

TABLE 2.—Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a.m. (E.S.T.) during February, 1934—Continued

Altitude (meters) m.s.l.	Los Angeles, Calif. (127 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (83 meters)		New Orleans, La. (1 meter)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (402 meters)		Omaha, Nebr. (306 meters)		Phoenix, Ariz. (338 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	344	1.6	118	1.0	24	0.9	25	1.7	117	1.4	15	1.6	33	0.7	96	1.6	142	1.9	13	0.4	158	0.6	327	1.4
500	14	.6	99	.7	314	.4	14	3.0	135	2.0	137	2.8	326	1.5	93	1.7	---	---	239	1.4	179	3.2	292	6.0
1,000	124	1.8	141	3.4	292	4.5	229	4.8	149	2.3	246	2.1	315	6.1	348	5.5	---	---	315	5.5	200	4.0	283	9.1
1,500	142	2.0	168	4.6	304	6.6	269	4.4	211	2.9	290	3.5	315	8.4	265	8.8	172	2.6	312	9.5	203	5.2	301	11.0
2,000	215	2.4	196	5.8	299	9.2	282	7.5	206	3.4	302	4.3	311	11.3	245	1.5	193	3.2	306	9.2	198	4.8	294	11.6
2,500	209	2.4	207	7.7	289	11.2	286	7.8	212	4.2	301	6.7	307	14.3	245	3.0	229	3.3	307	9.7	191	4.0	294	11.6
3,000	227	2.5	213	6.9	304	11.4	298	8.6	229	2.9	310	7.9	310	15.9	250	4.8	245	3.3	319	12.1	193	4.4	291	12.7
4,000	298	2.7	213	8.2	---	---	---	---	226	3.5	286	10.6	287	7.8	266	8.0	267	4.0	---	---	203	2.1	---	---
5,000	---	---	---	---	---	---	---	---	35	7	---	---	---	---	283	11.1	270	2.9	---	---	---	---	---	---

RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, MONTROSE W. HAYES, in charge]

In February there was a flood in the Cottonwood and other small creeks, near Red Bluff, Calif. The flood was caused by a local downpour and did considerable damage.

Most of the rivers where a regular flood service is maintained were low during the month. The lower Mississippi River was unusually low. The mean stage during the month at Memphis, Tenn., was the lowest during the

past 45 years; however, at New Orleans it was not quite so low as in 1931.

Late in the month floods occurred in a few rivers of the Ohio Valley and the Southeastern States. As most of these floods continued well into March a discussion of them and of ice movement in rivers in February will appear in a later issue of the MONTHLY WEATHER REVIEW.

WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

[The Marine Division, WILLIS E. HURD, acting in charge]

NORTH ATLANTIC OCEAN

By HERBERT C. HUNTER

Pressure.—The average pressure over the North Atlantic during February 1934 was generally higher than normal, and over the northeastern portion was much above normal, Valencia, Ireland, averaging 0.61 inch above. There was a slight deficiency indicated at a few southwestern island stations. (See table 1.) The lowest pressure reading yet reported on shipboard this month was 28.84 inches, which is considerably higher than the lowest readings usually reported during winter months. This was noted not quite 300 miles south of Sable Island, on the 13th, by the British S.S. *San Tirso*. Among land stations, Halifax, Nova Scotia, noted a slightly lower reading that day, and Julianehaab, Greenland, a considerably lower reading on the following day. Also Nantucket recorded a pressure of 28.81 inches on the 20th.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure (sea level) at selected stations for the North Atlantic Ocean and its shores, February 1934

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Julianehaab, Greenland	29.50	---	30.12	18, 19, 24	28.55	14
Reykjavik, Iceland	29.78	+0.24	30.62	26	29.14	24
Lerwick, Shetland Islands	30.05	+0.33	30.69	1	29.84	8
Valencia, Ireland	30.51	+0.61	30.92	15	29.85	24
Lisbon, Portugal	30.24	+0.14	30.58	15	29.96	5
Madeira	30.09	+0.02	30.24	20	29.91	19
Horta, Azores	30.32	+0.17	30.57	4	29.98	12
Belle Isle, Newfoundland	29.81	+0.06	30.38	18	29.16	24
Halifax, Nova Scotia	29.95	+0.04	30.66	28	28.82	13
Nantucket	30.04	0.00	30.83	28	28.81	20
Hatteras	30.16	+0.05	30.84	28	29.41	13
Bermuda	30.10	-0.02	30.46	28	29.62	13
Turks Island	30.06	-0.02	30.18	24, 28	29.92	17
Key West	30.10	+0.03	30.31	27	29.88	12
New Orleans	30.16	+0.07	30.63	27	29.72	25
Cape Gracias, Nicaragua	29.99	+0.04	30.10	23	29.94	18 to 21

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

Cyclones and gales.—Reports so far received indicate that gales were somewhat less frequent than usual over the North Atlantic during February. They were especially few over the eastern and central portions of the chief steamship lanes between North American ports and the English Channel. However, in and near the Bay of Biscay and to southwestward toward the region of the Azores, gale force was attained on a few days, but nearly always with wind from a northerly direction and with least pressure either above or almost up to 30 inches. The most notable of these reports was one of force 11, about 200 miles off the coast of Portugal, on the 2d, encountered by Belgian S.S. *Makala*. (See chart VIII.)

The first 2 days brought numerous reports of gales over American coastal waters from the Carolinas to Newfoundland. On the morning of the 1st the southernmost of a series of low-pressure areas was central over Georgia, whence it advanced northeastward to the northern portion of the Gulf of St. Lawrence by the evening of the 2d, increasing greatly in intensity. Thereafter the advance was toward the north-northeast, so that scarcely any other vessels on the usual routes were affected by the winds connected with it. The first of the two reports of wind of hurricane strength is related to this cyclone; the British S.S. *Polycarp* reported force 12 during the early hours of the 2d, approximately 300 miles east-northeast of Hatteras.

From the 3d to the 8th, inclusive, very few gales were noted; and none from between the 10th and 55th meridians.

From late on the 8th, near the coast of Georgia, gales were encountered over a narrow strip extending northeastward to within about 500 miles of Ireland, where the wind was strongest on the 12th. Before this storm ceased to affect the steamship lanes another, which proved somewhat more important, started over nearly the same path.

Not far from the North Carolina coast the schooner-yacht *Uvira*, bound for Central American waters, was disabled by high winds and heavy seas, but was towed into port on the 15th. The second and final advice of hurricane force is connected with this storm, the Italian S.S. *Nicolo Odero* encountering a brief but very intense squall from the south, when about 400 miles east of Bermuda, during the late evening of the 13th. The area of low pressure causing it advanced more to northward during the 14th and 15th, so that practically no gales were noted in connection with this storm anywhere to eastward of mid-ocean. (See charts IX and X.)

From the 17th to the 20th a moderate number of gales were encountered, all in the section to westward of the 50th meridian and nearly all within the area between the South Carolina coast, Bermuda, Cape Race, and Cape Cod. Chart XI indicates the situation on the 20th. The 3 days from 21st to 23d inclusive were almost without severe winds, but the final 5 days of the month show several reports, this time well scattered over the area close to or north of the 35th parallel of latitude. During the second half of February it was only on these 5 days that any gales were noted in the portion of the North Atlantic to eastward of longitude 40°.

The northeast trade wind of the Caribbean region attained unusual strength during the final week of February. The American S.S. *Makiki*, bound from Cristobal to New York, encountered winds of at least force 6 during most of 6 days, blowing from between north-northeast and east-southeast. Gale strength was attained during the night of the 26-27th, in the west-central Caribbean.

Fog.—Fog was encountered less than is usually the case during February, particularly from mid-ocean eastward and to the northward of the 35th parallel. It was no more prevalent than during January, save in a very few 5° squares, mainly within short distances to eastward or southeastward of Newfoundland. The greatest prevalence was 7 days, chiefly between the 13th and 22d, in the square from 40° to 45° north, 50° to 55° west. From the 45th parallel eastward there was scarcely any fog, save very near the English and French coasts. However, the region around the Canary and Madeira Islands experienced a condition resembling fog during 3 days about the 21st; a powdery dust filled the air, presumably blown from the continental areas to eastward and northeastward. No fog has been reported from any part of the Gulf of Mexico save immediately at the shores, or from the vicinity of the eastern coasts of Florida and Georgia.

OCEAN GALES AND STORMS, FEBRUARY 1934

Vessel	Voyage		Position at time of lowest barometer		Gale began	Time of lowest barometer	Gale ended	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN													
Cities Service Kansas, Am.S.S.	Boston	Galveston	32 30 N.	74 40 W.	Feb. 1	9p Feb. 1	Feb. 2	Inches 29.64	S	SSW., 9	WNW	S., 11	S.-SW.
Yuri Maru, Jap.S.S.	New Orleans	Philadelphia	34 57 N.	75 30 W.	do	12a, 2	do	29.48	SE	W, 8	NNW	NW., 10	12 points.
Polycarp, Br.S.S.	Barbados	New York	36 00 N.	71 06 W.	do	3a, 2	do	29.26	SSW	SSW, 12	NNW	SSW., 12	SSW.-NNW.
Makala, Belg.S.S.	Belgian Congo	Antwerp	40 46 N.	10 48 W.	do	4a, 2	Feb. 4	29.99	NNE	NNE., 11	NE	NNE, 11	None.
McKeesport, Am.S.S.	Havre	New York	41 07 N.	64 10 W.	Feb. 2	Noon, 2	Feb. 2	29.26	SSW	SSW., 9	NW	SSW., 10	SW.-SSW.-NW.
Spidoleine, Belg.M.S.	Port Arthur	Antwerp	37 55 N.	63 02 W.	do	3p, 2	do	29.33	S	SSW., 10	WNW	S., 10	S.-SSW.
New York, Ger.S.S.	New York	Cherbourg	41 00 N.	60 12 W.	do	6p, 2	Feb. 3	29.48	SE	S., 11	SE	S., 11	None.
Exilona, Am.S.S.	Casablanca	Norfolk	36 00 N.	70 00 W.	Feb. 4	9p, 4	Feb. 4	30.03	NW	NW., 7	NW	NW., 10	SW.-NW.
Binnendyk, Du.S.S.	Rotterdam	New York	41 09 N.	64 30 W.	Feb. 6	7p, 6	Feb. 6	29.32	ENE	N., 9	N	N., 9	ENE.-N.
Bremen, Ger.S.S.	Bremerhaven	do	42 30 N.	56 20 W.	Feb. 7	5a, 7	Feb. 7	29.27	SSE	SW., 11	WNW	SW., 11	SSE.-SW.-W.
San Tirso, Br.S.S.	Nanchitita, Mexico	Great Britain	33 20 N.	76 15 W.	Feb. 9	6a, 9	Feb. 10	30.06	N	N., 7	N	N., 9	Steady.
Black Falcon, Am.S.S.	Rotterdam	New York	43 58 N.	48 24 W.	Feb. 10	Noon, 10	do	29.30	N	SSW., 7	NW	N., 9	S.-N.-NW.
Henri Jaspard, Belg.S.S.	Antwerp	do	50 15 N.	29 00 W.	Feb. 11	11p, 11	Feb. 12	29.29	SSE	S., 9	SW	S., 9	SSE.-S.
Washington, Am.S.S.	Baltimore	Port Arthur	29 56 N.	77 48 W.	Feb. 12	4p, 12	do	29.65	SW	W	W	W., 10	None.
Volendam, Du.S.S.	Rotterdam	New York	45 52 N.	41 28 W.	do	9p, 12	do	29.71	S	S., 9	SW	S., 9	S.-SW.
San Tirso, Br.S.S.	Nanchitita, Mexico	Great Britain	39 43 N.	61 00 W.	do	6a, 13	Feb. 14	28.84	SSW	SW., 10	W	SW., 10	SSW.-SW.
Panuco, Am.S.S.	Puerto Mexico	New York	36 19 N.	75 03 W.	Feb. 13	1p, 13	do	29.41	NW	NW., 7	NW	NW., 10	None.
Nicolo Odero, Ital.S.S.	Gibraltar	Wilmington, N.C.	32 02 N.	57 50 W.	do	8p, 13	do	30.00	SSW	SSW., 10	SSW	S., 12	SSW.-S.
Paris, Fr.S.S.	Havre	New York	43 24 N.	58 06 W.	do	8a, 14	do	29.24	S	WSW., 2	WNW	WSW., 9	None.
Europa, Ger.S.S.	English Channel	do	42 45 N.	53 40 W.	do	9a, 14	do	29.33	S	SSE, 6	W	WSW., 10	SSE.-WSW.
Adria, Ger.M.S.	Aruba	Marseille	33 48 N.	24 06 W.	Feb. 14	4p, 14	Feb. 15	30.17	NNE	NE., 8	E	NNE., 9	NNE.-NE.
Danmark, Dan.Ship	Charleston	Cherbourg	35 10 N.	67 30 W.	Feb. 17	10p, 17	Feb. 18	29.63	N	N., 11	NNW	N., 11	N.-NNW.
Queen of Bermuda, Br.S.S.	Bermuda	New York	34 00 N.	66 30 W.	do	12p, 17	do	29.33	NW	NW., 9	NNW	NW., 10	NW.-N.
Steel Mariner, Am.S.S.	Gibraltar	do	32 10 N.	54 20 W.	Feb. 18	2p, 18	Feb. 19	29.79	S	S., 9	W	S., 9	S.-WSW.
Illinois, Am.S.S.	Houston	Philadelphia	36 43 N.	75 03 W.	Feb. 19	8p, 19	Feb. 20	29.37	NW	NW., 9	NW	NW., 10	NE.-NW.
Leerdam, Du.S.S.	Rotterdam	New York	41 08 N.	66 17 W.	Feb. 20	9a, 20	do	29.20	SE	SSE, 8	WNW	SSE, 9	SE.-SSE.-S.
Black Tern, Am.S.S.	Antwerp	do	41 56 N.	62 20 W.	Feb. 23	3p, 23	Feb. 25	29.26	SSE	WSW., 9	NW	WSW., 10	SSE.-S.-WSW.
Carlsholm, Swed.S.S.	Gothenburg	Baltimore	58 36 N.	12 24 W.	do	8a, 24	do	29.33	S	W., 9	NNW	—, 11	6 points.
Steel Scientist, Am.S.S.	Gibraltar	New York	36 19 N.	51 08 W.	Feb. 24	Mdt., 24	do	29.76	SW	SW., 8	WNW	W., 9	SW.-WNW.
Collamer, Am.S.S.	Havre	do	41 57 N.	44 19 W.	Feb. 25	6a, 25	do	29.60	SSE	SSW, 8	WSW	S., 9	S.-SW.-WSW.
Sundance, Am.S.S.	Bremen	Charleston	48 55 N.	36 40 W.	do	9p, 25	oo	29.68	SE	SSE, 9	SSE	SSE, 9	SSE.-WSW.
Makiki, Am.S.S.	Cristobal	New York	12 12 N.	78 18 W.	Feb. 24	3a, 26	Mar. 2	29.92	NNE	NE, 5	ESE	NE., 8	NE.-E.-ESE.
Solana, Am.S.S.	Fall River	Curacao	35 30 N.	70 17 W.	Feb. 25	4p, 26	Feb. 26	29.71	SSE	SW., 10	W	SSW., 10	SSW.-W.
West Imboden, Am.S.S.	Para	Boston	38 42 N.	68 49 W.	Feb. 26	10p, 26	do	29.71	SW	NW., 9	NW	NW., 10	SW.-NW.
Boschdijk, Du.S.S.	Boulogne	New York	43 01 N.	59 12 W.	Feb. 27	4a, 27	Feb. 27	29.46	WSW	SSE., 7	W	WSW., 9	SSE.-SSW.-WSW.
Clydefield, Br.M.S.	Curacao	London	47 20 N.	20 00 W.	do	2a, 28	Feb. 28	30.17	NNW	NNW., 9	N	NNW., 9	NNW.-N.
New York, Ger.S.S.	Cherbourg	New York	45 48 N.	43 00 W.	Feb. 28	4a, 28	do	30.02	SW	SW., 9	W	SW., 9	SW.-W.
Carlsholm, Swed.S.S.	Gothenburg	Baltimore	51 38 N.	33 39 W.	do	9a, 28	Mar. 1	29.88	SW	WSW., 9	W	—, 10	2 points.

1 Position approximate.