Atmospheric conditions during solar radiation measurements, Blue Hill Observatory of Harvard University

Date and time from apparent noon	Air temperature	Wind, Beaufort scale	Visibility (scale 0-10)	Skybluness	Cloudiness and remarks
March 1936	°C.				
2; 2.51 a. m.	−5.6	NE 3	6	7	1 Stcu; dense haze.
2; 1.28 p. m.	−3.9	ENE 3	8	7	Few Ci; 2 Cu; light haze.
4; 2.56 a. m.	+3.6	SSW 2	7	7	1 Ci; mod. to dense haze.
4; 0.26 a. m.	+6.3	S 4	7	7	Few Ci; Few Acu; mod. to dense haze; Acu. near sun; wind blowing in tube.
6; 2.07 a. m.	−1.9	WNW 4	8	6	Zero clouds; mod. haze.
7; 3.23 a. m.	−7.2	N 3	7	7	5 Ci; Few Stcu; light to mod. haze; thin Ci near sun.
8; 2.25 a. m.	−3.1	NW 1	8	8	Few Ci; mod. to dense haze North.
10; 0.20 a. m.	+8.5	SE 1	6	5	1 Acu; mod. haze.
13; 3.03 a. m.	+3.1	SW 6	7	8	Few Frcu; light to mod. haze; gusty wind.
15; 0.19 a. m.	+7.9	ENE 1	6	4	Zero clouds; dense haze.
15; 1.14 p. m.	+9.4	NNE 2	7	4	Zero clouds; mod. haze.
20; 0.22 a. m.	+10.8	SSW 5	7	6	1 Ci; 1 Stcu; mod. to dense water haze.
23; 3.22 a. m.	+4.4	WNW 5	10	7	Few Ci.
24; 0.17 a. m.	+9.4	ENE 3	8	7	2 Ci; few Acu; light to mod. haze.
26; 2.48 a. m.	+6.9	NW 2	6	7	Few Ci; few Frcu; dense haze.
26; 0.02 a. m.	+11.1	W 2	7	8	Few Ci; mod. haze.
28; 2.16 a. m.	+9.3	WNW 5	8	8	Few Acu; few Frcu; light to mod. haze; wind gusty.
28; 0.24 a. m.	+10.9	WNW 5	8	8	Few Acu; few Cu; light haze; wind gusty.
29; 3.08 a. m.	+8.2	W 4	8	6	Zero clouds; light to mod. haze.
29; 0.20 a. m.	+13.2	WSW 5	8	7	Zero clouds; light to mod. haze.
30; 3.24 p. m.	+17.7	E 2	7	7	1 Ci; mod. to heavy haze.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR MARCH 1936

[Dependent alone on observations at Zurich and its station at Arosa]

[Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

March 1936	Relative numbers	March 1936	Relative numbers	March 1936	Relative numbers
1	*a* 74	11	79	21	104
2	68	12	*a* 67	22	96
3	*a* 60	13	*Ec* 59	23	82
4	*a* 55	14	68	24	53
5	*Mc*	15	56	25	*Ec* 49
6	*a* 60	16	*a* 61	26	*ad*
7	*Mc* 83	17	60	27	*d*
8	89	18	*Mc* 66	28	*Mc* 98
9	*Ec* 88	19	*Macd* 87	29	98
10	*ad* 92	20	112	30	*Eac* 103
				31	109

Mean, 28 days = 77.7

a = Passage of an average-sized group through the central meridian.
b = Passage of a large group or spot through the central meridian.
c = New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d = Entrance of a large or average-sized center of activity on the east limb.

POSITIONS AND AREAS OF SUN SPOTS

NOTE.—The reports for March, not having been received, will be included with those for April in the next issue.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in charge]

By L. T. SAMUELS

At those stations with a sufficient period of record for the determination of approximate normals, upper-air temperatures during March averaged above normal except on the Pacific Coast, where the departures were negative (see table 1). In practically all cases the departures were of moderate magnitude. Mean temperatures for the month were slightly lower over the central and north-central part of the country than over corresponding latitudes in the eastern and western sections.

Upper-air relative humidity departures were, in general, of opposite sign to those for temperature. Mean upper-air relative humidities for the month were strikingly low over Maxwell Field and Pensacola as compared to the other stations.

The directions of the upper-air wind resultants were close to normal in most cases (see table 2). Resultant velocities exceeded the normals over most of the northern stations, and were mostly below normal elsewhere. Departures were in general of small magnitude.

TABLE 1.—*Mean free-air temperatures and relative humidities obtained by airplanes during March 1936*

TEMPERATURE (° C.)

Stations	Altitude (meters) m. s. l.																	
	Surface		500		1,000		1,500		2,000		2,500		3,000		4,000		5,000		Number of observations
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	
Barksdale Field (Shreveport), La.[1] (52 m)	12.8		15.4		13.6		11.0		8.2		5.5		2.8		−3.0		−10.0		30
Billings, Mont.[2] (1,088 m)	−0.9						−1.0		−3.8		−7.5		−11.1		−17.9		−24.5		31
Cheyenne, Wyo.[2] (1,873 m)	−2.4								−1.9		−2.4		−5.2		−12.1		−19.1		29
El Paso, Tex.[3] (1,194 m)	10.2						11.6		9.0		5.4		1.8		−5.3		−11.5		31
Fargo, N. Dak.[2] (274 m)	−6.1		−5.2		−5.4		−6.8		−8.7		−10.6		−13.1		−18.8		−25.9		29
Kelly Field (San Antonio), Tex.[1] (206 m)	12.3		16.2		14.8		13.1		10.9		8.1		4.9		−1.9		−9.3		30
Lakehurst, N. J.[3] (39 m)	4.8		6.0		4.2		2.3		0.1		−2.4		−5.0		−11.6		−21.3		26
Maxwell Field (Montgomery), Ala.[1] (52 m)	10.7		13.1		10.6		7.0		5.0		2.8		+0.3		−5.5		−13.0		24
Mitchel Field (Hempstead, Long Island), N. Y.[1] (29 m)	4.4		5.4		3.6		1.5		−0.3		−2.8		−5.6		−12.6				21
Murfreesboro, Tenn.[2] (174 m)	7.5		10.2		8.5		6.0		3.3		0.6		−2.2		−8.4		−14.9		31
Norfolk, Va.[3] (10 m)	9.9	+2.6	12.1	+5.2	9.6	+4.7	6.4	+3.8	3.9	+3.5	1.2	+2.9	−1.6	+2.4	−8.1	+1.8	−14.0	+1.8	17
Oklahoma City, Okla.[2] (391 m)	10.3		11.6		11.7		9.7		6.9		4.1		1.0		−5.9		−12.9		26
Omaha, Nebr.[2] (300 m)	1.7	+1.9	2.8	+2.3	3.3	+2.3	2.3	+2.0	0.3	+1.5	−2.3	+1.3	−5.5	+1.0	−12.3	+0.7	−19.2	+0.6	31
Pearl Harbor, Territory of Hawaii[3] (6 m)	20.2	−2.3	18.9	−1.0	15.3	−0.9	12.2	−1.2	10.4	−0.7	9.2	−0.2	6.1	−1.1	−0.5	−2.3			31
Pensacola, Fla.[3] (2 m)	14.0	+1.7	14.5	+2.7	12.5	+2.5	10.6	+2.5	8.2	+2.1	5.6	+1.6	3.3	+1.5	−2.6	+1.4	−9.4	+1.2	28
San Diego, Calif.[3] (10 m)	12.3	−1.7	12.2	−0.7	11.9	−0.3	10.3	+0.1	7.6	−0.3	4.5	−0.7	1.3	−1.0	−4.2	−0.2	−10.1	+0.5	30
Scott Field (Belleville), Ill.[1] (135 m)	4.3		6.5		6.2		4.7		2.3		−0.4		−3.3		−9.1		−15.1		31
Seattle, Wash.[3] (10 m)	6.4	−2.4	2.5	−3.3	−0.5	−3.3	−2.8	−2.8	−6.4	−3.4	−10.0	−4.1	−13.3	−4.6	−18.0	−3.6	−25.0	−3.8	8
Spokane, Wash.[2] (596 m)	0.8				2.2		0.4		−2.7		−5.9		−9.4		−16.5		−23.7		31
Washington, D. C.[3] (13 m)	6.2	+0.8	8.1	+3.8	6.1	+3.7	3.7	+3.4	1.3	+3.1	−1.1	+2.8	−4.2	+1.9	−10.0	+1.8	−15.8	+2.0	23
Wright Field (Dayton), Ohio[1] (244 m)	3.4		4.4		4.2		2.6		0.5		−1.8		−4.1		−10.0		−17.1		30

[1] Army. [2] Weather Bureau. [3] Navy.

TABLE 1.—*Mean free-air temperatures and relative humidities obtained by airplanes during March 1936*—Continued

RELATIVE HUMIDITY (PERCENT)

Stations	Altitude (meters) m. s. l.																		
	Surface		500		1,000		1,500		2,000		2,500		3,000		4,000		5,000		Number of observations
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	
Barksdale Field (Shreveport), La.	73	------	60	------	54	------	50	------	45	------	38	------	39	------	37	------	35	------	------
Billings, Mont.	60	------	------	------	------	------	53	------	52	------	56	------	60	------	61	------	58	------	------
Cheyenne, Wyo.	64	------	------	------	------	------	------	------	62	------	56	------	56	------	57	------	52	------	------
El Paso, Tex.	35	------	------	------	------	------	34	------	35	------	38	------	39	------	39	------	32	------	------
Fargo, N. Dak.	87	------	79	------	68	------	63	------	61	------	60	------	57	------	51	------	52	------	------
Kelly Field (San Antonio), Tex.	83	------	71	------	65	------	57	------	55	------	52	------	51	------	49	------	46	------	------
Lakehurst, N. J.	78	------	62	------	61	------	58	------	50	------	49	------	49	------	46	------	42	------	------
Maxwell Field (Montgomery), Ala.	72	------	51	------	44	------	46	------	33	------	23	------	20	------	19	------	22	------	------
Mitchel Field (Hempstead, Long Island), N. Y.	83	------	69	------	67	------	62	------	56	------	54	------	56	------	52	------	------	------	------
Murfreesboro, Tenn.	81	------	67	------	66	------	62	------	59	------	55	------	55	------	51	------	48	------	------
Norfolk, Va.	75	+7	58	−3	52	−6	55	−2	51	−3	46	−4	45	−1	50	+5	54	+10	------
Oklahoma City, Okla.	53	------	52	------	47	------	44	------	43	------	41	------	41	------	42	------	40	------	------
Omaha, Nebr.	73	−4	67	−5	56	−5	50	−4	46	−5	45	−6	45	−7	47	−6	46	−7	------
Pearl Harbor, Territory of Hawaii.	81	+9	79	+4	83	+5	80	+6	71	+5	50	−3	42	0	35	+5	------	------	------
Pensacola, Fla.	85	+7	72	+4	61	0	48	−8	41	−11	36	−12	31	−13	26	−13	28	−11	------
San Diego, Calif.	85	+11	78	+8	60	+4	45	−1	40	+2	35	+2	33	+3	28	+2	26	0	------
Scott Field (Belleville), Ill.	77	------	62	------	54	------	47	------	45	------	42	------	43	------	39	------	41	------	------
Seattle, Wash.	73	+3	80	+9	80	+11	72	+6	71	+7	66	+7	62	+8	57	+7	56	+7	------
Spokane, Wash.	78	------	------	------	66	------	61	------	61	------	57	------	59	------	60	------	58	------	------
Washington, D. C.	77	+9	59	−4	56	−5	58	−2	56	−2	47	−6	51	+1	52	+4	49	+4	------
Wright Field (Dayton), Ohio	80	------	75	------	67	------	59	------	61	------	61	------	58	------	57	------	59	------	------

Observations taken about 4 a. m., 75th meridian time, except along the Pacific coast and Hawaii where they are taken at dawn.

NOTE.—The departures are based on "normals" covering the following total number of observations made during the same month in previous years, including the current month: Norfolk, 146; Omaha, 154; Pearl Harbor, 132; Pensacola, 153; San Diego, 182; Seattle, 60; Washington, 210.

Errata: "Monthly Weather Review", December 1935—Murfreesboro, Tenn., mean annual temperature for 1935 at 5-kilometer level should be changed from −8.9° C., to −10.0° C.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 5 a. m. (E. S. T.) during March 1936*

[Wind from N=360°, E=90°, etc.]

Altitude (m) m. s. l.	Albuquerque, N. Mex. (1,554 m)		Atlanta, Ga. (309 m)		Billings, Mont. (1,088 m)		Boston, Mass. (15 m)		Cheyenne, Wyo. (1,873 m)		Chicago, Ill. (192 m)		Cincinnati, Ohio (153 m)		Detroit, Mich. (204 m)		Fargo, N. Dak. (274 m)		Houston, Tex. (21 m)		Key West, Fla. (11 m)		Medford, Oreg. (410 m)		Murfreesboro, Tenn. (180 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°		°	
Surface	276	1.4	276	0.9	292	3.6	201	0.7	275	3.6	260	1.4	244	0.8	300	0.5	269	2.0	207	0.2	90	1.2	324	0.7	209	1.5
500	------	------	253	2.7	------	------	268	4.5	------	------	247	3.4	238	5.6	265	1.5	293	4.5	179	2.7	127	2.6	312	1.0	223	5.4
1,000	------	------	274	6.4	------	------	276	7.3	------	------	271	6.8	269	9.5	276	6.0	298	7.2	231	0.8	195	1.6	302	1.7	266	7.6
1,500	------	------	284	7.4	277	10.4	272	9.7	------	------	269	8.1	285	10.0	276	7.8	294	9.0	301	3.1	233	1.6	274	2.0	278	9.5
2,000	300	5.5	281	7.7	287	10.4	288	10.3	279	7.0	275	9.4	281	10.7	278	9.9	292	10.8	302	4.1	265	3.6	289	3.3	278	9.7
2,500	302	7.4	275	7.0	294	11.9	287	10.3	286	12.2	286	12.1	287	11.6	285	9.2	300	13.2	302	4.8	270	4.6	299	6.4	294	11.8
3,000	293	8.1	275	9.4	293	13.9	------	------	295	13.1	280	14.0	------	------	297	10.8	306	13.1	302	6.9	277	6.4	293	7.8	------	------
4,000	290	10.0	278	12.9	295	13.8	------	------	293	9.0	274	14.7	------	------	------	------	------	------	291	5.1	272	9.2	297	10.5	------	------
5,000	286	11.2	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	282	10.4	------	------

Altitude (m) m. s. l.	Newark, N. J. (14 m)		Oakland, Calif. (8 m)		Oklahoma City, Okla. (402 m)		Omaha, Nebr. (306 m)		Pensacola, Fla.[1] (24 m)		St. Louis, Mo. (170 m)		Salt Lake City, Utah (1,294 m)		San Diego, Calif. (15 m)		Sault Ste. Marie, Mich. (198 m)		Seattle, Wash. (14 m)		Spokane, Wash. (603 m)		Washington, D. C. (10 m)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	280	1.6	344	0.9	184	0.9	312	1.2	11	1.1	274	1.8	151	2.3	289	0.7	271	1.0	165	1.9	206	1.1	326	0.9
500	264	6.3	345	3.7	206	1.5	305	2.2	309	2.7	268	5.8	------	------	282	2.5	272	1.3	208	3.8	------	------	282	4.6
1,000	273	8.8	11	5.4	244	4.7	290	5.9	318	5.9	273	10.3	------	------	309	3.2	292	5.2	228	4.3	225	5.1	283	6.1
1,500	278	11.4	359	4.7	263	7.5	289	9.1	322	6.0	290	11.6	164	2.2	315	3.8	290	6.9	246	5.5	244	6.9	285	8.2
2,000	272	9.4	352	3.7	271	7.8	290	11.3	314	8.0	290	11.6	245	2.0	319	3.7	294	8.4	255	4.6	249	6.5	275	7.7
2,500	------	------	358	3.4	279	8.6	299	13.2	306	5.7	297	11.7	291	4.0	314	3.3	292	8.9	283	4.3	260	8.5	252	7.9
3,000	------	------	353	3.4	294	7.1	296	13.6	311	7.0	288	13.9	297	7.2	357	3.0	306	8.2	282	6.5	274	7.5	256	10.3
4,000	------	------	------	------	------	------	------	------	311	5.2	------	------	301	9.3	336	7.9	------	------	272	9.2	287	10.9	------	------
5,000	------	------	------	------	------	------	------	------	------	------	------	------	295	9.3	355	6.6	------	------	------	------	------	------	------	------

[1] Navy stations.