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METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR JULY 1949

AEROLOGICAL OBSERVATIONS

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

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 July 1949*

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Albany, N. Y. (1,004.9 mb.)				Albuquerque, N. Mex. (838.9 mb.)				Atlanta, Ga. (983.4 mb.)				Big Spring, Tex. (925.9 mb.)				Bismarck, N. Dak. (953.3 mb.)				Boise, Idaho (913.0 mb.)				Brownsville, Tex. (1,012.1 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	86	21.9	75	31	1,620	25.9	43	31	300	25.1	80	31	774	28.4	46	31	505	22.0	63	31	868	27.6	29	31	6	27.5	83
1,000	31	128	22.6	71	31	39	(*)	----	31	153	(*)	----	31	81	(*)	----	31	84	(*)	----	31	53	(*)	----	31	113	27.0	82
950	31	581	21.6	63	31	512	(*)	----	31	605	24.8	73	31	548	(*)	----	31	539	(*)	----	31	519	(*)	----	31	572	24.2	79
900	31	1,043	19.0	63	31	999	(*)	----	31	1,078	21.9	73	31	1,027	27.6	46	31	1,005	21.2	51	31	995	27.9	22	31	1,040	22.7	59
850	31	1,532	15.7	66	31	1,505	(*)	----	31	1,572	18.3	76	31	1,531	23.9	49	31	1,497	18.2	54	31	1,499	24.1	21	31	1,536	20.3	50
800	31	2,044	12.7	62	31	2,036	23.2	42	31	2,091	15.3	74	31	2,058	19.5	56	31	2,014	14.7	56	31	2,023	19.6	24	31	2,056	17.2	49
750	31	2,589	9.9	56	31	2,599	18.7	47	31	2,639	12.1	69	31	2,611	15.0	60	31	2,563	11.4	53	31	2,575	14.8	28	31	2,607	13.8	49
700	30	3,154	7.0	56	31	3,182	13.8	53	31	3,212	9.0	64	31	3,190	10.7	62	31	3,130	7.7	49	31	3,151	9.8	32	30	3,182	10.1	48
650	29	3,763	3.5	57	31	3,808	8.8	59	31	3,827	5.5	61	31	3,808	6.7	60	31	3,743	3.6	45	31	3,760	4.7	37	30	3,799	6.4	45
600	29	4,406	.0	51	31	4,459	3.6	67	31	4,474	2.1	55	31	4,458	2.5	54	31	4,382	-.6	42	30	4,405	-.5	38	30	4,448	2.4	46
550	29	5,098	-4.0	46	31	5,161	-1.7	75	31	5,173	-1.8	51	31	5,157	-1.5	48	31	5,076	-5.4	40	30	5,094	-5.7	37	30	5,151	-1.3	44
500	28	5,843	-8.7	45	31	5,912	-6.5	68	31	5,924	-6.0	46	30	5,911	-5.6	44	31	5,813	-10.1	43	30	5,833	-11.1	38	30	5,902	-5.5	42
450	28	6,665	-13.6	44	31	6,739	-11.0	56	31	6,749	-11.1	44	30	6,741	-10.6	37	31	6,625	-15.4	38	30	6,638	-16.6	38	28	6,729	-10.5	37
400	28	7,539	-19.5	46	31	7,626	-16.5	44	31	7,636	-17.0	40	30	7,627	-16.8	35	31	7,495	-21.9	----	29	7,511	-22.7	----	28	7,618	-16.5	35
350	27	8,518	-25.9	----	31	8,616	-23.3	----	31	8,623	-24.0	----	30	8,616	-23.5	----	31	8,465	-28.6	----	28	8,477	-30.1	----	28	8,607	-23.6	----
300	27	9,614	-34.2	----	30	9,724	-31.8	----	31	9,729	-32.2	----	29	9,724	-31.8	----	31	9,549	-37.0	----	27	9,551	-38.6	----	28	9,714	-32.0	----
250	26	10,864	-43.9	----	29	10,985	-41.7	----	31	10,989	-42.2	----	29	10,988	-41.4	----	31	10,786	-45.9	----	26	10,779	-47.8	----	26	10,975	-42.1	----
200	26	12,326	-54.8	----	27	12,459	-53.6	----	30	12,458	-54.1	----	29	12,465	-53.1	----	30	12,246	-54.4	----	26	12,223	-54.7	----	25	12,447	-54.4	----
175	25	13,171	-59.4	----	23	13,298	-60.1	----	30	13,301	-60.7	----	29	13,311	-59.6	----	27	13,096	-56.9	----	24	13,074	-55.5	----	25	13,289	-60.8	----
150	25	14,126	-63.2	----	19	14,247	-66.3	----	28	14,247	-66.4	----	29	14,260	-65.9	----	25	14,066	-59.1	----	21	14,036	-56.9	----	21	14,229	-67.5	----
125	23	15,243	-65.3	----	13	15,348	-70.0	----	25	15,342	-70.4	----	26	15,355	-70.8	----	20	15,200	-60.5	----	19	15,181	-59.4	----	11	15,312	-71.8	----
100	14	16,601	-65.3	----	5	16,686	-70.0	----	20	16,669	-71.1	----	17	16,671	-71.4	----	17	16,591	-59.6	----	11	16,567	-60.2	----	6	16,618	-73.8	----
80	5	17,990	-63.1	----	----	----	----	----	10	18,010	-67.1	----	11	17,995	-67.4	----	----	----	----	----	7	17,981	-57.8	----	----	----	----	----
60	----	----	----	----	----	----	----	----	----	----	----	----	6	19,776	-60.6	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Buffalo, N. Y. (990.3 mb.)				Camaguey, Cuba [1] (---- mb.)				Caribou, Maine (990.7 mb.)				Charleston, S. C. (1,016.0 mb.)				Ciudad Victoria, Mex. (972.6 mb.)				Columbia, Mo. (986.4 mb.)				Dodge City, Kans. (924.2 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	221	21.7	74	----	----	----	----	31	191	17.4	81	31	13	24.3	91	30	335	30.4	53	31	239	24.8	83	31	792	25.3	65
1,000	31	135	(*)	----	----	----	----	----	31	110	(*)	----	31	153	25.4	85	30	83	(*)	----	31	118	(*)	----	31	89	(*)	----
950	31	589	21.8	62	----	----	----	----	31	553	19.0	64	31	608	23.3	77	30	544	28.4	54	31	575	25.0	73	31	549	(*)	----
900	31	1,050	19.0	65	----	----	----	----	31	1,015	16.3	62	31	1,075	20.7	71	30	1,023	24.3	58	31	1,045	22.1	73	31	1,026	26.1	59
850	31	1,540	16.1	68	----	----	----	----	31	1,499	12.8	67	31	1,568	18.0	66	30	1,521	20.3	62	31	1,540	19.0	73	31	1,529	23.5	59
800	31	2,054	13.4	62	----	----	----	----	31	2,005	9.4	66	31	2,086	15.2	63	30	2,042	16.4	66	31	2,060	16.0	68	31	2,056	19.9	59
750	31	2,599	10.6	54	----	----	----	----	31	2,542	6.4	60	31	2,636	12.1	60	30	2,593	12.4	67	31	2,613	13.1	61	31	2,611	16.0	59
700	31	3,166	7.5	51	----	----	----	----	31	3,102	3.9	46	31	3,207	9.0	53	30	3,164	8.9	54	31	3,184	9.9	55	31	3,193	12.1	57
650	31	3,776	4.1	47	----	----	----	----	31	3,703	.8	40	31	3,821	5.5	50	29	3,778	5.3	50	31	3,803	6.2	55	31	3,814	8.1	53
600	31	4,420	.3	47	----	----	----	----	31	4,340	-3.1	41	31	4,469	1.9	48	29	4,426	1.7	43	31	4,449	2.4	57	31	4,466	3.4	55
550	30	5,112	-3.3	43	----	----	----	----	29	5,026	-7.3	40	30	5,168	-2.0	48	28	5,126	-2.0	40	31	5,152	-1.7	54	31	5,168	-1.1	51
500	29	5,860	-7.5	38	----	----	----	----	29	5,762	-11.9	35	30	5,920	-6.2	40	25	5,875	-6.1	36	31	5,900	-6.4	52	30	5,920	-5.7	46
450	29	6,680	-12.5	38	----	----	----	----	28	6,569	-17.2	31	29	6,743	-11.3	39	24	6,705	-11.2	35	31	6,730	-11.2	44	30	6,744	-10.8	41
400	29	7,563	-18.5	39	----	----	----	----	28	7,436	-23.4	----	28	7,633	-17.3	37	24	7,588	-16.9	36	31	7,611	-17.0	39	29	7,636	-16.9	39
350	29	8,544	-25.8	----	----	----	----	----	27	8,400	-29.8	----	28	8,619	-24.5	----	23	8,576	-24.1	----	31	8,598	-24.1	----	27	8,627	-23.5	----
300	27	9,639	-33.7	----	----	----	----	----	27	9,481	-37.5	----	28	9,723	-33.0	----	23	9,682	-32.5	----	31	9,704	-32.4	----	27	9,735	-31.8	----
250	27	10,892	-43.3	----	----	----	----	----	26	10,714	-45.7	----	28	10,982	-42.8	----	22	10,940	-42.6	----	30	10,964	-41.9	----	26	10,998	-41.3	----
200	22	12,356	-54.2	----	----	----	----	----	26	12,173	-53.2	----	26	12,448	-54.2	----	22	12,408	-55.0	----	28	12,436	-53.0	----	26	12,475	-53.1	----
175	17	13,210	-59.4	----	----	----	----	----	25	13,027	-55.5	----	25	13,290	-60.3	----	21	13,247	-61.5	----	28	13,248	-58.6	----	26	13,322	-59.1	----
150	14	14,161	-63.3	----	----	----	----	----	22	14,013	-57.4	----	22	14,240	-66.1	----	19	14,191	-68.0	----	26	14,234	-63.9	----	22	14,275	-64.8	----
125	9	15,281	-66.6	----	----	----	----	----	16	15,149	-58.9	----	19	15,341	-70.3	----	14	15,287	-72.7	----	23	15,333	-68.0	----	18	15,376	-69.5	----
100	5	16,637	-63.4	----	----	----	----	----	9	16,582	-60.1	----	14	16,653	-70.1	----	8	16,574	-74.5	----	11	16,679	-68.8	----	15	16,701	-69.4	----
80	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	17,895	-72.0	----	----	----	----	----	10	18,038	-64.5	----

See footnote at end of table.

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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 July 1949*—Continued

Standard pressure surface (mb.)	El Paso, Tex. (880.6 mb.)				Ely, Nev. (810.2 mb.)				Glasgow, Mont. (937.4 mb.)				Grand Junction, Colo. (852.6 mb.)				Great Falls, Mont. (836.6 mb.)				Greensboro, N. C. (986.4 mb.)				Hatteras, N. C. (1,017.7 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	30	1,195	28.3	44	30	1,908	21.5	32	31	648	22.3	47	31	1,474	25.7	36	31	1,128	21.3	42	31	273	23.7	89	31	3	26.1	87
1,000	30	46	(*)	----	30	32	(*)	----	31	78	(*)	----	31	41	(*)	----	31	69	(*)	----	31	153	(*)	----	31	158	25.4	83
950	30	522	(*)	----	30	502	(*)	----	31	533	(*)	----	31	511	(*)	----	31	530	(*)	----	31	604	23.9	78	31	613	23.0	77
900	30	1,013	(*)	----	30	983	(*)	----	31	1,001	21.4	42	31	997	(*)	----	31	1,005	(*)	----	31	1,077	21.3	78	31	1,080	20.1	75
850	30	1,509	26.8	40	30	1,486	(*)	----	31	1,494	18.0	43	31	1,501	(*)	--	31	1,492	19.4	38	31	1,570	18.1	79	31	1,571	17.4	68
800	30	2,041	22.7	43	30	2,018	23.6	25	31	2,009	14.0	47	31	2,034	23.9	32	31	2,010	15.2	41	31	2,088	15.0	78	31	2,088	14.8	62
750	30	2,603	18.0	50	30	2,579	19.6	23	31	2,552	10.0	49	31	2,597	19.4	36	31	2,557	10.8	45	31	2,635	12.1	74	31	2,633	11.9	58
700	30	3,184	13.0	57	30	3,165	14.4	27	31	3,119	5.6	51	31	3,182	14.5	41	31	3,123	6.2	49	31	3,209	8.8	72	31	3,207	8.8	56
650	30	3,805	8.0	62	30	3,787	8.9	33	31	3,723	1.7	49	31	3,806	9.1	50	31	3,729	1.5	53	31	3,826	5.5	65	31	3,820	5.7	49
600	30	4,459	3.0	66	30	4,440	3.0	40	31	4,362	−2.7	48	31	4,460	3.6	57	31	4,365	−3.2	55	31	4,470	2.1	57	31	4,468	2.0	44
550	30	5,158	−1.6	64	30	5,139	−3.2	48	31	5,049	−7.2	44	31	5,160	−1.9	59	31	5,048	−7.9	53	31	5,173	−1.7	52	31	5,168	−2.0	41
500	30	5,912	−6.2	59	30	5,885	−8.8	49	31	5,783	−12.1	39	31	5,911	−7.0	57	31	5,782	−12.9	43	31	5,922	−5.8	48	31	5,917	−6.1	36
450	30	6,738	−11.0	51	30	6,700	−14.2	42	29	6,585	−17.8	39	31	6,735	−11.8	48	31	6,586	−18.4	41	31	6,748	−10.9	43	31	6,745	−11.1	32
400	29	7,627	−16.6	43	30	7,576	−20.4	----	29	7,451	−24.3	----	30	7,619	−18.0	42	31	7,446	−24.8	----	31	7,637	−17.0	42	31	7,630	−17.4	34
350	28	8,617	−23.7	----	29	8,550	−27.5	----	29	8,408	−31.6	----	30	8,603	−25.0	----	31	8,401	−32.5	----	31	8,624	−24.2	----	31	8,616	−24.5	----
300	27	9,726	−31.9	----	29	9,640	−35.5	----	28	9,478	−39.8	----	30	9,705	−33.0	----	31	9,469	−40.9	----	31	9,729	−32.3	----	31	9,720	−32.7	----
250	25	10,988	−41.7	----	29	10,884	−45.0	----	28	10,700	−48.5	----	30	10,961	−42.4	----	30	10,692	−49.5	----	31	10,989	−42.2	----	30	10,977	−42.8	----
200	22	12,461	−54.0	----	29	12,345	−54.2	----	25	12,130	−54.4	----	27	12,429	−53.2	----	30	12,129	−55.6	----	30	12,457	−54.0	----	29	12,443	−54.5	----
175	21	13,304	−60.6	----	28	13,192	−58.4	----	24	12,989	−55.4	----	25	13,277	−58.8	----	29	12,980	−55.5	----	29	13,302	−60.0	----	27	13,285	−60.7	----
150	21	14,247	−67.3	----	25	14,149	−62.9	----	22	13,966	−58.0	----	22	14,233	−63.7	----	28	13,959	−56.8	----	28	14,253	−65.7	----	26	14,230	−66.7	----
125	13	15,325	−71.8	----	18	15,256	−66.1	----	16	15,129	−58.2	----	19	15,335	−67.2	----	28	15,109	−57.9	----	18	15,350	−68.8	----	22	15,314	−70.2	----
100	----	----	----	----	12	16,612	−66.0	----	10	16,522	−58.4	----	12	16,685	−67.3	----	16	16,515	−58.1	----	7	16,676	−68.5	----	9	16,620	−69.8	----
80	----	----	----	----	8	17,963	−63.1	----	----	----	----	----	----	----	----	----	13	17,924	−56.9	----	----	----	----	----	5	17,972	−65.1	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11	19,756	−54.5	----	----	----	----	----	----	----	----	----
50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	9	20,928	−53.0	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Havana, Cuba [1] (---- mb.)				Honolulu, T. H. (1,016.1 mb.)				International Falls, Minn. (971.4 mb.)				Joliet, Ill. (994.6 mb.)				Lake Charles, La. (1,014.1 mb.)				Lander, Wyo. (830.2 mb.)				Las Vegas, Nev. (933.0 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	26.7	63	31	360	18.0	81	30	178	23.0	81	31	5	26.0	88	31	1,696	21.9	37	31	660	34.5	15
1,000	----	----	----	----	31	144	24.4	65	31	108	(*)	----	30	129	(*)	----	31	129	26.4	83	31	40	(*)	----	31	23	(*)	----
950	----	----	----	----	31	591	20.7	72	31	559	19.9	69	30	584	23.7	67	31	585	24.6	78	31	506	(*)	----	31	497	(*)	----
900	----	----	----	----	31	1,057	17.2	78	31	1,017	17.2	68	30	1,051	20.7	67	31	1,056	21.7	74	31	989	(*)	----	31	985	33.2	18
850	----	----	----	----	31	1,544	14.5	75	31	1,503	14.2	67	30	1,544	17.6	65	31	1,550	18.8	70	31	1,488	(*)	----	31	1,496	28.5	20
800	----	----	----	----	31	2,055	13.0	55	31	2,013	11.5	60	30	2,060	14.7	60	31	2,069	15.8	65	31	2,018	22.4	29	31	2,029	23.6	24
750	----	----	----	----	31	2,600	11.5	36	31	2,556	8.5	57	30	2,610	12.0	51	31	2,619	12.7	62	31	2,578	17.8	32	31	2,592	18.3	29
700	----	----	----	----	31	3,171	9.5	26	31	3,118	5.6	56	30	3,179	8.6	50	31	3,192	9.4	59	31	3,159	12.6	38	31	3,172	12.8	36
650	----	----	----	----	31	3,788	6.8	----	31	3,725	1.8	53	30	3,796	4.9	45	31	3,806	6.0	57	31	3,777	7.3	43	31	3,704	7.3	40
600	----	----	----	----	31	4,436	3.9	----	30	4,361	−2.1	50	30	4,436	.9	42	31	4,455	2.1	51	31	4,428	1.9	48	30	4,442	2.3	44
550	----	----	----	----	31	5,139	−.2	----	30	5,049	−5.9	47	30	5,136	−2.7	37	31	5,156	−1.8	49	30	5,124	−3.6	49	30	5,139	−2.6	42
500	----	----	----	----	31	5,894	−5.5	----	29	5,787	−10.4	40	30	5,882	−7.0	38	31	5,905	−6.3	48	30	5,871	−8.9	43	30	5,888	−7.6	33
450	----	----	----	----	31	6,718	−11.4	----	29	6,596	−15.6	33	30	6,705	−12.2	37	31	6,735	−11.3	47	30	6,689	−14.5	38	30	6,709	−13.0	----
400	----	----	----	----	31	7,604	−18.3	----	28	7,464	−22.1	----	30	7,588	−18.3	37	31	7,616	−16.4	42	30	7,561	−20.7	----	30	7,589	−19.5	----
350	----	----	----	----	31	8,585	−26.2	----	27	8,430	−29.2	----	30	8,570	−25.5	----	30	8,603	−24.0	----	30	8,534	−28.2	----	30	8,567	−26.7	----
300	----	----	----	----	31	9,680	−35.1	----	27	9,512	−37.4	----	29	9,669	−33.9	----	30	9,709	−32.1	----	30	9,620	−36.8	----	30	9,660	−35.1	----
250	----	----	----	----	31	10,925	−45.2	----	25	10,744	−46.2	----	29	10,921	−43.4	----	30	10,960	−42.3	----	29	10,858	−45.3	----	30	10,906	−44.6	----
200	----	----	----	----	31	12,378	−56.3	----	24	12,199	−53.4	----	27	12,383	−53.7	----	30	12,437	−54.5	----	27	12,311	−54.5	----	28	12,365	−55.1	----
175	----	----	----	----	31	13,216	−61.2	----	23	13,056	−55.5	----	27	13,231	−58.7	----	30	13,278	−61.3	----	25	13,159	−58.3	----	26	13,209	−60.2	----
150	----	----	----	----	31	14,164	−64.4	----	21	14,029	−57.7	----	26	14,185	−63.6	----	29	14,219	−67.3	----	24	14,121	−61.6	----	23	14,156	−65.2	----
125	----	----	----	----	31	15,270	−67.2	----	15	15,179	−59.0	----	24	15,297	−67.7	----	26	15,306	−72.2	----	16	15,239	−64.4	----	16	15,248	−68.7	----
100	----	----	----	----	31	16,607	−68.9	----	5	16,575	−58.1	----	14	16,636	−66.9	----	17	16,619	−73.1	----	8	16,592	−64.5	----	11	16,597	−68.4	----
80	----	----	----	----	28	17,945	−66.6	----	----	----	----	----	12	17,985	−62.2	----	6	17,928	−67.8	----	----	----	----	----	----	----	----	----
60	----	----	----	----	21	19,700	−61.5	----	----	----	----	----	----	----	----	----	5	19,689	−62.3	----	----	----	----	----	----	----	----	----
50	----	----	----	----	21	20,840	−57.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
40	----	----	----	----	16	22,256	−54.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
30	----	----	----	----	9	24,105	−51.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Little Rock, Ark. (1,005.5 mb.)				Mazatlan, Mex. (1,009.3 mb.)				Medford, Oreg. (967.2 mb.)				Merida, Mex. (1,012.1 mb.)				Miami, Fla. (1,017.5 mb.)				Nantucket, Mass. (1,014.9 mb.)				Nashville, Tenn. (995.3 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	79	26.2	84	31	14	28.9	74	30	401	26.2	32	23	27	27.1	75	31	4	26.4	81	30	14	19.3	93	31	177	25.6	84
1,000	31	127	26.3	81	31	97	28.2	75	30	104	(*)	----	23	133	26.6	76	31	157	26.0	79	30	141	20.6	85	31	136	(*)	----
950	31	583	25.3	75	31	556	25.0	73	30	563	24.9	33	23	586	24.5	71	31	611	23.2	79	30	590	21.0	70	31	592	25.0	72
900	31	1,055	22.4	74	31	1,026	22.7	70	30	1,029	21.1	39	23	1,059	21.7	69	31	1,080	20.4	76	30	1,053	18.7	66	31	1,063	21.9	73
850	31	1,551	19.4	70	31	1,522	19.8	70	30	1,520	17.0	45	23	1,553	18.3	70	31	1,572	17.4	72	30	1,542	15.9	62	31	1,558	18.6	74
800	31	2,071	16.4	66	31	2,043	16.9	69	30	2,034	13.2	49	23	2,071	15.0	68	31	2,088	14.6	68	30	2,055	13.1	55	31	2,076	15.4	72
750	31	2,622	13.1	67	31	2,596	13.9	66	30	2,575	9.7	50	23	2,616	11.9	61	31	2,631	11.5	65	30	2,599	10.5	48	31	2,626	12.2	70
700	31	3,196	10.0	62	31	3,171	10.6	66	30	3,144	6.7	41	23	3,191	8.8	56	31	3,205	8.2	62	30	3,167	7.6	45	31	3,198	8.9	63
650	31	3,814	6.4	58	31	3,791	6.6	68	30	3,748	2.8	39	23	3,804	5.0	59	31	3,818	4.6	61	29	3,777	4.3	41	30	3,817	5.2	60
600	31	4,461	2.5	57	30	4,439	2.4	71	30	4,391	−1.4	32	23	4,450	1.3	60	30	4,462	.9	58	29	4,422	.5	42	28	4,457	1.7	56
550	31	5,161	−1.3	52	30	5,140	−1.9	72	30	5,077	−5.9	26	23	5,146	−2.7	61	29	5,167	−3.1	55	29	5,114	−3.5	37	28	5,159	−2.1	50
500	30	5,913	−5.4	43	29	5,891	−6.2	67	30	5,817	−11.0	26	23	5,896	−6.8	56	28	5,907	−7.1	51	29	5,862	−7.9	37	27	5,906	−6.5	44
450	30	6,742	−10.4	42	28	6,717	−11.2	62	29	6,623	−16.6	26	23	6,720	−11.7	54	28	6,735	−11.9	47	27	6,680	−12.6	----	27	6,731	−11.6	38
400	30	7,632	−16.3	38	27	7,604	−17.0	57	29	7,491	−23.2	----	23	7,605	−17.7	47	26	7,614	−17.7	44	27	7,560	−18.4	----	26	7,613	−17.5	33
350	29	8,623	−23.2	----	25	8,591	−23.9	----	28	8,458	−30.8	----	23	8,589	−25.0	----	25	8,598	−24.9	----	25	8,542	−25.0	----	26	8,600	−24.2	----
300	28	9,732	−31.4	----	25	9,697	−32.3	----	26	9,538	−39.2	----	23	9,689	−33.7	----	24	9,699	−33.4	----	25	9,644	−33.0	----	25	9,707	−32.4	----
250	27	10,995	−41.4	----	24	10,957	−42.3	----	23	10,767	−48.4	----	23	10,941	−43.9	----	24	10,952	−43.5	----	24	10,897	−42.9	----	25	10,966	−42.5	----
200	26	12,472	−52.9	----	22	12,427	−54.5	----	23	12,208	−56.0	----	22	12,399	−56.1	----	19	12,419	−55.1	----	23	12,361	−54.2	----	23	12,433	−54.3	----
175	25	13,323	−58.9	----	21	13,271	−61.2	----	21	13,067	−57.1	----	22	13,235	−62.6	----	17	13,256	−61.3	----	21	13,203	−59.6	----	21	13,279	−60.0	----
150	24	14,282	−64.7	----	19	14,216	−68.1	----	13	14,044	−58.6	----	20	14,166	−68.8	----	13	14,206	−67.2	----	19	14,156	−64.0	----	11	14,247	−66.3	----
125	19	15,374	−69.7	----	13	15,289	−74.1	----	10	15,181	−59.3	----	12	15,228	−72.6	----	5	15,290	−71.8	----	15	15,262	−66.0	----	7	15,342	−70.9	----
100	13	16,700	−70.6	----	----	----	----	----	6	16,570	−58.5	----	7	16,531	−72.7	----	----	----	----	----	9	16,618	−65.2	----	----	----	----	----
80	7	18,050	−67.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

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 July 1949*—Continued

Standard pressure surface (mb.)	New Orleans, La. (1,015.3 mb.)				North Platte, Nebr. (917.0 mb.)				Oakland, Calif. (1,013.3 mb.)				Oklahoma City, Okla. (968.3 mb.)				Omaha, Nebr. (977.8 mb.)				Phoenix, Ariz. (969.0 mb.)				Pittsburgh, Pa. (973.3 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	2	25.9	88	31	849	23.5	67	31	6	15.4	78	31	391	27.3	67	31	308	26.3	69	31	339	33.9	33	23	382	23.4	79
1,000	31	136	25.8	84	31	79	(*)	----	31	118	14.1	78	31	103	(*)	----	31	108	(*)	----	31	52	(*)	----	23	142	(*)	----
950	31	595	23.8	79	31	542	(*)	----	31	565	18.9	51	31	564	27.3	62	31	566	25.4	62	31	518	34.4	31	23	597	23.8	70
900	31	1,061	21.2	76	31	1,014	25.5	53	31	1,020	21.5	24	31	1,037	24.5	63	31	1,037	22.5	62	31	1,007	31.0	31	23	1,066	21.1	68
850	31	1,554	18.4	73	31	1,515	22.8	50	31	1,513	20.0	22	31	1,536	21.2	63	31	1,532	19.4	58	31	1,515	26.8	35	23	1,559	17.8	68
800	31	2,073	15.3	71	31	2,040	19.5	49	31	2,032	16.8	24	31	2,059	17.8	63	31	2,052	16.7	53	31	2,046	22.2	40	23	2,076	14.4	68
750	31	2,622	12.5	66	30	2,596	15.5	49	31	2,585	13.8	23	31	2,612	14.6	57	31	2,602	13.7	50	31	2,604	17.3	47	23	2,624	11.2	62
700	31	3,194	9.4	63	30	3,175	11.4	46	31	3,156	10.2	21	31	3,189	10.8	56	31	3,178	10.3	51	31	3,187	12.4	54	23	3,192	8.0	59
650	30	3,810	5.9	62	30	3,793	7.0	46	31	3,771	6.3	----	31	3,805	6.7	55	31	3,794	6.4	44	31	3,807	7.4	57	23	3,807	4.2	58
600	30	4,457	2.1	59	30	4,443	2.3	46	31	4,418	2.0	----	31	4,456	2.7	54	31	4,443	2.2	42	31	4,458	2.4	57	23	4,447	.8	55
550	29	5,156	−1.6	54	30	5,143	−2.5	45	31	5,114	−2.5	----	31	5,159	−1.6	51	31	5,144	−2.2	39	31	5,157	−2.0	54	23	5,144	−2.7	45
500	28	5,909	−5.9	53	30	5,890	−7.2	39	31	5,863	−7.7	----	31	5,908	−5.7	43	31	5,891	−6.8	39	31	5,907	−6.7	50	23	5,891	−6.8	42
450	28	6,738	−11.0	54	29	6,710	−12.5	35	30	6,684	−13.7	----	31	6,737	−10.8	38	31	6,715	−12.1	37	31	6,734	−11.6	45	22	6,719	−11.7	----
400	28	7,623	−16.6	52	29	7,590	−18.6	36	30	7,561	−20.5	----	31	7,623	−16.8	37	31	7,598	−18.2	37	31	7,617	−17.6	37	22	7,601	−18.0	----
350	27	8,609	−23.6	----	29	8,572	−25.4	----	30	8,534	−28.2	----	31	8,611	−23.6	----	31	8,581	−25.3	----	31	8,602	−24.5	----	22	8,586	−24.7	----
300	25	9,722	−31.6	----	29	9,672	−33.6	----	29	9,621	−36.5	----	30	9,718	−32.1	----	31	9,681	−33.2	----	30	9,707	−32.9	----	22	9,688	−33.2	----
250	23	10,987	−41.5	----	25	10,921	−43.1	----	29	10,860	−45.7	----	30	10,978	−41.8	----	30	10,934	−42.8	----	29	10,965	−42.7	----	20	10,948	−42.8	----
200	23	12,460	−53.9	----	24	12,386	−53.9	----	29	12,318	−53.8	----	30	12,453	−53.1	----	29	12,400	−53.8	----	25	12,431	−54.4	----	17	12,433	−53.7	----
175	19	13,301	−60.6	----	24	13,233	−59.2	----	29	13,169	−56.7	----	30	13,301	−59.1	----	28	13,245	−58.9	----	25	13,273	−60.7	----	15	13,286	−59.7	----
150	17	14,244	−66.6	----	22	14,188	−64.6	----	28	14,134	−60.4	----	27	14,252	−65.1	----	28	14,202	−63.6	----	22	14,222	−66.5	----	15	14,235	−65.3	----
125	13	15,344	−70.8	----	15	15,308	−69.2	----	27	15,260	−63.4	----	18	15,361	−70.6	----	26	15,304	−67.2	----	15	15,311	−70.9	----	13	15,336	−68.9	----
100	----	----	----	----	10	16,637	−68.7	----	24	16,625	−61.6	----	11	16,692	−71.9	----	20	16,645	−67.4	----	5	16,627	−69.7	----	11	16,678	−67.6	----
80	----	----	----	----	5	17,984	−65.4	----	19	18,001	−62.8	----	----	----	----	----	13	17,987	−63.1	----	----	----	----	----	6	18,034	−63.2	----
60	----	----	----	----	----	----	----	----	13	19,789	−59.0	----	----	----	----	----	7	19,768	−58.7	----	----	----	----	----	----	----	----	----
50	----	----	----	----	----	----	----	----	9	20,953	−56.7	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Portland, Maine (1,012.4 mb.)				Rapid City, S. Dak. (902.0 mb.)				St. Cloud, Minn. (976.9 mb.)				San Antonio, Tex. (985.7 mb.)				San Juan, P. R. (1,015.8 mb.)				Santa Maria, Calif. (1,006.0 mb.)				Sault Ste. Marie, Mich. (989.9 mb.)			
Surface	31	20	18.7	86	31	980	21.9	53	31	317	21.3	78	31	240	27.2	72	31	15	26.1	82	31	71	14.1	85	31	221	16.1	86
1,000	31	126	20.7	76	31	65	(*)	----	31	111	(*)	----	31	111	(*)	----	31	154	25.4	81	31	122	13.5	85	31	129	(*)	----
950	31	576	20.7	65	31	525	(*)	----	31	565	22.3	67	31	568	26.4	70	31	605	22.1	83	31	565	16.5	69	31	575	18.4	67
900	31	1,037	18.2	62	31	1,000	(*)	----	31	1,029	19.8	63	31	1,043	23.2	72	31	1,074	19.1	81	31	1,021	22.3	25	31	1,033	16.7	61
850	31	1,525	15.1	60	31	1,500	23.2	39	31	1,520	16.7	61	31	1,540	20.3	68	31	1,564	16.6	74	31	1,516	21.3	24	31	1,519	14.1	58
800	31	2,036	11.9	56	31	2,026	19.3	42	31	2,035	14.0	55	31	2,062	17.4	58	31	2,079	14.3	63	31	2,038	18.3	27	31	2,028	11.6	55
750	31	2,579	8.9	53	31	2,584	15.3	46	31	2,580	11.2	53	31	2,610	14.3	51	31	2,625	11.7	54	31	2,592	14.8	26	31	2,573	9.1	51
700	31	3,143	6.2	43	31	3,158	11.0	47	31	3,150	7.8	51	31	3,191	10.6	50	31	3,197	8.4	49	31	3,166	11.1	29	31	3,135	6.0	48
650	31	3,752	3.0	41	31	3,775	6.4	46	30	3,760	4.0	48	31	3,805	6.7	50	31	3,810	4.6	43	31	3,782	7.0	28	31	3,742	2.7	44
600	31	4,391	−.8	40	31	4,422	1.6	48	29	4,407	.1	45	31	4,457	2.9	51	31	4,454	1.3	37	31	4,432	2.9	----	30	4,382	−.9	34
550	31	5,082	−4.8	40	30	5,120	−3.3	47	28	5,101	−4.4	39	31	5,156	−.9	46	30	5,150	−2.9	35	31	5,131	−1.5	----	30	5,073	−4.8	----
500	30	5,824	−9.5	37	30	5,866	−8.2	45	28	5,847	−8.6	----	31	5,913	−5.2	40	30	5,898	−7.1	32	31	5,883	−6.5	----	30	5,815	−9.2	----
450	30	6,638	−14.6	38	30	6,687	−13.5	37	28	6,663	−13.8	----	29	6,738	−10.6	39	29	6,720	−12.4	32	31	6,707	−12.4	----	29	6,626	−14.7	----
400	29	7,514	−20.3	----	30	7,563	−19.8	35	28	7,541	−20.0	----	29	7,629	−16.5	32	29	7,602	−18.7	32	31	7,587	−19.2	----	28	7,499	−21.2	----
350	29	8,489	−27.4	----	30	8,540	−27.0	----	28	8,517	−27.0	----	28	8,618	−23.5	----	29	8,583	−26.1	----	31	8,566	−26.4	----	28	8,470	−28.1	----
300	29	9,581	−35.4	----	29	9,632	−35.3	----	28	9,610	−34.8	----	28	9,726	−31.8	----	29	9,679	−34.9	----	30	9,661	−34.7	----	27	9,556	−35.8	----
250	29	10,826	−44.9	----	29	10,878	−44.2	----	27	10,861	−43.6	----	23	10,991	−41.5	----	27	10,920	−45.4	----	29	10,914	−43.7	----	27	10,799	−44.5	----
200	28	12,235	−54.6	----	29	12,342	−53.7	----	25	12,325	−53.4	----	20	12,462	−53.3	----	23	12,368	−57.0	----	26	12,388	−52.9	----	20	12,258	−52.8	----
175	28	13,131	−58.8	----	25	13,201	−57.8	----	24	13,183	−57.2	----	17	13,308	−59.5	----	21	13,202	−62.6	----	24	13,239	−57.4	----	17	13,116	−56.3	----
150	26	14,094	−62.5	----	23	14,160	−61.3	----	24	14,149	−60.8	----	14	14,271	−65.5	----	20	14,141	−67.4	----	23	14,207	−62.3	----	8	14,086	−59.1	----
125	23	15,214	−63.9	----	16	15,290	−63.4	----	22	15,278	−36.4	----	12	15,365	−70.3	----	17	15,224	−70.6	----	21	15,317	−66.2	----	----	----	----	----
100	13	16,576	−62.5	----	7	16,691	−63.2	----	19	16,646	−62.4	----	7	16,671	−73.0	----	11	16,534	−72.4	----	14	16,640	−69.0	----	----	----	----	----
80	----	----	----	----	----	----	----	----	14	18,035	−59.1	----	----	----	----	----	7	17,848	−70.4	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Spokane, Wash. (930.9 mb.)				Swan Island, W. I.[1] (---- mb.)				Tacubaya, Mex. (775.0 mb.)				Tampa, Fla. (1,017.0 mb.)				Tatoosh Island, Wash. (1,015.3 mb.)				Toledo, Ohio (993.3 mb.)				Washington, D. C. (1,013.8 mb.)			
Surface	31	721	24.6	27	----	----	----	----	30	2,306	16.6	69	31	9	26.0	84	31	31	12.1	92	31	191	23.9	74	30	25	25.6	79
1,000	31	88	(*)	----	----	----	----	----	30	69	(*)	----	31	158	25.8	80	31	158	11.3	90	31	131	(*)	----	30	146	25.5	76
950	31	545	(*)	----	----	----	----	----	30	532	(*)	----	31	612	23.1	78	31	592	11.1	76	31	587	23.5	65	30	602	23.1	72
900	31	1,015	22.2	29	----	----	----	----	30	1,011	(*)	----	31	1,080	20.4	76	31	1,037	10.3	61	31	1,053	20.6	64	30	1,067	20.3	72
850	31	1,507	17.7	35	----	----	----	----	30	1,506	(*)	----	31	1,573	17.5	73	31	1,511	8.5	59	31	1,545	17.7	61	30	1,559	17.5	67
800	31	2,021	12.9	42	----	----	----	----	30	2,037	(*)	----	31	2,090	14.6	70	31	2,011	6.3	55	31	2,062	14.9	58	30	2,075	14.7	66
750	31	2,561	8.0	48	----	----	----	----	30	2,591	14.7	69	31	2,638	11.6	64	31	2,541	3.6	55	31	2,611	11.9	52	30	2,626	11.8	64
700	31	3,123	4.1	49	----	----	----	----	30	3,165	10.4	74	31	3,208	8.5	60	31	3,095	.9	50	31	3,180	8.4	49	30	3,195	8.7	60
650	31	3,726	.4	44	----	----	----	----	30	3,786	5.8	79	31	3,822	4.9	61	31	3,691	−2.2	48	31	3,797	4.6	50	30	3,809	5.1	57
600	31	4,360	−3.7	39	----	----	----	----	30	4,430	1.5	82	31	4,466	1.0	58	31	4,320	−5.7	45	31	4,437	1.2	43	30	4,454	1.4	58
550	31	5,042	−8.2	39	----	----	----	----	30	5,128	−2.8	79	31	5,162	−2.8	57	30	5,004	−9.5	37	31	5,134	−2.8	40	30	5,157	−2.5	55
500	31	5,774	−12.9	35	----	----	----	----	30	5,879	−6.8	70	31	5,911	−7.2	55	29	5,731	−14.3	38	30	5,884	−7.1	39	30	5,902	−6.6	46
450	31	6,573	−18.5	34	----	----	----	----	30	6,706	−11.7	62	31	6,731	−12.2	54	29	6,526	−20.0	42	29	6,704	−12.2	41	30	6,729	−11.4	39
400	31	7,437	−25.1	----	----	----	----	----	30	7,590	−17.5	53	31	7,617	−17.8	51	29	7,385	−26.3	----	29	7,588	−17.9	39	30	7,611	−17.2	34
350	31	8,393	−32.4	----	----	----	----	----	30	8,576	−24.6	----	30	8,602	−24.8	----	28	8,331	−33.7	----	28	8,571	−25.4	----	30	8,599	−23.9	----
300	30	9,456	−40.7	----	----	----	----	----	29	9,679	−33.2	----	30	9,704	−33.3	----	27	9,399	−40.9	----	28	9,670	−33.5	----	30	9,705	−31.9	----
250	26	10,672	−49.1	----	----	----	----	----	29	10,934	−43.4	----	30	10,957	−43.5	----	25	10,625	−48.3	----	27	10,930	−43.2	----	29	10,969	−41.6	----
200	24	12,125	−53.5	----	----	----	----	----	28	12,397	−55.5	----	30	12,417	−55.6	----	21	12,075	−53.0	----	27	12,394	−54.5	----	29	12,443	−53.3	----
175	19	12,979	−52.5	----	----	----	----	----	24	13,237	−61.9	----	30	13,254	−62.0	----	20	12,938	−52.5	----	27	13,237	−60.1	----	29	13,290	−59.3	----
150	15	13,964	−53.0	----	----	----	----	----	----	----	----	----	30	14,192	−67.8	----	17	13,930	−52.4	----	22	14,194	−65.8	----	28	14,242	−64.4	----
125	9	15,119	−53.7	----	----	----	----	----	----	----	----	----	23	15,283	−71.5	----	13	15,104	−53.0	----	18	15,291	−69.6	----	27	15,341	−68.4	----
100	5	16,520	−54.2	----	----	----	----	----	----	----	----	----	13	16,599	−71.1	----	8	16,537	−52.4	----	9	16,598	−68.0	----	25	16,673	−69.0	----
80	5	17,948	−54.5	----	----	----	----	----	----	----	----	----	6	17,894	−67.9	----	----	----	----	----	----	----	----	----	19	18,019	−64.7	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	7	19,806	−61.0	----
50	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	20,949	−58.3	----

[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, are computed, and expressed in these tables, on the basis of 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.

LATE REPORT FOR JUNE 1949

TABLE 1

Standard pressure surface (mb.)	Swan Island, W. I. (1,012.3 mb.) Number of observations	Dynamic height	Temperature	Relative humidity	Standard pressure surface (mb.)	Swan Island, W. I. (1,012.3 mb.) Number of observations	Dynamic height	Temperature	Relative humidity
Surface	30	10	27.0	82	450	29	6,712	−11.4	49
1,000	30	118	26.2	83	400	29	7,600	−17.4	44
950	30	581	23.2	84	350	29	8,586	−24.4	----
900	30	1,042	20.6	78	300	29	9,690	−32.8	----
850	30	1,534	17.9	73	250	29	10,947	−43.0	----
800	30	2,052	15.2	67	200	29	12,411	−55.0	----
750	30	2,602	12.5	57	175	29	13,251	−61.5	----
700	30	3,174	9.4	52	150	27	14,195	−67.5	----
650	30	3,790	6.0	51	125	24	15,274	−72.7	----
600	30	4,437	2.2	51	100	15	16,584	−73.8	----
550	29	5,136	−2.0	53	80	8	17,911	−72.1	----
500	29	5,888	−6.5	53	60	5	19,621	−65.5	----

TABLE 2.—*Free-air resultant winds based on pilot balloon observations made near 2200 G. C. T. during July 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	31	156	3.1	31	220	1.0	31	146	1.1	31	16	0.8	31	128	1.4	31	325	5.2	30	132	6.8	31	248	2.3	31	267	0.7	31	175	2.8	31	233	1.3	31	7	2.1	31	140	2.3
500	---	---	---	---	---	---	31	158	1.4	---	---	---	---	---	---	---	---	---	30	139	7.6	31	256	3.3	31	280	2.0	31	177	4.0	31	235	1.6	---	---	---	---	---	---
1,000	31	147	3.0	---	---	---	30	168	1.2	---	---	---	31	157	2.1	31	324	4.9	30	153	6.4	30	256	4.3	31	275	4.0	28	187	3.1	31	248	2.0	---	---	---	---	---	---
1,500	31	157	3.2	---	---	---	28	167	1.3	31	339	.6	30	194	2.7	31	319	3.2	29	160	4.2	29	260	5.5	30	271	5.9	26	209	2.1	30	236	2.8	---	---	---	31	150	1.8
2,000	29	166	3.4	30	240	1.3	26	176	.6	31	245	1.7	29	231	3.9	31	288	2.5	26	157	4.0	29	268	6.2	28	277	7.0	23	201	.6	29	245	3.0	31	16	2.2	31	137	1.3
2,500	29	167	2.1	30	304	.8	23	191	.7	31	249	3.9	28	237	6.5	31	256	4.2	21	151	3.3	26	276	6.8	23	277	8.4	22	122	.4	24	256	2.3	31	31	1.4	31	100	.9
3,000	27	155	1.3	30	270	.9	22	152	.9	30	254	6.8	26	242	8.5	31	249	6.5	19	132	2.5	23	277	7.7	22	282	9.4	22	175	.5	22	259	2.3	31	356	.4	29	80	1.8
4,000	24	24	.9	30	225	.5	19	176	.8	30	258	10.9	26	259	9.6	31	242	10.5	18	136	2.0	19	290	11.0	17	300	10.0	21	152	.7	19	276	2.4	28	270	2.5	28	80	3.0
5,000	18	38	1.9	26	304	.8	14	198	2.3	27	263	13.1	22	269	12.5	29	247	12.8	17	157	1.5	16	292	12.2	15	286	12.0	20	142	.9	12	294	4.0	23	265	5.2	26	94	2.9
6,000	12	77	1.8	24	263	1.4	12	229	.9	21	263	15.0	15	275	14.8	22	252	13.7	17	100	1.4	10	287	16.8	---	---	---	18	79	1.4	10	276	3.0	14	267	7.0	21	59	1.9
8,000	---	---	---	22	265	2.6	---	---	---	10	272	17.5	---	---	---	15	239	13.3	10	113	2.6	---	---	---	---	---	---	12	111	4.2	---	---	---	---	---	---	---	---	---
10,000	---	---	---	19	261	4.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	19	253	4.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
14,000	---	---	---	15	230	3.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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.)			Joliet, 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	30	214	3.5	31	273	2.1	27	220	1.1	30	320	1.0	30	109	2.2	31	195	1.5	31	210	3.0	30	136	1.2	31	305	2.8	31	128	3.1	24	151	1.9	31	176	0.5	29	217	1.4
500	---	---	---	---	---	---	27	221	1.6	---	---	---	30	124	2.0	31	214	1.3	---	---	---	30	157	1.3	31	311	3.0	30	124	3.9	24	158	2.2	31	195	.8	29	247	2.4
1,000	---	---	---	---	---	---	27	220	2.2	30	257	.7	29	179	2.0	31	227	1.6	31	205	3.8	28	198	1.4	31	320	2.9	30	115	3.4	19	149	.9	31	242	1.3	27	268	3.9
1,500	---	---	---	31	277	2.3	25	227	3.0	30	258	1.9	27	206	2.8	27	243	2.5	31	205	4.3	28	213	1.8	31	306	2.1	27	105	2.6	16	75	1.7	30	235	2.0	26	290	5.5
2,000	30	212	3.5	31	274	2.5	25	234	3.3	28	249	3.0	27	223	2.3	22	255	3.7	31	204	4.2	24	175	1.5	31	248	2.0	25	102	2.9	---	---	---	26	214	3.4	23	296	6.8
2,500	30	215	4.4	31	279	2.2	21	249	4.1	26	242	5.9	27	211	2.1	20	261	4.7	31	206	3.7	19	128	1.9	31	216	3.4	25	85	2.4	---	---	---	23	200	3.0	19	303	7.1
3,000	30	212	5.1	31	271	2.2	20	251	4.7	25	251	6.9	23	211	1.4	20	263	4.7	31	206	4.5	16	82	.4	30	216	4.1	24	67	2.0	---	---	---	20	206	3.0	16	305	7.8
4,000	29	221	4.9	30	259	3.5	17	242	4.5	16	262	9.5	20	106	.9	16	262	5.2	31	207	5.4	10	113	1.5	30	225	6.7	20	57	2.4	---	---	---	17	226	3.4	11	307	6.6
5,000	26	222	6.5	29	259	5.0	15	257	3.0	13	270	10.7	16	88	2.2	10	268	6.3	29	208	5.4	---	---	---	28	230	8.2	16	97	2.5	---	---	---	15	249	4.1	10	308	8.4
6,000	24	231	8.8	24	259	6.8	---	---	---	---	---	---	14	76	3.2	---	---	---	24	214	6.3	---	---	---	24	236	8.9	12	76	2.5	---	---	---	12	231	4.2	---	---	---
8,000	12	232	13.7	16	258	10.8	---	---	---	---	---	---	---	---	---	---	---	---	19	221	9.9	---	---	---	19	248	12.5	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	220	13.9	---	---	---	10	248	9.8	---	---	---	---	---	---	---	---	---	---	---	---

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	31	280	5.2	31	175	3.4	31	159	1.8	31	252	0.7	31	3	0.5	31	225	1.2	30	186	1.5	30	137	3.1	31	261	3.8	31	256	2.1	31	249	2.4	31	218	3.5	29	214	2.3
500	31	269	4.0	31	172	3.3	31	151	2.6	31	254	1.1	---	---	---	31	210	1.7	30	185	2.0	30	144	4.0	31	260	1.9	31	258	3.2	31	257	2.1	---	---	---	29	220	2.7
1,000	29	225	2.9	31	180	4.2	31	181	2.9	31	238	1.8	31	6	.6	31	209	3.8	29	191	1.8	30	151	3.7	30	252	1.3	29	255	4.1	30	261	1.5	31	215	4.1	29	235	2.9
1,500	29	205	3.3	30	189	5.0	31	194	2.8	31	226	2.2	31	105	.4	30	230	5.0	26	221	2.9	30	143	3.5	28	232	1.4	27	266	4.8	28	266	1.8	31	219	4.7	28	258	3.3
2,000	29	189	3.7	26	207	4.3	30	208	3.3	31	231	1.9	31	215	1.0	27	246	5.0	23	235	4.6	30	146	3.2	27	226	1.6	25	285	6.2	25	283	1.2	30	224	4.6	26	281	3.3
2,500	29	189	3.6	26	226	3.8	26	238	2.8	31	247	.7	31	251	2.8	26	254	6.1	20	257	4.1	29	141	2.6	25	205	2.6	20	285	7.4	21	262	2.2	29	229	5.0	24	283	4.1
3,000	29	204	4.5	24	233	3.4	26	269	3.1	31	187	.8	30	266	5.6	26	267	6.6	15	268	4.9	28	153	2.0	24	192	3.6	18	284	9.6	18	249	3.9	24	226	7.0	22	285	5.2
4,000	29	209	6.1	21	296	3.0	20	289	5.9	30	166	1.3	26	270	9.8	21	268	9.7	12	279	6.5	25	106	1.4	23	200	4.2	17	286	13.1	17	238	5.4	21	242	9.2	19	285	6.4
5,000	26	217	6.7	17	307	3.7	17	292	8.5	29	148	2.4	24	266	12.0	17	280	11.0	---	---	---	20	106	.9	22	202	4.5	14	285	15.1	16	249	7.7	19	246	11.2	17	296	6.7
6,000	24	222	6.7	12	308	5.1	16	282	9.5	22	176	3.2	18	262	13.7	13	284	14.9	---	---	---	17	87	1.2	20	215	4.4	10	284	20.1	16	248	9.8	17	242	12.9	17	291	9.4
8,000	23	234	7.6	---	---	---	13	279	11.1	15	216	5.3	13	255	19.0	---	---	---	---	---	---	---	---	---	19	215	5.8	---	---	---	15	246	12.3	11	254	13.4	14	285	8.4
10,000	19	241	16.0	---	---	---	11	272	13.3	11	229	8.5	---	---	---	---	---	---	---	---	---	---	---	---	12	221	9.8	---	---	---	14	255	14.3	---	---	---	---	---	---
12,000	12	246	18.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11	247	19.3	---	---	---	---	---	---

TABLE 3.—*Free-air resultant winds based on rawin observations made near 0300 G. C. T., during July 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.)			Medford, Oreg. (401 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	31	177	1.1	31	145	3.8	31	82	1.4	31	131	4.5	31	230	1.6	31	184	0.8	31	112	1.5	31	61	0.6	30	207	0.8	31	196	3.2	31	235	1.1	31	166	1.0	31	338	6.3
500	---	---	---	---	---	---	---	---	---	29	143	9.0	31	265	5.6	31	201	4.1	31	159	3.1	---	---	---	29	215	2.3	30	202	5.5	31	233	2.7	31	159	3.4	31	336	6.5
1,000	---	---	---	31	151	6.1	31	117	2.6	29	147	8.6	31	280	6.7	31	197	3.1	31	184	3.1	---	---	---	29	218	3.4	29	206	4.5	31	251	4.5	30	164	2.1	31	323	5.9
1,500	---	---	---	31	154	7.3	31	207	2.5	29	148	6.6	31	284	7.3	31	207	2.0	31	209	2.8	31	54	.6	29	224	3.4	28	208	2.6	31	265	4.8	30	179	1.5	31	304	4.5
2,000	31	206	.8	31	158	6.5	31	247	4.4	30	149	5.0	30	276	7.2	31	207	1.5	31	220	2.7	31	292	.9	29	220	2.1	28	239	1.7	31	271	5.8	30	170	1.4	31	278	2.9
2,500	31	190	.6	31	152	4.6	31	265	6.5	31	148	4.5	30	276	8.6	31	205	1.5	31	240	2.1	31	285	1.7	29	226	1.3	27	264	1.5	31	275	7.6	30	168	.8	31	258	3.4
3,000	31	350	1.5	31	148	2.5	31	270	8.5	31	147	3.8	30	276	10.0	31	201	1.1	31	260	1.9	31	280	2.6	29	241	1.1	27	287	1.9	31	278	9.3	30	162	.1	31	237	5.0
4,000	30	224	1.3	31	64	2.5	31	272	10.6	30	120	2.1	30	276	12.4	31	158	1.1	31	296	1.7	31	266	3.3	29	258	1.7	27	284	1.9	29	281	11.1	30	7	.8	31	222	6.9
5,000	30	280	1.2	31	54	2.7	31	275	11.8	30	107	2.5	28	278	15.3	31	119	2.4	31	307	2.5	30	269	4.9	30	226	1.9	28	269	1.5	28	282	13.6	30	356	1.5	31	240	8.2
6,000	30	276	1.7	30	52	2.4	31	273	14.1	30	81	2.3	28	278	16.3	30	116	3.3	31	305	3.2	30	263	7.1	30	245	2.3	27	273	1.7	27	277	15.7	29	333	1.9	30	249	10.1
8,000	30	267	2.9	30	55	2.6	28	267	17.8	28	92	3.8	24	282	20.2	28	104	4.1	31	282	5.6	30	249	11.3	30	241	1.5	28	335	1.6	26	272	20.4	29	277	1.4	27	244	13.5
10,000	30	242	5.0	29	38	1.4	25	261	22.0	27	98	3.4	20	285	27.2	28	74	5.1	31	268	7.1	30	242	17.1	30	336	2.2	24	355	2.6	22	268	24.7	28	260	3.0	24	250	15.3
12,000	29	237	5.5	29	45	2.3	21	258	26.7	27	98	5.2	14	281	30.5	28	53	5.7	28	266	8.5	23	243	18.6	28	1	3.6	23	3	5.9	16	259	29.5	26	246	4.9	17	254	16.7
14,000	19	204	6.5	29	87	3.3	16	258	22.1	22	78	8.9	12	287	20.6	22	62	7.8	24	281	8.4	15	229	16.3	29	6	3.1	21	25	4.6	12	269	22.2	23	280	.5	---	---	---
16,000	---	---	---	22	81	5.7	11	275	12.0	---	---	---	---	---	---	14	61	8.8	15	277	8.9	---	---	---	13	32	7.9	---	---	---	---	---	---	16	13	4.6	---	---	---

Altitude (meters) m. s. l.	Miami, Fla. (12 m.)			Nantucket, Mass. (14 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.)			San Antonio, Tex. (242 m.)			San Juan, P. R. (28 m.)			St. Cloud, Minn. (318 m.)			Santa Maria, Calif. (72 m.)			Sault Ste. Marie, Mich. (221 m.)			Spokane, Wash. (726 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	31	101	1.1	30	227	1.7	31	161	0.8	31	152	1.2	31	281	5.2	31	139	3.3	31	119	0.8	31	119	3.2	31	107	4.1	31	154	1.2	31	284	3.9	31	252	0.7	31	219	2.9
500	31	129	3.7	30	259	5.5	30	177	2.2	31	179	2.3	31	272	4.8	30	147	4.9	---	---	---	31	145	6.6	31	92	8.4	30	170	1.9	31	313	2.5	31	250	2.6	---	---	---
1,000	31	128	3.7	30	277	5.4	30	173	1.9	31	165	1.5	31	257	4.7	30	165	7.2	31	120	.9	31	148	6.6	31	97	8.7	30	205	3.3	31	300	2.6	30	262	5.5	31	223	4.1
1,500	31	124	3.5	30	282	5.8	30	179	2.8	31	113	.9	31	223	3.5	30	185	5.6	31	166	1.8	31	152	4.3	31	99	8.3	30	229	4.3	31	247	.2	30	268	6.3	31	229	5.1
2,000	31	116	3.2	30	283	6.6	31	198	3.4	31	92	1.0	31	206	3.1	31	212	4.0	31	195	2.4	31	142	3.0	31	94	8.4	30	249	5.0	31	138	1.8	30	274	6.8	31	236	4.8
2,500	31	107	3.2	30	277	7.4	31	199	3.7	31	79	.9	31	198	3.2	31	246	2.7	30	223	3.5	31	132	2.7	31	96	7.8	30	255	6.0	31	155	2.3	30	280	8.3	31	244	4.8
3,000	31	102	2.9	29	280	8.3	31	202	2.8	31	86	.5	31	193	3.3	31	269	1.8	30	219	4.4	31	119	2.9	31	97	7.4	30	265	5.9	31	184	2.4	30	281	9.0	31	245	6.4
4,000	31	104	3.0	28	278	9.1	30	202	1.4	30	124	.2	31	216	4.3	31	2	1.5	29	269	8.1	31	94	2.5	31	92	6.4	29	273	7.4	31	207	3.9	29	288	11.0	31	244	9.3
5,000	30	99	3.3	26	279	10.8	29	189	.5	29	184	1.0	31	224	5.1	31	5	2.3	27	271	12.1	31	72	2.5	30	94	5.6	28	269	9.7	31	222	4.9	29	283	12.8	31	248	12.1
6,000	29	85	3.3	26	294	11.1	29	208	1.4	28	145	.7	29	232	6.8	31	332	3.3	28	270	14.8	31	55	2.4	29	97	3.9	28	272	11.9	31	227	6.3	29	281	13.9	30	245	13.5
8,000	26	67	4.7	19	297	16.3	26	208	2.4	26	110	1.5	28	239	8.6	31	321	4.2	26	258	16.4	29	57	3.7	29	128	2.6	26	269	16.3	31	230	9.7	26	283	20.7	27	248	16.3
10,000	24	59	6.8	10	282	16.8	25	230	3.5	24	78	2.1	26	240	11.8	30	314	3.7	19	245	22.4	27	88	2.9	27	236	1.2	26	265	22.2	30	224	13.5	18	282	29.0	19	253	18.1
12,000	19	50	9.0	---	---	---	24	224	3.7	20	90	4.4	20	238	12.2	30	307	4.2	14	238	27.1	23	94	3.6	23	241	2.8	23	268	22.5	27	228	15.6	10	285	25.9	13	255	20.3
14,000	13	64	13.4	---	---	---	16	307	1.3	16	68	8.8	15	239	14.0	29	303	2.5	---	---	---	14	87	5.4	19	246	3.1	17	266	21.2	22	220	14.5	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	12	236	5.3	13	203	1.2	---	---	---	---	---	---	11	133	6.9	14	258	15.0	15	211	9.8	---	---	---	---	---	---

Altitude (meters) m. s. l.	Tatoosh Island, Wash. (33 m.)		
	Observations	Direction	Speed
Surface	31	214	3.0
500	31	279	5.3
1,000	31	273	4.2
1,500	31	276	2.7
2,000	31	277	3.4
2,500	31	277	4.4
3,000	31	274	5.2
4,000	31	274	7.2
5,000	30	273	8.4
6,000	29	269	10.2
8,000	28	261	12.6
10,000	23	256	14.2
12,000	17	263	13.8
14,000	14	261	15.7

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 III in the June 1948 issue of the MONTHLY WEATHER REVIEW.