

OCEAN GALES AND STORMS, JANUARY, 1928

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	Highest force of wind and direction	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
North Atlantic Ocean													
American Shipper, Am. S. S.	London	New York	40 52 N.	67 47 W.	Jan. 1.	Noon, 1.	Jan. 2.	29.49	SSW	SSW	W	W, 9	SSW-W.
John W. Mackay, Br. S. S.	Halifax	Cable operations	49 56 N.	39 20 W.	Jan. 6.	8 a., 6.	Jan. 8.	29.49	SW	SW, 6	W	SW, 10	SW-W.
Stockholm, Swed. S. S.	Gothenburg	New York	58 18 N.	10 36 W.	Jan. 7.	11 p., 7.	Jan. 8.	28.80	W	WSW, 9	W	W, 11	SW-W.
City of Flint, Am. S. S.	Boston	London	48 51 N.	35 00 W.	Jan. 11.	10 a., 11.	Jan. 11.	29.19	SW	SW, 10	SW	—, 10	Steady.
Rockaway Park, Am. S. S.	Liverpool	Boston	46 39 N.	30 20 W.	Jan. 13.	Noon, 13.	Jan. 14.	29.42	SSW	SSW, 8	WNW	WSW, 12	SSW-WSW.
Breedijk, Du. S. S.	Galveston	Rotterdam	45 15 N.	40 44 W.	Jan. 15.	6 a., 16.	Jan. 16.	28.85	S	WNW, 11	NW	WNW, 12	S-NW.
Inkum, Br. S. S.	Newport	Liverpool	48 23 N.	32 08 W.	Jan. 16.	1 p., 16.	Jan. 16.	29.13	S	W	WSW	S, 12	—
Ampetoo, Belg. S. S.	Baton Rouge	Rotterdam	39 48 N.	58 37 W.	Jan. 17.	2 p., 17.	Jan. 20.	29.37	SW	W, 10	Var.	WNW, 12	SW-WNW.
Rockaway Park, Am. S. S.	Liverpool	Boston	45 43 N.	37 42 W.	Jan. 16.	Noon, 16.	Jan. 23.	28.96	S	W, 10	WNW	—, 12	SSW-W.
Mercian Br. S. S.	Manchester	New York	50 01 N.	26 42 W.	Jan. 18.	1 p., 19.	Jan. 20.	28.71	SSE	SW	W	—, 12	S-WSW.
Balsam, Am. S. S.	Baltimore	Baltimore	45 10 N.	21 29 W.	Jan. 16.	8 a., 19.	Jan. 20.	29.36	S	SSW, 11	NW	SSW, 11	—
William Penn, Am. M. S.	Karachi, India	New York	37 20 N.	10 16 E.	Jan. 20.	2 p., 20.	Jan. 21.	30.10	NW	NW, 9	NW	NW, 12	—
Casper, Am. S. S.	Sarpsborg, Norway	Portland, Me.	51 32 N.	43 18 W.	Jan. 22.	8 a., 22.	Jan. 28.	28.93	WNW	WNW, 9	NW	NW, 12	Steady.
Ampetoo, Belg. S. S.	Baton Rouge	Rotterdam	47 35 N.	30 54 W.	Jan. 23.	Noon, 23.	Jan. 26.	29.81	WNW	WNW, 9	WNW	WNW, 12	Do.
Thuringia, Ger. S. S.	Cobb	Boston	49 57 N.	25 41 W.	Jan. 24.	Mdt., 24.	Jan. 25.	29.74	SE	SW, 11	WSW	—, 12	—
Providence, Fr. S. S.	Lisbon	New York	39 23 N.	44 36 W.	Jan. 24.	9 a., 25.	Jan. 26.	29.61	SE	S, 10	W	S, 10	S-SSW.
Arkansas, Dan. S. S.	South Shields	Baltimore	56 15 N.	24 00 W.	Jan. 23.	1 a., 25.	Jan. 26.	28.66	WSW	SSW, 11	NW	NW, 12	SW-NW.
Reliance, Ger. S. S.	New York	San Juan	39 30 N.	73 30 W.	Jan. 25.	4 p., 25.	Jan. 26.	29.63	WNW	WNW, 11	W	WNW, 11	Steady.
Hellig Olav, Dan. S. S.	Oslo	New York	52 40 N.	41 25 W.	Jan. 26.	4 p., 26.	Jan. 28.	29.18	SSE	SW, 7	W	WSW, 11	SSE-SW.
Monterey, Am. S. S.	New York	Tampico	19 24 N.	95 42 W.	Jan. 27.	5 a., 27.	Jan. 28.	30.11	N	N, 6	N	N, 8	Steady.
Thuringia, Ger. S. S.	Cobb	Boston	47 30 N.	34 45 W.	Jan. 26.	4 a., 27.	Jan. 27.	29.94	SSW	SSW, 10	SSW	—, 11	Do.
Cabo Espartei, Span. S. S.	Malaga	New York	34 22 N.	68 05 W.	Jan. 27.	4 a., 28.	Jan. 30.	29.56	WSW	WSW, 10	WNW	—, 10	—
Balsam, Am. S. S.	Glasgow	Baltimore	38 54 N.	61 00 W.	Jan. 27.	5 p., 29.	Jan. 30.	29.52	SW	SW, 12	NNW	SW, 12	—
Trinculo, Br. S. S.	Curacao	Avonmouth	46 00 N.	15 03 W.	Jan. 28.	Mdt., 29.	Jan. 29.	29.81	SW	NW	ESE	NW, 10	NW-WNW.
Columbus, Ger. S. S.	Cherbourg	New York	48 18 N.	32 13 W.	Jan. 30.	Mdt., 30.	Jan. 31.	29.68	SW	WSW, 7	NNW	WSW, 10	Steady.
Atlanta City, Am. S. S.	Port Said	Gibraltar	36 20 N.	3 15 W.	Jan. 30.	1 a., 30.	Jan. 30.	29.65	NNW	NNW, 8	NNW	NNW, 9	SW-S-NNW.
Arkansas, Dan. S. S.	South Shields	Baltimore	50 20 N.	35 08 W.	Jan. 30.	1 a., 31.	Feb. 1.	29.45	SW	SW, 12	NW	—, 12	WSW-NW.
Lorain, Am. S. S.	Hamburg	do.	37 — N.	62 — W.	Jan. 31.	1 p., 31.	Jan. 31.	30.26	WSW	WSW, 9	NW	NNW, 9	SW-W.
North Pacific Ocean													
Aorangi, Br. M. S.	Honolulu	Victoria	31 40 N.	148 26 W.	Jan. 1.	3 a., 2	Jan. 4.	29.33	SW	W, 6	S	S, 10	W-WSW.
Stanley, Am. S. S.	Pulupandan	San Pedro	34 00 N.	160 20 W.	1	2 p., 1	4	29.18	NNW	WNW, 7	W	W, 10	NNE-WNW.
Malolo, Am. S. S.	San Francisco	Honolulu	31 16 N.	140 07 W.	2	Noon, 2	3	29.74	SW	WSW, 9	WNW	WSW, 9	SW, 3-WSW.
Havre Maru, Jap. S. S.	Los Angeles	Yokohama	32 34 N.	144 55 E.	2	9 p., 2	3	29.48	SSW	WSW, 9	W	W, 9	SSW-W.
West Niger, Am. S. S.	Columbia River	do.	41 00 N.	150 00 E.	2	Mdt., 3	4	29.10	SE	WNW, 6	NW	NW, 12	SE-WNW.
Atlantic Maru, Jap. S. S.	Kobe	San Francisco	43 10 N.	141 16 W.	3	Noon, 3	4	28.84		S, 9		SW, 10	S-SW.
Paris Maru, Jap. S. S.	Vancouver	Yokohama	42 20 N.	148 20 E.	3	2 p., 3	4	28.61	W	W, 11	NW	W, 11	W-NW.
Tamaha, Br. S. S.	Shanghai	San Pedro	40 06 N.	176 10 E.	3	5 p., 5	7	29.12	SSE	NW, 8	NW	WNW, 10	W-NNW.
Bohemian Club, Am. S. S.	Balboa	do.	15 34 N.	98 44 W.	5	6 p., 5	6	29.94	N	N	N	N, 10	Steady.
Makiki, Am. S. S.	Seattle	Honolulu	36 44 N.	143 16 W.	6	4 p., 6	6	29.50	SSW	S, 8	SW	SW, 9	—
Silvercedar, Br. M. S.	Manila	San Francisco	34 58 N.	162 23 W.	6	4 a., 7	7	29.31	NW	NW	WNW	W, 9	NW-W.
Robin Adair, Am. S. S.	Balboa	San Pedro	16 00 N.	94 40 W.	6	2 a., 7	7	30.10	N	NNW, 10	NE	NNW, 10	N-NNW.
Bessmer City, Am. S. S.	Los Angeles	Yokohama	30 20 N.	146 50 E.	7	4 a., 8	9	29.87	NW	NW, 8	NNE	NW, 9	—
Kohshun Maru, Jap. S. S.	Mike	Coos Bay	45 23 N.	168 15 W.	7	Mdt., 8	9	28.59	E	NE, 10	N	NE, 10	NE-N.
Akagisan Maru, Jap. S. S.	Yokohama	San Francisco	46 50 N.	155 09 W.	9	Noon, 9	11	28.57	SSE	SSW, 9	WSW	SSE, 10	SSE-WSW.
Melroy Maru, Jap. S. S.	Vancouver	Yokohama	41 43 N.	147 23 E.	11	8 p., 11	13	29.54	W	WNW, 2	NW	W, 9	—
Tahchee, Br. S. S.	Cebu	San Pedro	39 40 N.	165 54 W.	16	8 p., 17	17	29.70	S	S, 10	SSW	S, 10	S-SSW.
Emp. of Russia, Br. S. S.	Yokohama	Victoria	49 43 N.	170 35 W.	17	4 a., 18	18	29.38	NW	WNW, 8	W	WNW, 9	WNW-W.
Do.	do.	do.	50 11 N.	142 47 W.	20	3 p., 20	20	29.51	N	N, 9	N	N, 9	Steady.
Las Vegas, Am. S. S.	Kobe	Portland	46 05 N.	164 15 E.	19	3 p., 20	20	28.46	ENE	WNE, 4	ENE	ENE, 11	—
Tacoma, Br. S. S.	Yokohama	San Francisco	40 00 N.	163 15 E.	18	4 a., 19	21	29.02	ESE	W, 9	NW	W, 9	ESE-WSW.
Grace Dollar, Am. S. S.	Manila	do.	31 18 N.	144 51 E.	20	8 a., 20	21	30.08	NW	NW, 8	NNW	NW, 9	Steady.
Do.	do.	do.	34 16 N.	168 00 E.	26	2 a., 26	26	29.93	S	S, 7	SSW	S, 9	Do.
Edenton, Am. S. S.	Pulupandan	Honolulu	16 40 N.	145 45 E.	20	4 p., 21	24	29.83	NE	NE, 7	ENE	NE, 8	NE-E.
Lio, Am. M. S.	San Francisco	Balboa	15 33 N.	94 40 W.	22	2 p., 22	22	29.95	NE	NNE	NE	NE, 10	NE-NE.
Makaweli, Am. S. S.	Bellingham	Hilo	36 21 N.	141 11 W.	27	Mdt., 27	28	29.78	NNE	NNE, 7	NE	N, 9	NE-N.
Jadden, Am. S. S.	San Pedro	New Orleans	14 50 N.	96 20 W.	28	4 p., 28	29	29.84	E	ENE	N	NNE, 10	E-NE-N.
Archer, Am. S. S.	Pulupandan	San Pedro	41 08 N.	152 49 E.	28	11 a., 29	31	29.13	NE	NE, 7	W	NW, 9	—

NORTH PACIFIC OCEAN

By WILLIS E. HURD

The year 1928 opened with cyclonic weather, accompanied by widespread gales which frequently attained force 10, prevailing over the greater part of the ocean east of the one hundred and eightieth meridian. At this time the only persisting remnants of anticyclones at sea in west longitudes were found off the coast of southern California and at the northern extremity of the Gulf of Alaska. However, this great low pressure area soon began to slowly contract northward, until by the 12th a practically normal barometric condition prevailed, the

cyclone now lying over and somewhat to the southward of Aleutian waters; the east Pacific anticyclone in good strength occupying the central part of the ocean; thereafter it remained quite stable until toward the end of January, when a cyclone of some energy moved into its region from the north and disturbed the weather along the east-central part of the upper California-Hawaii routes from the 27th to the 31st.

Pressure over northern waters was considerably below the normal, while along the American coast south of Alaska, and in mid-ocean below the thirtieth parallel, it was above normal. See following table of barometric data:

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level at indicated hours, North Pacific Ocean, January, 1928

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Dutch Harbor ¹	29.35	-0.29	29.86	26th.....	28.18	6th.
St. Paul ¹	29.37	-0.32	29.82	25th.....	28.90	13th. ²
Kodiak ¹	29.45	-0.19	30.10	1st.....	28.40	7th.
Midway Island ¹	30.09	+0.09	30.40	11th.....	29.80	8th. ²
Honolulu ²	30.09	+0.09	30.21	22d.....	29.89	1st.
Juneau ³	29.84	-0.04	30.46	18th.....	28.78	7th.
Tatoosh Island ³	30.10	+0.16	30.44	26th.....	29.67	21st.
San Francisco ³	30.23	+0.14	30.45	7th.....	29.90	14th.
San Diego ³	30.13	+0.07	30.31	17th.....	29.79	14th.

¹ P. m. observations only.
² For 30 days.
³ A. m. and p. m. observations.

⁴ Corrected to 24-hour mean.
⁵ And other dates.

January, however, was less stormy than either of the two preceding months. Yet moderate to strong gales were experienced over most of the upper two-thirds of the ocean during the first few days, though they did not attain to hurricane force except on the 3d, between 40° N., 150° E., and the upper Japanese coast. After the 7th, although moderate scattered gales continued, there was a general diminution of high windiness until after mid month, then a gradual increase over large sections of the ocean, the maximum known wind of this latter

period being of force 11 near 46° N., 164° E., on the 21st. Local gales of forces 8 and 9 occurred during the last five days of the month in connection with the cyclone which hung off the California coast. This disturbance, the most peculiar of the month, moved about in all directions, expanding and contracting, while hemmed in by anticyclones except on its northwestern quadrant, where it connected with the northern low.

At Honolulu the prevailing wind direction continued from the east, average velocity, 10.5 miles, maximum velocity, 31 miles, from the east.

This January was reported as one of the warmest on record off the coast of southeastern Alaska.

Northers were exceptionally frequent and severe in the Gulf of Tehuantepec. Gales equaling or exceeding force 8 occurred on about 30 per cent of the days, attaining force 10 on four occasions. The winds thence down the Central American coast were also unusually strong, reaching force 7 on several days.

Fog was of very slight occurrence over by far the greater area of the ocean, except adjacent to the American coast. Nine days with fog were reported off Lower California, and it was observed on 14 days between the thirtieth and fortieth parallels, from the coast to longitude 132° W. Some 20 per cent of fog formed along the coastwise routes between latitudes 40° and 50° N., with slightly the greatest frequency experienced about Vancouver Island.

CLIMATOLOGICAL TABLES

DESCRIPTION OF TABLES AND CHARTS

Table 1 gives the data ordinarily needed for climatological studies for about 176 Weather Bureau stations making simultaneous observations at 8 a. m. and 8 p. m. daily, seventy-fifth meridian time, and for about 37 others making only one observation. The altitudes of the instruments above ground are also given.

Beginning January 1, 1928, movement and velocity of the wind are printed as recorded by the three-cup anemometer replacing the four-cup pattern.

Table 2 gives, for about 35 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation, depth of snowfall and the respective departures from normal values except in the case of snowfall. The sea-level pressures have been computed according to the method described by Prof. F. H. Bigelow in the REVIEW of January, 1902, 30: 13-16.

CHART I.—*Temperature departures.*—This chart presents the departures of the monthly mean surface temperatures from the monthly normals. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly surface temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July, 1909, but smaller charts appear in W. B. Bulletin U from 1873 to June, 1909, inclusive.

CHART II.—*Tracks of centers of ANTICYCLONES;* and

CHART III.—*Tracks of centers of CYCLONES.* The Roman numerals show the chronological order of the centers. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the observations at 8 a. m. and 8 p. m., seventy-fifth meridian time. Within each circle is also given (Chart II), the last three figures of the highest barometric reading, or (Chart III) the lowest reading reported at or

near the center at that time, and in both cases as reduced to sea level and standard gravity. The inset map of Chart II shows the departure of monthly mean pressure from normal and the inset of Chart III shows the change in mean pressure from the preceding month.

CHART IV.—*Percentage of clear sky between sunrise and sunset.*—The average cloudiness at each Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the nighttime.

CHART V.—*Total precipitation.*—The scales of shading with appropriate lines show the distribution of the monthly precipitation. The inset on this chart shows the departure of the monthly totals from the corresponding normals.

CHART VI.—*Isobars at sea level, average surface temperatures, and prevailing wind directions.*—The pressures have been reduced to sea-level and standard gravity by the method described by Prof. Frank H. Bigelow in the REVIEW for January, 1902, 30:13-16. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of 8 a. m. and 8 p. m. readings at stations taking two observations daily, and to the 8 a. m. or the 8 p. m. observation, respectively, at stations taking but a single observation. The diurnal corrections so applied will be found in the Annual Report of the Chief of the Weather Bureau, 1900-1901, volume 2, Table 27, pages 140-164.

The sea-level temperatures are now omitted and average surface temperatures substituted. The isotherms can not be drawn in such detail as might be desired, for data from only the regular Weather Bureau stations are used.

The prevailing wind directions are determined from hourly observations at the great majority of the stations.