33.5	41	30	361	−38.0	38	29	344	−44.9	----	27	361	−35.9	----	15	355	−41.2	----	25	347	−44.7	----
9,000	20	315	−40.6	----	26	311	−45.6	----	27	295	−51.1	----	27	312	−43.4	----	13	305	−49.5	----	20	298	−52.7	----
10,000	19	272	−48.0	----	26	267	−51.7	----	27	253	−55.1	----	26	268	−49.0	----	13	262	−56.7	----	19	254	−59.8	----
11,000	16	233	−53.9	----	26	229	−56.7	----	27	217	−55.5	----	24	230	−52.5	----	11	224	−61.0	----	18	217	−62.7	----
12,000	15	199	−56.4	----	25	196	−56.6	----	25	186	−54.2	----	22	197	−54.4	----	10	190	−59.6	----	16	184	−61.0	----
13,000	11	170	−58.3	----	23	167	−56.5	----	20	158	−54.8	----	20	168	−54.9	----	7	162	−57.6	----	14	156	−59.2	----
14,000	6	145	−60.7	----	22	142	−58.9	----	19	136	−55.7	----	18	144	−57.3	----	7	138	−58.8	----	14	133	−59.4	----
15,000	----	----	----	----	16	121	−61.6	----	17	116	−56.9	----	17	123	−60.2	----	6	118	−60.7	----	12	113	−60.1	----
16,000	----	----	----	----	12	103	−63.6	----	14	99	−57.9	----	14	104	−62.3	----	5	100	−61.8	----	10	96	−61.4	----
17,000	----	----	----	----	9	88	−64.3	----	12	84	−59.1	----	11	89	−63.2	----	----	----	----	----	7	81	−63.2	----
18,000	----	----	----	----	5	75	−64.0	----	7	71	−60.4	----	----	----	----	----	----	----	----	----	----	----	----	----

Altitude (meters), m. s. l.	Stations with elevations in meters above sea level																			
	Sault Ste. Marie, Mich. (221 m.)				Seattle, Wash.[1] (27 m.)				Spokane, Wash. (598 m.)				Swan Island, West Indies (10 m.)				Washington, D. C.[1 5] (7 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	994	−10.6	81	17	1,012	6.2	88	31	947	−1.4	95	31	1,014	24.4	80	24	1,022	0.0	77
500	31	959	−11.0	87	17	955	5.3	75	----	----	----	----	31	959	21.4	83	24	960	−1.7	75
1,000	31	898	−11.5	88	17	898	2.8	73	31	901	0.9	89	31	905	18.2	80	24	902	−2.7	74
1,500	31	841	−11.7	86	17	843	−0.1	70	31	847	0.4	79	31	854	15.3	75	24	847	−3.1	69
2,000	31	788	−12.2	83	17	792	−3.0	66	31	795	−1.9	73	31	804	12.8	70	24	795	−4.4	65
2,500	31	738	−13.4	77	17	743	−5.7	61	31	747	−4.3	71	31	758	11.1	64	24	746	−6.2	59
3,000	31	691	−15.5	72	17	697	−8.6	56	31	700	−7.1	67	31	714	8.7	56	24	699	−8.3	56
4,000	31	604	−20.6	69	17	612	−14.5	56	30	615	−13.1	62	30	632	4.4	40	24	613	−13.6	53
5,000	31	527	−26.9	65	17	535	−21.4	60	30	539	−19.8	55	30	559	−1.3	34	22	537	−20.1	55
6,000	31	458	−33.6	65	17	467	−28.7	58	30	470	−26.8	52	30	492	−7.9	33	21	468	−26.9	56
7,000	31	396	−40.1	------	17	405	−36.2	55	30	407	−34.6	51	30	432	−15.0	31	21	407	−33.5	53
8,000	31	342	−47.0	------	16	350	−43.9	------	30	353	−42.5	------	30	377	−22.1	30	9	353	−41.6	------
9,000	31	2[illegible]3	−53.7	------	16	301	−51.3	------	30	303	−50.1	------	30	328	−28.9	29	9	304	−47.9	------
10,000	2[illegible]	250	−57.9	------	16	258	−57.1	------	29	260	−56.6	------	29	285	−35.9	28	9	261	−53.7	------
11,000	25	214	−58.1	------	16	220	−59.1	------	28	222	−59.8	------	29	246	−44.1	------	------	------	------	------
12,000	24	183	−56.9	------	16	188	−57.7	------	27	189	−59.4	------	29	212	−51.6	------	------	------	------	------
13,000	2[illegible]	156	−56.7	------	15	161	−56.2	------	27	161	−56.8	------	29	181	−59.2	------	------	------	------	------
14,000	17	133	−57.3	------	15	138	−55.4	------	26	138	−56.3	------	29	154	−67.0	------	------	------	------	------
15,000	16	113	−58.5	------	15	118	−55.5	------	25	118	−56.8	------	28	130	−75.1	------	------	------	------	------
16,000	12	96	−59.7	------	15	100	−56.5	------	19	100	−57.1	------	28	109	−81.9	------	------	------	------	------
17,000	7	82	−61.1	------	10	85	−57.8	------	14	86	−57.6	------	27	91	−84.4	------	------	------	------	------
18,000	------	------	------	------	------	------	------	------	9	73	−58.7	------	26	76	−81.1	------	------	------	------	------
19,000	------	------	------	------	------	------	------	------	------	------	------	------	20	64	−73.6	------	------	------	------	------
20,000	------	------	------	------	------	------	------	------	------	------	------	------	15	54	−66.8	------	------	------	------	------
21,000	------	------	------	------	------	------	------	------	------	------	------	------	6	46	−62.6	------	------	------	------	------

[1] U. S. Navy.
[2] Airplane observations.
[3] Observations made on Coast Guard vessels in or near the 5° square:
Lat. 35°00′ N. to 40°00′ N.
Long. 55°00′ W. to 60°00′ W.
[4] Observations made on Coast Guard vessels in or near the 5° square:
Lat. 35°00′ N. to 40°00′ N.
Long. 45°00′ W. to 50°00′ W.
[5] Radiosonde and airplane observations.

NOTE.—All observations taken at 12:30 a. m., 75th meridian time, except at Washington, D. C., and Lakehurst, N. J., where they are taken near 5 a. m. E. S. T., and at Norfolk, Va., where they are taken at about 6 a. m., and at Pearl Harbor, T. H., after sunrise.

None of the means included in this table are based on less than 15 surface or 5 standard level observations.

Number of observations refers to pressure only as temperature and humidity data are missing for some observations at certain levels, also, the humidity data are not used in daily observations when the temperature is below −40.0° C.

TABLE 2.—*Free-air resultant winds based on pilot balloon observations made near 5 p. m. (75th meridian time) during January 1941. Directions given in degrees from North (N=360°, E=90°, S=180°, W=270°)—Velocities in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (537 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (870 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington Vt. (132 m.)			Charleston, S. C. (18 m.)			Chicago, Ill. (192 m.)			Cincinnati, Ohio (157 m.)			Denver, Colo. (1,627 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	264	2.3	31	325	0.8	27	296	2.7	31	233	3.6	28	305	1.3	28	125	0.7	28	124	2.3	30	282	1.9	29	57	0.6	31	316	1.2	26	289	1.2	30	290	1.3	30	1	1.3
500	---	---	---	---	---	---	27	301	4.0	---	---	---	---	---	---	---	---	---	28	124	2.9	30	259	2.9	29	277	.8	31	304	1.9	26	275	2.4	30	264	2.1	---	---	---
1,000	30	252	2.8	---	---	---	26	300	4.7	---	---	---	28	285	4.1	28	118	1.5	25	159	3.0	21	264	5.2	28	285	4.7	30	279	4.8	20	291	4.9	21	250	5.0	---	---	---
1,500	27	250	5.2	---	---	---	26	291	6.4	31	249	5.0	25	296	5.9	28	156	3.8	21	204	2.6	11	286	6.2	25	310	5.7	28	276	8.4	15	285	8.4	18	276	6.5	---	---	---
2,000	22	252	7.4	31	312	1.2	23	298	9.5	30	282	4.9	20	290	8.8	27	181	4.1	17	236	2.9	---	---	---	17	310	8.4	25	277	10.4	13	297	10.5	15	275	10.8	30	15	1.1
2,500	20	257	9.4	30	279	3.3	23	295	11.1	29	285	8.0	19	289	10.8	23	204	4.8	13	257	4.1	---	---	---	14	307	9.6	24	273	11.1	13	295	11.6	10	278	10.8	30	309	2.4
3,000	19	261	11.0	28	275	5.7	23	290	12.6	26	290	8.7	19	295	12.5	21	212	4.9	13	253	5.2	---	---	---	10	299	10.5	21	276	12.4	13	299	14.3	10	284	12.6	29	299	5.1
4,000	18	259	13.9	21	278	8.2	22	282	15.8	24	294	8.5	18	297	15.5	19	217	5.6	12	263	8.0	---	---	---	---	---	---	13	272	14.1	10	305	17.0	---	---	---	27	291	5.1
5,000	16	266	13.3	21	264	10.8	21	288	16.7	21	297	11.7	16	299	16.4	17	255	3.1	11	264	10.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	25	303	6.5
6,000	15	268	15.0	18	286	11.8	19	292	21.6	16	295	10.7	14	299	19.6	15	263	4.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	21	295	7.7
8,000	11	279	20.8	15	298	13.4	16	292	26.6	12	307	14.3	11	302	17.3	14	283	5.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	302	10.8
10,000	---	---	---	11	261	20.9	11	300	29.3	---	---	---	---	---	---	11	322	5.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	297	10.3

Altitude (meters) m. s. l.	El Paso, Tex. (1,196 m.)			Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (766 m.)			Jacksonville, Fla. (14 m.)			Las Vegas, Nev. (570 m.)			Little Rock, Ark. (79 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (10 m.)			Minneapolis, Minn. (261 m.)			Mobile, Ala. (10 m.)			Nashville, Tenn. (194 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	316	1.7	31	274	0.2	29	86	0.4	25	292	2.1	28	246	1.2	29	351	1.4	31	79	1.6	28	227	0.8	25	59	0.6	31	34	1.4	28	293	1.5	30	290	0.5	30	280	0.8
500	---	---	---	---	---	---	---	---	---	25	287	3.7	---	---	---	27	256	1.2	---	---	---	28	261	2.3	25	65	.8	31	34	1.6	28	290	1.8	30	325	1.5	30	256	1.7
1,000	---	---	---	---	---	---	---	---	---	24	296	4.4	28	248	4.4	26	264	2.9	31	52	2.5	26	264	4.5	23	154	4.2	31	291	.7	20	310	4.8	27	343	1.9	21	258	3.8
1,500	31	316	1.2	---	---	---	29	88	.5	24	287	7.3	28	269	8.2	26	276	4.3	31	76	1.1	24	271	6.7	23	179	5.5	30	271	3.0	19	301	7.8	27	308	4.3	18	289	6.2
2,000	29	271	2.4	31	245	0.3	29	90	.8	24	295	9.8	28	277	10.4	26	275	6.4	30	220	1.5	23	279	8.5	22	203	8.3	27	285	4.6	17	308	10.5	25	294	6.7	17	294	8.5
2,500	24	266	6.3	31	234	1.4	27	185	1.4	23	292	12.9	28	282	12.0	26	286	7.8	28	229	2.3	21	286	8.6	19	210	8.6	25	283	5.5	13	310	12.1	24	296	8.9	17	289	10.6
3,000	24	270	8.9	31	231	2.6	27	237	2.4	21	297	15.1	26	286	11.8	25	293	9.8	27	246	2.8	20	289	10.4	15	205	8.7	25	283	7.0	13	314	14.8	23	287	10.7	14	283	12.1
4,000	21	279	13.5	23	245	4.1	20	287	4.2	18	287	18.2	24	289	13.4	22	290	10.7	26	279	5.3	18	297	13.9	11	200	6.1	23	282	9.7	11	310	17.5	22	285	14.4	11	282	13.2
5,000	15	288	14.4	20	278	6.1	17	278	6.0	16	286	23.0	21	283	15.8	22	287	13.5	24	294	6.7	15	280	15.8	---	---	---	21	280	12.0	---	---	---	15	296	17.0	---	---	---
6,000	12	303	16.1	16	290	3.1	16	286	8.2	15	287	25.8	13	286	17.7	20	287	15.8	22	305	10.7	---	---	---	---	---	---	19	279	15.7	---	---	---	---	---	---	---	---	---
8,000	---	---	---	13	287	4.7	---	---	---	---	---	---	---	---	---	13	282	22.6	16	321	18.9	---	---	---	---	---	---	13	286	25.6	---	---	---	---	---	---	---	---	---
10,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	282	31.2	11	319	18.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	296	24.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	New York, N. Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (344 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (183 m.)			San Diego, Calif. (15 m.)			Sault Ste. Marie, Mich. (230 m.)			Seattle, Wash. (14 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (10 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	27	313	4.8	30	174	1.5	24	251	1.5	25	301	2.4	31	80	0.5	29	360	2.8	23	262	1.8	30	24	0.9	31	277	2.4	28	332	1.2	26	175	1.1	22	84	1.0	25	283	2.8
500	26	306	6.1	30	165	2.5	24	230	1.8	25	318	3.3	31	85	1.1	---	---	---	22	257	4.0	30	68	1.1	31	286	1.7	28	308	1.6	26	167	3.8	---	---	---	25	290	6.0
1,000	25	314	7.4	27	205	3.6	23	246	3.2	22	298	5.0	31	108	1.8	29	354	2.9	18	276	6.0	27	212	1.3	26	66	0.6	25	303	3.7	24	190	5.9	22	150	2.2	23	291	7.5
1,500	19	310	10.7	25	217	4.9	20	249	6.1	15	304	8.4	31	158	1.5	29	315	5.4	18	285	7.9	24	231	3.0	26	105	0.7	21	296	5.1	21	205	7.0	19	200	5.2	19	303	9.4
2,000	14	303	11.8	25	221	4.7	19	267	6.8	14	303	9.6	29	192	2.0	27	310	8.5	17	288	10.4	22	247	4.9	26	250	0.8	19	301	6.2	21	209	6.8	17	213	6.3	16	301	10.0
2,500	10	306	14.2	22	214	4.6	15	285	8.3	13	301	10.5	26	220	2.2	25	307	9.7	15	296	12.9	16	252	7.5	26	261	2.9	18	297	8.0	17	198	8.2	14	235	6.9	14	299	14.7
3,000	---	---	---	20	238	4.7	15	281	9.4	13	296	11.9	25	238	3.0	25	308	11.2	15	300	14.6	14	259	9.2	24	261	2.9	16	299	8.4	14	210	8.4	13	244	8.4	14	298	14.7
4,000	---	---	---	14	322	3.0	15	276	12.5	13	296	14.1	22	274	6.3	25	298	11.7	15	302	17.3	13	260	13.4	17	267	2.2	---	---	---	12	222	10.4	10	248	10.3	11	293	19.2
5,000	---	---	---	14	306	4.7	15	279	12.8	13	299	14.9	21	274	7.7	24	302	12.6	12	297	18.0	13	261	14.0	14	293	4.1	---	---	---	10	236	10.7	---	---	---	---	---	---
6,000	---	---	---	12	294	6.2	14	290	15.4	13	303	17.5	19	286	10.3	20	298	13.2	11	302	18.2	11	270	15.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
8,000	---	---	---	10	333	7.8	12	287	17.9	---	---	---	14	283	12.3	17	305	12.4	---	---	---	10	275	19.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	---	---	---	10	277	25.4	---	---	---	---	---	---	16	295	13.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	286	16.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12	297	18.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Maximum free-air wind velocities (m. p. s.) for different sections of the United States based on pilot-balloon observations during January 1941*

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	41.0	NW	1,910	14	Caribou, Maine	54.0	WNW	4,420	14	Boston, Mass.	58.8	WNW	6,590	26	Caribou, Maine.
East-Central [2]	41.2	WNW	2,500	4	Knoxville, Tenn.	64.5	WNW	5,000	4	Louisville, Ky.	76.8	WSW	9,840	6	Greensboro, N. C.
Southeast [3]	32.1	W NW	2,500 2,500	16 4	Mobile, Ala. Atlanta, Ga.	48.4	W	5,000	4	Jacksonville, Fla.	69.4	WNW	9,575	11	Miami, Fla.
North-Central [4]	33.0	NW	2,500	3	Rapid City, S. Dak.	56.1	NW	5,000	3	Rapid City, S. Dak.	72.1	WNW	11,610	19	Huron, S. Dak.
Central [5]	39.1	NW	2,250	10	Springfield, Ill.	68.8	NW	4,420	30	Moline, Ill.	63.0	WNW	5,670	4	St. Louis, Mo.
South-Central [6]	34.1	WSW	2,450	16	New Orleans, La.	38.8	WSW	4,070	17	New Orleans, La.	72.0	W	9,030	16	Houston, Tex.
Northwest [7]	40.1	E	660	5	Tatoosh Island, Wash.	43.8	WSW	3,020	28	Great Falls, Mont.	54.0	NW	7,160	3	Havre, Mont.
West-Central [8]	34.8	SSE	2,440	8	Sacramento, Calif.	37.2	WNW	3,690	3	Casper, Wyo.	60.0	NW	12,110	30	Redding, Calif.
Southwest [9]	41.5	SSE	2,400	8	Bakersfield, Calif.	52.8	SSE	3,450	8	Sandberg, Calif.	73.8	N	7,380	17	Albuquerque, N. Mex.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, Louisiana, Oklahoma, Texas (except extreme west Texas) and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

TABLE 4.—*Mean altitudes and temperatures of significant points identifiable as tropopauses during January 1941, classified according to the potential temepratures (10° intervals between 290° and 409° A.) with which they are identified (based on radiosonde observations)*

Stations	Anchorage, Alaska			Barrow, Alaska			Bethel, Alaska			Bismarck, N. Dak.			Brownsville, Tex.			Charleston, S. C.			Denver, Colo.		
Potential temperatures ° A.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.
290–299	20	6.5	−43.6	26	6.9	−48.5	14	6.5	−43.8	4	6.6	−40.8							1	8.6	−59.0
300–309	26	8.3	−53.6	24	8.8	−59.5	37	8.1	−51.7	18	7.9	−48.5	1	6.0	−26.0	2	6.8	−36.0	11	8.1	−48.2
310–319	14	9.3	−56.1	8	10.0	−63.8	18	9.0	−54.4	22	10.1	−61.7	5	7.7	−32.2	10	8.7	−44.2	28	9.7	−56.9
320–329	3	9.9	−53.7	4	10.4	−62.8	6	10.0	−57.2	16	10.9	−61.7	24	9.1	−38.3	24	10.3	−53.8	14	11.1	−63.0
330–339	2	10.8	−54.5				2	10.6	−57.0	4	11.9	−64.5	20	10.9	−51.0	14	11.3	−56.9	5	12.0	−64.2
340–349							2	10.8	−52.5				9	12.4	−59.0	5	12.4	−60.4			
350–359	2	11.8	−54.5	1	12.6	−64.0	1	10.8	−53.0	1	11.2	−45.0									
360–369				2	12.4	−57.0							4	14.5	−68.2	2	13.8	−63.5	1	13.4	−61.0
370–379				1	13.3	−58.0				2	13.9	−60.0	3	14.9	−65.7	3	14.6	−63.0	1	14.8	−67.0
380–389							1	12.7	−48.0	1	15.0	−67.0	7	16.0	−71.3	4	15.3	−66.2	5	14.7	−61.0
390–399										1	14.4	−53.0	6	16.8	−73.0	7	15.9	−66.9	1	16.0	−66.0
400–409										3	15.9	−63.0	7	16.9	−70.7	9	16.7	−69.2			
Weighted means		8.2	−51.2		8.5	−55.8		8.4	−51.5		10.1	−57.1		11.9	−53.0		12.0	−57.2		10.5	−58.0
Mean potential temperature ° A. (weighted)	307.3			306.1			309.6			322.5			347.8			346.6			324.4		
Number days with observations	24			21			28			30			29			28			29		

Stations	El Paso, Tex.			Ely, Nev.			Fairbanks, Alaska			Great Falls, Mont.			Joliet, Ill.			Ketchikan, Alaska			Lakehurst, N. J.		
Potential temperatures ° A.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.
290–299				4	5.6	−31.8	19	7.2	−51.2	4	6.4	−38.8	1	5.9	−38.0	8	6.8	−46.0	3	7.7	−34.3
300–309	5	6.8	−34.8	12	7.7	−43.6	27	8.2	−53.0	17	8.1	−49.5	12	8.3	−49.1	15	8.1	−50.4	11	7.5	−44.6
310–319	12	8.6	−43.9	30	9.6	−55.2	13	9.5	−59.3	19	9.8	−59.2	28	9.7	−56.8	11	9.5	−57.4	19	9.8	−49.7
320–329	24	10.7	−57.8	17	10.9	−61.9				18	11.4	−66.5	16	10.7	−61.4	2	10.4	−59.0	8	10.6	−58.8
330–339	10	11.4	−59.1	6	11.5	−61.8				5	12.3	−68.4	3	11.3	−59.3				2	11.7	−61.0
340–349	1	12.2	−60.0	2	11.9	−54.5										1	11.4	−56.0	1	11.4	−57.0
350–359	2	13.8	−68.5	2	12.8	−60.5							1	11.9	−56.0				1	12.3	−58.0
360–369	4	14.0	−63.5	2	13.0	−57.5							2	13.4	−60.5				3	12.9	−56.7
370–379	1	14.9	−67.0	2	13.8	−59.5				1	12.8	−47.0									
380–389	6	15.4	−68.5	5	15.0	−59.8	1	13.0	−48.0	1	15.1	−63.0	2	14.4	−59.0				2	14.6	−62.0
390–399	6	16.0	−67.8	9	15.3	−62.3	1	13.5	−53.0	4	15.6	−64.0	2	14.8	−57.5	1	14.4	−52.0	1	11.8	−56.0
400–409	6	16.6	−69.2	3	16.2	−65.7				3	16.0	−63.3	2	15.6	−62.5				1	15.7	−64.0
Weighted means		11.8	−57.5		10.9	−55.3		8.3	−53.7		10.5	−58.5		10.3	−56.7		8.6	−52.1		10.0	−51.1
Mean potential temperature ° A. (weighted)	342.6			333.7			306.6			324.9			325.1			310.2			322.3		
Number days with observations	24			30			25			30			28			18			23		

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TABLE 4.—*Mean altitudes and temperatures of significant points identifiable as tropopauses during January 1941, classified according to the potential temperatures (10° intervals between 290° and 409° A.) with which they are identified (based on radiosonde observations)*—Con.

Stations	Medford, Oreg.			Miami, Fla.			Nashville, Tenn.			Nome, Alaska			Oakland, Calif.			Oklahoma City, Okla.			Omaha, Nebr.		
Potential temperatures ° A.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature ° C.
290-299	1	5.6	−33.0							13	7.1	−49.7							1	5.7	−32.0
300-309	17	8.3	−51.3				6	7.8	−43.7	17	8.2	−53.1	10	7.9	−45.1	9	7.8	−46.7	18	8.0	−48.2
310-319	21	10.2	−60.5	1	12.1	−56.0	18	9.0	−49.2	14	9.6	−59.3	21	9.1	−48.9	18	8.9	−45.6	25	9.4	−52.6
320-329	19	11.0	−61.3	11	9.1	−39.7	20	10.6	−57.7	3	10.4	−60.7	22	10.8	−58.7	20	10.8	−59.0	12	11.1	−62.4
330-339	3	12.3	−66.7	17	11.2	−53.1	12	11.4	−59.8	2	10.4	−56.0	5	11.7	−59.6	5	11.1	−56.0			
340-349				6	12.7	−61.3	2	11.8	−57.5				1	12.6	−65.0	2	12.8	−65.5	2	12.0	−62.5
350-359	1	12.5	−62.0	8	14.5	−73.0							1	12.8	−62.0	4	12.6	−58.5			
360-369	1	12.5	−58.0	10	15.4	−76.2	4	13.2	−58.8				1	13.6	−60.0	3	13.6	−61.0	1	14.3	−67.0
370-379	3	13.9	−60.7	8	16.1	−77.1	2	14.4	−64.0				2	14.2	−62.5	1	14.2	−60.0	2	13.6	−57.0
380-389	4	14.9	−63.2	3	16.9	−80.0	5	14.9	−63.2				4	14.9	−63.2	1	14.2	−57.0	3	14.9	−63.3
390-399	6	15.1	−59.7	3	16.5	−73.7	5	15.5	−63.4				5	15.4	−62.0	4	15.5	−64.2			
400-409	3	15.5	−60.3	4	17.4	−76.0	3	16.2	−66.0				4	16.2	−65.2	1	16.3	−66.0	3	15.9	−64.0
Weighted means		11.0	−58.7		13.3	−63.3		11.2	−56.2		8.5	−54.6		11.0	−55.3		10.7	−54.2		10.1	−54.5
Mean potential temperature °A (weighted)	332.2			353.5			337.2			306.7			334.8			331.5			324.4		
Number days with observations	31			26			28			21			29			24			26		

Stations	Phoenix, Ariz.			Portland, Maine			St. Paul, Minn.			San Diego, Calif.			Sault Ste Marie, Mich.			Seattle, Wash.			Spokane, Wash.			Swan Island West Indies		
Potential temperatures °A.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.	Number of cases	Mean altitude (km.) m. s. l.	Mean temperature °C.
290-299				3	6.5	−43.0	2	6.8	−46.5				10	6.4	−40.7				3	7.4	−48.0			
300-309	6	7.0	−35.3	26	7.5	−44.6	4	9.0	−56.5	3	6.7	−31.7	24	7.9	−48.2	6	9.0	−51.5	15	8.0	−47.8			
310-319	18	9.1	−47.6	26	9.0	−51.5	14	10.2	−62.0	11	8.5	−43.8	25	9.8	−59.9	8	9.9	−57.9	18	10.0	−60.3			
320-329	22	10.7	−58.3	12	10.4	−59.2	8	10.8	−63.5	22	10.2	−53.1	4	11.4	−67.2	9	10.3	−57.0	21	11.2	−63.7	2	8.2	−27.0
330-339	5	11.5	−59.6	6	11.0	−58.0	3	11.6	−62.0	7	11.6	−59.4	1	12.8	−75.0	3	12.5	−68.7	4	12.0	−66.0	10	10.2	−41.0
340-349	1	12.4	−59.0	2	11.2	−52.5	1	11.8	−56.0	3	11.9	−56.3	1	12.3	−67.0							16	13.5	−66.3
350-359	4	13.1	−63.0	2	13.4	−65.5													2	12.6	−60.0	12	15.0	−77.3
360-369	3	13.3	−58.7				1	13.0	−54.0										2	13.6	−62.0	20	16.4	−85.0
370-379	1	14.2	−62.0				1	13.5	−58.0	1	14.6	−67.1				1	14.2	−61.0				7	17.0	−85.7
380-389	1	15.6	−71.0	4	13.9	−57.8	2	14.3	−58.5	3	14.9	−62.0	1	14.0	−58.0				3	14.6	−62.3	3	17.7	−86.3
390-399	2	15.6	−63.0	1	14.2	−55.0							1	14.8	−61.0				3	15.4	−63.0	1	17.7	−80.0
400-409	3	16.6	−67.3							2	16.2	−63.5										1	18.3	−84.0
Weighted means		10.8	−54.5		9.3	−51.3		10.6	−60.2		10.5	−52.1		8.9	−53.6		10.3	−57.5		10.5	−58.7		14.6	−71.9
Mean potential temperature °A. (weighted)	332.3			319.4			324.0			331.4			311.8			320.4			324.6			355.8		
Number days with observations	26			29			17			25			28			16			28			27		

Information contained in footnotes to table 1 are also applicable to table 4.