METEOROLOGICAL AND CLIMATOLOGICAL DATA FOR MAY 1941

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AEROLOGICAL OBSERVATIONS

By EARL C. THOM

The mean surface temperatures for May were above normal over nearly all of the United States (chart I). At eight widely scattered stations surface temperatures were from 1° to 3° F. below normal for the month while over a considerable part of the upper Mississippi River Valley temperatures were from 6° to 8° F. above normal.

At 1,500 meters above sea level the 5 a. m. resultant winds for the month were from directions to north of normal over most of the country. The resultants were from directions to the south of normal at this level over most of the northwestern and over a considerable area in the Central States while the opposite turning from normal occurred over the rest of the country. At 3,000 meters the morning resultant winds were from directions to the north of normal over the eastern third of the country and over a small area in the Southwest, and were from directions to the south of normal over all other parts of the United States. When the 5 p. m. resultant winds were compared with the corresponding 5 a. m. normals for the 5,000 m. level it was found that the late afternoon resultants were from dirctions to the south of the corresponding morning normals over most of the country. The turning of resultants to the northward during the day at this level occurred over only two stations in the western two-thirds of the country and over six stations to the eastward.

At both the 1,500-m. and 3,000-m. levels the 5 a. m. resultant wind velocities for the month were generally above the corresponding normals while at 5,000 meters the late afternoon resultant velocities were considerably above the corresponding morning normals over all stations except Salt Lake City.

At 1,500 m. the late afternoon resultant winds for the month were from directions to the south of the directions of the corresponding morning winds except in the extreme Northwest and along the Gulf coast where opposite turning took place during the day. The turning of the resultants to the southward during the day was also generally the case at the 3,000-m. level.

The 5 p. m. resultant wind velocities at 1,500 meters were higher than the corresponding morning velocities over the extreme Northwest and over most of the Northeast and extreme East portions of the country, while these velocities in general decreased during the day at this level over the remainder of the country. At 3,000 meters the late afternoon resultant velocities were generally higher than those in the morning, there being only scattered stations where the velocities decreased during the day.

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

At radiosonde and airplane stations in the United States proper, the highest mean monthly pressure at each of the 20 standard levels from 1,000 to 18,000 meters occurred over the southern third of the United States. At 10,000 meters the highest mean pressure was over Miami. At 9 of the lower levels the highest mean pressure for the country was recorded over Pensacola while at 10 of the 20 standard levels the same highest mean pressure was reported over 2 or more stations. The lowest mean pressure for the month was recorded over Portland, Maine, for the standard levels from 1,000 to 3,000 meters and over Seattle, Wash., for the levels from 5,000 to 13,000 meters while the same minimum was reported by both Seattle, Wash., and Portland, Maine, for the 4,000-m. level and for the levels from 14,000 meters to 18,000 meters, inclusive.

Mean monthly pressures for May were generally higher than those of last month at all levels above the surface. The only exception of interest occurred over northeastern and extreme eastern parts of the country at the 1,000-, 1,500-, and 2,000-m. levels. This increase in mean pressure over that of last month was considerable over the western half of the country especially at the levels from 5,000 to 13,000 meters, inclusive. Over the Rocky Mountain Plateau region, for example, pressures averaged about 10 mb. higher than last month for these levels.

The largest difference between the highest and lowest mean monthly pressures at any of the standard levels for stations in the United States was 20 mb. which occurred at the 7,000-, 8,000-, and 9,000-m. levels. Steep pressure gradients occurred on the pressure charts across both the northwest and the northeast sections of the country with the steepest gradient, a change of 1 mb. for each 50 miles of horizontal distance, being recorded at both the 8,000- and 9,000-m. levels between Seattle, Wash., and Boise, Idaho.

Mean temperatures for the month were higher than they were in April at most levels up to and including 11,000 meters over all of the country. The only exceptions were over Brownsville at the levels from 2,000 to 4,000 meters, where temperatures averaged slightly lower than last month. At most of the levels from 12,000 to 19,000 meters, however, temperatures were higher than last month over the extreme northwestern and extreme northeastern parts of the United States. Over the rest of the country temperatures were lower than last month at these levels, being considerably lower over the Rocky Mountains as shown at Denver where temperatures averaged 5° C. lower than last month for the levels from 13,000 to 17,000 meters.

Comparisons of the May mean temperature charts for 1941 with those for 1940 show that temperatures over the eastern two-thirds of the country were higher than last year at most levels up to 12,000 meters, while they were lower at most of these levels over the western third of the country. Above 12,000 meters the departures were the opposite with most of these upper levels recording mean temperatures higher than last year over the western one-third and lower over the eastern two-thirds of the country.

At 1,000 meters temperatures were above normal over most of the country, being below normal at this level only at St. Louis and in parts of the extreme West. At 3,000 meters temperatures were below normal for the month over most of the northern half of the country and above normal to the southward. At 5,000 meters temperatures were generally below normal west of the Great Divide and in the extreme northeast with temperatures elsewhere in the country at this level above normal.

Mean relative humidities at the 1,000-m. level were below normal for the month over the southeast and over the southern California coastal area and above normal generally over the rest of the country. At the 3,000- and 5,000-m. levels relative humidities were generally above normal, there being only a few scattered exceptions.

The altitude at which the monthly mean temperature of 0° C. occurred, varied over the United States from 2,200 meters over Seattle, Wash., to 4,500 meters over Brownsville, Tex., and Pensacola, Fla. At San Juan this mean temperature of 0° occurred at 4,900 meters while at Swan Island it occurred at 5,000 meters. The level at which freezing conditions occurred during the month was higher than in April, being much higher over the Rocky Mountains where it averaged about 1,200 meters higher than last month.

The lowest temperature for the month in the free air over the United States was −79.0° C. (−110.2° F.) recorded over Miami, Fla., on the 6th at an altitude of 14,600 meters (about 9 miles). A lower temperature, −87.5° C. (−125.5° F.) was, however, recorded at 16,900 meters over Swan Island on the 5th.

Table 3 shows the maximum free air wind velocities and their directions for various sections of the United States during May as determined by pilot balloon observations. The highest wind velocity for the month was 70.8 meters per second (158.3 m. p. h.) observed over Rapid City, S. Dak., on May 7. This wind was blowing from the WNW. at an elevation of 9,990 meters.

The highest wind velocities observed in the month of May during the last 5 years occurred in 1939. In the upper-air layer from the surface to 2,500 meters a wind of 47.7 m. p. s. was reported on May 19, 1939, blowing from the WNW. at an elevation of 1,700 meters over Billings. In the next layer, from 2,500 meters to 5,000 meters, the highest wind during the month in the last 5 years was 58.7 m. p. s. reported on May 21, 1939, from the SSW. at an elevation of 3,080 meters over Ely, Nev., while above 5,000 meters the corresponding maximum for this period was 80.0 m. p. s. from the SSW. on May 8, 1939, at 16,630 meters over Redding, Calif.

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

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,620 m.)				Atlanta, Ga. (300 m.)				Bismarck, N. Dak. (505 m.)				Boise, Idaho (864 m.)				Brownsville, Tex. (6 m.)				Buffalo, N. Y. (221 m.)				Charleston, S. C. (14 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	837	16.0	48	31	983	19.0	61	30	953	12.8	71	31	914	12.7	70	31	1,013	22.7	91	31	989	10.9	73	30	1,016	16.8	88
500					31	960	21.4	58									31	957	20.7	84	31	957	13.6	64	30	960	19.4	55
1,000					31	906	18.7	54	30	899	12.9	65	31	899	14.8	63	31	903	19.1	70	31	902	11.2	58	30	906	16.9	46
1,500					31	854	15.5	53	30	846	10.5	64	31	848	12.6	54	31	852	16.9	60	31	849	8.0	58	30	854	13.8	44
2,000	31	800	15.2	46	31	805	11.9	55	30	797	8.0	62	31	798	8.8	54	31	804	14.7	53	31	799	5.0	60	30	804	10.6	45
2,500	31	754	11.9	44	31	758	8.4	58	30	750	4.7	61	31	751	5.0	58	31	757	12.2	49	31	751	1.7	63	30	757	7.6	45
3,000	31	710	8.2	45	31	713	5.1	57	30	705	1.6	61	31	706	1.8	61	31	713	9.4	45	31	705	−1.2	65	30	712	4.7	42
4,000	30	628	0.1	50	30	630	0.1	49	30	622	−4.4	60	30	623	−5.0	65	31	631	3.4	43	30	622	−6.3	62	30	629	−0.9	33
5,000	30	553	−7.7	54	30	556	−5.6	45	30	547	−11.0	59	30	548	−12.0	64	31	557	−3.0	41	29	546	−11.9	54	30	555	−7.0	28
6,000	30	486	−14.6	48	30	488	−12.2	42	30	480	−17.7	51	29	480	−18.9	58	31	491	−9.7	36	29	479	−18.6	50	30	487	−13.2	28
7,000	30	425	−21.8	44	29	428	−19.4	41	30	419	−24.8	47	26	419	−25.9	53	31	430	−16.9	33	29	418	−26.0	47	30	426	−20.1	25
8,000	30	370	−29.1	42	29	373	−26.5	39	29	364	−32.4	47	26	364	−33.4	52	31	376	−24.3	31	29	363	−33.3	44	30	371	−27.8	24
9,000	30	321	−36.5	41	29	323	−34.2	38	29	315	−40.0	45	24	315	−40.9		31	326	−31.5	30	29	314	−40.5		30	322	−35.9	24
10,000	30	278	−43.7		29	280	−42.0		29	272	−47.1		22	272	−48.3		31	283	−38.7	30	27	271	−47.2		30	279	−43.3	
11,000	30	239	−50.5		29	241	−49.3		28	233	−52.8		21	233	−53.6		30	244	−45.9		27	232	−51.3		30	240	−50.6	
12,000	29	204	−56.0		29	206	−55.8		28	200	−55.4		21	199	−55.0		30	210	−52.9		27	199	−54.2		29	205	−56.7	
13,000	29	174	−58.2		29	176	−59.8		28	171	−55.2		21	170	−54.0		28	179	−59.1		26	170	−56.4		28	175	−60.4	
14,000	28	149	−60.0		28	150	−62.2		28	146	−54.3		19	146	−53.6		27	153	−62.9		26	145	−56.4		28	149	−62.4	
15,000	28	127	−60.0		27	128	−62.8		28	125	−55.4		18	124	−54.3		27	129	−65.3		26	124	−56.1		28	126	−64.7	
16,000	28	108	−61.3		26	108	−63.3		28	107	−56.5		17	106	−55.4		26	110	−67.4		25	106	−57.1		27	107	−65.1	
17,000	27	92	−62.6		25	92	−63.0		26	91	−56.5		15	91	−56.0		25	93	−68.8		23	90	−57.4		26	91	−64.6	
18,000	25	78	−62.3		19	78	−61.6		17	78	−56.4		13	77	−56.2		20	78	−67.9		19	76	−56.5		21	77	−63.3	
19,000	20	67	−60.8		12	66	−59.4		8	67	−56.4		5	66	−56.2		13	67	−65.6		11	65	−55.6		16	66	−61.2	
20,000	8	56	−59.4																		6	55	−55.0		7	56	−58.5	

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Coco Solo, C. Z.[1] [2] (15 m.)				Denver, Colo. (1,616 m.)				El Paso, Tex. (1,193 m.)				Ely, Nev. (1,908 m.)				Great Falls, Mont. (1,128 m.)				Juneau, Alaska (49 m.)				Ketchikan, Alaska (26 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	23	1,011	26.9	88	28	836	12.0	68	31	880	20.7	45	31	808	8.4	61	31	885	11.3	58	29	1,005	10.5	66	31	1,010	9.8	75
500	23	956	24.6	90																	29	952	7.2	70	31	954	7.2	74
1,000	23	904	21.9	83																	29	895	3.4	74	31	897	3.6	76
1,500	23	853	19.1	77					31	849	20.4	42					31	846	11.2	57	29	841	−0.2	79	31	843	−0.1	78
2,000	23	804	16.7	67	28	799	11.9	61	31	801	17.0	41	31	800	10.1	56	30	796	7.7	56	29	790	−3.8	83	31	792	−3.5	75
2,500	23	758	14.3	56	28	752	8.8	59	31	755	13.3	42	31	753	8.2	50	30	749	4.0	57	29	741	−7.2	83	31	742	−6.7	72
3,000	23	714	11.5	51	27	708	5.4	58	31	711	9.2	43	31	708	4.4	50	30	704	0.2	59	28	695	−10.2	79	31	696	−9.9	67
4,000	10	633	4.7	55	27	626	−2.0	60	31	629	1.5	46	31	626	−3.3	56	30	621	−6.7	62	24	609	−16.4	70	31	610	−16.5	61
5,000					27	551	−9.7	60	31	555	−6.0	49	30	551	−10.5	59	30	546	−13.6	61	23	533	−23.2	66	31	534	−23.0	59
6,000					27	483	−16.9	60	30	488	−13.2	50	30	483	−17.1	54	30	477	−20.5	61	21	464	−30.0	64	31	465	−29.8	56
7,000					27	423	−23.9	56	30	427	−20.4	47	30	422	−24.7	51	30	416	−27.5	59	20	402	−37.1	63	30	403	−36.6	55
8,000					26	368	−31.2	54	30	372	−27.7	45	30	366	−31.9	48	30	362	−34.7	58	20	347	−43.9		26	348	−43.2	
9,000					26	319	−38.8	52	30	323	−35.4	44	28	317	−39.5	47	29	313	−41.6		16	298	−48.5		24	299	−48.2	
10,000					26	275	−46.4		29	279	−43.1		27	274	−46.9		29	270	−48.1		16	256	−50.7		23	257	−49.9	
11,000					24	236	−52.9		29	240	−49.7		26	235	−52.0		27	232	−53.0		13	220	−47.3		23	221	−50.1	
12,000					24	202	−58.1		29	206	−55.5		24	201	−54.4		25	198	−54.4		12	189	−45.8		21	189	−48.8	
13,000					23	173	−59.5		29	176	−59.6		24	172	−55.6		25	169	−53.5		12	162	−45.4		21	162	−48.4	
14,000					23	147	−59.1		29	150	−61.5		23	147	−56.3		24	145	−53.6		10	140	−45.5		16	139	−48.6	
15,000					21	126	−60.3		28	127	−62.2		22	125	−57.3		24	124	−54.1		10	120	−46.0		14	119	−49.0	
16,000					19	107	−61.1		27	108	−63.7		22	107	−58.5		19	105	−55.6		8	104	−46.2		11	102	−49.2	
17,000					17	91	−60.7		24	92	−65.2		19	91	−59.3		15	90	−55.9		8	89	−46.6		6	87	−49.0	
18,000					11	78	−60.0		21	78	−64.4		14	77	−59.5		12	76	−55.7		7	77	−46.9					
19,000					7	67	−59.3		12	66	−62.4		7	66	−58.7		8	65	−54.4		5	66	−47.2					

Footnotes at end of table.

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

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Lakehurst, N. J.[1] (39 m.)				Medford, Oreg. (401 m.)				Miami, Fla. (4 m.)				Nashville, Tenn. (180 m.)				Nome, Alaska (14 m.)				Norfolk, Va.[1 2] (10 m.)				Oakland, Calif. (20 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	1,010	11.1	81	31	968	13.7	68	31	1,016	20.6	84	31	996	18.2	69	30	1,007	4.2	70	29	1,017	16.5	78	31	1,016	15.5	74
500	31	957	14.1	67	31	956	14.0	68	31	960	19.7	82	31	960	19.4	59	30	948	0.9	71	29	960	18.1	56	30	958	12.8	76
1,000	31	902	11.4	63	31	901	11.7	68	31	905	16.5	82	31	906	16.3	58	30	891	−1.9	71	29	905	15.9	49	30	903	12.3	62
1,500	31	849	8.1	64	31	848	8.4	72	31	854	14.3	68	31	854	13.1	59	30	836	−4.3	68	29	853	12.8	52	30	850	10.5	59
2,000	31	799	4.7	66	31	798	4.9	76	31	804	12.7	51	31	804	9.8	59	30	785	−7.4	67	29	803	10.0	53	30	800	8.3	56
2,500	31	751	1.6	65	31	750	1.9	77	31	758	10.4	44	31	757	6.6	61	30	736	−10.4	65	28	756	6.5	55	30	753	5.7	51
3,000	31	706	−1.1	63	31	705	−1.0	73	31	713	7.9	39	31	712	3.4	60	30	689	−13.3	62	28	711	3.2	57	31	708	3.1	48
4,000	31	621	−6.6	57	31	621	−6.9	63	31	631	2.7	33	31	629	−1.9	51	30	603	−19.2	59	28	627	−2.6	54	31	625	−3.1	45
5,000	31	546	−12.1	50	31	546	−12.6	58	31	557	−3.2	30	31	554	−7.8	47	30	527	−25.6	58	23	553	−8.8	44	31	550	−9.5	43
6,000	31	478	−18.5	46	31	478	−19.4	58	31	490	−9.7	29	30	486	−14.5	46	29	458	−32.7	57	----	----	----	----	31	482	−16.5	43
7,000	31	417	−25.6	47	31	417	−25.9	57	31	430	−16.8	29	28	426	−21.3	44	29	396	−39.6	55	----	----	----	----	31	422	−23.7	41
8,000	31	363	−33.0	53	30	362	−33.4	55	30	376	−23.9	28	28	371	−28.3	43	29	342	−46.0	----	----	----	----	----	31	366	−31.1	39
9,000	31	314	−40.3	----	30	313	−40.9	----	29	327	−31.0	28	27	322	−35.6	42	29	293	−50.7	----	----	----	----	----	31	317	−38.5	39
10,000	31	271	−46.6	----	30	270	−47.3	----	29	284	−38.3	28	27	278	−43.2	----	28	252	−50.1	----	----	----	----	----	31	274	−45.7	----
11,000	31	233	−51.3	----	29	232	−52.1	----	29	245	−45.5	----	27	239	−50.5	----	28	217	−46.8	----	----	----	----	----	31	235	−51.8	----
12,000	30	199	−54.8	----	29	198	−54.5	----	29	210	−52.9	----	27	205	−56.5	----	28	186	−45.1	----	----	----	----	----	31	201	−55.7	----
13,000	30	170	−56.8	----	27	170	−53.9	----	28	179	−60.1	----	26	175	−61.1	----	27	160	−44.8	----	----	----	----	----	31	172	−56.3	----
14,000	29	146	−58.2	----	26	145	−54.0	----	27	152	−65.4	----	25	148	−62.3	----	26	138	−44.7	----	----	----	----	----	31	146	−56.9	----
15,000	27	124	−58.5	----	25	124	−54.5	----	27	129	−68.6	----	25	126	−63.2	----	22	119	−44.9	----	----	----	----	----	30	125	−57.7	----
16,000	23	106	−58.3	----	22	107	−55.7	----	26	110	−70.3	----	23	107	−63.5	----	21	102	−45.1	----	----	----	----	----	25	107	−59.2	----
17,000	19	90	−58.0	----	20	91	−56.0	----	25	93	−69.6	----	22	91	−64.0	----	21	88	−45.2	----	----	----	----	----	22	91	−59.6	----
18,000	7	76	−57.1	----	16	78	−55.8	----	20	78	−66.5	----	20	77	−63.0	----	16	76	−45.3	----	----	----	----	----	14	77	−58.2	----
19,000	----	----	----	----	7	67	−55.4	----	13	66	−63.1	----	18	65	−61.6	----	11	65	−45.6	----	----	----	----	----	10	66	−57.5	----
20,000	----	----	----	----	----	----	----	----	5	56	−60.1	----	12	55	−60.0	----	7	56	−45.8	----	----	----	----	----	----	----	----	----
21,000	----	----	----	----	----	----	----	----	----	----	----	----	5	47	−58.5	----	----	----	----	----	----	----	----	----	----	----	----	----

Stations with elevations in meters above sea level

Altitude (meters) m. s. l.	Oklahoma City, Okla. (391 m.)				Omaha, Nebr. (301 m.)				Pearl Harbor, T. H. (7 m.)[1 2]				Pensacola, Fla. (24 m.)				Phoenix, Ariz. (339 m.)				Portland, Maine (19 m.)				St. Louis, Mo. (171 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	969	18.9	85	31	979	17.8	71	31	1,015	21.1	78	30	1,016	23.5	73	31	970	20.6	51	27	1,009	8.9	86	31	996	18.0	73
500	31	957	19.4	79	31	956	17.5	68	31	959	19.5	77	30	961	21.6	66	31	953	25.4	42	27	953	12.6	69	31	959	17.2	69
1,000	31	903	18.2	70	31	902	15.0	65	31	905	16.4	82	30	908	19.1	61	31	900	22.8	36	27	898	9.7	66	30	904	14.1	69
1,500	31	852	15.6	69	31	850	12.3	65	31	853	13.7	79	30	856	16.1	58	31	849	19.0	34	27	844	6.4	66	30	852	11.1	70
2,000	31	803	12.9	64	31	800	9.3	64	31	804	12.1	61	30	807	12.9	57	31	800	14.8	35	27	794	3.0	69	30	802	8.9	67
2,500	31	756	10.0	59	31	753	6.1	63	31	757	10.9	46	30	760	10.1	53	31	754	10.9	36	27	746	−0.7	72	30	754	6.1	64
3,000	31	712	6.8	59	31	709	2.9	63	31	713	9.5	35	30	715	7.8	47	31	710	7.0	39	27	701	−2.5	72	30	710	3.2	63
4,000	31	630	0.4	58	31	626	−3.3	54	31	632	6.0	23	29	633	2.9	37	30	628	0.3	43	25	617	−8.5	66	29	626	−2.6	57
5,000	31	555	−5.7	52	31	550	−9.4	49	----	----	----	----	26	559	−2.7	36	30	554	−6.3	44	24	542	−14.4	60	29	552	−8.6	51
6,000	31	488	−12.6	47	31	483	−16.1	44	----	----	----	----	20	492	−9.0	37	30	487	−13.4	42	23	474	−21.3	55	29	484	−15.2	45
7,000	31	427	−19.5	43	27	423	−22.9	42	----	----	----	----	20	432	−16.0	40	28	426	−21.1	41	22	413	−28.9	56	29	423	−22.1	39
8,000	30	372	−26.7	41	27	368	−30.1	40	----	----	----	----	18	376	−23.5	43	28	371	−28.8	40	21	358	−36.0	53	27	369	−29.2	37
9,000	30	323	−34.1	40	27	318	−37.5	37	----	----	----	----	17	327	−31.0	48	27	322	−36.3	39	20	309	−43.0	----	26	319	−36.5	36
10,000	30	280	−42.1	----	26	275	−44.7	----	----	----	----	----	17	283	−38.4	----	26	279	−43.4	----	19	266	−48.2	----	23	276	−43.9	----
11,000	28	241	−49.7	----	26	236	−51.5	----	----	----	----	----	14	245	−45.5	----	26	240	−49.4	----	18	229	−51.1	----	21	237	−50.6	----
12,000	27	206	−56.6	----	25	202	−57.1	----	----	----	----	----	14	210	−52.1	----	26	206	−54.1	----	17	196	−53.1	----	21	203	−56.7	----
13,000	24	176	−61.5	----	25	172	−60.1	----	----	----	----	----	12	180	−57.9	----	25	175	−57.1	----	17	168	−54.8	----	20	173	−61.1	----
14,000	24	150	−62.0	----	22	147	−59.3	----	----	----	----	----	8	154	−62.7	----	25	150	−58.2	----	15	143	−55.1	----	19	147	−62.4	----
15,000	24	127	−62.2	----	22	125	−59.0	----	----	----	----	----	----	----	----	----	25	128	−59.2	----	13	122	−55.1	----	18	125	−62.1	----
16,000	24	108	−63.1	----	22	106	−59.3	----	----	----	----	----	----	----	----	----	25	109	−60.5	----	11	105	−56.1	----	17	107	−61.5	----
17,000	20	92	−63.2	----	22	91	−59.2	----	----	----	----	----	----	----	----	----	24	93	−61.8	----	10	89	−56.8	----	16	91	−61.4	----
18,000	13	78	−61.7	----	18	77	−59.5	----	----	----	----	----	----	----	----	----	21	79	−61.9	----	9	76	−56.5	----	15	77	−60.9	----
19,000	8	66	−60.5	----	15	66	−58.4	----	----	----	----	----	----	----	----	----	19	68	−60.3	----	----	----	----	----	13	66	−60.0	----
20,000	----	----	----	----	10	56	−57.6	----	----	----	----	----	----	----	----	----	10	57	−58.6	----	----	----	----	----	9	55	−58.7	----
21,000	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5	49	−56.6	----	----	----	----	----	5	47	−57.2	----

Footnotes at end of table.

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

Altitude (meters), m. s. l.	Stations with elevations in meters above sea level																							
	St. Paul, Minn. (225 m.)				San Diego, Calif.[1] (19 m.)				San Antonio, Tex. (174 m.)				San Juan, P. R. (15 m.)				St. Thomas, V. I.[1 2] (8 m.)				S. S. Marie, Mich. (221 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	31	987	15.5	74	29	1,011	18.2	79	31	994	21.3	91	30	1,013	24.9	87	28	1,015	27.6	75	31	989	8.4	79
500	31	956	15.3	70	29	956	16.4	73	31	958	20.5	89	30	959	23.3	88	28	960	23.5	93	31	957	10.4	71
1,000	31	901	13.1	67	29	901	16.6	58	31	904	18.8	80	30	905	20.3	83	28	907	20.2	84	31	901	9.8	64
1,500	31	848	10.4	67	29	850	15.0	46	31	853	16.1	75	30	854	17.5	79	28	856	17.6	77	31	848	7.3	63
2,000	31	799	7.8	65	29	800	13.3	38	31	804	14.1	67	30	805	15.1	68	28	807	15.5	68	31	798	4.4	62
2,500	31	752	5.2	63	29	754	10.4	34	31	757	11.9	57	30	759	12.7	65	27	760	13.3	59	31	750	1.3	63
3,000	31	707	2.3	65	29	709	7.1	33	31	713	9.2	49	30	715	10.0	59	27	717	10.9	52	31	704	−1.6	66
4,000	31	624	−3.8	65	29	628	0.8	34	31	631	3.0	45	30	634	4.7	50	27	635	5.7	52	31	620	−7.1	64
5,000	31	549	−9.7	54	29	553	−6.4	35	31	558	−3.4	40	30	560	−0.6	45					31	545	−12.6	56
6,000	31	481	−16.4	49	29	486	−12.7	34	31	490	−10.4	37	30	493	−6.2	42					31	477	−19.0	51
7,000	31	420	−23.8	47	29	426	−20.1	34	31	430	−17.2	36	30	434	−12.6	41					30	416	−26.0	50
8,000	30	366	−30.9	45	25	371	−27.8		31	375	−24.3	35	27	380	−19.6	41					29	362	−33.3	49
9,000	30	317	−38.0	44	24	322	−35.1		31	326	−31.8	35	26	331	−26.6	40					28	313	−40.6	
10,000	29	274	−44.9		22	278	−42.1		30	283	−39.6	35	24	288	−34.0	39					26	270	−47.1	
11,000	29	235	−51.3		22	240	−48.8		28	244	−47.2		21	249	−42.0						25	232	−52.0	
12,000	28	202	−56.2		22	206	−55.1		26	209	−53.7		19	214	−50.0						23	198	−55.1	
13,000	25	172	−58.0		20	176	−58.9		25	178	−58.6		17	183	−58.1						22	169	−55.7	
14,000	23	146	−56.7		16	150	−61.5		25	152	−61.7		17	156	−65.7						21	145	−55.0	
15,000	21	125	−56.7		14	127	−63.0		24	129	−63.8		17	132	−72.9						20	124	−55.2	
16,000	18	107	−57.3		11	108	−65.1		23	110	−65.2		16	111	−77.6						16	106	−55.8	
17,000	16	91	−56.7		8	92	−64.5		19	93	−66.2		15	93	−77.6						8	91	−56.2	
18,000	9	77	−56.1						15	79	−65.0		13	78	−74.5						6	78	−56.1	
19,000	8	66	−55.4						12	67	−62.9		11	66	−68.9									
20,000	7	56	−55.0										8	56	−63.6									
21,000	5	48	−54.2										5	46	−59.2									

Altitude (meters) m. s. l.	Stations with elevations in meters above sea level																Late report April 1941			
	Seattle, Wash.[1] (27 m.)				Spokane, Wash. (598 m.)				Swan Island, W. I. (10 m.)				Washington, D. C. (5 m.)				Swan Island, West Indies (10 m.)			
	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity	Number of observations	Pressure	Temperature	Relative humidity
Surface	30	1,012	12.8	76	31	943	11.7	73	30	1,010	26.4	84	29	1,016	16.1	65	30	1,011	26.3	81
500	30	956	10.4	77					30	956	23.4	88	29	958	16.6	57	30	956	22.6	85
1,000	30	901	7.4	80	31	899	11.3	66	30	903	20.4	84	29	903	13.9	53	30	903	20.3	82
1,500	30	848	4.1	84	31	846	8.2	63	30	852	17.9	78	29	851	10.6	53	30	852	18.1	68
2,000	30	796	0.8	84	31	796	4.7	65	30	803	15.5	71	29	801	6.8	55	30	803	15.5	59
2,500	30	748	−2.2	80	31	748	1.0	68	30	757	13.2	67	29	754	3.8	55	30	757	12.7	52
3,000	30	702	−4.8	74	31	703	−2.4	69	30	713	10.7	64	29	708	0.7	55	30	713	10.7	44
4,000	30	617	−10.4	67	30	619	−8.8	67	29	632	5.6	68	29	624	−5.2	57	30	632	5.5	35
5,000	30	541	−17.3	66	30	543	−15.3	63	28	559	0.1	67	29	549	−10.7	51	30	559	−0.4	33
6,000	30	473	−24.3	70	29	475	−22.0	59	28	493	−5.9	63	29	481	−17.0	46	30	492	−6.0	33
7,000	30	412	−31.4	73	26	414	−28.6	57	26	433	−12.0	58	29	421	−24.1	44	30	433	−12.8	34
8,000	30	356	−38.0	70	26	359	−36.0	54	25	380	−18.7	56	28	365	−31.4	42	30	379	−19.7	34
9,000	29	307	−44.6		23	310	−42.9		24	330	−26.0	55	28	317	−38.5	39	30	330	−26.6	34
10,000	29	265	−50.0		23	267	−48.8		23	288	−33.6	53	28	274	−44.9		30	287	−34.1	34
11,000	29	227	−52.7		22	230	−52.8		21	249	−42.0		28	235	−50.2		30	248	−41.7	
12,000	27	195	−52.7		20	196	−53.3		21	214	−50.0		27	202	−54.4		29	214	−49.5	
13,000	26	167	−52.6		20	168	−51.3		21	183	−58.6		27	172	−57.3		29	183	−57.4	
14,000	25	143	−52.8		18	144	−51.1		21	156	−67.0		27	147	−58.2		29	156	−64.9	
15,000	23	122	−53.6		13	123	−51.2		20	132	−74.4		24	125	−58.3		29	132	−72.3	
16,000	22	105	−54.7		10	106	−52.2		19	110	−79.7		18	106	−58.4		29	111	−77.6	
17,000	21	89	−55.6		6	91	−52.4		19	92	−81.4		13	91	−58.2		27	93	−79.6	
18,000	17	76	−55.6						13	77	−76.5		8	77	−57.3		24	78	−76.5	
19,000	12	64	−55.2						10	65	−70.8		5	65	−56.5		19	66	−70.4	
20,000	5	54	−54.7						5	55	−65.4						13	55	−64.4	
21,000																	9	47	−59.3	
22,000																	5	40	−56.2	

[1] U. S. Navy.
[2] Airplane observations.

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

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

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

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

Altitude (meters) m. s. l.	Abilene, Tex. (537 m.)			Albuquerque, N. Mex. (1,630 m.)			Atlanta, Ga. (299 m.)			Billings, Mont. (1,095 m.)			Bismarck, N. Dak. (512 m.)			Boise, Idaho (866 m.)			Brownsville, Tex. (7 m.)			Buffalo, N. Y. (220 m.)			Burlington, Vt. (132 m.)			Charleston, S. C. (18 m.)			Chicago, Ill. (192 m.)			Cincinnati, Ohio (152 m.)			Denver, Colo. (1,627 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	155	4.2	31	200	1.8	31	252	2.0	30	207	1.1	30	235	1.4	30	307	2.4	30	127	5.4	31	256	4.1	31	343	2.1	30	170	2.8	30	230	1.0	31	262	1.9	29	134	1.3
500	---	---	---	---	---	---	31	270	2.3	---	---	---	---	---	---	---	---	---	30	124	6.2	31	261	5.8	31	338	4.0	30	198	3.4	30	247	1.3	31	265	3.7	---	---	---
1,000	30	158	5.3	---	---	---	31	272	2.1	---	---	---	28	239	25.3	30	316	2.2	24	127	3.3	30	269	6.1	31	323	5.3	30	251	2.2	28	249	4.4	31	258	3.9	---	---	---
1,500	29	175	5.8	---	---	---	31	273	2.6	30	243	2.1	28	245	3.4	30	296	2.2	22	131	2.0	30	282	6.7	29	313	7.0	30	296	3.3	27	249	6.2	30	263	5.0	---	---	---
2,000	28	190	6.2	31	177	2.6	29	283	3.6	30	234	1.8	24	238	5.4	30	258	2.7	18	145	0.5	26	296	7.6	26	312	7.6	30	296	4.2	22	249	5.8	29	271	7.0	29	132	1.8
2,500	25	202	5.1	31	227	3.3	28	299	4.3	29	245	3.0	20	232	7.3	28	244	4.3	17	74	0.7	24	300	8.7	21	314	8.6	30	297	5.5	21	268	5.8	27	276	7.6	28	183	1.4
3,000	24	216	4.8	30	240	4.7	26	303	4.7	28	252	4.6	20	250	7.4	27	253	5.4	15	16	2.1	19	304	9.6	18	322	9.4	30	297	5.7	19	284	6.2	23	289	8.7	27	218	2.6
4,000	21	246	3.9	29	246	6.9	24	303	6.3	24	260	9.4	15	271	9.0	22	247	6.3	13	16	2.7	13	327	10.9	11	320	8.6	28	300	7.4	18	299	7.8	17	295	9.2	24	245	6.8
5,000	19	259	5.4	25	260	10.6	22	303	8.1	20	260	10.0	13	278	10.5	18	267	7.0	10	301	3.5	10	332	13.9	---	---	---	25	299	8.6	14	306	9.0	13	294	9.6	20	261	10.2
6,000	17	281	6.1	23	256	9.4	22	307	10.5	18	264	10.5	12	282	13.0	13	245	10.8	---	---	---	10	336	16.1	---	---	---	23	297	9.7	13	311	9.8	---	---	---	18	254	8.2
8,000	16	270	8.5	15	268	14.7	18	295	11.1	14	267	11.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15	298	7.6	10	325	12.6	---	---	---	11	243	15.3
10,000	14	262	11.5	10	297	16.8	15	303	15.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13	309	12.2	---	---	---	---	---	---	---	---	---
12,000	10	258	16.7	---	---	---	10	298	15.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	El Paso, Tex. (1,196 m.)			Ely, Nev. (1,910 m.)			Grand Junction, Colo. (1,413 m.)			Greensboro, N. C. (271 m.)			Havre, Mont. (767 m.)			Jacksonville, Fla. (14 m.)			Las Vegas, Nev. (570 m.)			Little Rock, Ark. (79 m.)			Medford, Oreg. (410 m.)			Miami, Fla. (10 m.)			Minneapolis, Minn. (265 m.)			Mobile, Ala. (9 m.)			Nashville, Tenn. (194 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	246	2.3	31	240	2.2	31	254	1.6	29	268	1.8	29	279	1.7	31	95	3.0	31	212	2.5	29	180	1.7	30	286	1.2	31	85	5.0	31	187	2.6	31	169	3.5	31	291	1.5
500	---	---	---	---	---	---	---	---	---	29	269	3.9	---	---	---	31	116	2.1	---	---	---	29	184	2.8	30	286	1.6	31	87	5.2	31	190	3.0	31	174	3.3	31	280	2.1
1,000	---	---	---	---	---	---	---	---	---	29	270	3.8	29	272	2.1	30	173	0.9	31	218	3.3	29	187	3.0	30	253	0.9	28	64	4.6	28	212	4.3	31	147	1.7	31	274	2.6
1,500	31	239	2.3	---	---	---	31	255	1.7	29	281	5.5	29	257	2.3	29	279	1.7	31	216	2.9	29	209	3.5	29	214	2.0	26	48	3.0	26	224	5.6	31	105	1.9	31	268	2.7
2,000	31	256	2.4	31	241	2.4	31	242	1.9	28	299	7.2	28	252	4.5	27	296	1.6	31	222	2.4	27	213	4.9	27	199	2.8	23	36	2.3	24	236	7.6	29	85	1.8	30	267	4.0
2,500	31	252	3.4	31	251	2.6	31	238	2.0	28	300	7.9	27	246	5.5	26	322	2.4	31	235	3.4	26	230	5.0	24	207	3.7	22	16	1.8	23	247	8.4	26	45	2.1	28	279	5.2
3,000	30	251	4.7	31	230	3.3	31	236	3.5	25	304	9.1	23	242	7.1	26	321	3.3	31	239	4.7	24	230	3.8	22	227	4.1	22	353	2.3	20	257	8.6	26	13	1.5	24	272	5.4
4,000	28	253	7.4	29	226	4.5	30	223	4.1	22	313	10.3	14	243	8.2	25	296	4.0	28	275	6.1	18	249	3.7	19	238	6.4	20	295	3.6	14	266	10.8	21	307	2.3	16	288	6.0
5,000	23	255	10.3	24	234	6.6	23	240	7.5	20	313	12.7	11	258	11.8	24	302	6.2	27	267	7.0	15	282	5.9	17	242	6.8	21	285	5.1	---	---	---	16	291	4.9	13	289	7.1
6,000	21	263	10.5	22	259	6.4	16	265	8.4	20	313	12.3	11	255	13.8	23	292	7.2	27	273	9.0	14	271	7.8	15	259	8.6	21	284	6.1	---	---	---	14	292	3.2	---	---	---
8,000	11	271	14.3	14	248	10.0	---	---	---	15	320	16.0	---	---	---	18	276	7.2	23	281	11.5	---	---	---	10	286	12.4	16	280	12.7	---	---	---	---	---	---	---	---	---
10,000	---	---	---	10	254	12.6	---	---	---	14	322	18.1	---	---	---	14	302	9.7	17	262	15.8	---	---	---	---	---	---	10	279	19.3	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12	287	15.6	11	265	18.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Altitude (meters) m. s. l.	New York, N. Y. (15 m.)			Oakland, Calif. (8 m.)			Oklahoma City, Okla. (402 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			San Antonio, Tex. (180 m.)			San Diego, Calif. (15 m.)			Sault St. Marie, Mich. (230 m.)			Seattle, Wash. (14 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (10 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	31	268	2.1	30	262	4.6	30	160	4.7	31	195	2.4	31	244	1.7	31	210	1.4	31	200	1.9	31	130	3.8	29	277	3.5	28	288	3.8	30	240	3.0	30	224	3.4	31	292	1.7
500	31	288	3.9	29	272	3.4	30	164	5.0	31	188	3.6	31	247	2.5	---	---	---	31	226	2.5	31	131	5.2	29	289	3.0	28	292	4.7	30	218	2.9	---	---	---	31	287	4.2
1,000	29	301	6.0	28	258	2.9	30	170	5.9	31	199	3.5	31	259	3.0	31	209	1.4	31	222	3.9	30	139	4.5	28	288	2.1	27	290	4.4	27	213	3.9	30	229	5.1	31	281	4.6
1,500	29	304	7.7	26	245	2.5	29	187	6.3	31	208	4.6	30	250	2.6	31	197	2.5	28	241	4.5	25	150	3.6	27	298	2.0	27	281	4.3	26	208	3.5	28	227	5.1	30	285	6.4
2,000	26	305	9.7	25	248	2.1	27	201	6.2	28	225	4.3	29	245	2.9	31	208	2.6	27	248	5.5	20	147	2.2	27	285	2.1	24	299	5.2	22	202	2.9	23	222	4.7	27	295	7.7
2,500	23	316	9.6	25	271	2.7	25	220	5.2	23	245	6.1	29	236	4.4	31	239	3.6	25	246	6.6	19	220	0.7	24	261	3.4	22	311	7.6	19	205	3.9	20	233	5.6	26	298	10.2
3,000	18	317	10.9	25	283	4.5	24	235	4.8	20	261	7.3	29	241	5.8	30	245	6.7	24	255	6.6	16	280	2.4	24	353	3.7	18	323	9.1	15	215	4.5	16	254	6.0	23	310	11.8
4,000	---	---	---	23	290	6.0	20	244	6.0	18	283	8.1	29	254	7.4	24	256	9.0	22	267	9.3	11	301	6.3	20	266	6.7	16	328	10.1	11	245	7.8	10	258	10.5	19	314	13.5
5,000	---	---	---	22	291	8.8	17	255	6.7	15	289	9.8	28	259	8.8	19	267	9.9	19	264	8.4	11	308	6.4	16	259	11.2	12	331	10.9	10	242	12.9	---	---	---	17	315	14.0
6,000	---	---	---	21	288	9.1	13	273	9.8	14	289	12.4	27	264	10.7	17	262	12.4	17	272	8.6	---	---	---	---	---	---	11	350	13.5	10	240	14.6	---	---	---	15	315	14.4
8,000	---	---	---	17	280	10.5	---	---	---	10	286	17.8	23	262	17.4	13	261	15.4	10	286	14.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	13	273	10.5	---	---	---	---	---	---	12	275	18.9	12	272	21.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	10	273	10.0	---	---	---	---	---	---	---	---	---	10	257	18.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

400000—41——2

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

Section	Surface to 2,500 meters (m. s. l.)					Between 2,500 and 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m) m. s. l.	Date	Station
Northeast [1]	42.0	NW	2,000	24	Harrisburg, Pa	44.0	NW	5,000	26	Caribou, Maine	64.2	NNE	10,880	20	Portland, Maine.
East-Central [2]	32.9	SSW	420	21	Norfolk, Va	47.2	WNW	4,890	9	Raleigh, N. C	46.0	N	12,940	18	Louisville, Ky.
Southeast [3]	27.2	E	620	26	Miami, Fla	42.5	NNW	5,000	13	Montgomery, Ala	65.5	W	13,080	11	Tampa, Fla.
North-Central [4]	37.4	S	1,780	23	Rapid City, S. Dak	35.4	WNW	2,820	8	Huron, S. Dak	70.8	WNW	9,990	7	Rapid City, S. Dak.
Central [5]	42.1	W	2,500	8	Des Moines, Iowa	56.0	WNW	3,090	8	Des Moines, Iowa	64.0	WNW	11,290	7	Wichita, Kans.
South-Central [6]	42.8	S	1,900	19	Amarillo, Tex	49.4	S	2,990	19	Amarillo, Tex	38.0	NW	5,770	12	Jackson, Miss.
Northwest [7]	41.4	W	2,500	5	Pendleton, Oreg	41.7	W	2,520	5	Pendleton, Oreg	56.5	WNW	6,850	7	Billings, Mont.
West-Central [8]	37.5	WNW	2,290	6	Cheyenne, Wyo	50.6	NNW	4,600	18	Sacramento, Calif	66.5	NNW	10,930	18	Redding, Calif.
Southwest [9]	38.7	ESE	1,850	21	Albuquerque, N.Mex.	42.0	NNW	4,170	4	Sandberg, Calif	60.3	N	9,020	19	Las Vegas, Nev.

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

WEATHER ON THE NORTH ATLANTIC OCEAN

By H. C. HUNTER

Atmospheric pressure.—The average pressure during May 1941, over those portions of the North Atlantic Ocean which are adequately covered by available reports was not far from normal. A moderate excess was evident over the southeastern area and a small excess over the northern and eastern Gulf of Mexico, but on the other hand there was a considerable deficiency over waters near the coasts of Newfoundland, the Maritime Provinces, and New England.

The extremes of pressure in the vessel reports received were 1,035.2 and 970.5 millibars (30.57 and 28.66 inches). The high mark was noted on the American liner *Exeter* near 36° N., 36° W., late on the evening of the 22d. The low reading was reported by the U. S. Coast Guard cutter *General Greene*, near 48° N., 52° W., during the early afternoon of the 30th.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, May 1941*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	*Millibars*	*Millibars*		*Millibars*	
Lisbon, Portugal	1,017.2	+2.3	1,031	3	1,004	17
Horta, Azores	1,023.1	+1.8	1,035	23	1,012	15
Belle Isle, Newfoundland	1,008.8	−3.4	1,027	14	986	31
Halifax, Nova Scotia	1,010.5	−4.4	1,025	28	993	18
Nantucket	1,012.2	−3.4	1,024	21	996	17
Hatteras	1,016.3	0.0	1,030	25	1,003	17
Turks Island [1]	1,015.6	−0.3	1,020	27, 28	1,006	1
Key West	1,015.9	+1.0	1,022	28	1,010	8
New Orleans	1,016.6	+1.7	1,023	15	1,006	6

[1] For 27 days.

NOTE.—All data based on available observations, departures compiled from best available normals related to time of observation, except Hatteras, Key West, Nantucket, and New Orleans, which are 24-hour corrected means.

Cyclones and gales.—The month seems to have been quieter over the North Atlantic than May usually is. The first 5 days and the final 8 included practically all the gales of note. In the entire month there were two whole gales (force 10) reported, but no storm of greater severity.

The earlier whole gale was met on the 15th by the Coast Guard cutter *Mojave*, which was at the time to southeastward of Nantucket. The later was encountered not far to eastward of Newfoundland on the 30th by the cutter *General Greene*. There had been a well-developed LOW over that part of the North Atlantic, shifting its position somewhat, for several days and it was joined on the 30th by a small-area vigorous cyclone which had developed over New York and New England early in the night of the 28th–29th and had advanced northeastward to beyond Newfoundland. It was at this time that the lowest known barometer reading of the month over the North Atlantic was noted, as mentioned above.

Duststorm.—The Hydrographic Bulletin of June 4 has a report of a duststorm near the North Carolina coast. The period, in ship's time, was approximately from midnight to dawn of the 18th.

From 0500 to 0900 G. C. T. on May 18, 1941, while steaming from a position off Cape Lookout Shoals Lighted Whistle Buoy 14 toward Frying Pan Shoals Lightship, a duststorm was encountered. The wind was westerly and the barometer was low (29.66 inches at midnight). At daybreak the bulkheads, booms, decks, etc., were found to be covered with fine brown dust that made little rivers of mud when being washed off with the deck hose.

Fog.—Somewhat less fog came to notice than during April just preceding. Particularly for the Gulf of Mexico and the waters just to eastward of the South Atlantic States, which had seen considerable April fog, there was none whatever reported in May except to northward of Cape Hatteras.

Between Capes Hatteras and Cod there was a marked decrease in amount of fog noted, the May dates for this strip being largely before the 12th. To eastward and northeastward of Cape Cod, as far as the eastern limits of Nova Scotia, May fog reports exceeded those for April. The period from the 7th to 11th is indicated as the foggiest part of May over these waters. The 5° square, 40° to 45° N., 65° to 70° W., furnished reports for 8 days.

The square, 40° to 45° N., 45° to 50° W., well to eastward of the American continent, is known to have had fog on 8 days, all during the middle decade of the month. These two squares just mentioned led all North Atlantic areas in reports of fog furnished.

When the fog conditions of previous Mays are compared with this year's showing, it appears that there was decidedly less than normal this year over waters just to eastward of the Middle Atlantic and New England States, but the absence of May fog near the coast from Hatteras to the Rio Grande is the usual condition.