

## Statistics of Some Weather Elements in the Vicinity of Lützow-Holm Bay

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### リュッツォウホルム湾附近の気象統計

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1956年から1960年迄行われた4回の南極観測における、宗谷及び海鷹丸の船上気象観測値を利用して、リュッツォウホルム湾附近の気象統計を行った。

資料の数の関係から、統計に要する区域は26の小海面にわけて、それぞれの区域ごとに各気象要素につき統計を行った。各気象要素は図及び表にあるように、風、天気、視程、全雲量及び下層雲量等であるが、更に、昭和基地に近い特別な3区域について、風向別の天気の頻度の統計も行ってある。

各要素についての総括的な結果は、海岸線から沖合に出るに従って気象条件は悪くなり、海岸線

に近づく程良くなる。風は海岸線に沿った東よりの風が一般に卓越しているが、海岸線に近い場所では海岸線の方向の変化に応じて最多風向が変わり、昭和基地に近づくに従ってリュッツォウホルム湾の東岸では北東によった風になる。又、海岸線からかなり沖合にでると、西よりの風の頻度が大きくなる傾向も見られる。

特別な3つの区域について統計した風向別の天気の頻度によると、風速が15ノット以上の場合では東よりの風は降雪を伴う事が圧倒的に多く、基地に近づくると地吹雪を伴う事もかなり多くなる。又、風速14ノット以下では西よりの風は霧やもやの出現する頻度が大きくなる傾向がある。

Statistics of the various meteorological elements of the Antarctic waters, from the west coast of Enderby Land to the west portion of the Cook Point, with the emphasis on Lützow-Holm Bay are carried out using the data, which were obtained on board the Soya, the Japanese Antarctic Research Expedition Ship, and the Umitaka-maru, research ship of the Tokyo University of Fisheries. Number of meteorological observations and the period of observations used in the statistics are as follows:—

The Soya:                   Jan. 6, 1957—Mar. 2, 1957 (Time in G.M.T.)  
                                  Dec. 19, 1957—Feb. 26, 1958  
                                  Jan. 1, 1959—Feb. 14, 1959  
                                  Dec. 26, 1959—Feb. 23, 1960

The Umitaka-maru: Jan. 6, 1957—Mar. 23, 1957

Some 2245 observations of the three-hourly observations which fall into the grid of statistics are actually used among the total of 2279.

Objective area of statistics is divided into 26 sections. However, the observations are not adequately spotted for our present purpose. Therefore, selection of the said

\* Japan Meteorological Agency. Member of the Japanese Antarctic Research Expedition, 1956-57.

small sections does not fully meet to our objectives and we are not to be satisfied by this fashion of selections. Fig. 1 shows these small sections.

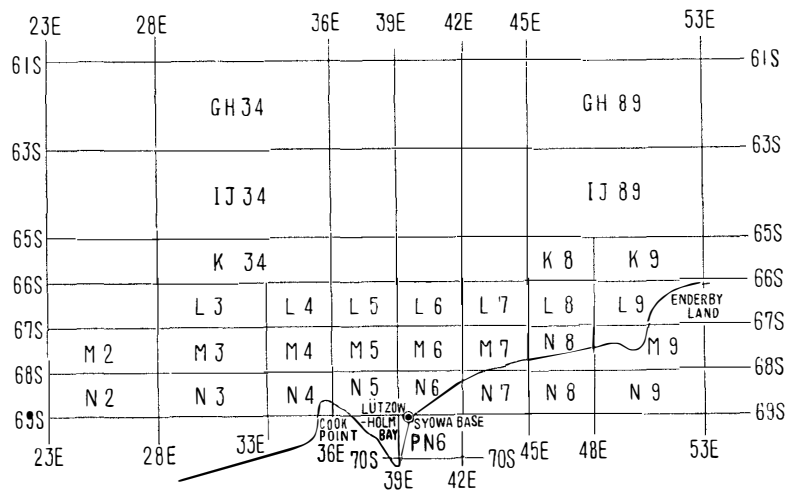


Fig. 1. Small sections for statistics object.

Following is the general principle of the determination of grids. First of all, grids are taken so as to show up the meridional climatic changes, paying special care to contain more abundant data. However, at the same time, reasonable east-west cut is also considered so as to manifest zontal climatic changes.

Meteorological elements taken in this statistics are, 1) mean wind direction and velocity, 2) wind-rose, 3) weather, 4) visibility, 5) total cloudiness and 6) amount of lower clouds. In addition to these elements, for specially divided regions. These values of statistics are shown in tables and figures.

#### General outlook of the meteorological conditions in the vicinity of Lützow-Holm Bay

In summer, the airmasses of Antarctic origin and the Southern Ocean origin meet together in the vicinity of Lützow-Holm Bay. Therefore, meteorological characteristics down there are so complicated. Particular, meridional change of meteorological factors as to the latitudes has a vivid speciality.

Owing to the shortage of the data used in these statistics meteorological characteristics are not fully explained. However, we can figure out the general tendencies from these statistics.

In the waters along the Antarctic, frequency of the easterly winds prevails compared with the other wind-directions, since the influences of the polar high and orographic effect play an important role to bring about such situations. This is also true for wind velocities, and we may say that all strong winds are the east winds. Moreover, the easterly winds take direction along the orography of the continent, and generally speaking, they parallel to the shore lines.

Namely, from the wind-direction frequency charts, we can see the most frequent

wind direction as such. In the small sections of M7 and N6, where the coast is located from ENE to WSW, the most frequent directions are 70°-90° (ENE-E) respectively, and occupy the 60% and 29% of the total observations respectively.

However, in the section of PN6 which is situated near Syowa Base and has a shore line of the direction of NE-NNE to SW-SSW, the most frequent direction becomes as 40%-60% (NE to ENE). It occupies 30% of the total observations.

In the vicinity of the Cook Point, namely in N5 and N4, these are 70°-90°, respectively. This is due to the complicated effect of the Cook Point. But, at the same time, we may mention the grand effect that the coast line from Enderby Land to Queen Maud Land runs generally from ENE to WSW from microscopic view point.

The detailed study of Fig. 2 tells us that in the region near the coast, frequency

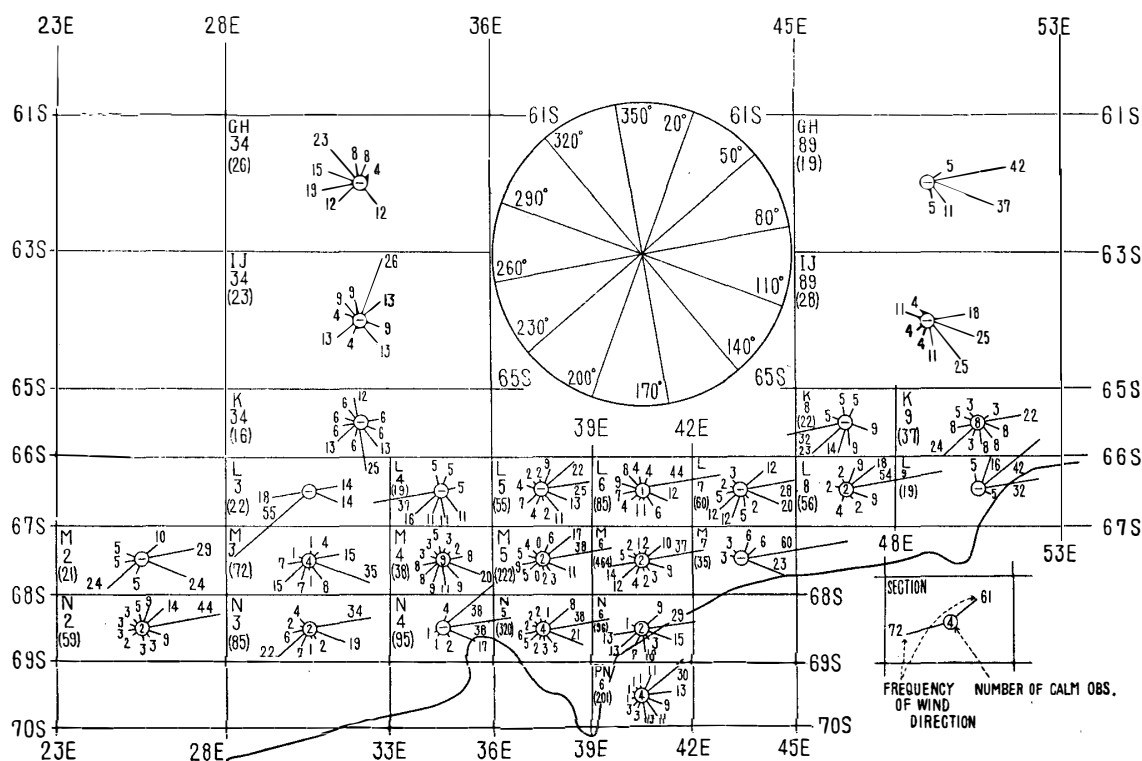


Fig. 2. Frequencies of wind direction.

of the easterly winds prevails, from Enderby Land up to Cook Point. However, in the waters north of 68°S off the coast of the Cook Point wind directions do not concentrate to the easterly component, but components of other directions come in the statistics. Consequently, each locality has its own characteristics.

There are the places where easterly winds have weak velocities, and in some regions there even are westerly winds. However, in the waters east of the Cook Point, frequency of the easterly winds becomes large and this is also true for the mean wind velocities (see Figs. 3/4 and Tables 1/2).

In the section K8, near Enderby Land, frequency of westerly winds is large and the mean wind direction and velocity also show up weak westerlies. The reason of this phenomenon is not clear yet because we do not have much observations. It is

Table 1. Number of wind directions, and frequencies and speed in every direction.

Section	Wind dir.	10°	40°	70°	100°	130°	160°	190°	220°	250°	280°	310°	340°	Calm	Total
		20°	50°	80°	110°	140°	170°	200°	230°	260°	290°	320°	350°		
		30°	60°	90°	120°	150°	180°	210°	240°	270°	300°	330°	360°		
GH 34	No. of obs.	2	1	—	—	3	—	—	3	5	4	6	2	—	26
	Frequency (%)	8	4	—	—	12	—	—	12	19	15	23	8	—	—
	Mean Speed (knots)	25.0	36.0	—	—	18.3	—	—	22.0	19.2	14.8	27.8	25.5	—	—
GH 89	No. of obs.	—	1	8	7	2	1	—	—	—	—	—	—	—	19
	Frequency (%)	—	5	42	37	11	5	—	—	—	—	—	—	—	—
	Mean Speed (knots)	—	10.0	27.6	14.6	10.0	17.0	—	—	—	—	—	—	—	—
I J 34	No. of obs.	6	3	—	2	3	—	1	3	—	1	2	2	—	23
	Frequency (%)	26	13	—	9	13	—	4	13	—	4	9	9	—	—
	Mean Speed (knots)	20.5	30.7	—	21.5	20.0	—	19.0	14.0	—	15.0	10.5	17.0	—	—
I J 89	No. of obs.	—	—	5	7	7	3	1	1	—	3	1	—	—	28
	Frequency (%)	—	—	18	25	25	11	4	4	—	11	4	—	—	—
	Mean Speed (knots)	—	—	19.6	14.6	12.4	13.3	14.0	12.0	—	7.7	10.0	—	—	—
K 34	No. of obs.	—	—	1	1	2	4	1	2	1	1	1	2	—	16
	Frequency (%)	—	—	6	6	13	25	6	13	6	6	6	13	—	—
	Mean Speed (knots)	—	—	22.0	17.0	11.0	10.5	18.0	7.0	13.0	1.0	10.0	20.0	—	—
K 8	No. of obs.	1	—	—	2	—	2	3	5	7	1	—	1	—	22
	Frequency (%)	5	—	—	9	—	9	18	23	32	5	—	5	—	—
	Mean Speed (knots)	5.0	—	—	17.5	—	8.5	6.3	8.2	6.4	3.0	—	3.0	—	—
K 9	No. of obs.	—	1	8	3	3	3	1	9	3	2	1	—	3	37
	Frequency (%)	—	3	22	8	8	8	3	24	8	5	3	—	8	—
	Mean Speed (knots)	—	9.0	18.1	13.3	8.3	4.3	7.0	7.9	5.3	3.0	5.0	—	0.0	—
L 3	No. of obs.	—	—	3	3	—	—	—	12	—	—	—	—	—	22
	Frequency (%)	—	—	14	14	—	—	—	55	—	—	—	—	—	—
	Mean Speed (knots)	—	—	21.7	12.0	—	—	—	8.5	—	—	—	—	—	—
L 4	No. of obs.	1	—	1	—	2	2	2	3	7	—	—	1	—	19
	Frequency (%)	5	—	5	—	11	11	11	16	37	—	—	5	—	—
	Mean Speed (knots)	2.0	—	9.0	—	6.0	8.5	11.0	9.0	11.3	—	—	13.0	—	—
L 5	No. of obs.	5	12	14	7	6	1	2	4	—	2	1	1	—	55
	Frequency (%)	9	22	25	13	11	2	4	7	—	4	2	2	—	—
	Mean Speed (knots)	6.0	14.1	17.6	12.9	13.7	11.0	10.0	9.3	—	8.5	3.0	5.0	—	—
L 6	No. of obs.	3	—	37	10	5	1	1	3	6	8	7	3	1	85
	Frequency (%)	4	—	44	12	6	1	1	4	7	9	8	4	1	—
	Mean Speed (knots)	13.0	—	21.7	14.6	7.0	10.0	5.0	10.7	3.8	13.5	7.0	5.7	0.0	—
L 7	No. of obs.	—	7	17	12	1	3	7	7	3	1	2	—	—	60
	Frequency (%)	—	12	28	20	2	5	12	12	5	2	3	—	—	—
	Mean Speed (knots)	—	12.4	15.6	15.9	15.0	6.0	7.3	2.7	4.0	6.0	4.5	—	—	—

L 8	No. of obs.	5	10	30	5	1	—	2	—	—	1	—	1	1	56
	Frequency (%)	9	18	54	9	2	—	4	—	—	2	—	2	2	
	Mean Speed (knots)	12.8	14.8	21.6	16.8	3.0	—	6.5	—	—	3.0	—	6.0	0.0	
L 9	No. of obs.	3	8	6	1	—	—	—	—	—	—	—	1	—	19
	Frequency (%)	16	42	32	5	—	—	—	—	—	—	—	1	—	
	Mean Speed (knots)	16.0	18.1	21.6	15.0	—	—	—	—	—	—	—	12.0	—	
M 2	No. of obs.	—	2	6	5	—	—	1	5	1	1	—	—	—	21
	Frequency (%)	—	10	29	24	—	—	5	24	5	5	—	—	—	
	Mean Speed (knots)	—	16.0	14.7	16.2	—	—	8.0	7.6	9.0	14.0	—	—	—	
M 3	No. of obs.	1	3	11	25	6	1	5	11	5	1	—	—	3	72
	Frequency (%)	1	4	15	35	8	1	7	15	7	1	—	—	4	
	Mean Speed (knots)	4.0	14.7	10.0	12.9	18.0	1.0	2.8	7.2	11.4	1.0	—	—	0.0	
M 4	No. of obs.	3	2	7	18	8	10	8	7	7	3	3	4	8	88
	Frequency (%)	3	2	8	20	9	11	9	8	8	3	3	5	9	
	Mean Speed (knots)	4.0	3.5	10.1	8.2	5.5	4.7	5.4	7.9	4.0	5.7	4.7	4.3	0.0	
M 5	No. of obs.	6	37	84	25	6	5	1	12	20	11	9	1	5	222
	Frequency (%)	3	17	38	11	3	2	0	5	9	5	4	0	2	
	Mean Speed (knots)	9.3	18.7	16.7	7.9	8.5	6.6	9.0	7.3	9.3	6.0	4.6	3.0	0.0	
M 6	No. of obs.	7	47	171	41	12	10	17	56	64	21	8	3	7	464
	Frequency (%)	2	10	37	9	3	2	4	12	14	5	2	1	2	
	Mean Speed (knots)	7.6	13.2	17.0	12.1	8.3	5.1	6.5	8.4	7.7	7.9	5.6	4.3	0.0	
M 7	No. of obs.	2	2	21	8	—	—	—	—	—	—	1	1	—	35
	Frequency (%)	6	6	60	23	—	—	—	—	—	—	3	3	—	
	Mean Speed (knots)	11.5	17.0	18.2	17.4	—	—	—	—	—	—	13.0	12.0	—	
N 2	No. of obs.	5	8	26	5	2	2	—	1	2	2	2	3	1	59
	Frequency (%)	9	14	44	9	3	3	—	2	3	3	3	5	2	
	Mean Speed (knots)	6.6	9.8	12.5	13.6	3.5	3.0	—	4.0	8.5	8.0	6.5	8.0	0.0	
N 3	No. of obs.	—	—	29	16	2	1	6	19	5	2	3	—	2	85
	Frequency (%)	—	—	34	19	2	1	7	22	6	2	4	—	2	
	Mean Speed (knots)	—	—	15.4	16.2	5.5	4.0	7.7	8.9	8.4	4.5	2.7	—	0.0	
N 4	No. of obs.	—	3	36	36	16	2	—	1	1	—	—	—	—	95
	Frequency (%)	—	4	38	38	17	2	—	1	1	—	—	—	—	
	Mean Speed (knots)	—	20.7	13.8	13.6	16.3	7.0	—	2.0	4.0	—	—	—	—	
N 5	No. of obs.	4	25	122	67	17	10	6	17	19	6	7	6	14	320
	Frequency (%)	1	8	38	21	5	3	2	5	6	2	2	2	4	
	Mean Speed (knots)	5.3	13.7	16.5	11.9	7.8	5.6	8.2	5.8	5.9	4.2	4.3	3.5	0.0	
N 6	No. of obs.	—	8	28	14	3	10	6	12	12	1	—	—	2	96
	Frequency (%)	—	9	29	15	3	10	7	13	13	1	—	—	2	
	Mean Speed (knots)	—	14.8	9.4	5.3	4.3	4.6	5.7	7.0	8.4	3.0	—	—	0.0	
PN 6	No. of obs.	23	61	27	18	22	26	5	5	2	3	2	3	4	201
	Frequency (%)	11	30	13	9	11	13	3	3	1	1	1	1	2	
	Mean Speed (knots)	13.4	15.8	7.9	6.1	6.5	5.4	4.4	5.6	4.0	2.7	3.5	5.3	0.0	

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Table 2. Number of wind speed observations in every wind direction.

Section	Wind Speed (knots)	Wind dir.	10°	40°	70°	100°	130°	160°	190°	220°	250°	280°	310°	340°
			20° 30°	50° 60°	80° 90°	110° 120°	140° 150°	170° 180°	200° 210°	230° 240°	260° 270°	290° 300°	320° 330°	350° 360°
G H 34	1-14		—	—	—	—	—	—	—	—	—	2	1	—
	15-33		2	—	—	—	3	—	—	3	5	2	4	2
	34 ≤		—	1	—	—	—	—	—	—	—	—	1	—
G H 89	1-14		—	1	—	4	2	—	—	—	—	—	—	—
	15-33		—	—	7	3	—	1	—	—	—	—	—	—
	34 ≤		—	—	1	—	—	—	—	—	—	—	—	—
I J 34	1-14		—	—	—	—	—	—	—	1	—	—	2	—
	15-33		6	2	—	2	3	—	1	2	—	1	—	2
	34 ≤		—	1	—	—	—	—	—	—	—	—	—	—
I J 89	1-14		—	—	—	4	6	3	1	1	—	3	1	—
	15-33		—	—	5	3	1	—	—	—	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
K 34	1-14		—	—	—	—	2	3	—	2	1	1	1	2
	15-33		—	—	1	1	—	1	—	—	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
K 8	1-14		1	—	—	—	—	2	3	4	7	1	—	1
	15-33		—	—	—	2	—	—	—	1	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
K 9	1-14		—	1	2	2	3	3	1	8	3	2	1	—
	15-33		—	—	6	1	—	—	—	1	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
L 3	1-14		—	—	—	2	—	—	—	12	4	—	—	—
	15-33		—	—	3	1	—	—	—	—	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
L 4	1-14		1	—	1	—	2	2	2	3	5	—	—	1
	15-33		—	—	—	—	—	—	—	—	2	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
L 5	1-14		5	7	5	5	4	1	2	4	—	2	1	1
	15-33		—	5	9	2	2	—	—	—	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—
L 6	1-14		2	—	9	7	5	1	1	2	6	6	6	3
	15-33		1	—	25	3	—	—	—	1	—	2	1	—
	34 ≤		—	—	3	—	—	—	—	—	—	—	—	—
L 7	1-14		—	5	8	6	—	3	7	7	3	1	2	—
	15-33		—	2	9	6	1	—	—	—	—	—	—	—
	34 ≤		—	—	—	—	—	—	—	—	—	—	—	—



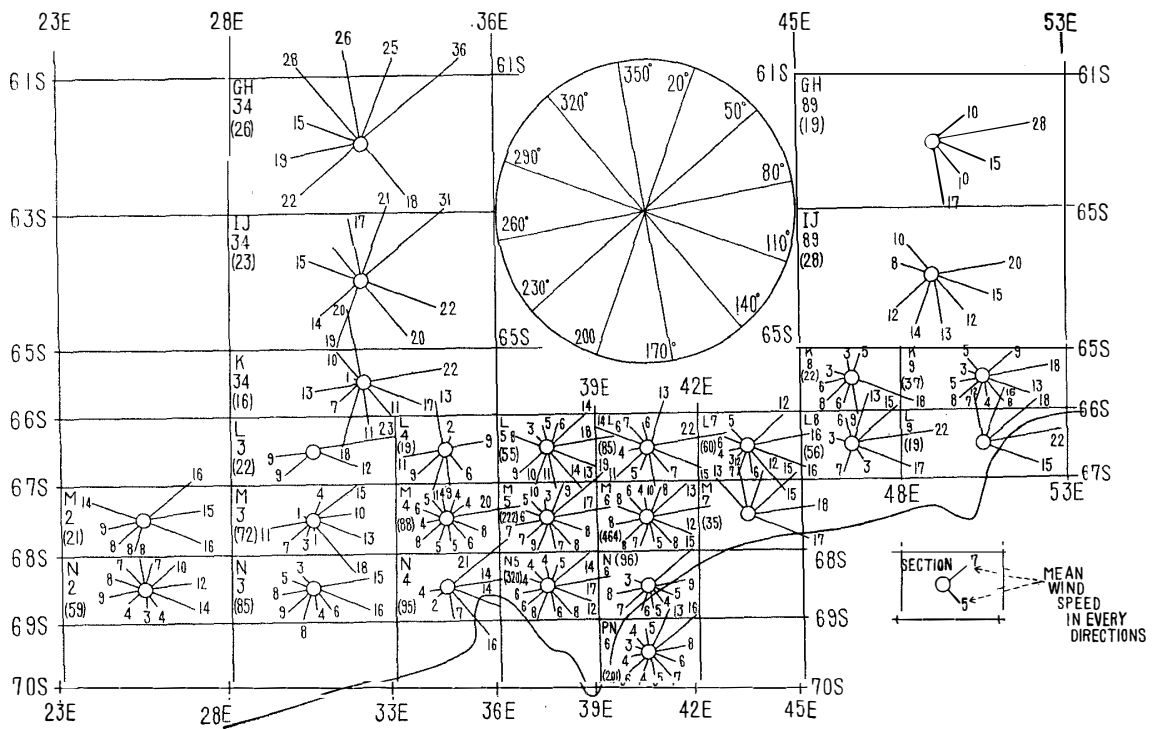


Fig. 3. Mean wind speed for every direction.

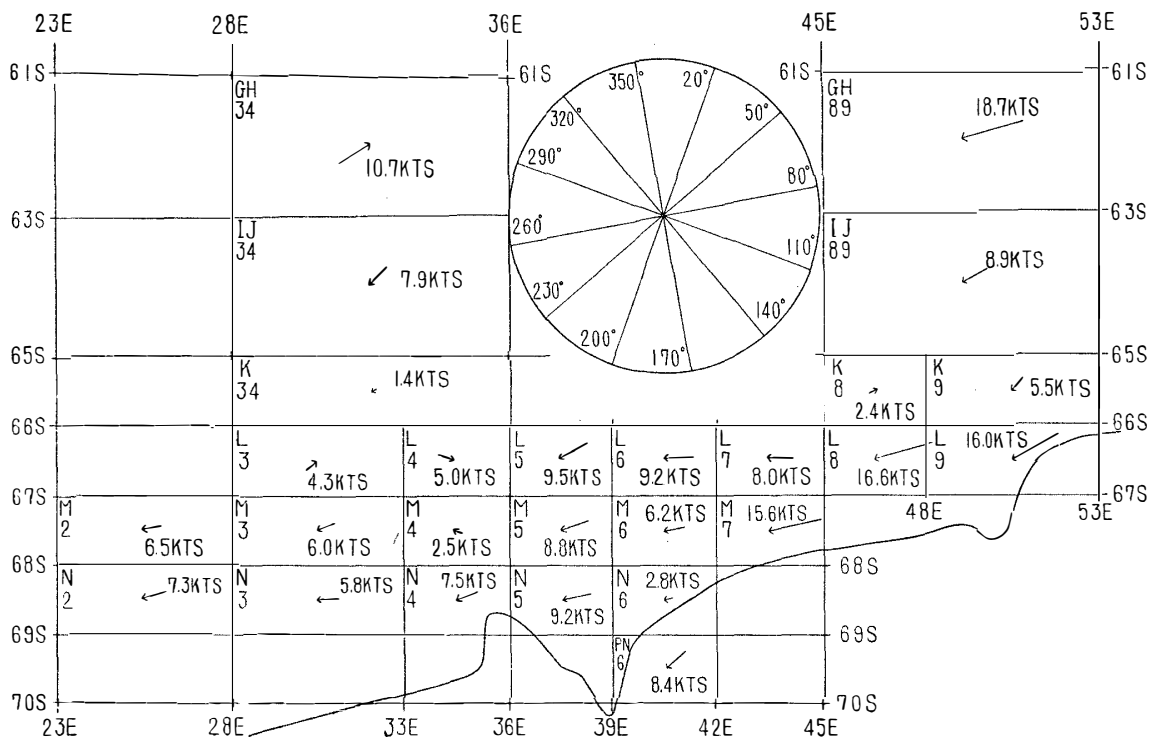


Fig. 4. Mean wind velocities.





Table 3. Frequencies of weather.

Section	No. of obs.	No. meters except photometers	Mist	Precipitation within sight	Blowing snow	Fog	Drizzle	Rain	Freezing rain	Snow	Rain and snow or ice pellets	Ice pellets	Unknown
GH 34	26	69%	—%	4%	—%	—%	—%	—%	—%	12%	12%	4%	—%
GH 89	19	58	—	—	—	—	—	—	—	42	—	—	—
IJ 34	23	43	—	9	—	—	4	—	—	35	—	9	—
IJ 89	28	86	—	4	—	—	—	—	—	11	—	—	—
K 34	16	69	—	13	—	—	—	—	—	19	—	—	—
K 8	22	87	—	5	—	9	—	—	—	—	—	—	—
K 9	37	70	—	—	—	14	—	—	—	16	—	—	—
L 3	22	77	—	5	—	—	—	—	—	18	—	—	—
L 4	19	58	—	16	—	5	—	—	—	21	—	—	—
L 5	55	29	—	—	—	6	2	—	—	62	2	—	—
L 6	85	47	—	2	—	1	—	—	—	50	—	—	—
L 7	60	57	—	2	—	2	—	—	—	38	2	—	—
L 8	56	27	2	—	7	4	—	—	—	59	2	—	—
L 9	37	70	—	—	—	14	—	—	—	16	—	—	—
M 2	21	71	—	—	—	5	—	—	—	19	5	—	—
M 3	72	61	—	—	—	8	1	—	—	28	—	1	—
M 4	88	64	—	2	—	9	1	—	—	24	—	—	—
M 5	222	49	2	1	—	7	1	2	1	35	2	—	—
M 6	464	51	0	3	0	1	—	—	—	43	0	1	—
M 7	35	23	—	—	—	—	3	—	—	74	—	—	—
N 2	59	58	—	5	—	9	—	—	—	25	2	—	2
N 3	85	61	—	—	4	5	—	—	—	29	1	—	—
N 4	95	43	—	—	3	—	2	1	—	50	1	—	—
N 5	320	58	—	3	0	2	1	—	—	36	—	—	—
N 6	96	83	1	2	—	5	—	—	—	8	—	—	—
PN 6	201	57	—	11	5	5	—	—	—	20	1	1	—

Note: The classification of weathers is composed of the following Int' Meteo' code figures.

The classification of weathers	Int' Meteo' code figure.
No. meteors except photometers.	00—03
Mist, Shallow fog or ice fog.	10—12
Precipitation within sight.	14—16, 18
Blowing snow.	36—39
Fog or ice fog.	28, 40—49
Drizzle	20, 50—59
Rain	21, 60—65, 25, 80—82
Freezing drizzle or freezing rain	24, 66—67
Snow	22, 70—78, 26, 85, 86
Rain and snow or ice pellets	23, 68, 69, 79, 83, 84
Ice pellets	27, 87—90
Unknown	Except above codes

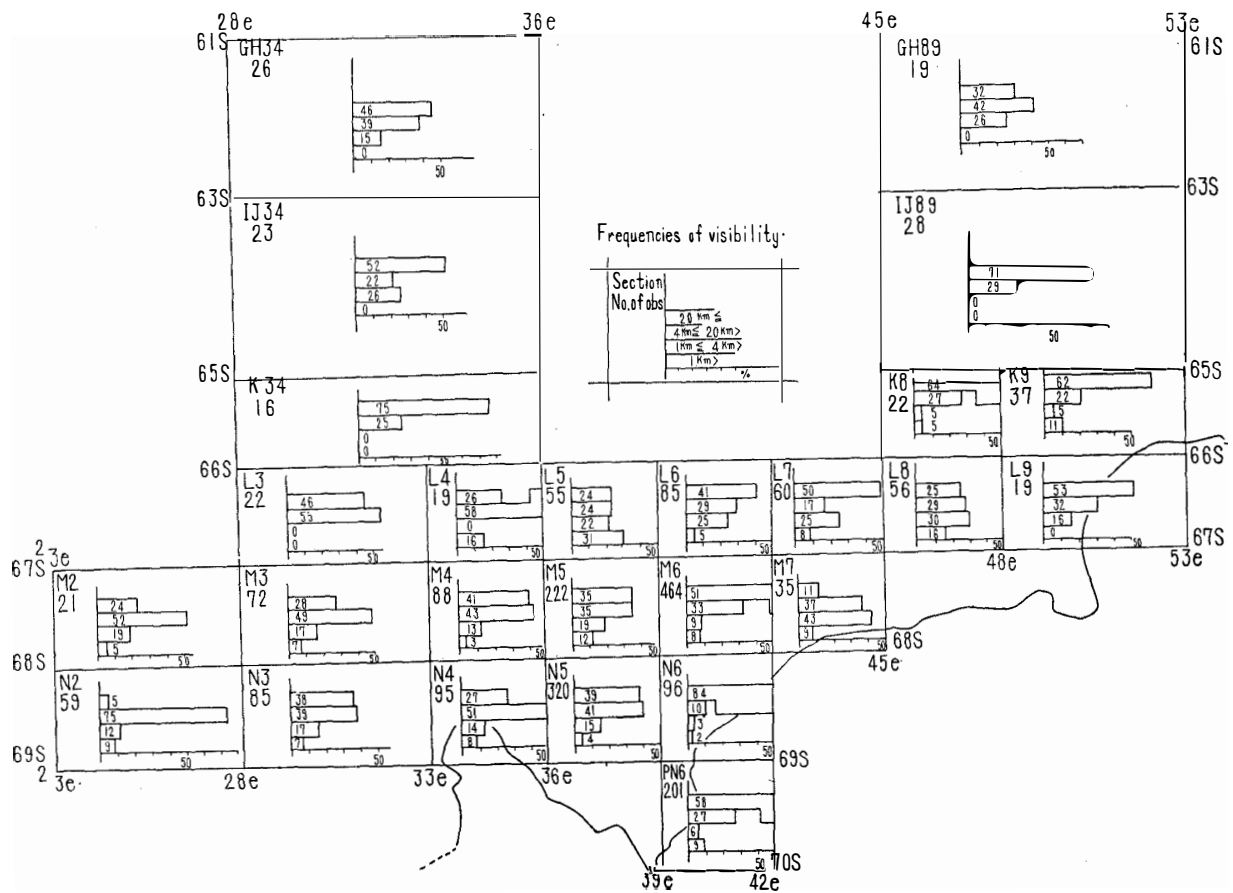


Fig. 6. Frequencies of visibility.

Table 4. Frequencies of visibility.

Section	No. of obs.	1 km >	1 km ≤ 4 km >	4 km ≤ 20 km >	20 km ≤
GH 34	26	—%	15%	39%	46%
GH 89	19	—	26	42	32
IJ 34	23	—	26	22	52
IJ 89	28	—	—	29	72
K 34	16	—	—	25	75
K 8	22	5	5	27	64
K 9	37	11	5	22	62
L 3	22	—	—	55	46
L 4	19	16	—	58	26
L 5	55	31	22	24	24
L 6	85	5	25	29	41
L 7	60	8	25	17	50
L 8	56	16	30	29	25
L 9	19	—	16	32	53
M 2	21	5	19	52	24
M 3	72	7	17	49	28
M 4	88	3	13	43	41
M 5	222	12	19	35	35
M 6	464	8	9	33	51
M 7	35	9	43	37	11
N 2	59	9	12	75	5
N 3	85	7	17	39	38
N 4	95	8	14	51	27
N 5	320	4	15	41	39
N 6	96	2	3	10	84
PN 6	201	9	6	27	58

Note: "Visibility" is defined the least visible distance in the all quadrants from the station, after J. M. A. obs.

Table 5. Frequencies of cloudiness

Section	No. of obs.	Cloud amounts					
		1 $\geq$	2—4	5—8	9 $\leq$	unknown	
GH	34	26	—%	—%	8%	89%	4%
GH	89	19	—	—	11	90	—
IJ	34	23	—	—	9	78	13
IJ	89	28	32	4	—	64	—
K	34	16	—	6	6	88	—
K	8	22	—	—	—	96	5
K	9	37	11	16	5	57	11
L	3	22	—	41	27	32	—
L	4	19	—	—	5	84	11
L	5	55	—	9	4	71	16
L	6	85	2	4	5	84	6
L	7	60	7	7	8	75	3
L	8	56	—	2	4	86	9
L	9	19	—	5	5	90	—
M	2	21	5	19	14	38	24
M	3	72	1	4	8	79	7
M	4	88	—	2	13	80	6
M	5	222	9	5	5	70	12
M	6	464	4	3	5	81	6
M	7	35	—	—	—	97	3
N	2	59	2	5	14	54	25
N	3	85	6	2	5	77	11
N	4	95	—	2	5	85	7
N	5	320	7	8	11	68	7
N	6	96	15	21	14	50	1
PN	6	201	17	9	10	62	3

Note: Cloudiness is used as the fraction of the celestial dome covered by clouds. It is denoted as unknown when cloud amount can't be estimated by fog or snow.

Table 6. Frequencies of lower cloud amount

Section	No. of obs.	Low cloud amounts					
		1 $\geq$	2—4	5—8	9 $\leq$	unknown	
GH	34	26	—%	31%	54%	12%	4%
GH	89	19	—	37	11	53	—
IJ	34	23	4	30	26	26	13
IJ	89	28	39	7	4	50	—
K	34	16	13	25	38	25	—
K	8	22	9	5	14	68	5
K	9	37	38	—	5	43	14
L	3	22	14	46	18	23	—
L	4	19	—	26	16	47	11
L	5	55	9	16	6	53	16
L	6	85	13	12	21	47	7
L	7	60	22	18	18	38	3
L	8	56	7	18	34	32	9
L	9	19	11	16	42	32	—
M	2	21	10	24	19	24	24
M	3	72	4	20	8	61	7
M	4	88	8	9	22	55	7
M	5	222	15	7	7	59	12
M	6	464	16	10	14	54	6
M	7	85	—	20	29	49	3
N	2	59	3	17	9	44	27
N	3	85	12	5	9	64	11
N	4	95	6	13	13	63	5
N	5	220	23	9	18	44	7
N	6	96	44	14	17	25	1
PN	6	201	39	20	9	29	3

Note: Lower cloud amount is used as the fraction of the celestial dome covered by clouds (Cu, Cb, Sc, St, Ns). It is denoted as unknown when low cloud amount cannot be estimated by fog or snow.

Table 7. Relations between wind direction and weather.

Area section M<sub>5</sub>+M<sub>6</sub>

Wind speed 0—14 knots

No. of obs. 489

Wind direction	No. of wind dirs.	No. meteors except photometers	Mist	Precipitation within sight	Blowing	Fog	Drizzle	Rain	Freezing rain	Snow	Rain and snow or ice pellets	Ice pellets
Calm	12	75%	17%	—%	8%	—%	—%	—%	—%	—%	—%	—%
10°, 20°, 30°	11	55	9	—	36	—	—	—	—	—	—	—
40°, 50°, 60°	45	58	2	—	36	—	—	—	—	2	2	—
70°, 80°, 90°	129	50	1	2	43	—	—	—	—	5	—	—
100°, 110°, 120°	52	60	—	—	35	—	2	—	—	4	—	—
130°, 140°, 150°	14	71	—	—	21	—	—	—	—	7	—	—
160°, 170°, 180°	15	53	—	7	40	—	—	—	—	—	—	—
190°, 200°, 210°	18	72	—	6	17	—	—	—	—	6	—	—
220°, 230°, 240°	59	92	—	2	3	—	—	—	—	2	2	—
250°, 260°, 270°	82	70	1	5	20	2	1	—	—	1	—	—
280°, 290°, 300°	31	58	—	—	29	3	3	—	—	7	—	—
310°, 320°, 330°	17	41	6	12	35	—	—	—	—	6	—	—
340°, 350°, 360°	4	25	—	—	75	—	—	—	—	—	—	—

Table 8. Relations between wind direction and weather.

Area section N<sub>5</sub>+N<sub>6</sub>

Wind speed 0—14 knots

No. of obs. 312

Wind direction	No. of wind dirs.	No. meteors except photometers	Mist	Precipitation within sight	Blowing snow	Fog	Drizzle	Rain	Freezing rain	Snow	Rain and snow or ice pellets	Ice pellets
Calm	16	94%	—%	—%	—%	—%	—%	—%	—%	6%	—%	—%
10°, 20°, 30°	4	75	—	—	—	—	—	—	—	25	—	—
40°, 50°, 60°	21	48	—	14	—	5	—	—	—	33	—	—
70°, 80°, 90°	82	61	—	4	—	2	—	—	—	33	—	—
100°, 110°, 120°	61	87	2	—	—	2	—	—	—	10	—	—
130°, 140°, 150°	17	71	—	6	—	6	—	—	—	18	—	—
160°, 170°, 180°	20	80	—	—	—	5	—	—	—	15	—	—
190°, 200°, 210°	12	92	—	—	—	8	—	—	—	—	—	—
220°, 230°, 240°	28	79	—	—	—	7	—	—	—	14	—	—
250°, 260°, 270°	31	68	—	—	—	7	—	—	—	26	—	—
280°, 290°, 300°	7	71	—	14	—	14	—	—	—	—	—	—
310°, 320°, 330°	7	29	—	29	—	—	14	—	—	29	—	—
340°, 350°, 360°	6	50	—	17	—	—	—	—	—	33	—	—

Table 9. Relations between wind direction and weather.

Area section PN<sub>6</sub>

Wind speed 0—14 knots

No. of obs. 160

Wind direction	No. of wind dirs.	No. meteors except photometers	Mist	Precipitation within sight	Blowing snow	Fog	Drizzle	Rain	Freezing rain	Snow	Rain and snow or ice pellets	Ice pellets
Calm	4	75%	—%	25%	—%	—%	—%	—%	—%	—%	—%	—%
10°, 20°, 30°	16	50	—	19	—	6	—	—	—	19	6	—
40°, 50°, 60°	30	67	—	13	—	—	—	—	—	20	—	—
70°, 80°, 90°	24	67	—	8	—	8	—	—	—	17	—	—
100°, 110°, 120°	18	67	—	11	—	—	—	—	—	22	—	—
130°, 140°, 150°	22	82	—	5	—	5	—	—	—	9	—	—
160°, 170°, 180°	26	73	—	4	—	12	—	—	—	8	—	4
190°, 200°, 210°	4	—	—	—	—	25	—	—	—	50	—	25
220°, 230°, 240°	6	33	—	17	—	33	—	—	—	17	—	—
250°, 260°, 270°	2	—	—	50	—	50	—	—	—	—	—	—
280°, 290°, 300°	3	100	—	—	—	—	—	—	—	—	—	—
310°, 320°, 330°	2	50	—	—	—	—	—	—	—	50	—	—
340°, 350°, 360°	3	100	—	—	—	—	—	—	—	—	—	—

Table 10. Relations between wind direction and weather.

Area section M<sub>5</sub>+M<sub>6</sub>

Wind speed 15 knots ≤

No. of obs. 197

Wind direction	No. of wind dirs.	No. meteors except photometers	Mist	Precipitation within sight	Blowing snow	Fog	Drizzle	Rain	Freezing rain	Snow	Rain and snow or ice pellets	Ice pellets
10°, 20°, 30°	2	50%	—%	—%	—%	—%	—%	—%	—%	50%	—%	—%
40°, 50°, 60°	36	6	—	3	—	6	—	8	3	69	6	—
70°, 80°, 90°	130	20	1	—	2	1	—	2	—	75	1	—
100°, 110°, 120°	13	31	—	8	—	—	—	—	—	62	—	—
130°, 140°, 150°	4	—	—	—	—	—	—	—	—	100	—	—
160°, 170°, 180°	—	—	—	—	—	—	—	—	—	—	—	—
190°, 200°, 210°	—	—	—	—	—	—	—	—	—	—	—	—
220°, 230°, 240°	8	88	—	—	—	—	—	—	—	13	—	—
250°, 260°, 270°	3	67	—	—	—	—	—	—	—	—	—	33
280°, 290°, 300°	1	—	—	—	—	—	—	—	—	100	—	—
310°, 320°, 330°	—	—	—	—	—	—	—	—	—	—	—	—
340°, 350°, 360°	—	—	—	—	—	—	—	—	—	—	—	—



And the various weather frequencies are studied for each wind direction in two cases. One is the case in which wind velocity over 15 kt, and the other under 14 kt. In the former case wind direction is divided into 13 directions, and the latter into 12 directions.

In Tables 7/8/9, it is shown that snowy weather shows considerably larger percentages in the case of easterly winds. Moreover, from Tables 10/11/12, we may conclude that when the easterly wind becomes over 15 kt, snowy weather is predominant. And in the section PN6 near Syowa Base, the case of ground bilizzard becomes common when the easterly winds exceed 15 kt.

It is shown that westerly winds are apt to bring about fog and mist. Actually, according to Tables 7/8/9, all three sections of M5+M6, N5+N6, PN6 show up tendencies of fog and mist appearances in westerly winds compared with the case of winds of other directions.

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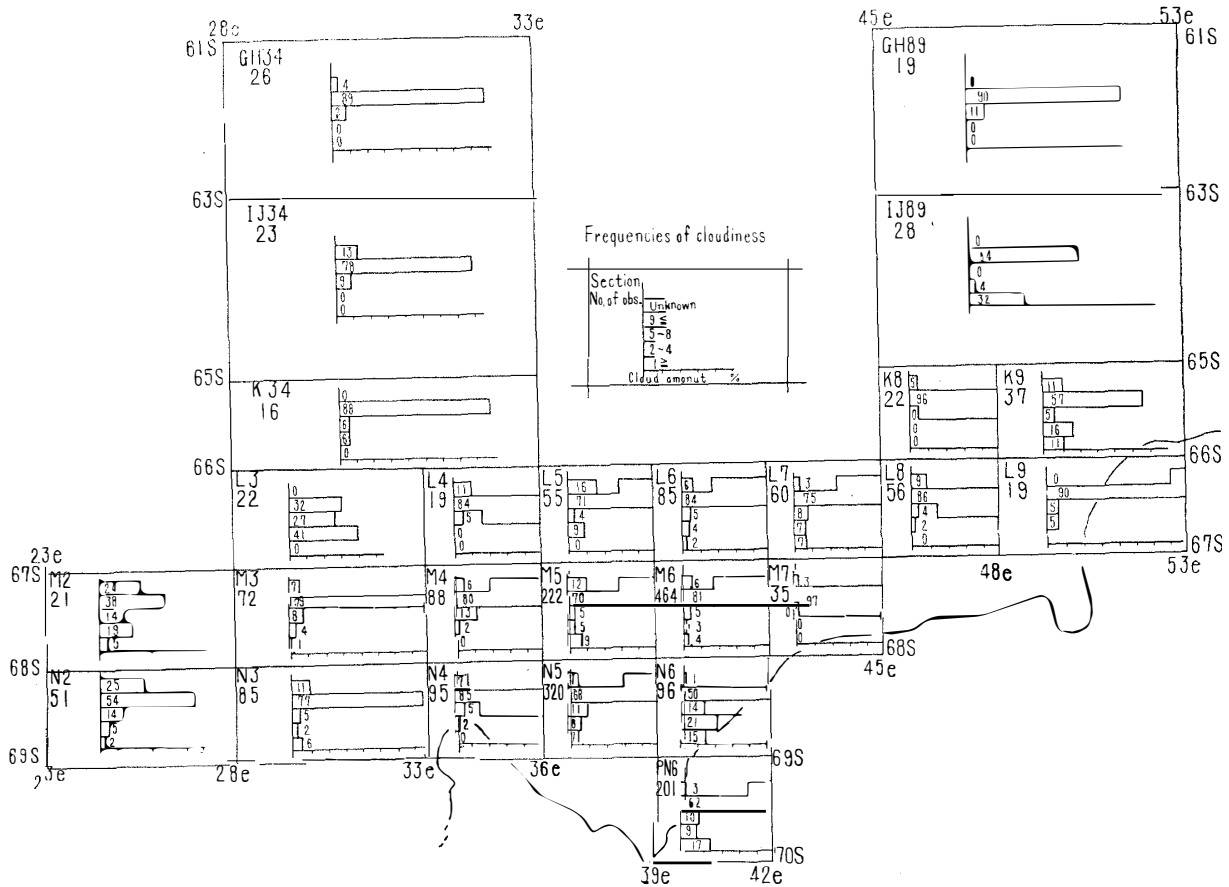


Fig. 7. Frequencies of cloudiness.



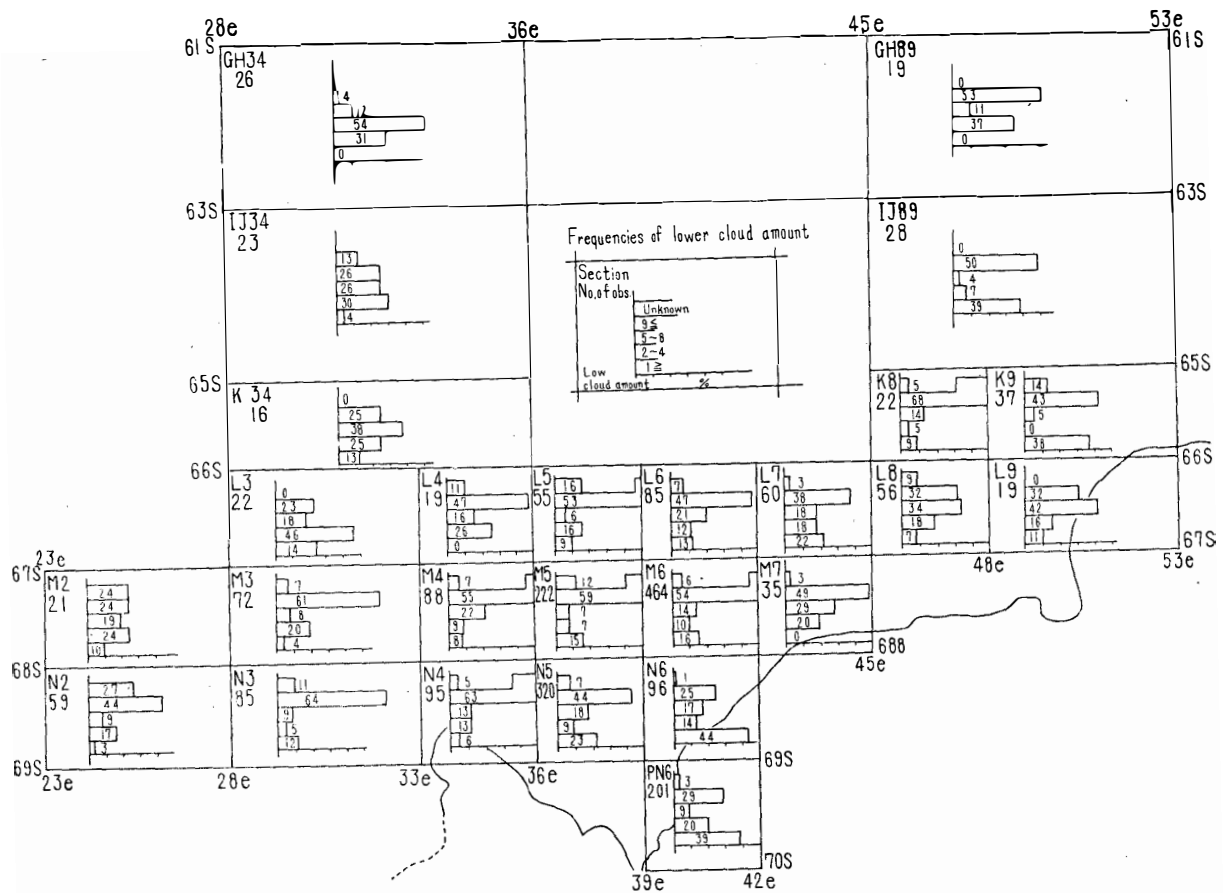


Fig. 8. Frequencies of lower cloud amount.

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