METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JANUARY 1949

AEROLOGICAL OBSERVATIONS

[For description of change in Table 1 and charts, see REVIEW, January 1946, p. 6]

Relative humidity data, beginning with October 1, 1948, were computed, and expressed in these tables, on the basis of the vapor pressure over water. Upper air values of relative humidity at levels with temperatures less than 0° C. have formerly been computed and expressed on the basis of the vapor pressure over ice. Therefore, relative humidity data for the period after October 1, 1948, should not be combined with earlier data without necessary conversion.

TABLE 1.—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during January 1949*

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Albany, N. Y. (1,011.8 mb.)				Albuquerque, N. Mex. (835.6 mb.)				Atlanta, Ga. (987.9 mb.)				Big Spring, Tex. (930.2 mb.)				Bismarck, N. Dak. (960.2 mb.)				Boise, Idaho (922.1 mb.)				Brownsville, Tex. (1,018.2 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	29	86	−2.1	77	31	1,620	−0.1	60	31	300	10.4	76	31	774	1.3	70	31	505	−16.2	76	31	868	−11.8	75	31	6	14.0	83
1,000	29	177	(*)	----	31	156	(*)	----	31	197	(*)	----	31	182	(*)	----	31	194	(*)	----	31	239	(*)	----	31	158	13.9	82
950	29	588	−3.5	70	31	583	(*)	----	31	630	11.4	71	31	608	(*)	----	31	587	−17.3	71	31	640	(*)	----	31	596	14.0	76
900	29	1,011	−4.6	74	31	1,024	(*)	----	31	1,078	10.6	67	31	1,039	2.2	65	31	991	−13.3	67	31	1,054	−10.3	65	31	1,048	13.6	70
850	29	1,460	−4.7	69	31	1,483	(*)	----	31	1,554	9.7	65	31	1,501	3.6	62	31	1,429	−10.9	63	31	1,493	−10.6	61	31	1,529	12.4	67
800	29	1,938	−4.8	60	31	1,968	−1.0	58	31	2,057	8.2	57	31	1,994	3.5	56	31	1,896	−10.2	60	31	1,961	−9.7	56	31	2,037	11.5	58
750	29	2,451	−5.9	56	31	2,485	−3.9	60	31	2,589	5.5	48	31	2,525	1.6	54	31	2,399	−11.2	57	31	2,460	−11.3	53	31	2,585	10.0	48
700	29	2,983	−7.9	54	31	3,022	−7.1	61	31	3,148	2.6	48	31	3,070	−.8	54	31	2,920	−13.1	54	31	2,984	−13.8	52	31	3,147	7.4	41
650	29	3,561	−10.6	52	31	3,604	−10.2	60	31	3,749	.3	40	30	3,665	−4.0	52	31	3,490	−15.8	53	31	3,549	−16.9	49	31	3,757	3.8	32
600	29	4,169	−13.2	48	31	4,209	−13.3	53	31	4,383	−3.3	42	30	4,287	−7.4	51	31	4,082	−18.9	53	31	4,140	−20.3	45	31	4,398	.0	----
550	29	4,831	−16.4	49	31	4,872	−17.3	45	31	5,066	−7.2	40	29	4,961	−11.4	50	31	4,724	−23.0	----	31	4,780	−24.4	----	31	5,091	−4.5	----
500	29	5,540	−20.6	----	31	5,574	−22.1	----	31	5,803	−12.2	39	29	5,684	−15.9	47	31	5,416	−27.6	----	30	5,461	−29.0	----	31	5,832	−9.6	----
450	29	6,318	−25.2	----	31	6,347	−27.1	----	29	6,605	−17.3	42	29	6,478	−20.8	----	30	6,167	−32.6	----	30	6,210	−33.4	----	31	6,649	−15.1	----
400	29	7.158	−31.1	----	31	7,180	−32.6	----	29	7,471	−23.3	----	29	7,333	−26.9	----	30	6,984	−38.6	----	30	7,026	−38.6	----	31	7,517	−21.7	----
350	29	8,091	−37.8	----	31	8,109	−38.3	----	29	8,434	−30.7	----	29	8,283	−33.4	----	29	7,897	−44.6	----	30	7,932	−43.8	----	31	8,487	−28.9	----
300	28	9,148	−45.5	----	31	9,155	−44.2	----	28	9,503	−39.4	----	29	9,347	−41.4	----	29	8,916	−49.8	----	29	8,962	−48.8	----	31	9,570	−37.4	----
250	28	10,342	−53.3	----	30	10,366	−49.8	----	27	10,720	−49.9	----	29	10,560	−49.9	----	27	10,103	−53.7	----	27	10,156	−53.0	----	31	10,803	−46.8	----
200	22	11,762	−59.7	----	29	11,820	−54.1	----	25	12,143	−59.9	----	26	12,010	−56.2	----	20	11,532	−53.6	----	26	11,596	−53.7	----	27	12,240	−57.2	----
175	20	12,584	−60.4	----	26	12,682	−54.6	----	23	12,964	−63.6	----	23	12,839	−57.9	----	17	12,374	−53.8	----	24	12,448	−52.8	----	25	13,076	−61.7	----
150	18	13,532	−59.6	----	25	13,661	−55.2	----	21	13,899	−64.7	----	19	13,818	−59.3	----	13	13,375	−53.0	----	22	13,437	−53.4	----	19	14,035	−63.0	----
125	13	14,649	−59.4	----	21	14,803	−57.4	----	15	15,004	−65.8	----	13	14,951	−62.1	----	5	14,598	−52.7	----	18	14,605	−53.8	----	16	15,155	−66.2	----
100	8	16,008	−59.5	----	16	16,203	−60.3	----	11	16,334	−68.3	----	6	16,291	−64.1	----	----	----	----	----	15	16,054	−55.2	----	7	16,487	−71.6	----
80	----	----	----	----	8	17,588	−59.2	----	----	----	----	----	----	----	----	----	----	----	----	----	10	17,458	−56.0	----	----	----	----	----

Standard pressure surface (mb.)	Buffalo, N. Y. (992.6 mb.)				Camaguey, Cuba (1,006.0 mb.)				Caribou, Maine (996.4 mb.)				Charleston, S. C. (1,021.6 mb.)				Ciudad Victoria, Mex. (977.6 mb.)				Columbia, Mo. (992.2 mb.)				Dodge City, Kans. (926.8 mb.)			
Surface	31	221	−0.6	78	30	122	18.8	92	31	191	−10.7	79	31	13	12.2	83	30	335	17.3	61	31	239	−1.8	80	31	792	−6.2	73
1,000	31	161	(*)	----	30	174	19.8	88	31	160	(*)	----	31	193	15.1	72	30	140	(*)	----	31	175	(*)	----	31	189	(*)	----
950	31	575	−1.8	75	30	620	18.4	81	31	557	−10.4	72	31	632	14.2	64	30	581	15.8	63	31	586	−2.3	76	31	598	(*)	----
900	31	999	−2.8	71	30	1,080	16.0	72	31	972	−10.8	67	31	1,084	12.7	61	30	1,036	14.2	66	31	1,013	−.2	67	31	1,020	−5.3	66
850	31	1,452	−3.9	68	30	1,564	13.5	60	31	1,411	−11.1	63	31	1,562	10.5	59	30	1,518	12.6	68	31	1,472	1.0	57	31	1,472	−2.5	60
800	31	1,930	−4.6	67	30	2,073	12.0	44	31	1,876	−11.3	56	31	2,066	8.3	52	30	2,026	11.7	70	31	1,959	−.2	53	31	1,954	−1.3	55
750	31	2,444	−5.3	57	30	2,619	11.1	----	31	2,374	−12.0	48	31	2,601	6.5	43	30	2,571	10.0	60	31	2,479	−1.5	51	31	2,470	−3.0	56
700	31	2,976	−7.2	58	30	3,185	8.4	----	31	2,897	−13.4	45	31	3,161	3.8	39	30	3,137	7.1	53	31	3,022	−3.3	48	31	3,011	−5.5	48
650	31	3,557	−9.3	52	30	3,800	5.5	----	31	3,466	−15.5	43	31	3,761	.5	39	30	3,748	4.0	37	31	3,610	−6.1	48	31	3,594	−8.2	41
600	31	4,167	−12.4	48	29	4,445	2.0	----	31	4,059	−18.6	44	31	4,397	−3.2	37	30	4,391	.6	----	31	4,227	−9.7	46	31	4,207	−11.9	41
550	30	4,832	−15.5	44	29	5,145	−2.6	----	31	4,705	−22.2	----	31	5,081	−7.1	35	30	5,086	−3.7	----	31	4,896	−13.6	42	31	4,871	−15.6	38
500	28	5,545	−19.4	43	29	5,890	−8.0	----	31	5,398	−26.3	----	31	5,819	−11.4	32	30	5,831	−8.9	----	31	5,613	−17.9	39	31	5,581	−20.1	37
450	28	6,322	−24.4	----	28	6,706	−14.2	----	30	6,170	−30.9	----	31	6,626	−16.9	35	30	6,649	−14.4	----	31	6,400	−23.4	----	30	6,370	−25.5	----
400	27	7,170	−30.3	----	28	7,582	−21.1	----	30	6,990	−36.1	----	30	7,490	−23.2	----	30	7,525	−20.5	----	30	7,253	−29.1	----	30	7,208	−31.6	----
350	27	8,107	−36.9	----	28	8,551	−29.1	----	30	7,905	−41.9	----	30	8,453	−30.5	----	29	8,498	−27.9	----	30	8,194	−35.8	----	30	8,139	−38.0	----
300	25	9,152	−43.9	----	28	9,633	−37.9	----	30	8,935	−47.6	----	29	9,531	−39.1	----	29	9,587	−36.3	----	29	9,258	−43.0	----	30	9,185	−44.4	----
250	20	10,366	−51.4	----	26	10,864	−47.9	----	29	10,122	−52.3	----	26	10,754	−49.3	----	29	10,826	−46.5	----	26	10,479	−50.8	----	28	10,406	−50.4	----
200	12	11,799	−56.5	----	26	12,302	−57.7	----	25	11,546	−54.0	----	21	12,191	−59.4	----	28	12,274	−57.8	----	14	11,888	−57.9	----	24	11,840	−55.5	----
175	9	12,676	−57.9	----	26	13,136	−62.3	----	22	12,404	−53.3	----	17	13,025	−62.7	----	28	13,105	−63.2	----	10	12,725	−60.7	----	22	12,693	−56.6	----
150	5	13,689	−57.2	----	26	14,075	−67.4	----	19	13,408	−53.3	----	11	13,981	−65.1	----	25	14,046	−66.3	----	5	13,628	−58.1	----	17	13,660	−57.4	----
125	----	----	----	----	21	15,164	−72.5	----	13	14,606	−55.0	----	6	15,059	−65.6	----	17	15,159	−68.6	----	----	----	----	----	7	14,791	−56.7	----
100	----	----	----	----	----	----	----	----	5	16,055	−55.0	----	----	----	----	----	6	16,464	−73.2	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	El Paso, Tex. (881.9 mb.)				Ely, Nev. (806.1 mb.)				Glasgow, Mont. (945.2 mb.)				Grand Junction, Colo. (851.5 mb.)				Great Falls, Mont. (889.2 mb.)				Greensboro, N. C. (990.4 mb.)				Hatteras, N. C. (1,022.5 mb.)			
Surface	31	1,195	2.2	72	31	1,908	−14.3	76	31	648	−16.8	66	31	1,474	−7.0	73	31	1,128	−11.2	63	21	273	7.5	78	31	3	10.3	87
1,000	31	164	(*)	----	31	232	(*)	----	31	216	(*)	----	31	198	(*)	----	31	213	(*)	----	31	192	(*)	----	31	190	12.7	77
950	31	591	(*)	----	31	638	(*)	----	31	612	(*)	----	31	613	(*)	----	31	620	(*)	----	31	616	9.1	67	31	624	11.6	66
900	31	1,035	(*)	----	31	1,060	(*)	----	31	1,015	−13.5	63	31	1,039	(*)	----	31	1,038	(*)	----	31	1,065	8.6	62	31	1,071	9.6	61
850	31	1,493	2.3	63	31	1,499	(*)	----	31	1,452	−11.5	56	31	1,486	(*)	----	31	1,473	−10.2	53	31	1,537	7.0	61	31	1,543	7.8	60
800	31	1,981	.8	61	31	1,966	(*)	----	31	1,916	−11.4	53	31	1,963	−5.0	63	31	1,939	−11.7	53	31	2,034	5.6	56	31	2,042	6.3	53
750	31	2,503	−1.4	57	31	2,469	−10.3	65	31	2,414	−12.5	50	31	2,472	−7.1	65	31	2,439	−13.0	56	30	2,568	3.6	54	31	2,575	4.0	50
700	31	3,044	−4.2	57	31	2,992	−11.9	58	31	2,934	−14.9	52	31	3,004	−9.8	66	31	2,956	−14.6	56	30	3,119	1.4	50	31	3,127	1.7	47
650	31	3,629	−7.1	54	31	3,562	−14.5	54	31	3,499	−17.6	53	31	3,579	−13.1	67	31	3,522	−17.7	54	30	3,713	−1.6	46	31	3,722	−1.5	46
600	31	4,246	−10.8	47	31	4,159	−18.1	52	30	4,084	−20.9	----	31	4,178	−16.2	64	31	4,108	−21.3	----	30	4,346	−5.0	44	30	4,353	−5.0	46
550	31	4,912	−14.8	44	31	4,805	−22.1	----	30	4,722	−24.8	----	31	4,832	−20.1	60	31	4,746	−25.3	----	30	5,024	−9.1	39	30	5,031	−9.1	40
500	31	5,625	−19.2	40	31	5,499	−26.9	----	30	5,408	−29.3	----	31	5,527	−24.9	----	31	5,430	−30.0	----	30	5,755	−13.9	40	30	5,763	−13.4	35
450	31	6,408	−24.0	----	31	6,256	−31.6	----	30	6,158	−34.6	----	31	6,294	−29.9	----	31	6,182	−35.1	----	30	6,557	−19.3	40	28	6,569	−18.9	38
400	29	7,247	−29.6	----	31	7,076	−37.4	----	30	6,966	−40.2	----	31	7,115	−35.7	----	30	6,975	−40.5	----	30	7,413	−25.7	----	27	7,436	−25.2	----
350	28	8,184	−35.5	----	31	7,987	−43.0	----	28	7,869	−45.8	----	30	8,039	−41.6	----	30	7,874	−45.6	----	29	8,370	−32.6	----	27	8,391	−32.5	----
300	26	9,242	−42.6	----	30	9,023	−47.5	----	28	8,882	−51.2	----	27	9,061	−47.7	----	30	8,889	−50.6	----	29	9,437	−40.5	----	26	9,463	−40.4	----
250	25	10,452	−49.6	----	29	10,213	−51.4	----	23	10,024	−54.0	----	22	10,254	−51.2	----	28	10,064	−53.1	----	28	10,654	−49.8	----	25	10,701	−50.0	----
200	21	11,915	−55.9	----	26	11,640	−52.6	----	20	11,461	−53.7	----	20	11,716	−51.0	----	25	11,481	−52.6	----	26	12,081	−58.1	----	21	12,124	−59.4	----
175	19	12,755	−56.6	----	22	12,515	−52.2	----	19	12,319	−53.8	----	19	12,590	−51.5	----	23	12,327	−52.2	----	25	12,917	−60.0	----	15	12,977	−62.4	----
150	16	13,742	−58.8	----	21	13,511	−52.9	----	15	13,275	−54.1	----	19	13,587	−52.6	----	21	13,322	−52.5	----	17	13.888	−61.1	----	12	13,936	−62.4	----
125	14	14,885	−61.0	----	18	14,679	−54.6	----	14	14,444	−54.8	----	13	14,759	−53.2	----	20	14,490	−54.1	----	9	15,042	−64.0	----	6	15,063	−64.2	----
100	6	16,279	−64.5	----	15	16,099	−56.6	----	8	15,899	−56.1	----	7	16,191	−55.3	----	14	15,961	−54.2	----	----	----	----	----	----	----	----	----
80	----	----	----	----	5	17,572	−58.2	----	5	17,346	−55.0	----	----	----	----	----	7	17,423	−56.1	----	----	----	----	----	----	----	----	----

See footnotes at end of table.

TABLE 1.—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during January 1949*—Continued

Standard pressure surface (mb.)	Havana, Cuba [1] (---- mb.)				Honolulu, T. H. (1,012.6 mb.)				International Falls, Minn. (975.5 mb.)				Joilet, Ill. (998.4 mb.)				Lake Charles, La. (1,020.7 mb.)				Lander, Wyo. (827.4 mb.)				Las Vegas, Nev. (940.3 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	----	----	----	----	31	3	23.1	71	31	360	−14.1	78	31	178	−2.7	82	30	5	11.8	84	31	1,696	−17.2	69	31	660	0.1	65
1,000	----	----	----	----	31	112	22.2	72	31	168	(*)	----	31	163	(*)	----	30	176	12.3	78	31	248	(*)	----	31	163	(*)	----
950	----	----	----	----	31	559	18.5	76	31	563	−13.0	76	31	575	−3.5	78	30	611	11.6	71	31	648	(*)	----	31	578	(*)	----
900	----	----	----	----	31	1,018	15.1	78	31	971	−11.8	67	31	998	−1.8	63	30	1,059	11.2	66	31	1,060	(*)	----	31	1,012	.6	52
850	----	----	----	----	31	1,500	12.0	74	31	1,410	−10.7	57	31	1,453	−1.0	56	30	1,536	10.1	61	31	1,492	(*)	----	31	1,469	−2.1	52
800	----	----	----	----	31	2,007	10.0	58	31	1,875	−11.3	54	31	1,937	−1.8	54	30	2,039	8.9	53	31	1,951	−11.3	62	31	1,948	−4.6	53
750	----	----	----	----	31	2,545	7.9	48	31	2,380	−12.1	54	31	2,455	−3.3	50	29	2,581	6.8	45	31	2,454	−11.0	56	31	2,460	−6.5	53
700	----	----	----	----	31	3,107	5.3	37	31	2,895	−14.1	56	31	2,993	−5.5	44	29	3,140	4.6	39	31	2,975	−12.9	56	31	2,990	−9.5	48
650	----	----	----	----	30	3,712	2.1	30	31	3,465	−16.2	55	31	3,580	−8.2	40	29	3,740	1.4	----	31	3,544	−15.1	55	31	3,567	−12.6	42
600	----	----	----	----	30	4,352	−1.7	----	31	4,054	−19.6	56	31	4,189	−11.4	37	29	4,380	−2.2	----	31	4,140	−18.6	51	30	4,166	−16.0	42
550	----	----	----	----	30	5,038	−6.2	----	30	4,705	−23.1	----	31	4,857	−15.4	38	28	5,064	−6.4	----	31	4,784	−22.6	----	30	4,819	−20.1	42
500	----	----	----	----	30	5,778	−11.5	----	30	5,394	−27.3	----	31	5,565	−19.9	38	28	5,805	−11.5	----	31	5,476	−27.3	----	30	5,517	−24.3	----
450	----	----	----	----	30	6,582	−17.5	----	30	6,149	−32.2	----	31	6,344	−25.3	----	28	6,611	−17.1	----	31	6,231	−32.7	----	30	6,283	−29.4	----
400	----	----	----	----	30	7,449	−23.9	----	30	6,966	−37.7	----	31	7,184	−31.0	----	28	7,477	−23.5	----	31	7,046	−38.2	----	30	7,108	−35.1	----
350	----	----	----	----	30	8,412	−30.4	----	30	7,874	−43.9	----	31	8,118	−37.4	----	28	8,438	−31.1	----	31	7,953	−44.0	----	30	8,027	−41.2	----
300	----	----	----	----	30	9,491	−37.3	----	30	8,894	−50.0	----	31	9,166	−44.6	----	28	9,512	−39.6	----	30	8,967	−50.5	----	29	9,053	−46.5	----
250	----	----	----	----	30	10,731	−44.9	----	30	10,073	−54.1	----	30	10,363	−51.8	----	28	10,733	−49.3	----	27	10,146	−53.8	----	27	10,253	−50.4	----
200	----	----	----	----	30	12,194	−53.0	----	28	11,493	−54.3	----	29	11,793	−56.6	----	28	12,160	−59.9	----	21	11,577	−52.9	----	26	11,695	−52.1	----
175	----	----	----	----	29	13,047	−56.9	----	28	12,350	−53.7	----	28	12,636	−57.8	----	26	12,987	−63.4	----	17	12,449	−52.0	----	24	12,563	−51.6	----
150	----	----	----	----	29	14,014	−61.1	----	28	13,338	−54.6	----	20	13,610	−57.5	----	24	13,926	−65.3	----	12	13,423	−52.2	----	23	13,567	−52.9	----
125	----	----	----	----	29	15,132	−66.0	----	21	14,521	−54.2	----	13	14,766	−58.9	----	19	15,034	−67.0	----	----	----	----	----	19	14,731	−55.3	----
100	----	----	----	----	24	16,472	−70.2	----	15	15,935	−55.3	----	----	----	----	----	9	16,397	−70.7	----	----	----	----	----	14	16,155	−57.8	----
80	----	----	----	----	21	17,794	−71.0	----	5	17,324	−56.3	----	----	----	----	----	5	17,752	−71.1	----	----	----	----	----	10	17,580	−58.2	----
60	----	----	----	----	18	19,520	−64.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
50	----	----	----	----	17	20,644	−60.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
40	----	----	----	----	12	22,054	−55.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
30	----	----	----	----	5	23,918	−51.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Little Rock, Ark. (1,012.3 mb.)				Mazatlan, Mex. (1,011.7 mb.)				Medford, Oreg. (975.8 mb.)				Merida, Mex. (1,014.6 mb.)				Miami, Fla. (1,021.8 mb.)				Nantucket, Mass. (1,019.1 mb.)				Nashville, Tenn. (1,000.7 mb.)			
Surface	31	79	6.5	81	31	14	19.7	77	31	401	−0.8	77	31	27	23.7	77	31	4	19.6	78	31	14	2.4	84	31	177	7.6	81
1,000	31	178	6.6	79	31	115	19.2	74	31	204	(*)	----	31	154	23.2	77	31	191	20.6	69	31	166	2.5	78	31	182	(*)	----
950	31	602	6.3	79	31	568	19.1	59	31	618	.9	59	31	602	21.0	75	31	633	17.6	71	31	585	1.0	78	31	609	7.4	73
900	31	1,044	6.7	74	31	1,020	17.5	48	31	1,049	−.9	53	31	1,068	18.0	75	31	1,093	14.5	69	31	1,014	−.5	72	31	1,049	6.7	69
850	31	1,513	6.1	68	31	1,507	14.7	44	31	1,504	−2.7	48	31	1,556	15.0	77	31	1,575	12.4	59	31	1,468	−1.0	61	31	1,518	5.5	61
800	31	2,010	5.2	65	31	2,016	11.6	42	31	1,982	−5.1	45	31	2,067	12.5	68	31	2,083	11.7	38	31	1,953	−1.5	53	31	2,013	4.0	59
750	31	2,540	3.4	59	31	2,561	8.1	45	31	2,492	−7.5	42	31	2,610	10.1	56	31	2,624	10.4	----	31	2,471	−2.8	46	31	2,543	2.6	56
700	31	3,094	1.3	53	31	3,118	4.5	43	31	3,021	−10.2	42	31	3,179	8.3	34	31	3,192	8.1	----	31	3,011	−5.1	49	31	3,093	.2	51
650	31	3,690	−1.7	50	31	3,720	.4	42	31	3,594	−12.8	41	31	3,792	5.8	----	31	3,802	5.0	----	31	3,589	−7.8	49	31	3,686	−3.0	51
600	31	4,320	−5.3	48	31	4,356	−3.1	39	31	4,195	−16.2	36	31	4,439	2.2	----	31	4,448	1.4	----	31	4,209	−11.1	42	31	4,314	−6.2	44
550	30	4,998	−9.2	46	31	5,041	−6.6	40	31	4,847	−20.1	34	31	5,135	−1.8	----	31	5,141	−3.1	----	31	4,874	−14.5	39	31	4,993	−9.9	41
500	29	5,733	−13.9	45	31	5,780	−11.2	42	31	5,546	−24.3	----	31	5,886	−7.3	----	31	5,890	−8.3	----	31	5,589	−18.8	38	31	5,720	−14.3	42
450	28	6,531	−19.1	46	29	6,590	−16.2	42	31	6,312	−28.9	----	31	6,702	−13.5	----	31	6,707	−14.0	----	31	6,370	−24.4	----	31	6,517	−19.5	43
400	28	7,392	−25.1	----	29	7,460	−21.8	----	31	7,140	−34.8	----	31	7,582	−20.5	----	31	7,582	−20.9	----	31	7,216	−30.0	----	31	7,376	−25.5	----
350	27	8,350	−31.8	----	29	8,429	−29.0	----	31	8,059	−41.2	----	30	8,552	−28.6	----	31	8,554	−28.7	----	31	8,154	−36.4	----	31	8,330	−32.7	----
300	27	9,420	−40.1	----	28	9,514	−37.1	----	31	9,091	−48.0	----	30	9,634	−37.5	----	30	9,638	−37.2	----	31	9,206	−43.7	----	31	9,396	−41.1	----
250	27	10,636	−49.5	----	26	10,755	−46.4	----	30	10,277	−54.0	----	30	10,865	−47.4	----	30	10,871	−47.1	----	30	10,415	−52.1	----	29	10,621	−50.9	----
200	25	12,067	−57.9	----	25	12,205	−56.9	----	30	11,695	−57.1	----	30	12,303	−58.1	----	28	12,310	−57.7	----	29	11,835	−57.6	----	25	12,050	−59.2	----
175	22	12,885	−60.6	----	24	13,041	−61.4	----	26	12,533	−55.8	----	29	13,134	−63.0	----	27	13,145	−61.2	----	24	12,686	−57.7	----	22	12,885	−61.6	----
150	15	13,820	−59.3	----	20	14,001	−63.5	----	19	13,493	−54.6	----	29	14,072	−67.4	----	24	14,092	−64.9	----	19	13,639	−57.9	----	16	13,838	−62.7	----
125	10	14,941	−60.9	----	9	15,145	−65.8	----	16	14,668	−54.8	----	27	15,158	−72.2	----	18	15,192	−68.8	----	13	14,772	−59.7	----	8	14,926	−62.0	----
100	----	----	----	----	----	----	----	----	10	16,085	−55.8	----	16	16,445	−77.4	----	11	16,524	−73.6	----	9	16,177	−60.2	----	5	16,294	−63.5	----
80	----	----	----	----	----	----	----	----	7	17,548	−56.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	New Orleans, La. (1,021.3 mb.)				North Platte, Nebr. (919.6 mb.)				Oakland, Calif. (1,019.7 mb.)				Oklahoma City, Okla. (974.5 mb.)				Omaha, Nebr. (984.3 mb.)				Phoenix, Ariz. (977.0 mb.)				Pittsburgh, Pa. (975.3 mb.)			
Surface	31	2	14.3	84	29	849	−12.1	77	31	6	5.9	56	31	391	−1.8	73	31	308	−7.1	76	31	339	6.4	69	30	382	2.9	76
1,000	31	180	15.4	77	29	197	(*)	----	31	166	6.5	49	31	182	(*)	----	31	181	(*)	----	31	147	(*)	----	30	178	(*)	----
950	31	620	13.7	66	29	599	(*)	----	31	589	4.3	47	31	595	−.9	71	31	584	−8.4	71	31	572	7.6	53	30	604	2.5	75
900	31	1,070	12.6	63	29	1,012	−10.4	72	31	1,023	2.1	43	31	1,025	1.9	66	31	1,003	−5.5	66	31	1,013	4.7	50	30	1,031	1.2	74
850	31	1,550	11.7	60	29	1,455	−7.8	61	31	1,483	.2	41	31	1,488	3.0	61	31	1,453	−3.9	63	31	1,476	1.3	53	30	1,491	1.1	66
800	31	2,055	9.7	58	29	1,929	−5.5	55	31	1,967	−1.6	38	31	1,979	2.0	55	31	1,932	−3.5	58	31	1,962	−1.8	56	30	1,978	.1	59
750	31	2,595	7.3	53	29	2,442	−5.3	51	31	2,485	−3.8	34	31	2,503	.4	54	31	2,446	−4.3	51	31	2,479	−4.5	51	30	2,503	−1.9	56
700	31	3,154	4.8	47	29	2,975	−7.2	49	31	3,021	−6.4	32	31	3,049	−2.0	51	31	2,983	−6.5	47	31	3,013	−7.4	42	30	3,040	−3.8	52
650	31	3,755	2.0	36	29	3,556	−10.3	48	31	3,601	−9.5	33	30	3,635	−5.2	51	31	3,563	−9.8	47	31	3,591	−10.7	40	29	3,633	−5.9	53
600	31	4,397	−1.4	----	28	4,164	−13.8	46	31	4,211	−13.4	33	30	4,256	−8.8	51	31	4,172	−13.6	42	31	4,198	−14.3	35	29	4,246	−9.1	56
550	31	5,086	−5.9	----	28	4,824	−18.3	43	31	4,872	−17.6	35	29	4,933	−12.3	45	31	4,833	−17.3	40	31	4,855	−18.2	34	29	4,920	−12.8	55
500	31	5,825	−10.8	----	28	5,525	−23.2	----	31	5,575	−22.3	----	29	5,652	−16.9	43	30	5,536	−22.1	----	31	5,559	−22.6	----	29	5,635	−17.5	55
450	31	6,636	−16.3	----	27	6,307	−28.2	----	31	6,349	−27.3	----	29	6,445	−21.9	----	30	6,306	−27.7	----	31	6,334	−28.1	----	29	6,429	−22.4	----
400	31	7,503	−22.9	----	26	7,149	−33.9	----	31	7,180	−33.3	----	27	7,305	−27.7	----	30	7,140	−33.0	----	31	7,161	−33.8	----	29	7,272	−28.4	----
350	30	8,469	−30.5	----	26	8,072	−40.2	----	31	8,106	−39.4	----	27	8,252	−34.2	----	30	8,067	−39.0	----	31	8,086	−39.0	----	28	8,219	−35.2	----
300	29	9,545	−39.2	----	23	9,115	−46.6	----	31	9,146	−45.9	----	25	9,318	−41.8	----	30	9,109	−45.5	----	31	9,130	−44.9	----	28	9,275	−43.2	----
250	29	10,767	−49.3	----	21	10,317	−52.3	----	30	10,336	−52.7	----	23	10,543	−50.0	----	30	10,308	−51.4	----	28	10,332	−50.2	----	28	10,479	−51.7	----
200	25	12,205	−59.9	----	14	11,693	−55.7	----	30	11,759	−56.2	----	22	11,972	−56.8	----	22	11,706	−54.1	----	23	11,772	−52.2	----	25	11,901	−58.6	----
175	24	13,027	−64.4	----	----	----	----	----	25	12,601	−54.0	----	19	12,812	−58.1	----	19	12,562	−55.0	----	21	12,642	−52.5	----	22	12,729	−58.8	----
150	20	13,972	−65.8	----	----	----	----	----	22	13,596	−54.5	----	14	13,766	−58.9	----	15	13,531	−55.6	----	21	13,635	−53.8	----	13	13,682	−59.6	----
125	15	15,084	−68.3	----	----	----	----	----	22	14,758	−56.5	----	9	14,933	−62.9	----	9	14,693	−57.7	----	19	14,796	−56.5	----	8	14,794	−59.8	----
100	6	16,444	−71.3	----	----	----	----	----	21	16,170	−59.0	----	----	----	----	----	----	----	----	----	12	16,197	−59.2	----	----	----	----	----
80	----	----	----	----	----	----	----	----	13	17,561	−58.9	----	----	----	----	----	----	----	----	----	5	17,606	−59.1	----	----	----	----	----

See footnotes at end of table.

TABLE 1.—*Mean dynamic height (geopotential) in units of 0.98 dynamic meters, temperature in degrees centigrade, and relative humidity in percent, for standard pressures, as obtained by radiosondes during January 1949*—Continued

Standard pressure surface (mb.)	Portland, Maine (1,018.4 mb.)				Rapid City, S. Dak. (904.1 mb.)				St. Cloud, Minn. (981.1 mb.)				San Antonio, Tex. (991.9 mb.)				San Juan, P. R. (1,016.0 mb.)				Santa Maria, Calif. (1,010.3 mb.)				Sault Ste. Marie, Mich. (992.2 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	20	−2.8	78	26	980	−12.7	66	31	317	−12.2	78	31	240	7.5	76	30	15	23.5	76	31	71	6.1	72	30	221	−6.8	75
1,000	31	163	(*)	----	26	199	(*)	----	31	168	(*)	----	31	170	(*)	----	30	153	22.8	73	31	155	6.7	66	30	157	(*)	----
950	31	572	−4.0	66	26	601	(*)	----	31	569	−11.0	72	31	601	8.1	72	30	600	19.3	76	31	578	5.2	55	30	562	−7.8	76
900	31	994	−5.3	67	26	1,013	(*)	----	31	978	−8.9	61	31	1,044	8.8	73	30	1,062	15.6	79	31	1,015	2.8	51	30	978	−8.1	74
850	31	1,442	−5.6	57	26	1,455	−7.7	54	31	1,422	−7.7	57	31	1,517	8.4	70	30	1,545	12.3	79	31	1,475	.4	48	30	1,421	−8.6	66
800	31	1,917	−6.4	51	26	1,927	−7.1	52	31	1,893	−8.2	56	31	2,019	7.7	57	30	2,052	10.0	67	31	1,960	−.9	41	30	1,891	−9.0	60
750	31	2,428	−7.4	44	26	2,436	−8.1	50	31	2,401	−8.7	50	31	2,555	6.8	44	30	2,591	9.8	36	31	2,481	−3.0	36	30	2,393	−10.3	59
700	31	2,956	−9.1	43	25	2,965	−9.5	49	31	2,926	−10.6	50	31	3,115	4.2	39	29	3,159	8.2	----	31	3,017	−5.8	38	30	2,918	−12.5	57
650	31	3,532	−11.4	42	25	3,540	−12.5	50	31	3,499	−13.6	51	31	3,716	.8	35	29	3,763	5.3	----	31	3,602	−8.8	38	30	3,489	−14.6	52
600	31	4,137	−14.6	38	24	4,146	−15.8	52	30	4,101	−16.9	50	31	4,353	−3.1	34	29	4,415	1.3	----	31	4,210	−12.5	34	30	4,084	−17.5	49
550	30	4,797	−18.1	37	24	4,800	−20.5	54	30	4,750	−20.7	----	31	5,040	−7.5	37	29	5,104	−2.9	----	31	4,873	−16.6	----	29	4,730	−21.5	----
500	30	5,502	−22.3	----	24	5,493	−25.1	----	30	5,448	−25.0	----	31	5,773	−12.0	36	29	5,856	−7.7	----	31	5,579	−21.4	----	29	5,423	−25.9	----
450	30	6,274	−27.2	----	24	6,261	−30.3	----	30	6,211	−29.9	----	31	6,580	−17.4	39	28	6,668	−13.6	----	31	6,358	−26.6	----	28	6,196	−30.5	----
400	30	7,108	−32.7	----	23	7,079	−36.0	----	30	7,036	−35.6	----	31	7,444	−23.4	----	27	7,553	−20.2	----	31	7,190	−32.4	----	27	7,018	−35.5	----
350	30	8,036	−39.2	----	23	7,994	−42.1	----	30	7,952	−42.0	----	30	8,411	−30.3	----	27	8,528	−27.6	----	31	8,118	−38.7	----	25	7,942	−40.9	----
300	30	9,076	−46.0	----	22	9,024	−48.7	----	28	8,984	−48.1	----	27	9,501	−38.3	----	27	9,618	−35.6	----	30	9,168	−45.0	----	18	9,007	−47.3	----
250	30	10,268	−53.1	----	22	10,207	−53.6	----	24	10,169	−53.8	----	19	10,727	−47.4	----	25	10,868	−45.0	----	30	10,366	−51.8	----	11	10,230	−54.9	----
200	30	11,690	−56.9	----	21	11,637	−54.5	----	9	11,532	−53.5	----	11	12,147	−56.4	----	23	12,324	−55.5	----	28	11,799	−54.5	----	----	------	------	----
175	24	12,496	−55.0	----	19	12,476	−53.6	----	----	------	------	----	6	12,948	−56.4	----	20	13,165	−61.1	----	26	12,652	−53.6	----	----	------	------	----
150	23	13,468	−55.9	----	17	13,467	−53.2	----	----	------	------	----	----	------	------	----	17	14,114	−66.2	----	26	13,640	−54.4	----	----	------	------	----
125	17	14,613	−57.3	----	12	14,643	−53.9	----	----	------	------	----	----	------	------	----	13	15,206	−71.3	----	20	14,801	−55.9	----	----	------	------	----
100	10	16,008	−59.1	----	----	------	------	----	----	------	------	----	----	------	------	----	9	16,511	−75.6	----	17	16,201	−58.7	----	----	------	------	----
80	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	17	17,598	−59.1	----	----	------	------	----
60	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	8	19,411	−58.4	----	----	------	------	----

Standard pressure surface (mb.)	Spokane, Wash. (938.8 mb.)				Swan Island, W. I.[1] (000.0 mb.)				Tacubaya, Mex. (773.8 mb.)				Tampa, Fla. (1,022.0 mb.)				Tatoosh Island, Wash. (1,021.3 mb.)				Toledo, Ohio (997.0 mb.)				Washington, D. C. (1,019.7 mb.)			
	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity	Number of observations	Dynamic height	Temperature	Relative humidity
Surface	31	721	−13.1	74	----	------	------	----	31	2,306	14.7	44	30	9	17.2	81	31	31	2.3	78	31	191	0.2	81	31	25	5.8	68
1,000	31	234	(*)	----	----	------	------	----	31	72	(*)	----	30	196	18.4	70	31	201	1.5	70	31	165	(*)	----	31	184	5.3	65
950	31	629	(*)	----	----	------	------	----	31	534	(*)	----	30	638	16.4	66	31	617	−.9	65	31	579	−1.3	75	31	605	4.2	64
900	31	1,045	−9.5	68	----	------	------	----	31	1,008	(*)	----	30	1,093	13.7	65	31	1,042	−2.5	62	31	1,006	−1.1	66	31	1,041	2.9	65
850	31	1,486	−9.7	64	----	------	------	----	31	1,499	(*)	----	30	1,574	11.6	63	31	1,495	−3.5	53	31	1,463	−.8	57	31	1,504	2.4	63
800	31	1,954	−10.1	64	----	------	------	----	31	2,024	(*)	----	30	2,079	10.2	46	31	1,973	−5.3	46	31	1,947	−1.8	54	31	1,993	1.0	59
750	31	2,454	−11.3	57	----	------	------	----	31	2,572	13.6	44	30	2,617	8.4	34	31	2,482	−7.5	43	31	2,465	−3.3	51	31	2,516	−.3	56
700	31	2,978	−13.6	51	----	------	------	----	31	3,147	9.5	47	30	3,182	6.0	----	31	3,012	−10.3	46	31	3,003	−5.1	50	31	3,061	−2.4	54
650	31	3,542	−16.6	48	----	------	------	----	31	3,762	4.7	52	30	3,790	3.3	----	31	3,581	−13.6	50	31	3,590	−7.6	46	31	3,649	−5.0	55
600	31	4,136	−20.1	48	----	------	------	----	31	4,405	.5	44	29	4,430	−.3	----	31	4,184	−17.0	49	31	4,202	−11.6	44	31	4,272	−8.0	51
550	31	4,778	−23.6	----	----	------	------	----	30	5,103	−3.0	----	29	5,121	−4.8	----	30	4,840	−20.1	43	31	4,869	−14.6	41	31	4,943	−12.2	44
500	31	5,467	−28.2	----	----	------	------	----	30	5,849	−7.6	----	29	5,862	−9.6	----	29	5,539	−24.9	----	31	5,581	−19.4	41	31	5,665	−16.7	43
450	31	6,220	−33.3	----	----	------	------	----	30	6,672	−13.4	----	29	6,675	−15.3	----	29	6,302	−29.8	----	31	6,365	−24.8	----	31	6,453	−22.0	----
400	31	7,034	−38.1	----	----	------	------	----	30	7,546	−20.2	----	29	7,546	−22.2	----	27	7,139	−35.2	----	31	7,204	−30.7	----	31	7,304	−28.2	----
350	31	7,941	−43.7	----	----	------	------	----	30	8,519	−28.3	----	28	8,515	−29.7	----	27	8,057	−41.3	----	31	8,138	−37.4	----	31	8,248	−35.1	----
300	29	8,981	−48.7	----	----	------	------	----	26	9,612	−36.8	----	27	9,593	−38.3	----	27	9,088	−48.1	----	31	9,185	−45.0	----	31	9,305	−42.9	----
250	26	10,139	−52.5	----	----	------	------	----	25	10,849	−46.4	----	25	10,828	−48.4	----	27	10,273	−53.6	----	31	10,380	−53.0	----	31	10,510	−51.6	----
200	21	11,572	−52.9	----	----	------	------	----	24	12,293	−57.4	----	22	12,255	−59.1	----	27	11,698	−55.9	----	31	11,797	−58.7	----	30	11,935	−59.0	----
175	18	12,431	−52.0	----	----	------	------	----	20	13,124	−62.7	----	21	13,090	−63.1	----	22	12,523	−54.0	----	30	12,630	−59.4	----	29	12,773	−61.3	----
150	12	13,419	−51.1	----	----	------	------	----	8	14,052	−67.2	----	20	14,036	−65.9	----	20	13,504	−53.8	----	28	13,599	−59.4	----	22	13,721	−60.0	----
125	10	14,640	−53.0	----	----	------	------	----	----	------	------	----	18	15,124	−69.9	----	19	14,670	−53.9	----	21	14,710	−60.0	----	13	14,861	−61.3	----
100	6	16,094	−53.3	----	----	------	------	----	----	------	------	----	16	16,435	−74.5	----	17	16,082	−54.5	----	15	16,080	−60.3	----	5	16,188	−61.5	----
80	----	------	------	----	----	------	------	----	----	------	------	----	10	17,732	−75.0	----	14	17,494	−54.4	----	9	17,439	−60.6	----	----	------	------	----
60	----	------	------	----	----	------	------	----	----	------	------	----	6	19,430	−70.7	----	7	19,336	−56.7	----	----	------	------	----	----	------	------	----

[1] Data not yet received.

(*) Temperature and relative humidity data for this level are not available or are available only for certain days. See note entitled "Change in Summarization of Radiosonde Data," p. 6, in the January 1946 issue of the MONTHLY WEATHER REVIEW.

NOTE.—All observations scheduled between 0300 and 0500, G. C. T. except at Ciudad Victoria, Mazatlan and Merida, where they are taken near 0200, G. C. T. "Number of observations" refers to those of dynamic height only. (In a few cases temperature or humidity data may be missing for one or more standard pressure surfaces of some observations.) Relative humidity data are not published for standard pressure surfaces having a corresponding mean temperature below −20° C.

Relative humidity data, beginning with October 1, 1948, were computed, and expressed in these tables, on the basis of the vapor pressure over water. Upper air values of relative humidity at levels with temperatures less than 0° C. have formerly been computed and expressed on the basis of the vapor pressure over ice. All relative humidity observations are obtained by electric hygrometer and have been adjusted to compensate for the values occurring below the operating range of the humidity element. For explanation of the adjustment see article entitled "Curve Method for Obtaining Monthly Means of Relative Humidity," p. 241, MONTHLY WEATHER REVIEW, December 1944.

None of the means included in these tables are based on less than 15 observations at the surface or 5 observations at a standard pressure level.

TABLE 2.—*Free-air resultant winds based on pilot balloon observations made near 2200 G. C. T., during January 1949. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Speeds in meters per second*

Altitude (meters) m. s. l.	Abilene, Tex. (534 m.)			Albuquerque, N. Mex. (1,627 m.)			Atlanta Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (505 m.)			Boise, Idaho (868 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (100 m.)			Charleston, S. C. (16 m.)			Cincinnati, Ohio (273 m.)			Denver, Colo. (1,618 m.)			El Paso, Tex. (1,198 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	22	257	2.2	31	156	2.2	26	263	2.4	29	237	3.7	26	303	3.2	30	343	0.7	28	110	1.7	23	255	2.0	26	251	1.2	30	253	1.0	24	233	2.7	27	72	0.8	30	204	1.4
500	---	---	---	---	---	---	26	260	2.6	---	---	---	---	---	---	---	---	---	28	122	2.2	23	240	4.1	26	229	3.3	30	236	3.3	24	221	3.9	---	---	---	---	---	---
1,000	22	244	4.9	---	---	---	25	249	4.7	---	---	---	26	303	6.3	30	326	1.1	19	166	4.8	15	240	6.3	25	245	5.9	26	258	5.1	19	228	8.0	---	---	---	---	---	---
1,500	18	249	8.0	---	---	---	22	265	7.6	29	262	6.5	23	299	7.3	30	316	2.9	11	198	7.2	11	266	10.1	18	265	8.9	25	263	7.2	18	242	10.9	---	---	---	30	244	1.6
2,000	18	254	10.7	31	172	2.8	18	275	11.3	28	293	7.7	20	295	10.5	30	325	4.4	---	---	---	---	---	---	14	272	13.2	23	276	7.5	16	247	13.9	27	52	.8	27	243	3.7
2,500	16	250	14.0	31	213	5.1	15	273	12.8	24	292	8.0	16	292	11.9	27	341	4.3	---	---	---	---	---	---	12	274	14.4	22	281	9.7	15	264	16.0	27	224	1.9	23	243	8.6
3,000	15	244	17.4	24	236	13.6	15	270	14.5	24	291	8.8	16	287	12.3	26	353	5.6	---	---	---	---	---	---	11	276	15.9	21	278	12.7	13	271	18.8	25	242	4.0	21	248	11.2
4,000	14	242	23.4	20	247	11.2	14	270	17.3	23	293	8.9	15	284	15.0	22	90	8.0	---	---	---	---	---	---	---	---	---	18	281	15.0	10	271	23.0	24	260	7.3	17	247	16.1
5,000	11	247	29.7	17	247	14.0	12	273	20.1	19	286	8.5	12	267	16.9	21	3	10.3	---	---	---	---	---	---	---	---	---	15	282	19.0	---	---	---	19	259	13.2	15	249	22.1
6,000	---	---	---	16	248	15.1	10	263	21.7	16	316	8.1	10	270	17.1	16	359	10.8	---	---	---	---	---	---	---	---	---	13	290	20.2	---	---	---	15	247	13.7	14	249	25.8
8,000	---	---	---	14	236	24.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13	250	15.9	---	---	---

Altitude (meters) m. s. l.	Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,475 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (16 m.)			Joilet, Ill. (178 m.)			Las Vegas, Nev. (663 m.)			Little Rock, Ark. (88 m.)			Medford, Oreg. (416 m.)			Miami, Fla. (11 m.)			Mobile, Ala. (66 m.)			Nashville, Tenn. (182 m.)			New York, N. Y. (15 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	27	14	1.2	28	327	0.4	26	272	1.1	27	266	2.5	27	153	0.9	25	254	2.7	30	340	1.0	22	245	1.6	30	319	0.8	31	104	3.6	24	152	1.7	22	198	2.2	27	317	3.9
500	---	---	---	---	---	---	26	261	2.3	---	---	---	27	214	2.3	25	244	4.0	---	---	---	22	236	3.8	30	315	.7	31	102	5.1	23	169	2.6	22	199	4.8	27	295	4.5
1,000	---	---	---	---	---	---	25	257	6.0	27	267	5.3	27	240	3.5	15	238	8.3	30	344	1.3	18	242	6.1	30	123	.9	31	99	3.9	19	253	1.9	19	211	8.1	22	308	7.2
1,500	---	---	---	28	324	.4	24	268	9.3	27	287	7.0	25	254	3.0	14	250	10.6	29	335	2.5	17	260	8.7	29	79	1.4	31	88	2.6	19	241	3.7	13	237	11.5	21	300	9.1
2,000	27	23	1.3	28	218	.9	23	284	12.6	26	303	7.5	24	271	4.0	13	252	10.8	27	327	3.5	12	260	11.8	27	30	4.3	29	76	2.0	18	245	5.8	11	248	14.6	18	289	12.1
2,500	27	334	2.8	27	203	1.8	21	280	14.5	19	297	6.4	22	284	5.0	12	258	11.7	25	335	3.5	10	255	14.8	25	20	7.8	27	86	2.3	16	248	7.6	10	246	15.1	17	293	14.2
3,000	24	336	3.5	25	223	2.8	21	280	15.2	16	290	6.3	21	273	6.8	10	267	12.5	24	334	3.8	---	---	---	24	10	9.8	24	90	1.1	16	251	10.2	10	254	18.2	11	292	15.0
4,000	17	341	6.5	19	262	3.6	17	280	21.8	13	291	2.6	20	280	9.7	---	---	---	21	340	8.1	---	---	---	22	3	14.3	20	291	2.1	12	252	13.3	---	---	---	---	---	---
5,000	13	338	7.9	13	307	8.3	14	282	24.5	---	---	---	17	287	10.8	---	---	---	20	349	12.0	---	---	---	20	7	19.8	15	280	6.8	12	248	15.0	---	---	---	---	---	---
6,000	12	342	8.9	10	322	12.0	13	288	25.6	---	---	---	17	282	14.2	---	---	---	18	341	14.5	---	---	---	13	357	17.7	14	284	8.8	---	---	---	---	---	---	---	---	---
8,000	---	---	---	---	---	---	---	---	---	---	---	---	10	291	19.9	---	---	---	11	353	19.6	---	---	---	---	---	---	10	270	11.6	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Cloud, Minn. (318 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (221 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (725 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	30	322	1.7	21	259	4.0	24	285	2.5	31	156	0.9	26	336	4.2	27	282	2.6	19	263	2.2	22	326	0.2	29	251	2.0	23	281	1.2	29	349	0.2	30	66	0.4	27	269	1.6
500	30	3	3.4	21	258	4.5	24	282	2.2	31	185	.7	---	---	---	27	291	3.7	19	256	4.3	22	220	.7	29	259	1.3	23	276	1.3	29	215	.9	---	---	---	27	274	4.0
1,000	30	7	4.6	20	251	7.5	22	279	4.2	31	204	1.7	26	332	4.3	26	293	5.6	16	259	8.1	20	221	2.9	27	320	1.0	18	228	2.0	27	285	.8	30	126	.3	25	276	7.1
1,500	27	8	7.3	17	253	9.4	20	276	5.2	29	205	2.9	26	314	7.8	25	287	7.8	12	265	13.6	18	243	5.6	21	15	1.9	15	282	3.9	24	329	1.8	29	289	2.4	23	286	9.9
2,000	27	10	7.9	17	251	10.1	17	276	7.1	25	208	3.2	23	300	8.7	22	285	9.8	10	267	16.3	17	242	8.4	19	352	2.7	14	283	7.7	21	336	3.5	26	320	4.1	19	287	13.3
2,500	27	7	9.4	15	251	13.4	14	272	11.0	21	223	3.2	22	300	8.1	20	279	11.9	---	---	---	13	250	11.9	18	351	5.6	14	283	9.8	20	345	5.2	26	328	5.3	18	283	15.9
3,000	26	1	10.7	13	246	17.3	13	284	11.6	20	253	5.1	19	298	8.1	18	277	14.0	---	---	---	13	246	14.1	18	335	7.9	12	280	10.7	18	343	6.5	20	344	6.5	18	281	19.1
4,000	26	357	13.7	10	253	21.6	12	279	14.2	19	264	6.2	13	278	10.1	17	283	15.1	---	---	---	10	245	20.5	12	345	13.9	11	282	14.1	14	349	11.7	16	12	10.8	16	277	22.5
5,000	22	351	17.2	---	---	---	12	271	17.7	14	269	7.6	10	261	14.9	14	274	19.4	---	---	---	10	249	24.7	11	345	13.4	---	---	---	12	358	16.8	16	8	15.5	11	280	25.7
6,000	19	354	21.4	---	---	---	12	263	19.7	13	275	8.4	---	---	---	11	275	19.2	---	---	---	---	---	---	11	339	15.4	---	---	---	---	---	---	12	354	17.7	---	---	---
8,000	10	358	20.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Free-air resultant winds based on rawin observations made near 0300 G. C. T., during January 1949. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Speeds in meters per second*

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,636 m.)			Big Spring, Tex. (774 m.)			Bismarck, N. Dak. (505 m.)			Brownsville, Tex. (7 m.)			Caribou, Maine (191 m.)			Charleston, S. C. (13 m.)			Columbia, Mo. (237 m.)			Grand Junction, Colo. (1,473 m.)			Greensboro, N. C. (275 m.)			Hatteras, N. C. (3 m.)			International Falls, Minn. (358 m.)			Little Rock, Ark. (80 m.)			Miami, Fla. (12 m.)		
Altitude (meters) m. s. l.	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed	Observations	Direction	Speed
Surface	31	105	1.8	29	123	1.3	31	334	2.6	31	21	0.9	31	258	1.2	31	211	0.7	31	252	1.1	31	113	0.4	31	295	0.5	31	294	0.7	31	315	0.5	31	356	0.5	31	78	1.9
500	---	---	---	---	---	---	---	---	---	30	126	4.3	31	271	4.5	31	240	3.0	31	235	3.5	---	---	---	31	246	2.8	31	259	4.1	29	235	.4	31	199	2.5	31	100	5.3
1,000	---	---	---	29	199	2.3	31	328	5.7	30	51	6.8	31	278	6.8	31	244	3.8	31	252	6.4	---	---	---	31	260	6.6	31	261	5.2	29	240	2.1	31	221	5.9	31	95	4.8
1,500	---	---	---	29	220	5.2	31	325	5.3	30	175	8.5	30	278	8.2	31	256	5.0	31	247	8.4	31	106	.4	31	263	9.2	29	284	6.7	29	273	3.6	31	232	8.8	31	90	4.4
2,000	31	204	1.8	28	235	8.5	30	315	6.3	30	190	8.6	30	273	10.2	31	262	6.0	30	250	11.0	31	153	1.1	31	266	11.3	29	283	8.3	29	270	4.8	31	230	11.6	31	92	3.5
2,500	31	222	4.3	27	233	10.4	29	305	7.5	30	199	8.8	28	278	14.5	30	272	7.5	30	252	13.5	31	186	2.5	30	267	14.5	29	278	9.9	27	262	7.0	30	226	12.7	31	102	2.2
3,000	30	232	6.1	27	234	13.0	29	299	8.6	30	209	9.7	27	277	15.8	30	270	8.8	30	250	15.0	31	212	4.2	29	265	16.4	28	282	11.5	27	261	9.6	29	231	14.5	31	105	1.5
4,000	30	244	10.9	26	234	20.2	28	277	11.0	30	223	10.4	23	276	17.7	30	273	12.1	28	250	17.3	31	229	6.5	28	264	17.9	26	286	15.7	27	261	13.5	29	231	20.8	31	270	.5
5,000	27	249	12.7	25	236	24.9	28	269	11.6	31	223	13.6	19	286	18.9	30	271	16.5	25	257	22.7	30	244	8.8	26	273	20.1	26	284	17.9	26	264	17.6	27	229	23.1	30	299	3.7
6,000	25	247	14.4	19	225	28.8	27	264	13.1	31	225	16.4	16	291	20.2	27	273	17.6	23	246	27.5	28	251	10.0	21	276	22.5	24	287	19.2	24	258	21.8	26	228	28.8	30	288	6.0
8,000	16	255	14.5	13	238	33.0	26	257	16.8	29	235	19.3	11	300	22.6	21	283	20.1	17	251	39.3	20	281	9.3	18	277	25.5	21	292	23.4	20	246	28.2	14	231	35.3	28	297	6.8
10,000	12	255	21.4	---	---	---	24	248	17.6	21	236	18.3	---	---	---	16	291	23.2	---	---	---	12	305	13.7	14	279	32.2	13	295	24.3	12	239	30.0	---	---	---	28	294	8.1
12,000	---	---	---	---	---	---	15	245	18.6	15	244	17.8	---	---	---	---	---	---	---	---	---	10	276	14.9	---	---	---	---	---	---	11	255	23.3	---	---	---	24	290	8.6
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22	278	13.6
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12	277	12.4

Altitude (meters) m. s. l.	Nantucket, Mass. (13 m.)			Nashville, Tenn. (180 m.)			New Orleans, La. (6 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (392 m.)			Rapid City, S. Dak. (980 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 m.)			Tatoosh Island, Wash. (33 m.)		
Surface	30	289	2.0	31	225	1.2	31	112	1.1	31	20	1.8	30	298	0.9	26	311	2.5	29	295	1.4	31	45	3.1	31	48	4.2	31	58	1.5	30	52	0.8	31	133	0.5	30	92	3.3
500	29	275	4.3	31	220	5.4	31	174	4.2	31	356	4.8	27	260	1.8	---	---	---	31	293	1.3	31	85	2.4	31	53	6.9	31	13	2.3	30	93	.6	---	---	---	28	70	2.1
1,000	28	271	5.8	31	237	8.5	29	193	4.5	31	1	6.6	27	256	5.0	26	306	2.6	31	262	1.4	31	159	5.0	31	50	7.0	31	15	2.3	30	263	2.5	31	244	.6	28	17	.7
1,500	28	273	8.4	31	250	11.7	29	214	7.3	31	5	6.8	28	248	7.4	26	313	5.2	30	256	4.2	31	193	7.3	30	45	6.3	31	349	3.3	28	284	4.2	31	330	1.0	28	296	2.1
2,000	28	272	10.7	31	250	13.8	29	224	9.7	31	359	7.1	27	251	9.8	25	305	5.3	30	248	6.4	31	206	8.7	29	44	5.8	31	336	5.2	28	274	6.8	31	328	4.0	28	308	5.1
2,500	28	273	13.7	30	252	15.9	29	226	10.7	31	354	8.8	27	244	11.7	25	275	7.5	29	257	9.0	31	219	11.5	29	44	6.1	31	329	8.0	27	271	9.0	31	327	4.6	29	322	7.6
3,000	28	273	15.3	28	258	17.5	29	228	12.1	30	349	11.0	27	238	14.8	24	264	9.4	29	258	10.1	30	223	23.5	29	38	7.0	31	332	10.2	26	267	11.1	31	332	6.6	28	321	10.2
4,000	27	277	18.3	26	255	20.4	30	231	16.2	30	345	14.9	21	234	21.6	22	261	12.9	28	261	13.9	30	226	17.7	28	35	5.6	30	333	12.8	22	267	14.4	31	340	8.9	22	318	11.9
5,000	25	286	22.3	23	253	25.0	28	236	19.6	28	349	15.6	21	237	21.4	19	256	15.5	28	259	17.2	27	232	22.0	28	14	6.4	27	324	11.0	20	260	17.5	28	337	11.8	19	322	13.1
6,000	22	289	24.7	18	258	26.0	27	242	21.1	25	346	18.6	20	238	26.0	16	245	19.9	25	259	19.1	22	230	25.6	28	10	9.0	25	337	14.5	16	262	23.4	24	341	13.3	16	323	14.1
8,000	12	297	20.0	---	---	---	19	252	18.5	17	354	16.8	---	---	---	12	265	21.1	18	251	20.7	12	248	29.0	22	340	9.6	22	346	16.3	---	---	---	13	347	12.9	---	---	---
10,000	---	---	---	---	---	---	14	259	19.3	12	350	21.2	---	---	---	---	---	---	10	238	19.3	---	---	---	22	297	15.7	16	329	16.3	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	12	251	22.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22	276	25.4	12	309	15.2	---	---	---	---	---	---	---	---	---
14,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16	288	22.9	11	312	12.7	---	---	---	---	---	---	---	---	---

NOTE.—Resultants prepared from rawins at high altitudes are biased toward lower wind speeds. Values appearing in this table should therefore be used with caution when the number of observations missing is greater than three. See note following table 3 in the June 1948 issue of the MONTHLY WEATHER REVIEW.