

OCEAN GALES AND STORMS, JANUARY 1941—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began January	Time of lowest barometer January	Gale ended January	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									
<b>NORTH PACIFIC OCEAN—Con.</b>													
President Van Buren, Am. S. S.	Hong Kong	San Francisco	38 12 N.	179 16 E.	22	4a, 23	22	982.7	SE	W, 6	SE	SE, 8	WNW-WSW-WNW
Emidio, Am. S. S.	Shanghai	Los Angeles	41 16 N.	179 20 W.	22	12m, 22	22	972.2	SE	S, 6	SSE	E, 8	NE-S-SW
President Van Buren, Am. S. S.	Hong Kong	San Francisco	37 54 N.	158 24 W.	25	1p, 25	25	973.6	SE	SSW, 8	SW	SW, 9	SE-WSW
Noto Maru, Jap. M. S.	Yokohama	do	38 10 N.	164 21 W.	25	12m, 25	26	962.1	SW	SW, 8	W	W, 11	SW-WSW
Emidio, Am. S. S.	Shanghai	Los Angeles	42 20 N.	163 00 W.	25	6p, 25	26	960.0	ENE	NNW, 9	W	N, 10	NNE-NNW
Coldbrook, Am. S. S.	Kobe	Vancouver, B. C.	50 30 N.	135 34 W.	25	8a, 26	27	964.4	NE	NNW, 8	SSW	NNE, 9	None
Chirkof, U. S. A. T.	Seward	Ketchikan	58 36 N.	147 30 W.	27	8a, 27	28	967.5	NE	SSE, 6	SSE	SSE, 8	NE-S
Emidio, Am. S. S.	Shanghai	Los Angeles	41 50 N.	151 00 W.	27	3a, 28	28	982.7	S	S, 10	SSW	SSE, 10	SSE-SW
Coldbrook, Am. S. S.	Kobe	Vancouver, B. C.	50 10 N.	143 27 W.	28	4p, 28	29	982.1	SSE	SE, 10	W	SE, 10	SSE-SE-S
Texmar, Am. S. S.	Balboa	Los Angeles	9 15 N.	85 54 W.	30	4p, 30	31	1,007.8	NNE	NNE, 6	NE	NNE, 8	E-S
Coldbrook, Am. S. S.	Kobe	Vancouver, B. C.	49 11 N.	126 48 W.	30	5a, 31	31	997.3	SE	ESE, 9	SE	E, 10	E-S
Swiftsure Bank Lightship, U. S.	On station		48 33 N.	125 00 W.	30	6a, 30	30	1,002.7	SE	SE, 9	S	SE, 10	SE-S
Swiftsure Bank Lightship, U. S.	do		48 33 N.	125 00 W.	31	8a, 31	*1	1,003.7	E	E, 7	SE	SE, 10	E-SE

\* Position approximate.

\* February.

WEATHER ON THE NORTH PACIFIC OCEAN

By WILLIS E. HURD

*Atmospheric pressure.*—Owing to the prevalence of numerous cyclonic depressions on northern and middle waters of the North Pacific Ocean during January 1941, the average barometer was below normal at all coastal and island stations shown in table 1, except in the extreme southwest, where pressures were normal or slightly above. The greatest departures occurred in the Aleutian region, with the maximum at Dutch Harbor, where the average pressure, 993.5 millibars (29.34 inches), was 8.2 millibars (0.24 inch) below the normal. The lowest station pressure reading was 963 millibars (28.44 inches), at Kodiak, on the 27th. The lowest reported ship's barometer was 960 millibars (28.35 inches), read on the American S. S. *Emidio*, near 42° N., 163° W., 25th. Nearly as low a reading, 961 millibars (28.38 inches), was made on the Japanese S. S. *Norfolk Maru*, near 47° N., 164° W., on the 8th.

Regions of moderately high average pressure lay off the coasts of California and eastern China.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean January 1941, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	Millibars	Millibars		Millibars	
Barrow	1,018.5	-0.1	1,042	21	985	30
Dutch Harbor	993.5	-8.2	1,012	11	976	8
St. Paul	999.6	-3.8	1,014	25	983	28
Kodiak	995.1	-4.9	1,019	21	963	27
Juneau	1,006.8	-5.1	1,025	23	985	27
Tatoosh Island	1,012.5	-2.8	1,028	1	992	24
San Francisco	1,017.3	-2.3	1,027	17	1,004	6
Mazatlan	1,014.0	-0.2	1,016	9, 12, 23	1,011	27
Honolulu	1,015.6	-0.3	1,021	5	1,010	27
Midway Island	1,015.0	-1.9	1,028	1	1,001	22
Guam	1,012.4	-0.1	1,016	13	1,010	16, 18
Manila	1,013.3	+1.1	1,018	15	1,010	18, 24
Hong Kong	1,017.3	-2.3	1,030	31	1,008	22
Naha	1,019.0	+0.4	1,031	31	1,011	22, 23
Titijsima	1,016.3	0.0	1,024	27	1,009	8
Petrovsk	1,002.5	-1.6	1,027	23	974	16

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 observations.

*Extratropical cyclones and gales.*—January 1941 was less severely stormy than the preceding December in northern and eastern waters, but was much more stormy in mid-ocean, especially between latitudes 30° and 40° N., longitudes 160° W., and 170° E., where gales were few and moderate in December. Stormy conditions were for the most part local during the first 5 days of the month, but on the 6th to 12th they became more widespread, as well as again on about the 18th to 25th. Some 15 reports from ships showed gales of force 10 as observed on 12 days. Four reports gave winds encountered as high as force 11 to 12, but these velocities appear to have been more in the form of sharp squalls than of sustained high winds.

From January 1 to 5 few gales were encountered on the Pacific, and those were mostly in connection with moderately stormy conditions in middle longitudes. The exception was a south gale of force 8 reported off the lower coast of Oregon on the 4th. The highest wind was of force 10, encountered on the 3d, near 39° N., 174° E., in the midst of stormy weather in which one vessel was involved from the 2d to the 6th. On the 5th this ship came under the influence of another low and encountered a further gale near 39° N., 162° E. By the 6th this low going eastward, had deepened, and in conjunction with another deep cyclone center to the eastward of the 180th meridian, was causing fresh to whole gales at various points between longitudes 160° E. and 155° W., along the middle and northern routes. By the 7th the western and more important cyclone was central near 42° N., 175° E., moving rapidly northeastward toward the eastern Aleutians, near which it was central on the 8th, accompanied by low pressures and scattered gales, the strongest of which, of force 11, was reported near 41° N., 162° W., on the 8th.

Meanwhile, another disturbance, of less extent, had developed on the 7th some 600 miles off the central California coast. To the westward of the center and about midway of the route toward Honolulu, the wind in localities had risen to force 9 from northerly directions. By the 8th the disturbance had moved southeastward to near 33° N., and 125° W., still causing high winds to the westward of the center, and also to the eastward near

Point Arguello. On the 9th it had moved slowly northwestward, lessening in energy, but ere its disintegration had given rise to a southeasterly gale of force 8 close in off the coast north of San Francisco.

On the 17th to 19th, in nearly the same region, stormy weather again occurred, in the lower quadrants of an elongated low pressure area with center in the Gulf of Alaska. During the 18th, which was the stormiest day, southeasterly gales occurred along the northern California coast, and gales of higher intensity were reported about midway between California and the Hawaiian Islands. The strongest winds, occurring in fierce morning squalls of hurricane force, were encountered by the American S. S. *Makiki* near 35° N., 141° W.

From the 11th to 15th, near midocean, cyclonic conditions were prevalent, and scattered gales of force 9 to 10 were reported daily from localities to the northward of about the 35th parallel, between about longitudes 175° W. and 170° E.

On the 19th and 20th the American S. S. *Admiral Halstead*, east-bound from the Philippines, ran into stormy weather to the northward of Midway Island. Near 33° N., 178° W., on the 19th, her barometer had fallen below 982 millibars (29 inches), and early on the following day she rode through northwesterly squalls of hurricane force.

From the 21st to 25th, while a succession of low centers appeared over a great extent of middle longitudes, ships reported gales in many localities, the positions of which may best be visualized by reference to the table of gales and storms. Among the ships experiencing the greatest stress of weather during this period may be mentioned the Japanese M. S. *Noto Maru*, Yokohama to San Francisco. This ship entered the gale region on the 20th not far from 37° N., 160° E. On the 22d, near 170° E., the wind force had increased to 10. On the 23d and 24th the winds on ship were of less intensity, but on the 25th, near 38° N., 164° W., with a low barometer of 962.1 millibars (28.41 inches), they had risen to their highest velocity, force 11. A special report on the storm by Third Officer H. S. Littlefair, of the American S. S. *President Van Buren*, Hong Kong to San Francisco, told of similar weather from the 22d to 25th, culminating in the heaviest gales, force 9 to 10, near 38° N., 157° W., on the 25th. It was in this storm, on the 25th, that the American S. S. *Emidio* had the lowest barometer of the month, with northerly gales of force 9-10, near 42° N., 163° W.

During the 28th a deep cyclone covered a great extent of the northeastern part of the ocean, centered at about 45° to 50° N., 155° to 165° W. During the day two vessels reported southeasterly gales of force 8 in the Gulf of Alaska, and two reported southeasterly gales of force 10 much farther southward, one near 50° N., 143° W., and the other near 42° N., 151° W. The storm went rapidly northeastward during the 29th.

Swiftsure Bank Lightship reported gales of force 8 on the 14th to 17th and on the 24th, and of force 10 on the 30th and 31st.

*Tehuantepecers and Papagayos.*—Owing to the southward extension of anticyclones into the Gulf of Mexico on several days of the month, an unusual number of "overflow northers" entered Pacific waters, resulting in gales, for the most part from the northeast, not only in the Gulf of Tehuantepec, but also west of Costa Rica, where they are known as Papagayos. The Tehuantepecers occurred as follows: of force 7 on the 12th; of force

8 on the 8th to 11th; of force 9 on the 18th to 20th. The Papagayos were observed as follows: of force 7 on the 10th and 20th; of force 8 on the 11th and 30th; of force 9 on the 12th.

*Fog.*—Very little fog was reported. It was observed on 3 days at the entrance to the Strait of Juan de Fuca; on 1 day off the Oregon coast; and on 1 day near 34° N., 146° W.

## RIVER STAGES AND FLOODS

By BENNETT SWENSON

Precipitation during January 1941 was above normal in the upper half of the Mississippi, the middle and lower Missouri, the upper and middle Arkansas, the Rio Grande, the Gila and the Sacramento River basins; elsewhere the precipitation was generally below normal. Snow depths at the end of the month were below normal except in the following areas: Portions of the northeast with depths of 10 to over 30 inches, the extreme upper Mississippi Basin with more than 15 inches in northern Wisconsin and Minnesota, and portions of the Rocky and Sierras Mountain regions.

The temperature was above the average for the month over the country except in the extreme northeast. This was the second consecutive month of mild weather this winter.

The excessive rainfall resulted mainly in light to moderate floods at isolated points as follows:

*Atlantic Slope drainage.*—No floods of any consequence occurred in this area. The Santee River reached flood stage at Rimini and Ferguson, S. C., from January 2 to 5. The rise was due mainly to dam-water release. Flood stage was also reached in the Savannah River at Clyo, Ga., on January 12.

*East Gulf of Mexico drainage.*—A slight rise occurred in the Tombigbee River on January 6 but no overflow occurred. Flooding continued in the Pearl River Basin from December; at Pearl River, La., the stage fell below the flood level on January 12. The total losses, most of which occurred in December, were estimated at \$10,200. Warnings were issued well in advance in most instances and money value of property saved by flood warnings totalling \$6,700 has been reported.

*Mississippi System.*—Heavy rains in portions of Kansas brought the stages in the Osage and lower Neosho Rivers close to bankful from the 17-19, but no overflow occurred, except for a slight overflow in the Osage at La Cygne, Kans., where a crest of 25.5 feet (0.5 foot above flood stage) was reached on the 19th.

The Sulphur River in Texas was in flood at the beginning of the month, continuing until the 6th at Naples, Tex. Another rise near the end of the month resulted in a slight overflow at Ringo Crossing, Tex., on the 24th. Damages amounting to \$2,500 were reported.

*West Gulf of Mexico drainage.*—In the Trinity River at Trinidad, Tex., the stage was above flood stage from December 17 to January 10, the highest stage being 36.5 feet on December 24. High water continued in the lower Trinity River during November, December, and most of January, being above flood stage much of this time.

Some flooding occurred also in the Sabine and Guadalupe Rivers.

*Pacific Slope drainage.*—The Sacramento River again experienced flood stages in January but were slightly lower than in December. The waters of the previous flood had only partially receded when the rise of this month began,