

OCEAN GALES AND STORMS, FEBRUARY 1938—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began February—	Time of lowest barometer February—	Gale ended February—	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 PACIFIC OCEAN													
Kinai Maru, Jap. M. S.	Los Angeles	Yokohama	46 30 N.	157 50 W.	15	8p, 15	16	28.57	S	SW, 10	WNW	W, 11	S-W
Pres. Coolidge, Am. S. S.	Honolulu	do	33 34 N.	165 11 E.	16	6p, 16	17	28.99	SW	SW, 7	N	W, 12	SW-N.
California, Am. S. S.	Los Angeles	do	31 23 N.	179 44 W.	16	11a, 16	18	29.48	S	S, 7	W	SW, 8	S-W.
Nako Maru, Jap. M. S.	Yokohama	Los Angeles	45 02 N.	165 10 W.	18	10a, 18	19	28.94	SSE	SSE, 8	SW	SW, 9	SE-SSW.
Fujisan Maru, Jap. M. S.	Los Angeles	Kure	33 00 N.	145 00 E.	17	3p, 17	18	29.20	S	SW, 8	W	W, 10	S-W.
Sanyo Maru, Jap. M. S.	Yokohama	Los Angeles	41 25 N.	153 51 E.	17	10a, 18	18	29.02	SE	ESE, 9	NW	ESE, 9	SE-SW.
Empress of Russia, Br. S. S.	Victoria, B. C.	Yokohama	49 52 N.	129 23 W.	19	4a, 20	20	29.69	SE	SW, 4	S	SSE, 8	
Sanyo Maru, Jap. M. S.	Yokohama	Los Angeles	46 33 N.	175 50 W.	21	8p, 21	22	28.83	E	ENE, 9	NE	ENE, 9	2 points.
California, Am. S. S.	Los Angeles	Yokohama	31 47 N.	167 30 E.	21	2p, 21	22	29.33	W	W, 8	W	W, 9	
Kongo Maru, Jap. M. S.	Yokohama	Los Angeles	43 06 N.	162 42 E.	21	10p, 22	22	29.02	NW	NW, 5	NW	NW, 8	NW-S.
Toho Maru, Jap. M. S.	Kure	do	36 00 N.	162 00 E.	21	10p, 21	22	29.17	S	W, 8	W	W, 8	
Empress of Japan, Br. S. S.	Honolulu	Victoria, B. C.	33 21 N.	146 46 W.	22	Noon, 23	23	29.49	S	S, 8	SW	S, 9	
Empress of Russia, Br. S. S.	Victoria, B. C.	Yokohama	51 57 N.	161 43 W.	22	4a, 23	24	28.66	E	ENE, 6	NNE	NNE, 8	E-NE.
City of Daihart, Am. M. S.	Los Angeles	Honolulu	30 18 N.	134 46 W.	26	1p, 26	26	29.52	SSW	SSW, 8	WSW	SSW, 8	S-WSW.
Do	do	do	28 50 N.	139 44 W.	27	5p, 27	27	29.46	S	SW, 8	WNW	SSW, 9	S-WSW.
Lurline, Am. S. S.	Honolulu	San Francisco	30 08 N.	142 36 W.	28	6p, 28	28	29.46	SSW	SSW, 8	SW	SSW, 8	SSW-SW.
Pres. Taft, Am. S. S.	do	do	36 36 N.	127 06 W.	28	4p, 28	28	29.37	SE	SW, 8	SW	SW, 8	SE-SW.
Pres. McKinley, Am. S. S.	Yokohama	Victoria, B. C.	49 59 N.	159 55 W.	27	6p, 28	28	28.85	NNW	NW, 7	NW	NW, 10	

1 Barometer uncorrected.

NORTH PACIFIC OCEAN, FEBRUARY 1938

By WILLIS E. HURD

Atmospheric pressure.—Extensive low-pressure areas lay along the northern steamer routes of the Pacific throughout February 1938. The average center of the Aleutian cyclone was in consequence shifted to the southward and eastward of its normal position over the Aleutians, and extended to the north from the western part of the Gulf of Alaska (Kodiak, 29.67 inches) southwestward and then westward below the Aleutians well toward the Kuril Islands. Pressures over the eastern Aleutians and the Bering Sea, as shown by Dutch Harbor (29.79 inches) and St. Paul (29.91 inches), were 0.19 and 0.26 inch, respectively, higher than the normal. Thence northward anticyclonic conditions continued into the Arctic Ocean.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, February 1938

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Point Barrow	30.22	+0.10	30.82	18	29.52	25
Dutch Harbor	29.79	+ .19	30.52	2	29.04	23
St. Paul	29.91	+ .26	30.56	2	29.16	28
Kodiak	29.67	+ .05	30.38	9	28.86	23
Juneau	29.91	- .01	30.39	15	29.48	3
Tatoosh Island	29.83	- .17	30.38	24	29.18	3
San Francisco	30.00	- .10	30.32	6	29.25	9
Mazatlan	29.95	+ .02	30.00	2, 27	29.88	21
Honolulu	29.93	- .12	30.10	15	29.76	26
Midway Island	29.84	- .15	30.10	3	29.22	8
Guam	29.85	- .06	29.97	25	29.53	13
Manila	29.90	+ .01	30.03	22	29.83	14, 16, 18
Hong Kong	30.03	- .03	30.29	22, 24	29.68	15
Naha	30.06	+ .01	30.30	21, 24	29.74	15
Titijima	29.98	.00	30.24	26-28	29.77	17
Tokyo	29.92	- .01	30.24	28	29.38	17

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

In lower midocean and in coastal waters of the United States, average pressures were unusually low for the month, owing to the southward and eastward extension and persistence of lows. At Tatoosh Island the average pressure, 29.83 inches, was subnormal by 0.17 inch. At

Midway Island, the average barometer, 29.84, was lower than the normal by 0.15 inch, and was also the lowest average reading of record for the period 1916-38. Here daily readings above normal occurred on only 6 days. Even as far south as Honolulu pressure was as much as 0.12 inch below the normal. The lowest pressure reading of the month, 28.47, was reported by the Japanese motorship *Kumikawa Maru*, near 45° N., 149° W., on the 26th.

In Asiatic waters the usual anticyclone peculiar to February extended well eastward from the China coast. The eastern North Pacific high, however, was weakly developed and on the average occupied only a small region lying southwest of southern California.

Cyclones and gales.—Throughout the month the northern and central waters of the North Pacific were traversed by lows, some of them of considerable depth. However, gales were of somewhat less frequency and severity than in the previous January. The ocean as a whole cannot be classed as particularly stormy. In two sections, however, gales were more frequent than elsewhere; one, extending from the eastward of Japan nearly to Midway Island, and the other southwest of California. Along most of the central and eastern parts of the northern routes gales were few and scattered with only one instance reported of a wind as strong as force 11. This was encountered by the Japanese motorship *Kinai Maru*, barometer 28.57, near 46° N., 158° W., on the 16th.

At the close of the preceding month the heaviest storminess occurred between Japan and longitude 150° E., with the highest wind-force, 11, reported by the Japanese motorship *Kwanto Maru* on the 31st, near 38° N., 149° E. On February 1 the place of greatest intensity in the storm region was near 42° N., 157° E. Here at noon the British steamer *Eclipse* encountered a southerly hurricane, preceded during the voyage from Yokohama to San Francisco by fresh to full gales since the afternoon of January 31.

The most important lows of the month economically were those that developed off the west coast of the United States during the period of the 1st to 14th. These lows were of less extent and depth than many others forming in the central and western Pacific, but they were the cause of much damage in coastal and inland localities of California, owing to strong winds and heavy rains with attendant

floods. At the Weather Bureau office, San Francisco, the maximum wind velocity for a 5-minute period was at the rate of 38 miles from the southwest, lowest barometer 29.25 on the 9th, but winds were reported by the press to have been much higher in the harbor. At Los Angeles on the same date the highest velocity was 26 miles from the east. Owing to heavy coastal seas there was some damage and loss to small shipping there. The strongest gales reported by ships a day or two out from west-coast ports of the United States during the period were of force 9, on the 1st, 12th, and 13th.

During the last week in February there was further stormy weather in the vicinity, but mostly midway along the San Francisco-Hawaii routes. The heaviest gale reported in this area and period was of force 9, barometer 29.46, experienced by the American motorship *City of Dalhart*, near 29° N., 140° W.

To the immediate northward of Midway Island the stormiest weather occurred on the 8th and 16th, but no gales were reported there in excess of force 8 on those dates. To the near westward of Midway fresh gales occurred on the 6th and 7th; but between longitude 170° E. and central Japan, latitudes 30° N. and 40° N., there was much stormy weather during the 15th to 22d, the winds being particularly strong on the 15th to 18th, with forces of 9 to 10 covering a considerable area from near Yokohama eastward. On the 16th the strongest gale of the region—of force 12 from the west—was encountered by the American steamer *President Coolidge* in 33°34' N., 165°11' E. Shortly afterward the ship's barometer fell to 28.99 inches, which is an unusually low

reading in an extra-tropical cyclone of that low latitude.

Gales at the end of February so far as indicated by reports, were confined to localities west and southwest of California, where there were winds of force 8, and to the southeastward of the Aleutian Islands, where the American steamer *President McKinley*, near 50° N., 160° W., had a northwest wind of force 10 and a barometer down to 28.85.

Gales of Mexican-Central American waters.—Only 2 Tehuantepecers were reported in the month. These were of force 7 in the Gulf of Tehuantepec on the 1st and 7th, and of force 8 on the 1st at some distance to the south of the Gulf. Off the coast of Costa Rica a northeaster of force 8 occurred on the same date.

Fog.—There was considerably more fog observed on the ocean than during any preceding cold month of the season. Near the thirty-fifth parallel, to the northward of Midway Island, fog occurred on the 1st to 3d. Between about 40° and 50° N., 170° E. and 165° W., fog was seen on 10 days during the 1st to 11th. Along the belt, 38° to 42° N., 135° to 155° W., fog was reported on the 13th to 16th and on the 20th and 24th. Near the California coast it occurred on the 21st, 23d, and 24th; off Lower California, on the 7th; and near the Gulf of Tehuantepec on the 3d.

Waterspouts.—Five waterspouts, circulation clockwise, were reported by the American steamer *Tulsagas* on the 13th, in 45°49' N., 124°18' W. When observed, the ship had a south wind of force 7, barometer 29.41 inches (uncorrected). The weather was squally, with passing showers of rain and hail.