METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR APRIL 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 April 1949*

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Albany, N. Y. (1,002.4 mb.)				Albuquerque, N. Mex. (836.3 mb.)				Atlanta, Ga. (981.4 mb.)				Big Spring, Tex. (926.5 mb.)				Bismarck, N. Dak. (954.6 mb.)				Boise, Idaho (915.3 mb.)				Brownsville, Tex. (1,012.4 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	86	7.4	73	30	1,620	14.4	37	30	300	14.7	64	30	774	14.8	59	30	505	9.1	52	30	868	14.3	38	30	6	21.3	83
1,000	30	105	(*)	----	30	77	(*)	----	30	140	(*)	----	30	118	(*)	----	30	114	(*)	----	30	110	(*)	----	30	112	21.1	82
950	30	532	6.4	61	30	530	(*)	----	30	577	14.9	56	30	563	(*)	----	30	547	(*)	----	30	554	(*)	----	30	558	19.0	76
900	30	969	3.6	60	30	997	(*)	----	30	1,031	12.3	56	30	1,020	15.2	55	30	993	8.8	44	30	1,011	15.4	30	30	1,020	17.4	67
850	30	1,431	.7	62	30	1,482	(*)	----	30	1,508	9.9	55	30	1,502	12.5	55	30	1,463	5.4	46	30	1,491	11.5	33	30	1,508	15.7	61
800	30	1,915	−2.1	63	30	1,994	12.6	35	30	2,010	7.7	49	30	2,008	9.9	52	30	1,955	2.2	46	30	1,994	7.4	37	30	2,021	13.3	53
750	30	2,431	−4.5	61	30	2,539	8.4	38	30	2,543	5.2	47	29	2,547	6.9	48	30	2,479	−.9	46	30	2,525	3.3	41	30	2,567	10.7	46
700	30	2,966	−7.0	61	30	3,096	3.6	42	30	3,099	2.1	44	29	3,104	3.0	47	30	3,021	−4.0	42	30	3,076	−.7	44	30	3,134	8.1	38
650	30	3,457	−10.0	63	30	3,699	−1.4	48	30	3,696	−1.6	39	29	3,700	−1.1	44	30	3,610	−7.7	39	30	3,666	−5.0	41	30	3,744	3.9	39
600	30	4,154	−13.7	57	30	4,324	−6.6	51	30	4,327	−5.4	36	29	4,334	−5.8	44	30	4,220	−11.8	39	30	4,288	−9.1	39	30	4,386	−1.0	44
550	30	4,811	−17.5	51	29	5,000	−12.2	55	30	5,005	−9.7	38	29	5,009	−10.4	41	30	4,885	−15.6	38	30	4,959	−13.6	40	30	5,072	−6.1	46
500	30	5,517	−22.5	----	29	5,716	−17.3	52	30	5,733	−14.4	38	29	5,738	−15.5	40	29	5,593	−21.1	----	30	5,673	−18.9	39	30	5,813	−11.5	47
450	30	6,290	−27.9	----	28	6,503	−23.0	----	30	6,531	−19.9	38	29	6,531	−21.2	----	29	6,369	−26.8	----	30	6,455	−24.8	----	30	6,618	−17.2	42
400	29	7,125	−33.7	----	26	7,348	−29.8	----	30	7,388	−25.9	----	29	7,385	−27.8	----	28	7,208	−33.2	----	30	7,294	−31.1	----	30	7,486	−23.3	----
350	29	8,047	−40.4	----	26	8,285	−36.8	----	30	8,341	−32.9	----	29	8,330	−34.9	----	26	8,143	−40.4	----	29	8,229	−38.6	----	30	8,450	−30.0	----
300	28	9,078	−47.0	----	26	9,335	−44.3	----	29	9,410	−41.0	----	29	9,388	−42.6	----	25	9,169	−48.5	----	29	9,268	−46.6	----	28	9,524	−38.3	----
250	26	10,263	−52.4	----	23	10,521	−51.8	----	28	10,622	−50.4	----	29	10,597	−50.4	----	24	10,349	−56.2	----	28	10,455	−54.9	----	28	10,753	−47.5	----
200	23	11,700	−52.5	----	22	11,941	−56.7	----	26	12,049	−58.8	----	28	12,028	−56.0	----	17	11,783	−59.1	----	28	11,860	−59.5	----	27	12,200	−56.3	----
175	21	12,555	−51.2	----	18	12,781	−57.7	----	23	12,895	−60.6	----	28	12,874	−57.1	----	12	12,631	−57.1	----	25	12,690	−57.5	----	26	13,041	−59.7	----
150	17	13,562	−51.8	----	13	13,729	−56.0	----	19	13,843	−59.8	----	28	13,848	−57.3	----	8	13,640	−56.8	----	23	13,662	−56.4	----	24	14,005	−61.7	----
125	15	14,737	−53.5	----	9	14,857	−55.2	----	13	14,978	−61.0	----	21	14,996	−59.0	----	6	14,806	−56.2	----	21	14,809	−57.1	----	19	15,127	−64.1	----
100	9	16,157	−55.4	----	6	16,256	−56.3	----	9	16,376	−64.5	----	15	16,385	−61.6	----	----	----	----	----	16	16,208	−57.6	----	7	16,471	−67.8	----
80	----	----	----	----	----	----	----	----	----	----	----	----	6	17,778	−64.2	----	----	----	----	----	11	17,614	−56.9	----	----	----	----	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	19,447	−57.2	----	----	----	----	----

Standard pressure surface (mb.)	Buffalo, N. Y. (988.1 mb.)				Camaguey, Cuba [1] (------ mb.)				Caribou, Maine (987.8 mb.)				Charleston, S. C. (1,014.2 mb.)				Ciudad Victoria, Mex. (972.0 mb.)				Columbia, Mo. (987.1 mb.)				Dodge City, Kans. (925.0 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	30	221	5.6	71	----	----	----	----	30	191	2.6	78	30	13	16.1	82	27	335	25.2	53	30	239	11.0	64	30	792	10.6	67
1,000	30	122	(*)	----	----	----	----	----	30	90	(*)	----	30	133	17.2	73	27	83	(*)	----	30	129	(*)	----	30	132	(*)	----
950	30	545	5.9	58	----	----	----	----	30	510	2.6	66	30	574	15.9	63	27	537	23.5	54	30	564	11.4	54	30	567	(*)	----
900	30	983	3.4	59	----	----	----	----	30	943	.2	66	30	1,028	13.1	62	27	1,004	19.7	60	30	1,009	8.4	57	30	1,021	11.7	57
850	30	1,444	.3	61	----	----	----	----	30	1,399	−2.7	69	30	1,507	11.0	54	27	1,494	16.2	65	30	1,478	5.4	58	30	1,497	9.1	56
800	30	1,928	−1.9	59	----	----	----	----	30	1,877	−5.6	67	30	2,012	8.9	48	27	2,008	13.0	70	30	1,972	3.1	57	30	1,997	6.1	55
750	30	2,443	−4.4	60	----	----	----	----	30	2,383	−8.5	64	30	2,549	6.0	46	27	2,550	10.3	71	30	2,498	.8	52	30	2,528	3.3	55
700	30	2,980	−7.2	54	----	----	----	----	30	2,914	−10.7	58	30	3,106	2.8	42	27	3,121	8.3	58	30	3,045	−1.4	46	30	3,079	.1	50
650	30	3,556	−10.4	49	----	----	----	----	30	3,484	−13.8	56	30	3,706	−.8	39	27	3,732	5.0	48	30	3,638	−5.0	45	30	3,672	−3.6	47
600	30	4,166	−14.0	48	----	----	----	----	30	4,084	−17.3	55	30	4,336	−5.0	36	27	4,380	.5	43	30	4,256	−8.7	41	30	4,297	−7.8	41
550	30	4,826	−17.8	43	----	----	----	----	30	4,734	−21.3	----	30	5,018	−9.5	34	26	5,068	−5.0	41	30	4,928	−13.1	38	30	4,968	−12.7	40
500	30	5,529	−22.5	----	----	----	----	----	30	5,428	−25.8	----	30	5,745	−14.1	35	25	5,812	−10.2	38	30	5,645	−18.0	37	29	5,690	−17.7	34
450	30	6,296	−28.0	----	----	----	----	----	30	6,187	−31.1	----	30	6,545	−19.4	37	25	6,627	−15.2	----	30	6,427	−23.9	----	29	6,474	−23.6	----
400	30	7,129	−34.1	----	----	----	----	----	30	7,009	−37.0	----	30	7,404	−25.6	----	25	7,500	−21.1	----	30	7,272	−30.3	----	29	7,319	−30.2	----
350	30	8,050	−40.8	----	----	----	----	----	30	7,920	−43.3	----	30	8,358	−32.5	----	23	8,472	−28.9	----	30	8,207	−37.8	----	28	8,257	−37.5	----
300	30	9,083	−47.2	----	----	----	----	----	27	8,950	−48.7	----	30	9,427	−40.7	----	23	9,555	−37.5	----	29	9,247	−45.6	----	28	9,304	−45.2	----
250	28	10,274	−52.0	----	----	----	----	----	25	10,147	−51.8	----	30	10,643	−50.0	----	23	10,787	−47.7	----	29	10,441	−52.4	----	27	10,497	−53.0	----
200	24	11,709	−52.6	----	----	----	----	----	21	11,603	−51.6	----	28	12,072	−57.9	----	23	12,228	−57.6	----	21	11,872	−55.1	----	26	11,926	−57.6	----
175	17	12,559	−51.4	----	----	----	----	----	16	12,476	−50.7	----	27	12,913	−59.4	----	20	13,070	−62.5	----	14	12,709	−55.4	----	24	12,776	−57.9	----
150	13	13,567	−51.7	----	----	----	----	----	10	13,499	−50.8	----	24	13,872	−60.1	----	12	14,027	−64.2	----	12	13,708	−55.9	----	22	13,767	−57.5	----
125	11	14,737	−52.0	----	----	----	----	----	7	14,664	−50.2	----	24	15,006	−61.4	----	----	----	----	----	7	14,882	−58.1	----	21	14,921	−58.7	----
100	6	16,160	−54.1	----	----	----	----	----	----	----	----	----	18	16,365	−64.1	----	----	----	----	----	5	16,324	−61.5	----	13	16,314	−61.6	----
80	----	----	----	----	----	----	----	----	----	----	----	----	8	17,711	−64.1	----	----	----	----	----	----	----	----	----	8	17,710	−61.7	----

Standard pressure surface (mb.)	El Paso, Tex. (879.6 mb.)				Ely, Nev. (808.4 mb.)				Glasgow, Mont. (937.1 mb.)				Grand Junction, Colo. (851.1 mb.)				Great Falls, Mont. (885.6 mb.)				Greensboro, N. C. (983.6 mb.)				Hatteras, N. C. (1,015.4 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	17.7	31	30	1,908	9.0	42	30	648	12.1	32	30	1,474	12.5	47	30	1,128	11.5	37	30	273	11.9	69	30	3	15.2	77
1,000	30	80	(*)	----	30	99	(*)	----	30	94	(*)	----	30	93	(*)	----	30	94	(*)	----	30	133	(*)	----	30	132	15.1	72
950	30	534	(*)	----	30	543	(*)	----	30	534	(*)	----	30	540	(*)	----	30	540	(*)	----	30	564	12.9	53	30	568	13.3	62
900	30	1,003	(*)	----	30	1,007	(*)	----	30	985	12.7	28	30	1,003	(*)	----	30	1,000	(*)	----	30	1,017	10.2	53	30	1,019	10.8	55
850	30	1,487	17.0	31	30	1,487	(*)	----	30	1,463	8.9	33	30	1,484	(*)	----	30	1,470	10.3	33	30	1,490	7.3	55	30	1,493	8.2	55
800	30	2,000	13.1	32	30	1,995	10.8	33	30	1,960	4.8	38	30	1,994	11.8	36	30	1,970	6.3	38	30	1,986	4.8	51	30	1,991	5.4	54
750	30	2,543	8.9	33	30	2,534	7.5	32	30	2,484	.6	43	30	2,532	7.4	41	30	2,498	1.9	42	30	2,516	2.5	46	30	2,521	3.1	50
700	30	3,105	4.6	35	30	3,093	2.7	37	30	3,032	−3.5	45	30	3,093	2.7	46	30	3,047	−2.3	43	30	3,065	−.3	42	29	3,074	.4	42
650	30	3,704	−.4	38	30	3,691	−2.4	42	30	3,615	−7.6	47	30	3,688	−2.1	49	30	3,635	−6.7	44	30	3,656	−3.7	40	28	3,664	−3.2	39
600	30	4,337	−5.4	41	30	4,316	−7.4	44	30	4,232	−11.7	47	30	4,318	−7.1	51	30	4,251	−11.3	47	30	4,281	−7.4	----	28	4,290	−6.8	42
550	30	5,015	−10.7	40	30	4,989	−12.4	42	30	4,893	−16.2	45	30	4,991	−12.0	47	30	4,915	−16.0	46	30	4,952	−11.7	----	28	4,965	−11.0	43
500	29	5,738	−16.2	34	30	5,708	−17.7	38	30	5,604	−21.2	----	30	5,712	−17.2	44	30	5,623	−21.3	----	30	5,677	−16.3	----	28	5,689	−15.8	44
450	29	6,530	−22.2	----	30	6,491	−23.4	----	30	6,380	−26.9	----	30	6,498	−22.8	----	29	6,398	−26.7	----	30	6,465	−21.7	----	28	6,481	−21.1	----
400	29	7,379	−28.0	----	30	7,338	−30.2	----	30	7,212	−33.3	----	30	7,345	−29.4	----	29	7,230	−33.1	----	30	7,320	−28.0	----	28	7,335	−27.2	----
350	29	8,324	−35.1	----	30	8,272	−37.7	----	30	8,136	−40.4	----	29	8,282	−36.8	----	29	8,153	−40.5	----	29	8,269	−34.9	----	27	8,281	−34.2	----
300	29	9,382	−42.5	----	28	9,310	−46.0	----	30	9,168	−48.4	----	28	9,327	−45.4	----	29	9,186	−48.3	----	29	9,326	−42.5	----	26	9,338	−41.5	----
250	28	10,588	−50.4	----	26	10,504	−54.2	----	29	10,339	−56.0	----	26	10,525	−53.2	----	29	10,365	−55.6	----	29	10,535	−50.4	----	26	10,551	−49.9	----
200	27	12,021	−56.9	----	21	11,898	−59.4	----	22	11,758	−57.9	----	20	11,962	−58.8	----	27	11,771	−58.7	----	24	11,975	−56.8	----	25	11,986	−56.6	----
175	26	12,865	−58.2	----	18	12,723	−57.8	----	22	12,604	−55.2	----	16	12,829	−58.6	----	24	12,608	−56.2	----	20	12,833	−57.1	----	23	12,836	−57.9	----
150	23	13,814	−57.9	----	12	13,679	−55.5	----	20	13,579	−53.9	----	14	13,797	−57.0	----	23	13,589	−55.1	----	15	13,821	−57.1	----	18	13,816	−58.5	----
125	18	14,965	−60.0	----	8	14,818	−56.1	----	18	14,748	−54.6	----	11	14,948	−56.4	----	19	14,749	−55.4	----	----	----	----	----	12	14,979	−59.6	----
100	14	16,347	−63.5	----	5	16,237	−56.8	----	15	16,170	−55.2	----	5	16,355	−59.0	----	15	16,167	−56.2	----	----	----	----	----	9	16,383	−62.1	----
80	6	17,663	−63.6	----	----	----	----	----	11	17,602	−55.2	----	----	----	----	----	7	17,582	−55.3	----	----	----	----	----	----	----	----	----
60	----	----	----	----	----	----	----	----	6	19,440	−55.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
50	----	----	----	----	----	----	----	----	5	20,580	−55.9	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

See footnotes 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 April 1949*—Continued

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Havana, Cuba [1] (..... mb.)				Honolulu, T. H. (1,018.2 mb.)				International Falls, Minn. (972.0 mb.)				Joliet, Ill. (994.5 mb.)				Lake Charles, La. (1,014.6 mb.)				Lander, Wyo. (828.2 mb.)				Las Vegas, Nev. (935.4 mb.)			
Standard pressure surface (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	3	24.2	60	30	360	4.3	66	30	178	6.5	71	30	5	17.7	84	30	1,696	8.9	46	29	660	20.4	28
1,000	----	----	----	----	30	161	21.7	63	30	126	(*)	----	30	131	(*)	----	30	129	18.0	75	30	98	(*)	----	29	76	(*)	----
950	----	----	----	----	30	604	17.9	72	30	549	5.8	59	30	560	8.0	53	30	570	16.2	69	30	544	(*)	----	29	523	(*)	----
900	----	----	----	----	30	1,064	14.3	80	30	989	3.4	59	30	999	5.4	52	30	1,025	14.4	59	30	1,001	(*)	----	29	994	21.2	22
850	----	----	----	----	30	1,545	11.6	73	30	1,450	.4	60	30	1,464	2.9	48	30	1,508	12.2	54	30	1,478	(*)	----	29	1,484	17.0	24
800	----	----	----	----	30	2,051	11.0	47	30	1,934	−2.3	56	30	1,952	.6	44	30	2,014	9.9	49	30	1,984	9.9	37	29	1,996	12.5	28
750	----	----	----	----	30	2,595	10.0	24	30	2,450	−4.7	52	30	2,478	−1.6	43	30	2,553	6.9	51	30	2,518	5.6	39	28	2,536	7.7	33
700	----	----	----	----	30	3,159	7.2	24	30	2,984	−7.4	49	30	3,015	−4.2	43	30	3,111	3.5	49	30	3,075	1.0	43	28	3,094	2.9	35
650	----	----	----	----	30	3,769	3.6	----	30	3,563	−10.3	49	30	3,602	−7.7	42	30	3,710	−.2	48	30	3,670	−4.1	48	28	3,690	−2.0	35
600	----	----	----	----	30	4,409	−.3	----	30	4,169	−13.9	50	30	4,213	−11.5	39	30	4,346	−4.4	51	30	4,291	−8.8	50	28	4,319	−6.7	35
550	----	----	----	----	30	5,099	−4.9	----	30	4,828	−18.4	50	30	4,877	−16.1	36	29	5,027	−8.8	49	30	4,962	−13.7	47	28	4,994	−11.5	35
500	----	----	----	----	30	5,842	−10.3	----	29	5,530	−23.5	----	29	5,580	−21.2	----	28	5,756	−14.3	44	30	5,677	−19.1	42	28	5,716	−16.9	----
450	----	----	----	----	30	6,654	−16.4	----	28	6,296	−28.8	----	29	6,356	−26.7	----	28	6,555	−19.8	36	30	6,459	−25.0	----	28	6,500	−23.1	----
400	----	----	----	----	30	7,520	−22.8	----	28	7,123	−34.9	----	29	7,189	−33.0	----	28	7,412	−26.0	----	30	7,297	−31.5	----	28	7,348	−30.1	----
350	----	----	----	----	30	8,484	−30.6	----	28	8,040	−41.7	----	29	8,115	−39.6	----	28	8,364	−33.2	----	30	8,228	−38.9	----	28	8,283	−37.6	----
300	----	----	----	----	30	9,559	−39.3	----	26	9,064	−48.7	----	29	9,154	−46.4	----	27	9,428	−41.3	----	30	9,265	−47.6	----	28	9,329	−45.1	----
250	----	----	----	----	30	10,783	−48.6	----	22	10,259	−54.5	----	29	10,346	−52.6	----	26	10,637	−50.5	----	30	10,444	−55.8	----	28	10,524	−53.0	----
200	----	----	----	----	30	12,219	−57.4	----	18	11,672	−55.7	----	28	11,771	−54.1	----	23	12,059	−58.9	----	27	11,842	−59.8	----	27	11,939	−58.7	----
175	----	----	----	----	30	13,054	−61.2	----	9	12,504	−53.5	----	28	12,628	−53.5	----	20	12,893	−60.2	----	22	12,690	−57.7	----	27	12,777	−58.3	----
150	----	----	----	----	30	14,006	−63.5	----	5	13,487	−52.1	----	24	13,607	−53.7	----	18	13,848	−60.3	----	20	13,673	−56.8	----	26	13,747	−57.9	----
125	----	----	----	----	30	15,119	−65.7	----	----	----	----	----	21	14,759	−54.4	----	14	14,976	−62.1	----	15	14,827	−57.7	----	25	14,891	−59.7	----
100	----	----	----	----	29	16,467	−68.4	----	----	----	----	----	14	16,162	−55.6	----	10	16,341	−65.9	----	8	16,230	−58.1	----	20	16,283	−61.5	----
80	----	----	----	----	27	17,799	−68.7	----	----	----	----	----	10	17,605	−57.1	----	----	----	----	----	----	----	----	----	11	17,650	−62.3	----
60	----	----	----	----	26	19,546	−62.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
50	----	----	----	----	25	20,679	−59.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
40	----	----	----	----	22	22,085	−56.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
30	----	----	----	----	15	23,921	−52.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
20	----	----	----	----	5	26,555	−48.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	Little Rock, Ark. (1,005.9 mb.)				Mazatlan, Mex. (1,009.1 mb.)				Medford, Oreg. (970.0 mb.)				Merida, Mex. (1,009.3 mb.)				Miami, Fla. (1,016.6 mb.)				Nantucket, Mass. (1,011.7 mb.)				Nashville, Tenn. (994.4 mb.)			
Surface	30	79	15.8	64	18	14	22.2	75	30	401	15.1	52	30	27	27.5	64	30	4	23.1	77	30	14	6.4	85	30	177	13.9	66
1,000	30	129	16.2	61	18	93	21.6	72	30	141	(*)	----	30	109	26.8	65	30	148	22.8	75	30	110	7.5	77	30	130	(*)	----
950	30	566	14.7	57	18	539	21.0	45	30	581	15.9	42	30	564	24.7	64	30	599	20.4	72	30	537	7.1	61	30	563	13.0	57
900	30	1,020	11.9	60	18	1,004	19.9	34	30	1,034	12.5	46	30	1,034	21.6	66	30	1,059	17.5	71	30	976	4.7	60	30	1,014	10.0	60
850	30	1,496	9.4	58	18	1,494	17.2	----	30	1,510	8.6	52	30	1,528	18.6	67	30	1,546	14.9	61	30	1,439	1.9	59	30	1,487	7.2	61
800	30	1,997	7.2	55	17	2,008	14.2	----	30	2,008	4.8	56	30	2,046	15.2	68	30	2,057	12.2	57	30	1,926	−.7	60	30	1,984	5.0	54
750	30	2,530	4.4	47	17	2,555	11.1	----	30	2,537	1.3	51	30	2,593	12.2	60	30	2,602	9.4	48	30	2,439	−3.3	55	30	2,511	2.4	52
700	30	3,084	.8	45	17	3,121	7.7	----	30	3,084	−2.0	49	30	3,167	9.7	45	28	3,164	6.7	42	30	2,982	−5.8	51	30	3,063	−.8	50
650	30	3,677	−3.2	48	17	3,732	4.2	----	30	3,674	−5.6	45	30	3,780	6.3	38	28	3,774	3.3	36	30	3,564	−8.6	48	30	3,653	−4.4	45
600	30	4,304	−7.1	47	17	4,375	.5	----	30	4,293	−9.1	40	30	4,429	2.2	32	28	4,412	−.5	33	30	4,177	−12.1	45	30	4,277	−8.3	45
550	30	4,977	−11.5	47	17	5,069	−3.8	----	30	4,962	−13.3	40	30	5,124	−2.3	27	28	5,105	−4.5	30	30	4,839	−16.4	42	30	4,947	−12.5	41
500	30	5,702	−16.1	40	17	5,813	−8.8	----	30	5,679	−18.2	41	30	5,875	−7.0	----	28	5,847	−9.3	31	30	5,547	−21.1	----	30	5,668	−17.3	40
450	30	6,490	−21.7	----	17	6,629	−14.4	----	29	6,458	−24.1	----	30	6,696	−12.9	----	28	6,662	−15.3	33	30	6,321	−26.6	----	29	6,451	−22.8	----
400	29	7,346	−28.0	----	16	7,503	−20.8	----	29	7,302	−30.8	----	30	7,576	−19.3	----	28	7,532	−21.7	----	30	7,157	−32.9	----	29	7,300	−28.8	----
350	28	8,298	−35.2	----	16	8,475	−28.1	----	29	8,236	−38.0	----	30	8,553	−27.0	----	28	8,501	−29.2	----	30	8,083	−39.5	----	29	8,243	−35.4	----
300	28	9,354	−43.0	----	16	9,563	−36.5	----	28	9,280	−46.1	----	30	9,643	−35.6	----	28	9,583	−37.6	----	30	9,121	−46.6	----	28	9,302	−43.0	----
250	27	10,570	−50.7	----	16	10,800	−46.6	----	28	10,469	−54.4	----	30	10,884	−45.4	----	28	10,815	−47.1	----	29	10,315	−51.5	----	27	10,512	−51.3	----
200	22	12,016	−57.8	----	16	12,244	−57.5	----	28	11,876	−60.2	----	29	12,333	−57.0	----	27	12,259	−57.2	----	26	11,753	−53.4	----	25	11,934	−57.4	----
175	20	12,854	−57.8	----	16	13,078	−61.4	----	25	12,708	−58.1	----	29	13,166	−62.5	----	24	13,093	−61.8	----	24	12,603	−52.9	----	23	12,780	−57.6	----
150	17	13,823	−58.0	----	15	14,025	−64.2	----	21	13,674	−56.3	----	27	14,108	−67.3	----	20	14,041	−64.5	----	21	13,644	−52.9	----	21	13,757	−57.1	----
125	12	14,958	−59.7	----	14	15,128	−67.1	----	16	14,832	−57.1	----	25	15,190	−71.4	----	15	15,140	−65.9	----	16	14,749	−53.9	----	20	14,913	−58.7	----
100	----	----	----	----	12	16,459	−70.0	----	10	16,252	−57.3	----	15	16,493	−75.3	----	8	16,471	−69.9	----	11	16,176	−55.1	----	12	16,329	−61.8	----
80	----	----	----	----	9	17,792	−72.2	----	----	----	----	----	6	17,801	−77.2	----	----	----	----	----	----	----	----	----	----	----	----	----

Standard pressure surface (mb.)	New Orleans, La. (1,015.4 mb.)				North Platte, Nebr. (917.7 mb.)				Oakland, Calif. (1,016.9 mb.)				Oklahoma City, Okla. (963.7 mb.)				Omaha, Nebr. (978.8 mb.)				Phoenix, Ariz. (971.1 mb.)				Pittsburgh, Pa. (969.9 mb.)			
Surface	30	2	17.8	84	30	849	8.8	68	30	6	13.6	72	30	391	14.4	62	30	308	12.6	56	30	339	22.4	32	30	382	8.2	63
1,000	30	133	18.8	77	30	126	(*)	----	30	147	13.1	70	30	128	(*)	----	30	136	(*)	----	30	81	(*)	----	30	127	(*)	----
950	30	578	16.7	69	30	568	(*)	----	30	583	13.1	59	30	565	15.0	56	30	569	11.6	45	30	534	24.6	23	30	558	8.2	59
900	30	1,032	14.5	62	30	1,010	10.5	55	30	1,033	12.7	41	30	1,020	12.1	57	30	1,016	8.6	49	30	1,000	21.0	23	30	997	5.5	56
850	30	1,514	12.3	57	30	1,484	7.7	52	30	1,510	10.5	34	30	1,496	9.0	59	30	1,486	5.3	53	30	1,490	16.8	25	30	1,462	2.9	55
800	30	2,020	10.3	49	30	1,981	4.6	53	30	2,012	7.8	31	30	1,996	6.6	53	30	1,978	2.6	46	30	2,002	12.3	28	30	1,951	.0	54
750	29	2,560	7.4	48	30	2,511	1.6	51	30	2,543	4.6	33	30	2,529	4.4	48	30	2,506	.1	41	30	2,546	7.7	32	30	2,471	−2.5	53
700	28	3,121	4.1	47	30	3,058	−1.3	49	30	3,100	1.0	34	30	3,082	1.0	47	30	3,048	−2.7	40	30	3,101	2.9	38	30	3,010	−5.2	49
650	28	3,722	.3	50	30	3,648	−5.0	48	30	3,692	−2.4	29	30	3,676	−3.0	46	30	3,638	−6.2	40	30	3,701	−1.9	37	30	3,596	−8.4	45
600	27	4,357	−3.9	50	30	4,269	−9.1	46	30	4,322	−6.5	31	30	4,303	−7.0	44	30	4,254	−9.8	38	30	4,327	−6.3	36	30	4,206	−12.0	40
550	27	5,040	−8.4	45	30	4,939	−13.7	45	30	4,994	−11.1	34	30	4,978	−11.9	40	30	4,924	−14.3	40	30	5,006	−11.2	35	30	4,870	−16.3	38
500	27	5,771	−13.0	40	30	5,654	−18.9	45	30	5,720	−16.5	37	30	5,698	−17.2	38	30	5,636	−19.4	41	30	5,726	−16.7	36	30	5,576	−21.4	----
450	27	6,574	−18.3	39	30	6,437	−24.7	----	30	6,509	−22.4	----	30	6,485	−22.8	----	30	6,418	−25.0	----	30	6,517	−22.4	----	30	6,353	−26.8	----
400	27	7,436	−25.0	----	30	7,275	−31.2	----	30	7,357	−29.4	----	30	7,333	−29.3	----	30	7,256	−31.4	----	29	7,357	−29.3	----	30	7,185	−32.7	----
350	25	8,390	−32.4	----	30	8,206	−38.8	----	30	8,295	−36.9	----	30	8,272	−36.7	----	30	8,187	−38.9	----	29	8,304	−36.4	----	30	8,113	−38.8	----
300	25	9,460	−40.1	----	30	9,244	−47.3	----	30	9,344	−45.0	----	29	9,315	−44.5	----	30	9,226	−47.2	----	29	9,348	−43.8	----	29	9,164	−45.3	----
250	24	10,679	−49.7	----	29	10,425	−55.4	----	29	10,534	−54.0	----	29	10,513	−52.5	----	30	10,410	−55.0	----	27	10,557	−51.7	----	26	10,375	−50.6	----
200	22	12,122	−58.5	----	27	11,829	−58.9	----	29	11,942	−60.2	----	23	11,917	−56.5	----	25	11,833	−57.8	----	27	11,979	−57.7	----	23	11,822	−53.6	----
175	20	12,966	−61.2	----	24	12,665	−57.0	----	27	12,764	−59.2	----	20	12,766	−57.1	----	19	12,698	−56.3	----	27	12,820	−57.9	----	19	12,683	−54.1	----
150	19	13,914	−61.5	----	20	13,652	−57.1	----	27	13,733	−58.1	----	18	13,719	−56.7	----	13	13,686	−55.9	----	23	13,792	−57.8	----	14	13,646	−53.9	----
125	12	15,036	−62.5	----	18	14,808	−58.3	----	26	14,881	−59.0	----	15	14,872	−58.6	----	9	14,846	−57.1	----	22	14,928	−59.9	----	11	14,828	−55.8	----
100	7	16,393	−65.0	----	10	16,211	−60.2	----	20	16,262	−60.0	----	7	16,266	−60.8	----	5	16,289	−59.6	----	19	16,316	−62.3	----	5	16,254	−57.8	----
80	----	----	----	----	----	----	----	----	10	17,652	−61.1	----	----	----	----	----	----	----	----	----	15	17,695	−63.5	----	----	----	----	----
60	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11	19,475	−63.2	----	----	----	----	----

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 April 1949*—Continued

STATIONS AND MEAN SURFACE PRESSURES

Standard pressure surface (mb.)	Portland, Maine (1,009.4 mb.)				Rapid City, S. Dak. (902.5 mb.)				St. Cloud, Minn. (978.0 mb.)				San Antonio, Tex. (986.8 mb.)				San Juan, P. R. (1,015.8 mb.)				Santa Maria, Calif. (1,008.6 mb.)				Sault Ste. Marie, Mich. (988.6 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	20	5.3	80	30	980	7.7	57	30	317	5.9	69	30	240	16.8	73	30	15	24.3	81	30	71	12.3	80	30	221	2.8	67
1,000	30	97	(*)	----	30	117	(*)	----	30	133	(*)	----	30	125	(*)	----	30	153	23.2	79	30	143	11.6	79	30	127	(*)	----
950	30	520	5.2	59	30	555	(*)	----	30	561	7.6	55	30	569	16.7	66	30	598	19.7	79	30	584	13.4	63	30	550	4.6	51
900	30	956	2.5	60	30	1.003	(*)	----	30	1,000	4.9	53	30	1,024	14.3	67	30	1,063	16.8	75	30	1,029	13.2	47	30	984	3.1	47
850	30	1,415	−.6	61	30	1,477	8.8	43	30	1,463	1.8	57	30	1,506	12.2	63	30	1,549	13.9	74	30	1,509	11.6	40	30	1,445	.6	47
800	30	1,897	−3.6	63	30	1,975	5.3	47	30	1,950	−.8	54	30	2,013	10.5	57	30	2,059	11.9	60	30	2,013	8.7	37	30	1,929	−2.3	47
750	30	2,410	−6.3	60	30	2,504	1.9	48	30	2,472	−2.7	46	30	2,555	7.4	53	30	2,601	10.6	----	30	2,551	5.5	35	30	2,445	−5.0	47
700	30	2,941	−8.7	56	30	3,052	−1.8	53	30	3,008	−5.2	42	30	3,114	4.4	42	30	3,169	8.2	----	30	3,104	2.2	34	30	2,978	−7.6	51
650	30	3,519	−11.6	50	30	3,643	−5.4	48	30	3,591	−8.3	38	29	3,713	.7	38	30	3,780	5.3	----	30	3,700	−1.4	29	30	3,559	−10.8	49
600	30	4,121	−14.9	45	30	4,261	−9.5	46	30	4,204	−11.9	38	29	4,350	−3.8	34	30	4,427	1.7	----	30	4,331	−5.5	30	30	4,163	−14.4	50
550	30	4,777	−19.1	42	30	4,933	−14.0	45	30	4,862	−16.1	38	29	5,030	−8.6	34	30	5,122	−2.8	----	30	5,009	−10.2	29	30	4,823	−18.7	51
500	29	5,472	−24.2	----	30	5,645	−19.1	43	30	5,576	−21.2	----	29	5.763	−13.9	34	28	5,868	−7.7	----	30	5,734	−15.5	31	30	5,521	−23.6	----
450	27	6,227	−29.7	----	30	6,428	−24.9	----	30	6,346	−27.0	----	29	6,562	−19.6	33	27	6,684	−13.5	----	30	6,527	−21.6	----	29	6,292	−29.2	----
400	27	7,062	−35.5	----	30	7,265	−31.4	----	30	7,182	−33.2	----	29	7,419	−26.1	----	27	7,562	−20.0	----	30	7,377	−28.2	----	28	7,123	−35.3	----
350	27	7,979	−41.7	----	30	8,196	−38.8	----	30	8,107	−40.3	----	28	8,373	−33.1	----	27	8,539	−27.0	----	30	8,320	−35.5	----	28	8,040	−42.3	----
300	27	9,009	−47.7	----	29	9,232	−47.3	----	30	9,141	−47.9	----	27	9,445	−40.7	----	27	9,631	−35.2	----	29	9,384	−43.5	----	24	9,050	−49.9	----
250	24	10,199	−51.5	----	28	10,421	−54.8	----	29	10,323	−54.2	----	26	10,674	−49.2	----	26	10,877	−44.5	----	29	10,586	−52.2	----	18	10,228	−54.2	----
200	21	11,645	−52.0	----	23	11,837	−58.3	----	29	11,745	−55.4	----	22	12,120	−56.8	----	25	12,332	−55.7	----	28	12,003	−59.1	----	11	11,662	−55.3	----
175	17	12,507	−52.4	----	17	12,688	−54.7	----	27	12,603	−53.8	----	20	12,959	−59.6	----	22	13,169	−61.9	----	27	12,839	−59.5	----	----	------	------	----
150	14	13,494	−53.1	----	13	13,668	−54.1	----	26	13,591	−53.0	----	15	13,938	−60.8	----	20	14,106	−67.8	----	25	13,800	−58.8	----	----	------	------	----
125	10	14,691	−55.0	----	9	14,852	−56.1	----	23	14,755	−53.9	----	11	15,076	−62.4	----	15	15,201	−72.4	----	24	14,938	−59.4	----	----	------	------	----
100	----	------	------	----	----	------	------	----	18	16,182	−54.5	----	5	16,456	−66.6	----	8	16,508	−77.4	----	23	16,327	−61.0	----	----	------	------	----
80	----	------	------	----	----	------	------	----	13	17,613	−55.2	----	----	------	------	----	----	------	------	----	19	17,700	−62.2	----	----	------	------	----
60	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	5	19,443	−62.0	----	----	------	------	----

Standard pressure surface (mb.)	Spokane, Wash. (931.9 mb.)				Swan Island, W. I.[1] (---- mb.)				Tacubaya, Mex. (772.6 mb.)				Tampa, Fla. (1,015.9 mb.)				Tatoosh Island, Wash. (1,015.7 mb.)				Toledo, Ohio (992.3 mb.)				Washington, D. C. (1,011.9 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	721	11.1	50	----	------	------	----	30	2,306	19.7	30	30	9	20.4	78	30	31	8.1	86	30	191	6.3	74	30	25	11.8	63
1,000	29	125	(*)	----	----	------	------	----	30	14	(*)	----	30	146	20.5	73	30	159	7.3	84	30	126	(*)	----	30	124	11.6	63
950	29	560	(*)	----	----	------	------	----	30	484	(*)	----	30	590	18.7	66	30	584	5.0	80	30	552	7.3	58	30	553	9.4	57
900	29	1,012	10.9	42	----	------	------	----	30	966	(*)	----	30	1,051	16.2	59	30	1,020	2.9	73	30	994	4.8	56	30	997	7.0	59
850	29	1,486	7.0	44	----	------	------	----	30	1,469	(*)	----	30	1,536	13.9	55	30	1,481	1.1	65	30	1,457	2.2	54	30	1,465	4.1	60
800	29	1,980	3.2	48	----	------	------	----	30	2,002	(*)	----	30	2,045	11.4	48	30	1,966	−1.2	61	30	1,945	−.2	50	30	1,956	1.5	58
750	29	2,502	−.6	47	----	------	------	----	30	2,560	17.9	29	30	2,585	8.5	41	30	2,485	−3.8	60	30	2,467	−2.5	46	30	2,478	−.9	54
700	29	3,047	−4.1	46	----	------	------	----	30	3,146	13.3	32	30	3,148	5.5	36	30	3,020	−6.8	57	30	3.004	−5.1	42	30	3,021	−3.8	51
650	29	3,631	−8.2	48	----	------	------	----	30	3,765	8.0	38	30	3,751	2.1	32	30	3,600	−9.7	51	30	3,591	−8.5	42	30	3,604	−7.2	47
600	29	4,244	−12.1	44	----	------	------	----	30	4,419	2.6	44	30	4,390	−2.2	34	30	4,209	−13.5	50	30	4,199	−12.2	41	30	4,220	−11.0	44
550	29	4,906	−16.5	42	----	------	------	----	30	5,120	−2.8	51	30	5,071	−7.0	37	30	4,867	−17.9	51	30	4,864	−16.9	39	30	4,884	−15.3	38
500	29	5,614	−21.3	----	----	------	------	----	30	5,865	−7.9	42	30	5,813	−11.6	38	30	5,573	−22.0	----	30	5,567	−22.0	----	30	5,598	−20.0	35
450	29	6,389	−26.5	----	----	------	------	----	30	6,690	−13.3	----	30	6,614	−17.1	37	30	6,345	−27.0	----	30	6,341	−27.6	----	30	6,375	−25.5	----
400	29	7,223	−32.6	----	----	------	------	----	30	7,563	−19.3	----	30	7,486	−23.3	----	30	7,180	−32.8	----	30	7,170	−34.1	----	30	7,214	−31.6	----
350	29	8,150	−39.5	----	----	------	------	----	29	8,540	−27.4	----	30	8,447	−30.7	----	30	8,107	−39.5	----	30	8,090	−40.8	----	30	8,145	−38.0	----
300	28	9,191	−47.2	----	----	------	------	----	29	9,630	−36.1	----	30	9,523	−38.8	----	30	9,144	−47.0	----	30	9,124	−47.2	----	30	9,191	−44.9	----
250	28	10,375	−54.7	----	----	------	------	----	28	10,871	−45.7	----	30	10,746	−48.8	----	30	10,332	−53.7	----	27	10,311	−52.3	----	30	10,391	−50.7	----
200	22	11,800	−59.0	----	----	------	------	----	24	12,324	−56.6	----	28	12,182	−58.4	----	30	11,751	−56.9	----	25	11,736	−53.9	----	29	11,830	−55.3	----
175	21	12,638	−56.6	----	----	------	------	----	22	13,160	−61.9	----	28	13,014	−61.5	----	29	12,598	−54.9	----	25	12,593	−53.6	----	28	12,681	−55.0	----
150	12	13,613	−56.3	----	----	------	------	----	18	14,105	−66.4	----	26	13,969	−63.7	----	29	13,587	−53.2	----	24	13,575	−53.9	----	25	13,656	−54.8	----
125	11	14,767	−55.8	----	----	------	------	----	16	15,194	−70.9	----	26	15,079	−66.5	----	28	14,761	−53.6	----	20	14,740	−55.4	----	21	14,815	−57.0	----
100	8	16,170	−56.5	----	----	------	------	----	10	16,511	−74.6	----	26	16,416	−69.7	----	22	16,194	−54.5	----	17	16,149	−56.8	----	17	16,215	−58.6	----
80	6	17,589	−56.0	----	----	------	------	----	5	17,822	−75.6	----	12	17,753	−70.4	----	16	17,620	−54.2	----	10	17,563	−57.7	----	11	17,603	−59.9	----
60	----	------	------	----	----	------	------	----	----	------	------	----	----	------	------	----	7	19,443	−54.1	----	5	19,395	−57.5	----	----	------	------	----

[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 Cludad, 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 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 April 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	29	355	0.4	30	289	1.7	24	283	3.2	30	295	2.8	30	263	2.0	30	307	2.8	30	121	4.0	29	263	4.3	30	309	1.4	30	218	3.0	29	309	1.5	29	329	1.5	30	250	2.5
500	---	---	---	---	---	---	24	269	3.8	---	---	---	29	265	4.8	---	---	---	30	126	4.6	29	270	4.8	30	289	2.6	30	213	5.3	29	290	1.5	---	---	---	---	---	---
1,000	29	259	.5	---	---	---	20	271	4.7	---	---	---	29	272	4.8	30	293	2.4	24	167	2.8	23	278	4.7	29	275	4.7	25	235	6.7	27	268	2.7	---	---	---	---	---	---
1,500	26	230	1.7	---	---	---	20	273	5.5	30	301	3.8	27	283	5.1	30	281	2.1	19	205	1.0	21	273	4.8	26	270	6.2	24	265	8.0	25	278	3.3	---	---	---	30	248	2.4
2,000	21	241	2.3	30	271	2.7	20	281	8.4	30	288	4.5	27	295	7.1	30	272	2.6	17	244	3.3	16	283	6.0	23	274	8.2	22	276	9.6	25	280	4.4	29	341	2.4	30	253	2.4
2,500	19	278	3.1	30	268	3.0	19	282	11.8	30	283	5.1	27	300	8.3	29	255	3.7	14	265	3.8	15	284	7.7	15	270	8.6	21	282	12.1	23	284	5.3	29	321	2.6	29	265	2.9
3,000	18	280	4.2	30	269	3.7	19	283	11.7	27	286	7.2	25	294	10.2	28	256	5.0	12	268	4.8	14	293	8.4	12	295	8.0	21	289	14.9	17	279	7.2	25	297	3.3	27	267	4.9
4,000	18	270	8.6	30	284	5.3	15	293	16.1	25	286	10.2	18	295	10.5	25	272	7.0	11	256	6.6	12	305	8.6	---	---	---	20	284	17.2	14	278	7.4	22	290	5.8	27	268	7.2
5,000	15	270	13.5	25	292	6.3	13	285	18.4	19	289	10.0	15	305	10.7	21	289	7.1	10	273	9.1	11	308	12.2	---	---	---	15	285	18.1	11	292	10.0	22	295	7.0	25	284	9.7
6,000	12	284	16.0	23	301	7.7	11	260	20.0	16	290	10.0	---	---	---	18	297	8.9	---	---	---	---	---	---	---	---	---	11	264	22.0	10	297	16.3	15	290	8.6	21	275	14.0
8,000	11	283	20.7	17	310	10.7	---	---	---	---	---	---	---	---	---	13	315	8.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13	271	16.4
10,000	---	---	---	13	302	11.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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. (12 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	304	2.6	30	311	2.1	25	255	3.4	30	277	4.7	28	117	0.8	30	344	1.1	30	213	0.6	30	11	0.5	30	331	2.1	30	157	3.5	26	224	1.8	27	278	1.4	29	262	2.9
500	---	---	---	---	---	---	25	261	5.1	---	---	---	28	225	1.2	30	337	1.3	---	---	---	30	311	1.1	30	326	2.0	30	159	4.4	26	222	2.2	27	308	1.6	29	252	5.1
1,000	---	---	---	---	---	---	25	266	6.5	30	272	7.0	26	222	4.5	28	286	1.2	30	199	.7	27	263	1.8	30	292	1.7	30	189	3.4	23	268	3.3	25	296	1.7	28	271	6.6
1,500	---	---	---	30	310	2.3	25	270	7.8	30	261	8.1	24	227	6.5	26	256	1.8	30	198	1.0	24	277	3.6	29	240	2.6	29	221	3.5	19	278	4.0	22	247	4.2	25	291	7.5
2,000	30	307	2.6	30	301	3.1	25	267	7.1	29	258	7.9	24	244	8.3	25	269	2.5	30	243	1.2	21	282	6.3	28	232	3.0	26	235	4.8	18	282	5.3	22	266	7.2	23	300	8.4
2,500	30	303	2.1	30	288	2.8	24	278	10.9	29	266	7.5	23	252	9.3	20	280	3.8	30	258	1.9	19	293	9.0	26	230	3.2	23	234	5.4	17	277	6.9	19	275	9.3	20	300	10.5
3,000	30	283	1.5	30	272	3.2	22	292	14.7	23	271	8.7	22	255	11.3	17	295	5.3	30	259	2.4	15	293	11.1	24	228	3.7	20	237	5.8	16	271	8.9	19	280	11.6	17	301	12.3
4,000	28	254	2.6	28	288	4.0	15	291	16.3	18	273	9.2	16	276	12.4	12	323	4.9	29	271	1.8	13	285	12.4	22	250	5.5	15	235	8.5	15	273	12.3	17	285	16.1	14	295	12.9
5,000	25	271	4.4	24	307	7.1	14	288	19.5	16	293	11.8	15	268	14.0	11	318	6.7	27	304	3.1	12	284	15.5	20	264	3.6	11	246	9.2	12	255	17.4	14	282	18.2	---	---	---
6,000	23	289	7.5	22	299	9.0	---	---	---	10	294	11.2	13	269	16.6	10	327	8.0	25	314	6.1	---	---	---	17	274	5.4	---	---	---	10	253	19.7	---	---	---	---	---	---
8,000	14	296	12.9	16	302	11.3	---	---	---	---	---	---	---	---	---	---	---	---	19	312	11.0	---	---	---	16	252	9.8	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14	295	15.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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	262	5.6	26	135	1.0	29	239	0.5	30	249	1.2	29	333	1.8	30	267	2.0	29	3	0.6	26	60	1.0	30	269	3.5	30	295	4.5	30	236	3.1	30	230	3.2	30	261	3.1
500	30	287	4.0	26	131	.8	29	260	.5	30	247	1.9	---	---	---	30	265	2.5	29	290	.9	26	51	.5	29	275	2.6	30	286	4.8	30	227	4.1	---	---	---	30	261	5.0
1,000	28	295	2.6	26	152	.6	29	193	.3	30	260	2.1	29	333	1.8	30	267	3.2	28	222	.9	25	304	.1	27	285	2.1	29	292	3.8	27	219	5.8	30	227	4.4	29	272	5.5
1,500	28	260	2.1	23	240	1.0	27	236	2.2	29	251	2.0	29	312	2.5	29	265	4.6	24	250	1.4	22	275	2.1	23	288	1.4	28	296	3.9	23	211	8.0	30	228	4.6	29	271	6.0
2,000	27	274	2.5	21	244	2.8	26	268	2.3	29	252	1.7	28	279	2.7	26	270	5.2	21	296	3.9	18	261	4.3	23	290	.6	28	293	5.5	21	218	8.9	29	234	5.4	27	271	7.6
2,500	27	275	3.0	19	250	4.8	26	299	3.5	28	247	.8	28	280	4.6	26	272	5.9	20	304	6.2	14	273	5.7	23	355	1.5	24	301	7.7	18	222	9.6	26	251	6.5	24	271	8.2
3,000	27	267	3.7	18	271	6.3	25	299	5.8	28	238	1.0	27	285	6.3	24	288	7.4	18	299	8.4	13	269	7.8	23	348	1.9	21	307	7.4	14	235	10.8	22	254	8.2	24	280	9.5
4,000	27	277	3.9	16	283	7.6	24	305	7.6	28	285	3.5	24	296	9.6	19	303	9.3	18	299	9.8	11	279	11.9	22	318	5.2	21	315	8.6	10	237	12.7	19	268	10.0	20	288	13.8
5,000	26	293	5.3	15	293	9.0	17	312	9.7	26	296	5.7	21	295	8.6	19	304	10.6	12	297	9.9	11	278	15.8	18	301	7.4	18	312	11.5	---	---	---	16	273	12.1	16	295	15.7
6,000	25	284	6.0	13	299	9.7	16	311	10.3	24	289	8.7	19	311	10.2	16	311	12.7	---	---	---	10	277	17.9	16	296	8.9	16	316	13.5	---	---	---	16	270	13.1	12	296	17.7
8,000	18	279	8.3	---	---	---	13	301	15.9	16	300	11.1	10	295	14.8	11	317	7.9	---	---	---	---	---	---	11	302	13.4	---	---	---	---	---	---	---	---	---	10	288	22.4
10,000	12	287	9.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Free-air resultant winds based on rawin observations made near 0300 G. C. T. during April 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	30	202	1.5	30	96	2.3	30	69	0.9	30	102	3.2	30	322	1.4	30	218	1.1	30	357	1.3	30	339	0.6	30	278	1.5	30	233	1.5	30	208	0.6	30	280	0.4	30	317	2.7
500	---	---	---	---	---	---	---	---	---	30	114	5.0	30	296	2.7	30	250	5.1	30	17	.8	---	---	---	30	267	3.4	30	259	5.6	30	230	1.3	30	275	1.1	30	317	3.4
1,000	---	---	---	30	97	3.5	28	276	1.7	30	117	3.6	30	289	3.3	30	253	6.2	28	348	.7	---	---	---	30	273	6.2	30	269	7.2	30	267	3.9	30	267	2.9	30	308	3.7
1,500	---	---	---	30	110	1.9	28	289	4.3	30	139	1.9	30	285	3.5	30	264	7.7	28	295	2.1	28	335	.8	30	271	6.7	30	274	9.0	30	280	5.4	30	277	4.3	30	286	2.2
2,000	30	213	.9	30	238	1.6	28	297	6.4	30	241	1.8	30	282	4.5	30	268	9.5	28	296	3.8	28	326	1.6	30	269	8.0	28	269	7.4	30	293	6.5	30	265	5.9	30	257	1.4
2,500	30	258	2.0	30	262	3.8	28	300	7.8	30	251	3.8	29	287	5.4	30	270	10.8	28	302	5.4	28	315	2.0	30	272	9.2	28	275	10.1	30	296	7.0	30	267	6.4	30	243	2.8
3,000	29	286	4.3	30	272	5.2	29	302	8.6	30	243	5.5	29	283	7.3	30	269	12.0	28	302	7.7	29	313	2.7	30	269	10.8	27	272	11.5	30	304	7.7	30	268	7.8	30	245	3.8
4,000	29	288	5.3	30	278	8.5	30	305	9.7	30	246	8.7	29	286	9.0	28	273	12.8	28	298	9.5	29	322	3.5	30	271	12.6	24	267	16.3	30	305	9.6	29	268	10.0	30	271	6.9
5,000	28	305	5.9	30	277	10.5	30	304	11.1	30	254	12.6	29	273	10.1	26	252	16.1	26	294	10.7	29	314	4.4	30	272	17.7	23	288	18.9	30	300	11.5	27	270	12.4	30	265	8.0
6,000	28	315	7.5	30	279	11.1	28	300	12.3	30	258	16.7	28	281	12.5	24	257	17.2	25	298	11.8	30	325	7.4	27	280	20.2	21	274	20.1	29	296	13.6	22	254	12.4	29	267	8.8
8,000	26	296	10.4	28	264	16.7	23	283	12.2	28	261	20.3	27	280	15.3	19	254	22.7	22	289	15.6	27	296	7.0	25	285	27.1	17	257	27.2	25	300	15.0	21	238	18.7	22	261	11.8
10,000	23	277	17.3	24	275	21.0	20	276	11.9	23	262	24.7	20	263	23.0	16	271	26.2	15	262	19.7	22	290	10.1	20	269	21.5	12	287	31.6	20	307	14.6	19	238	25.7	19	259	10.7
12,000	17	284	19.7	18	261	26.3	12	304	11.5	11	268	18.4	10	260	18.3	---	---	---	10	268	23.6	14	291	12.0	11	259	36.2	---	---	---	10	316	17.0	13	252	30.0	13	263	8.9
14,000	---	---	---	12	254	20.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	65	13.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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	30	133	0.6	29	254	0.9	30	298	0.9	30	69	0.6	30	274	4.5	29	180	0.3	30	157	1.3	30	47	2.1	30	103	3.3	30	180	0.1	30	270	2.6	30	312	1.9	30	221	2.3
500	30	159	2.2	29	256	4.2	30	285	.4	30	207	.4	30	291	4.2	29	202	.6	---	---	---	30	80	3.2	30	93	6.3	29	239	.7	29	333	3.6	30	308	2.1	---	---	---
1,000	30	205	1.7	29	284	4.4	30	238	4.1	30	263	1.5	30	295	3.7	29	215	.7	30	158	1.3	30	115	2.5	29	94	6.4	29	296	2.4	29	337	4.7	30	311	2.1	30	234	4.4
1,500	30	219	3.2	29	286	5.6	30	232	6.1	30	262	1.8	30	300	2.5	30	309	.9	30	213	2.1	30	173	1.9	28	92	5.6	29	303	3.5	29	357	4.0	30	308	3.2	30	242	6.1
2,000	30	227	3.8	28	283	8.8	30	262	7.0	30	255	3.3	30	313	2.5	30	289	3.2	30	267	3.5	30	242	2.9	28	90	4.7	29	304	4.6	29	6	4.2	30	308	4.8	30	247	7.0
2,500	30	236	4.1	28	281	9.2	30	269	9.5	29	253	6.0	30	317	2.2	30	279	4.3	30	284	5.0	30	261	4.8	28	89	4.2	29	300	5.7	29	355	4.5	30	312	5.3	30	249	7.5
3,000	30	232	4.3	27	280	11.3	30	273	12.0	29	265	7.7	30	293	2.2	30	284	6.2	28	294	6.7	30	269	6.2	28	85	4.0	29	310	7.4	30	342	3.5	29	312	6.5	30	260	8.4
4,000	29	244	8.5	25	275	15.1	29	278	13.6	28	259	11.3	30	293	2.7	30	288	7.6	28	307	8.7	29	269	10.0	29	82	3.1	29	307	9.3	30	310	4.2	28	311	8.0	30	259	10.1
5,000	29	257	11.1	25	271	18.6	27	277	15.0	27	260	15.2	30	302	4.4	30	281	8.6	27	310	9.0	28	263	13.1	29	63	1.5	28	301	9.9	30	304	5.2	28	306	8.4	28	259	12.0
6,000	29	256	14.2	22	273	20.0	26	277	17.7	27	259	19.8	30	295	7.0	30	280	10.1	23	307	8.2	28	264	15.7	27	249	.3	28	296	10.1	30	299	7.6	27	301	10.5	26	262	12.4
8,000	28	263	20.1	13	272	20.2	21	256	23.5	22	252	24.7	28	282	9.8	28	271	12.8	17	266	5.4	26	262	21.0	26	297	6.5	25	288	10.6	29	293	11.2	24	292	12.6	21	277	13.0
10,000	26	284	24.0	---	---	---	16	248	31.1	16	256	26.4	23	262	11.9	25	256	17.4	15	275	11.7	21	270	25.4	26	296	15.8	22	302	13.2	25	264	16.3	13	314	10.3	18	278	15.5
12,000	22	287	28.8	---	---	---	---	---	---	---	---	---	16	264	14.3	18	256	21.6	---	---	---	12	265	27.2	25	295	22.3	21	301	12.5	22	270	19.5	---	---	---	12	275	13.1
14,000	12	264	31.2	---	---	---	---	---	---	---	---	---	10	262	11.0	14	254	16.7	---	---	---	---	---	---	18	291	20.9	13	282	10.4	17	267	16.6	---	---	---	---	---	---
16,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15	256	11.1	---	---	---	---	---	---
18,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10	265	6.4	---	---	---	---	---	---

Altitude (meters) m. s. l.	Tatoosh Island, Wash. (33 m.)		
	Observations	Direction	Speed
Surface	30	209	2.2
500	30	208	4.1
1,000	29	219	5.0
1,500	29	226	6.8
2,000	29	236	8.1
2,500	29	238	9.3
3,000	29	242	10.1

Altitude (meters) m. s. l.	Tatoosh Island, Wash. (33 m.)		
	Observations	Direction	Speed
4,000	28	245	13.4
5,000	28	249	17.3
6,000	26	263	18.5
8,000	21	267	26.0
10,000	15	261	20.8
12,000	12	262	23.3

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.

RIVER STAGES AND FLOODS FOR APRIL 1949

The most damaging floods during the month occurred in the lower Rio Grande in Texas, seriously affecting growing crops. Considerable damage also resulted from the flash flood at Herington, Kans., and from the flooding on the Souris and Heart Rivers in North Dakota in connection with the ice break-up there. The crest on the lower Missouri at Nebraska City, Nebr., was second only to the great ice jam flood of March 1949, but was the highest of record for stages uninfluenced by ice conditions.

Precipitation during April was mostly below normal (see chart V). It was above normal over most of the southern states, portions of the Missouri Basin, and the central portion of the northeastern states. The heaviest precipitation occurred in northern Florida and southern Texas where it averaged 200 percent of normal.

Hudson Bay drainage.—Snowfall was heavy during the winter in the Red River Valley of the North from Fargo-Moorhead, northward to the Canadian border. The snow-cover ranged from 12 to 26 inches in this section with local depths of 61 inches at Grafton and 33 inches at Hannah, N. Dak. by the end of February. South of Fargo, the snow-cover was much lighter ranging up to 11 inches. During the second week of March, the water equivalent of the snow-cover ranged from 3 to 5 inches in the northern portion, with the heavier amounts in the Devil's Lake and Souris basins, and from 1 to 2 inches in

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