AEROLOGICAL OBSERVATIONS

[The Aerological Division, W. R. Gregg, in charge]

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Free-air temperatures averaged moderately above normal for August at all stations except Cleveland and Norfolk, where small negative departures occurred. (See Table 1.) Notwithstanding the positive temperature departures, free-air relative humidities were above normal at Atlanta, Dallas, and Pensacola. Elsewhere the humidity averaged mostly below normal.

Pronounced southerly components predominated in the monthly resultant free-air winds over the southern half of the country. (See Table 2.) Over most of this region the resultant velocities exceeded the normals. Resultant wind directions over the remainder of the country were close to normal but in most cases the resultant velocities exceeded the normal.

Airplane observations were made every day during the month at all Weather Bureau stations except Omaha, where no flight was possible on the 13th owing to low clouds and fog.

TABLE 1.—*Free-air temperatures and relative humidities during August, 1932*

[Weather Bureau airplane observations made near 5 a. m.; Navy observations near 7 a. m. (seventy-fifth meridian time)]

TEMPERATURE (° C.)

Altitude (meters) m. s. l.	Atlanta, Ga. (303 meters)[1]		Chicago, Ill. (195 meters)[2]		Cleveland, Ohio (246 meters)[2]		Dallas, Tex. (146 meters)[3]		Ellendale, N. Dak. (444 meters)		Norfolk, Va. (3 meters)[4]		Omaha, Nebr. (300 meters)[5]		Pensacola, Fla. (2 meters)[4]		San Diego, Calif. (9 meters)[4]		Washington, D. C. (2 meters)[4]	
	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	Mean	Departure from normal
Surface	21.7	(6)	18.0	(6)	16.3	(6)	24.8	(6)	21.6	+1.4	23.8	−0.9	19.8	(6)	25.9	+0.3	19.4	−2.8	22.2	−1.3
500	22.3	−0.6	20.3	−0.8	20.0	−1.1	26.0	+1.5	21.5	+1.5	22.5	−0.9	20.6	−1.5	24.2	+0.1	18.0	−2.4	22.2	+0.3
1,000	21.1	+1.1	19.0	+1.0	18.6	+0.6	24.1	+1.6	18.6	+0.5	20.1	−1.1	21.4	+1.1	21.6	+0.2	22.6	−1.1	20.6	+0.8
1,500	18.0	+1.1	15.6	+0.6	14.8	−0.2	20.9	+1.2	16.0	+0.5			19.2	+1.4						
2,000	14.9	+1.2	12.5	+0.4	11.4	−0.7	17.5	+0.9	13.3	+0.7	14.1	−0.5	16.3	+1.5	16.4	+1.2	21.6	+0.8	14.1	+0.2
2,500	12.0	+1.5	10.0	+0.7	8.7	−0.6	14.3	+0.8	10.3	+0.7			12.9	+1.3						
3,000	8.9	+1.3	7.5	+1.1	6.1	−0.3	11.5	+0.8	7.6	+1.0	8.5	−0.3	9.6	+1.4	10.6	+1.1	15.4	+1.3	8.4	+0.3
4,000	2.7	+0.9	1.8	+0.5	0.5	−0.8	5.9	+0.6	1.4	+0.6			3.1	+1.5	5.0	+1.1			4.3	+1.8
5,000	−2.9	−1.5	−4.3	−0.6	−5.5	−1.8	0.4	+0.8					−3.6	+0.9	−0.5	+1.1				

RELATIVE HUMIDITY (PER CENT)

Altitude (meters) m. s. l.	Atlanta, Ga. Mean	Departure from normal	Chicago, Ill. Mean	Departure from normal	Cleveland, Ohio Mean	Departure from normal	Dallas, Tex. Mean	Departure from normal	Ellendale, N. Dak. Mean	Departure from normal	Norfolk, Va. Mean	Departure from normal	Omaha, Nebr. Mean	Departure from normal	Pensacola, Fla. Mean	Departure from normal	San Diego, Calif. Mean	Departure from normal	Washington, D. C. Mean	Departure from normal
Surface	93	(6)	82	(6)	84	(6)	78	+4	61	−5	76	+1	85	(6)	89	+4	77	+2	74	+1
500	86	+16	68	+3	68	+3	71	−2	60	−4	70	+4	74	+7	83	+6	77	+4	62	−5
1,000	80	+11	60	−5	63	−2	68	+8	60	+2	66	+4	54	−6	82	+7	44	0	53	−10
1,500	79	+10	63	−1	69	+5	68	+10	57	0			52	−6						
2,000	77	+9	62	+1	65	+4	70	+12	53	−2	67	+4	54	−4	74	+5	23	−12	60	−6
2,500	70	+3	54	−3	56	−1	67	+11	51	−3			58	+1						
3,000	69	+3	47	−7	50	−4	62	+10	51	−3	65	+4	57	0	72	+10	23	−12	56	−4
4,000	62	−7	41	−5	47	+1	58	+19	47	−3			47	−5	73	+10			35	−22
5,000	45	−4	35	+3	41	+9	55	+26					44	−9	75	+10				

[1] Temperature and humidity departures based on normals of Due West, S. C.
[2] Temperature and humidity departures based on normals of Royal Center, Ind.
[3] Temperature departures based on normals determined by interpolating between those of Groesbeck, Tex., and Broken Arrow, Okla. Humidity departures based on normals of Groesbeck, Tex.
[4] Naval air stations.
[5] Temperature and humidity departures based on normals of Drexel, Nebr.
[6] Surface departures omitted because of difference in time between airplane observations and those of kites upon which the normals are based.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 7 a. m. (E. S. T.) during August, 1932*

[Wind from North=360°; East=90°; etc.]

Altitude (meters) m. s. l.	Albuquerque, N. Mex. (1,528 meters)		Atlanta, Ga. (309 meters)		Bismarck, N. Dak. (518 meters)		Brownsville, Tex. (12 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo. (1,873 meters)		Chicago, Ill. (195 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	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	39	0.5	59	0.5	19	0.6	153	1.4	185	2.9	289	3.1	233	1.4	191	1.9	146	2.2	116	1.8	124	0.3	124	2.3
500			146	1.9			167	9.8	206	5.4			265	4.4	247	3.8	189	8.3			178	1.2	127	4.4
1,000			157	1.6	199	2.5	167	9.8	272	4.2			264	4.7	280	4.1	186	8.5	99	3.0	176	2.0	138	3.6
1,500			131	1.0	249	1.5	162	8.3	287	5.9			267	5.1	285	4.6	181	6.4	328	1.3	180	2.3	139	3.0
2,000	180	2.2	156	0.6	294	3.4	154	6.6	282	6.3	271	4.2	279	5.8	287	5.2	178	3.8	294	2.3	170	2.7	133	3.0
2,500	196	1.9	324	0.2	295	5.7	142	5.1	285	7.2	252	4.8	288	7.3	274	5.7	167	2.6	266	3.2	172	2.8	130	2.8
3,000	239	2.2	294	0.6	288	7.0	131	3.8	297	8.7	255	4.7	292	7.2	273	6.6	166	2.0	258	5.5	200	2.8	126	2.7
4,000	276	1.8	318	2.2	261	7.6	101	3.6	291	11.0	265	4.4	288	7.5	290	7.0	156	2.3	253	7.0	221	2.4	115	1.8
5,000	305	1.0	291	1.7			51	2.1			264	4.2			293	8.5			286	5.8	178	1.8	128	2.3

	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (85 meters)		New Orleans, La. (25 meters)		Oakland, Calif. (8 meters)		Oklahoma, City, Okla. (402 meters)		Omaha, Nebr. (306 meters)		Phoenix, Ariz. (356 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D. C. (10 meters)	
	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	162	0.4	295	0.4	134	0.8	38	0.4	285	0.9	152	4.4	160	1.3	74	0.3	158	3.8	63	0.1	143	0.3	329	1.0
500	116	1.0	287	0.8	189	3.0	153	0.3	241	1.6	165	7.0	192	4.4	227	0.7			263	2.9	18	1.0	311	3.1
1,000	1	0.5	309	1.5	210	2.9	168	10.0	305	3.6	196	9.8	230	7.6	245	2.2			287	5.1	354	2.3	304	3.6
1,500	270	1.5	7	0.7	214	1.8	151	2.0	312	2.5	206	7.2	250	7.6	249	1.2	164	5.4	289	6.3	332	2.3	302	3.8
2,000	224	2.7	350	0.5	212	0.8	112	1.4	326	2.2	218	5.1	256	7.1	211	1.5	181	5.3	297	6.9	289	2.6	301	5.0
2,500	210	2.8	258	2.6	259	0.7	93	1.5	299	2.1	224	3.0	275	6.1	187	2.0	201	4.1	301	6.8	271	1.4	290	5.9
3,000	188	2.1	251	5.2	264	1.2	92	2.2	254	1.9	200	2.0	267	6.0	170	2.3	236	4.1	312	7.1	311	1.1	286	7.1
4,000	167	1.8	253	8.1	287	2.9	75	2.5			228	0.2	289	6.8	182	2.5	253	5.7	316	8.4			293	5.6
5,000							50	1.5					295	6.4			273	6.2	319	10.2				