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The Commercial Shrimp Fishery in Denmark Strait in 1989 and Early in 1990

by

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INTRODUCTION

For the year 1989 STACFIS recommended that the total allowable shrimp catches in the Denmark Strait be maintained at approximately 10,000 tons as a precautionary measure until the data base is sufficient for an improved assessment of this stock. The reported catches from the Greenland zone in Denmark Strait totalled to 9,315 tons of which Greenland vessels accounted for nearly 6,000 tons.

The fishery was carried out in two periods of the year, January-May (approx. 6,000 tons) and August-December (approx. 3,000 tons). In January-March 1990 a catch of nearly 6,000 tons has been taken.

Logbooks from all the 29 Greenland vessels fishing at East Greenland have been available to the Greenland Fisheries Research Institute, covering nearly all of the Greenland catches and about 64% of the total catches in the Greenland economic zone.

The present paper updates information given by Carlsson & Kanneworff (1989) on catches and analysis of commercial fishery data.

MATERIALS AND METHODS

Total catches and number of vessels fishing in the Greenland zone were compiled by nation and month based on the compulsory weekly reporting to Greenland authorities by all vessels above 80 GRT (smaller vessels are not joining this fishery).

Logbook data were analyzed to show the overall distribution of effort and catches, and of effort and catch-rates by month. Monthly mean catch-rates from 1980 to March 1990 were calculated from available logbook data.

RESULTS AND DISCUSSION

Reported catches in 1989 and 1990

Tables 1 and 3 show reported catches for the Greenland zone by nation and month, and Tables 2 and 4 the corresponding total numbers of reporting vessels for the years 1989 and 1990, respectively.

Since the start of the fishery the seasonal distribution has gradually levelled out from a pure winter-spring fishery to a fishery during most of the year except for June and July where only little effort has been spent. About 35% of the catches in 1989 were taken in the last part of the year.

In 1989 highest catches - especially by Greenland vessels - were taken in January through April, corresponding to 62% of the total for the year. Also in December a substantial catch was taken (approximately 1,000 tons).

In January-March 1990 a catch of approximately 5,800 tons was taken in the area (Table 3) by vessels from the same nations as the year before. A total of 59 vessels participated in the fishery (Table 4).

Geographical distribution of the fishery

Fig. 1-4 show the distribution of total catches by Greenland vessels in 1986-1989. Fig. 5 gives the monthly distribution of CPUE and effort from January 1989 to March 1990 by statistical rectangle.

When comparing the distribution of the fishery through the last four years (Fig. 1-4) it is evident, that the total fishing area has changed substantially from year to year. These changes are connected partly with variations in the environmental conditions, i.e. ice cover, and partly with the yearly distribution of concentrations of berried female shrimp. A displacement of the total fishery towards the southernmost part of the area is also indicated. Similar to earlier years most of the fishery - however with only low catch rates - took place in the eastern and northern parts during the months August to November. In June and July the fishing activity was very low.

Catch and effort

Similar to 1987 and 1988 highest mean catch rates were found early in the year, but in 1989 these catch rates did not reach the same level as in the years before (Figure 6, corresponding effort is given i Table 5). Also, in the last part of the year the catch rates were considerably lower than in earlier years. Much effort was spent during these months (46% of the total for the year). In January-March 1990 catch rates again reached a maximum, but at an even lower level than in 1989. The annual mean catch rate decreased from 197 kg per hour in 1988 to 138 kg per hour in 1989. The general trend in the catch rates from the last three years is declining. It is, however, difficult to draw firm conclusions from the reported catch rate figures due to several factors:

1. Variations in ice cover over the fishing grounds may influence the access to shrimp concentrations,

2. Improvement in gear technology may result in higher catch rates than otherwise obtained, and

3. Eventual changes in discarding procedures caused by market requirements for larger shrimp or special products, higher competition between an increasing number of vessels in the fishery, and vessel quota limitations.

In spite of these complications, the continued decrease in catch rates through the later years may reflect a decreasing stock abundance, possibly caused by several years of too high removal from this stock.

By-catches in the shrimp fishery

By-catches are reported in logbooks from the shrimp fishery in similar amounts from year to year (2-3% of the shrimp catches) with redfish being the most dominant species, especially in February and March. However, as the reported levels can not be considered to be accurate, no compiling of the existing data has been made.

CONCLUSIONS

Reported catches of shrimp in 1989 from the Greenland part of Denmark Strait totalled 9,315 tons, a decline from 12,500 tons in the year before, which was the highest catch figure on record for this area. The total number of participating vessels was around 60 as in the years before. The mean catch per vessel decreased from 185 tons in 1988 to around 150 tons in 1989. The fishery took place in all months of the year with very low activity in June and July. 66% of the catches were taken in the first half of the year.

In 1988 the fishery has been more concentrated to the southern part of the fishing areas compared to earlier years.

As usual logbook data showed high catch rates early in the year, but the level of these rates was lower than in earlier years. Also, the catch rates in the last part of the year was lower than normal, as was the overall mean catch rate of 138 kg/hour for the Greenland fleet. However, some complications in interpreting these data are noted.

REFERENCES

Carlsson, D. M., and P. Kanneworff. 1989. The Commercial Shrimp Fishery in Denmark Strait in 1988. NAFO SCR Doc. 89/70, Serial No. N1650.

Table 1. Catches of shrimp (tons) at East Greenland in 1989 by nation and month as reported to the Greenland authorities.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
DENMARK	92	153	36	-	-	1	-	9	20	19	17	19	366
FAROE ISL.	150	86	99	103	1	-	-	-	-	-	24	132	595
FRANCE	-	-	25	186	7	-	7	50	-	-	-	-	275
GREENLAND	1869	1299	414	648	234	7	1	43	133	314	442	577	5981
NORWAY	57	60	160	342	83	2	-	102	262	428	283	319	2098
TOTAL	2168	1598	734	1279	325	10	8	204	415	761	766	1047	9315

Table 2. Number of vessels in the shrimp fishery in 1989 at East Greenland by nation as reported to the Greenland authorities.

Nation	No. of vessels
DENMARK	2
FAROE ISL.	7
FRANCE	2
GREENLAND	29
NORWAY	21
TOTAL	61

Table 3. Catches of shrimp (tons) at East Greenland in 1990 by nation and month (January - April) as reported to the Greenland authorities.

	JAN	FEB	MAR	APR	TOTAL
DENMARK	75	23	101	6	205
FAROE ISL.	201	231	74	1	507
FRANCE	-	-	36	-	36
GREENLAND	1392	1647	955	488	4482
NORWAY	154	161	186	116	617
TOTAL	1822	2062	1352	611	5847

Table 4. Number of vessels in the shrimp fishery in 1990 (January-March) at East Greenland by nation as reported to the Greenland authorities.

Nation	No. of vessels
DENMARK	2
FAROE ISL.	8
FRANCE	2
GREENLAND	28
NORWAY	19
TOTAL	59

Table 5. Number of hours trawled by year and month from April 1980 to March 1990 in the main fishing area at East Greenland as reported in available logbooks.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1980	-	-	-	35	1297	315	59	31	482	1166	464	-	3849
1981	-	-	-	1343	914	7	-	-	-	-	-	-	2264
1982	-	-	763	1570	1394	-	-	-	-	-	-	-	3727
1983	-	-	484	457	-	-	-	-	-	-	-	-	957
1984	105	312	281	-	-	-	-	-	-	-	-	-	698
1985	647	610	570	625	-	-	-	-	-	51	360	643	3506
1986	1565	2593	2413	1032	602	-	-	-	-	77	686	1160	10128
1987	3608	4471	2965	951	403	-	-	81	400	751	1915	4067	19612
1988	6951	7950	6408	1121	550	-	-	1019	1487	2565	3202	4903	36156
1989	6859	6335	3900	3505	2312	137	15	713	2280	2600	7004	7097	42757
1990	8039	5407	2454	-	-	-	-	-	-	-	-	-	15903

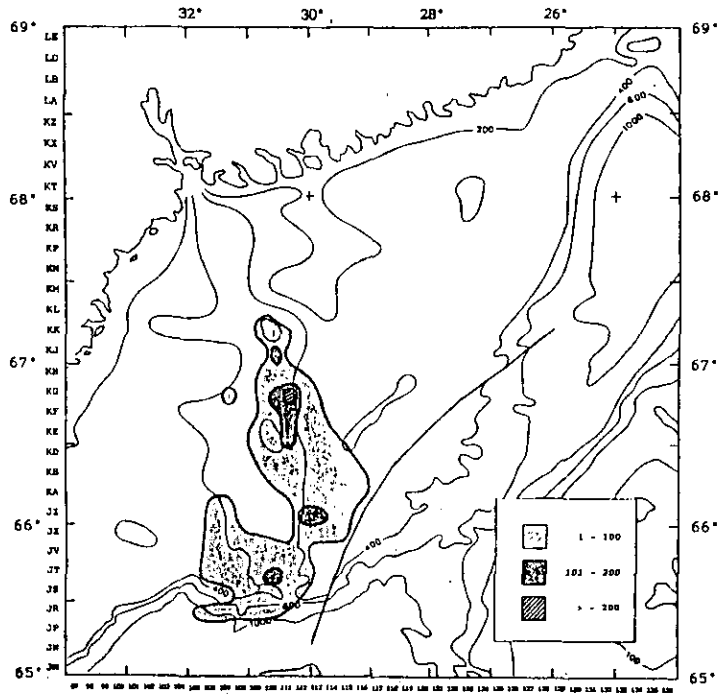


Figure 1. Distribution of catches of shrimp (tons per statistical unit) in the fishery at East Greenland in 1986, based on available logbook information.

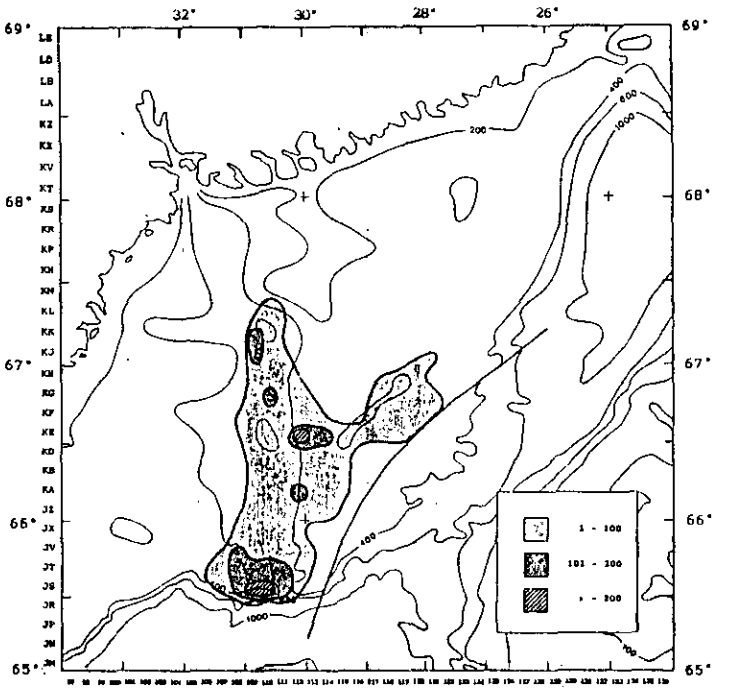
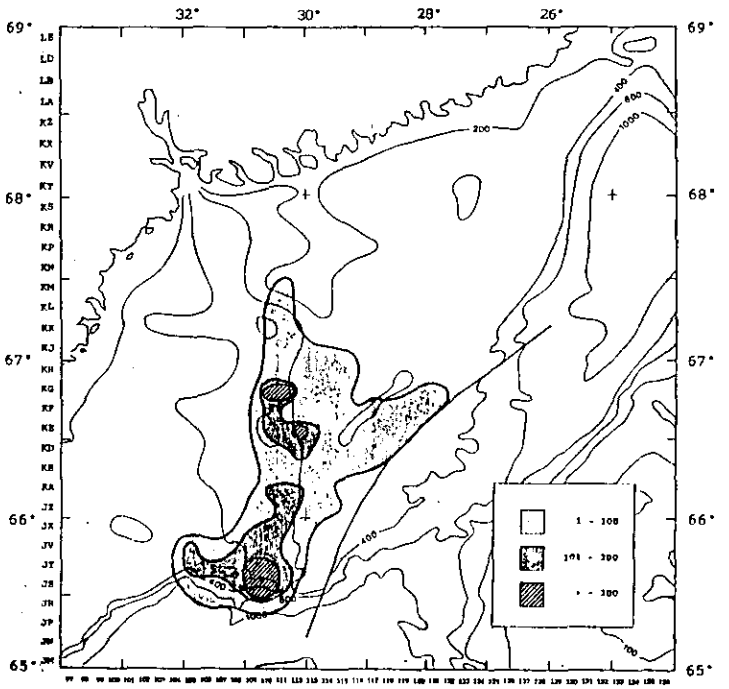


Figure 2. Distribution of catches of shrimp (tons per statistical unit) in the fishery at East Greenland in 1987, based on available logbook information.



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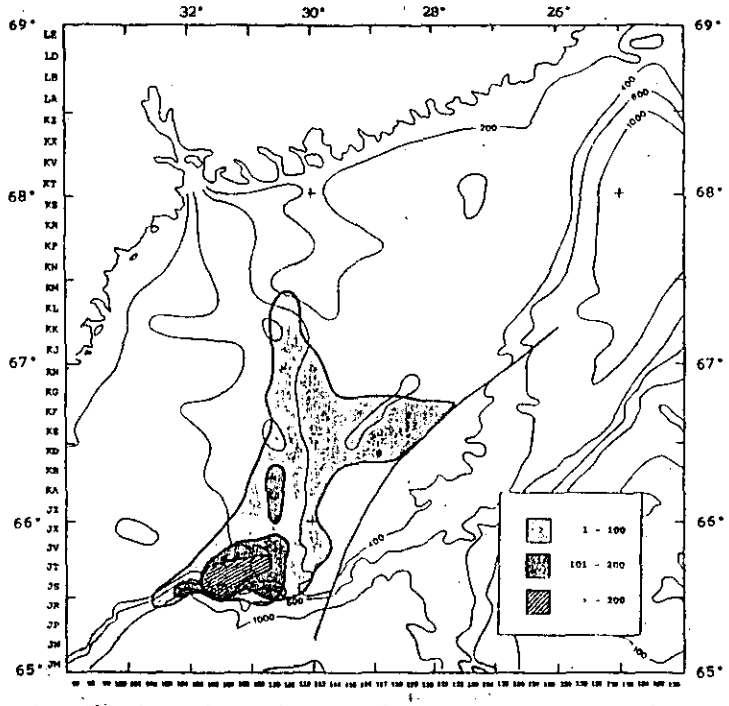


Figure 4. Distribution of catches of shrimp (tons per statistical unit) in the fishery at East Greenland in 1989, based on available logbook information.

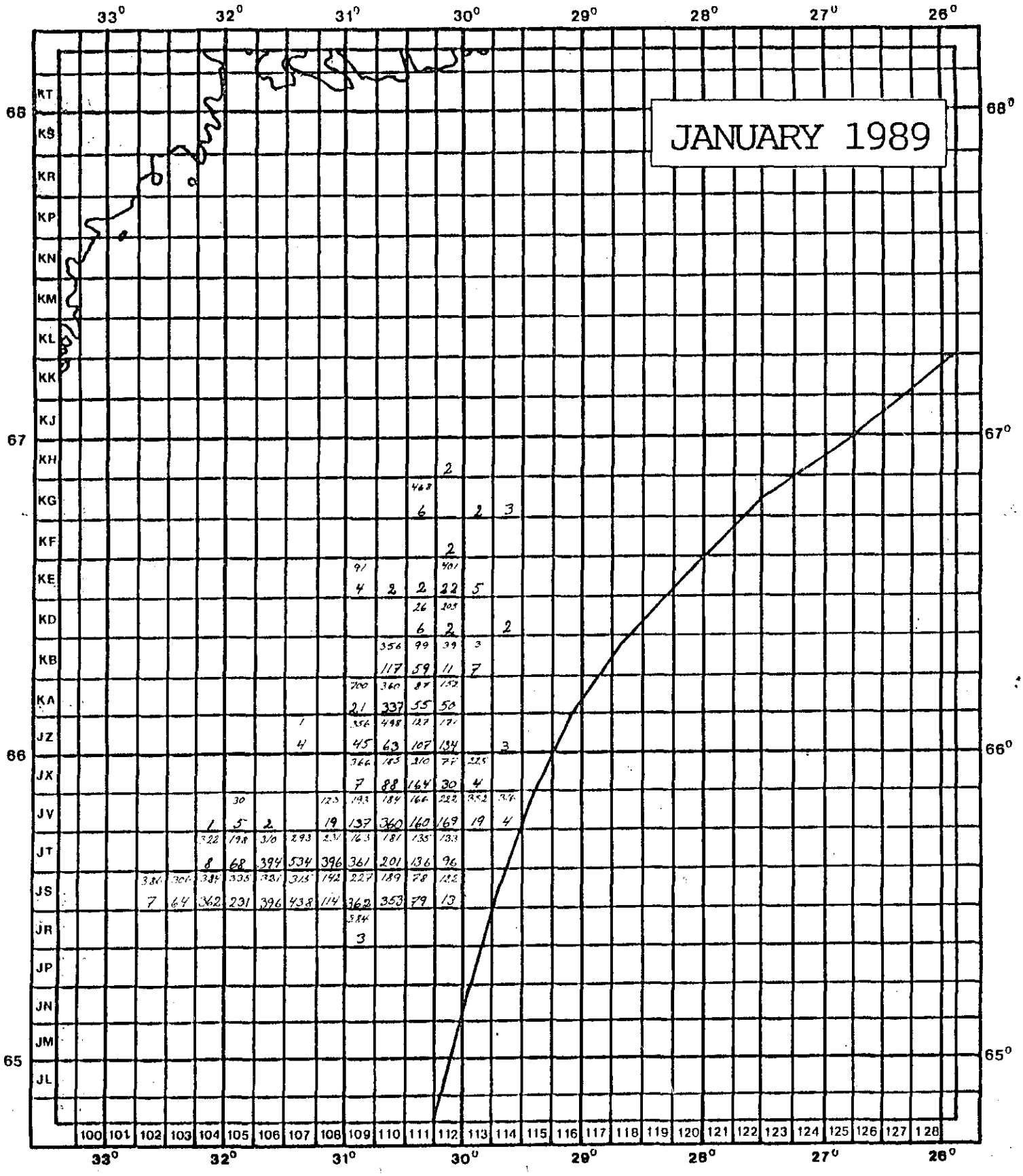


Figure 5. Distribution of mean catch of shrimp (kg/hour) and effort (hours) in the shrimp fishery at East Greenland in January 1989 based on available logbook information.

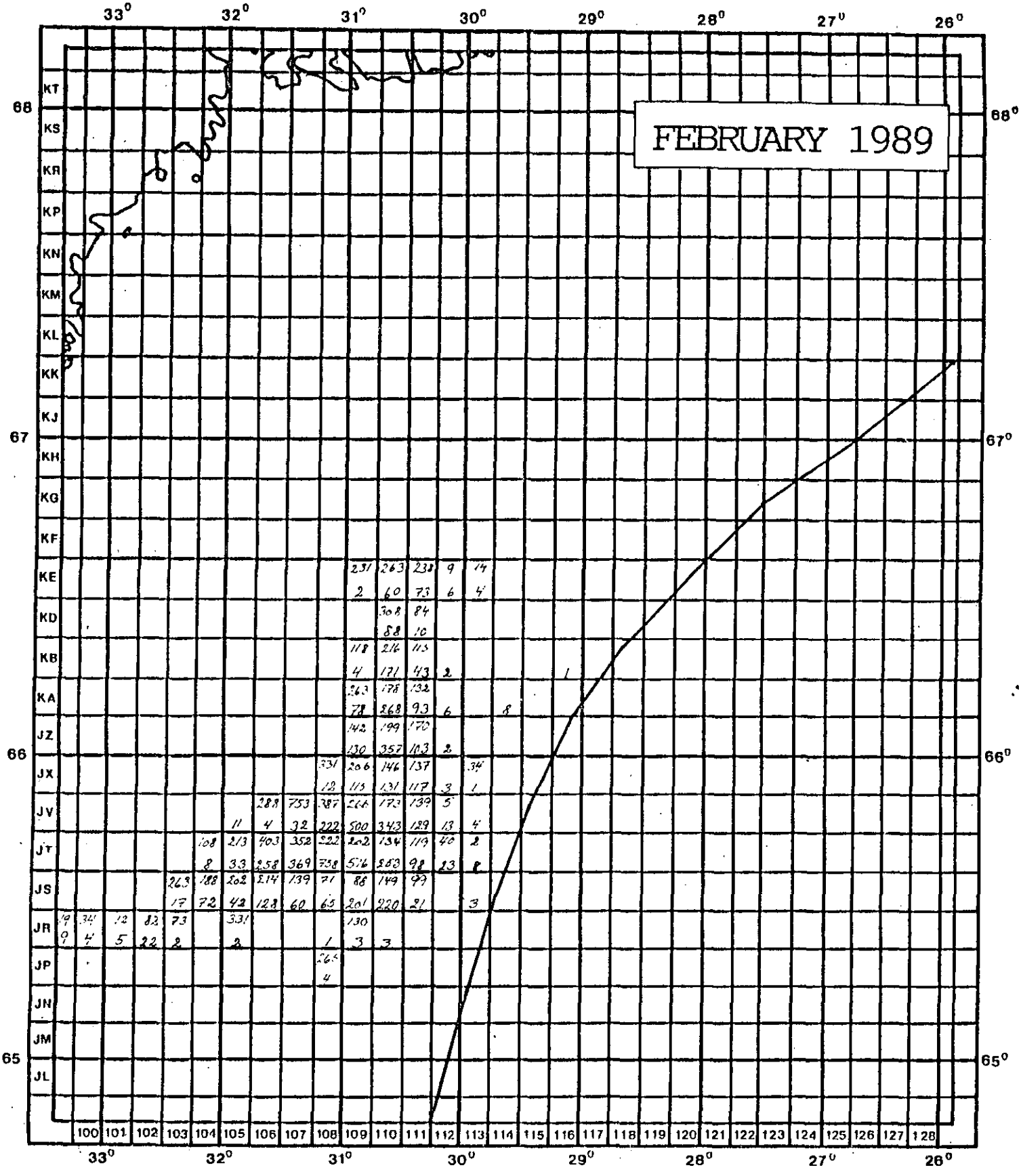


Figure 5, continued. Data from February 1989.

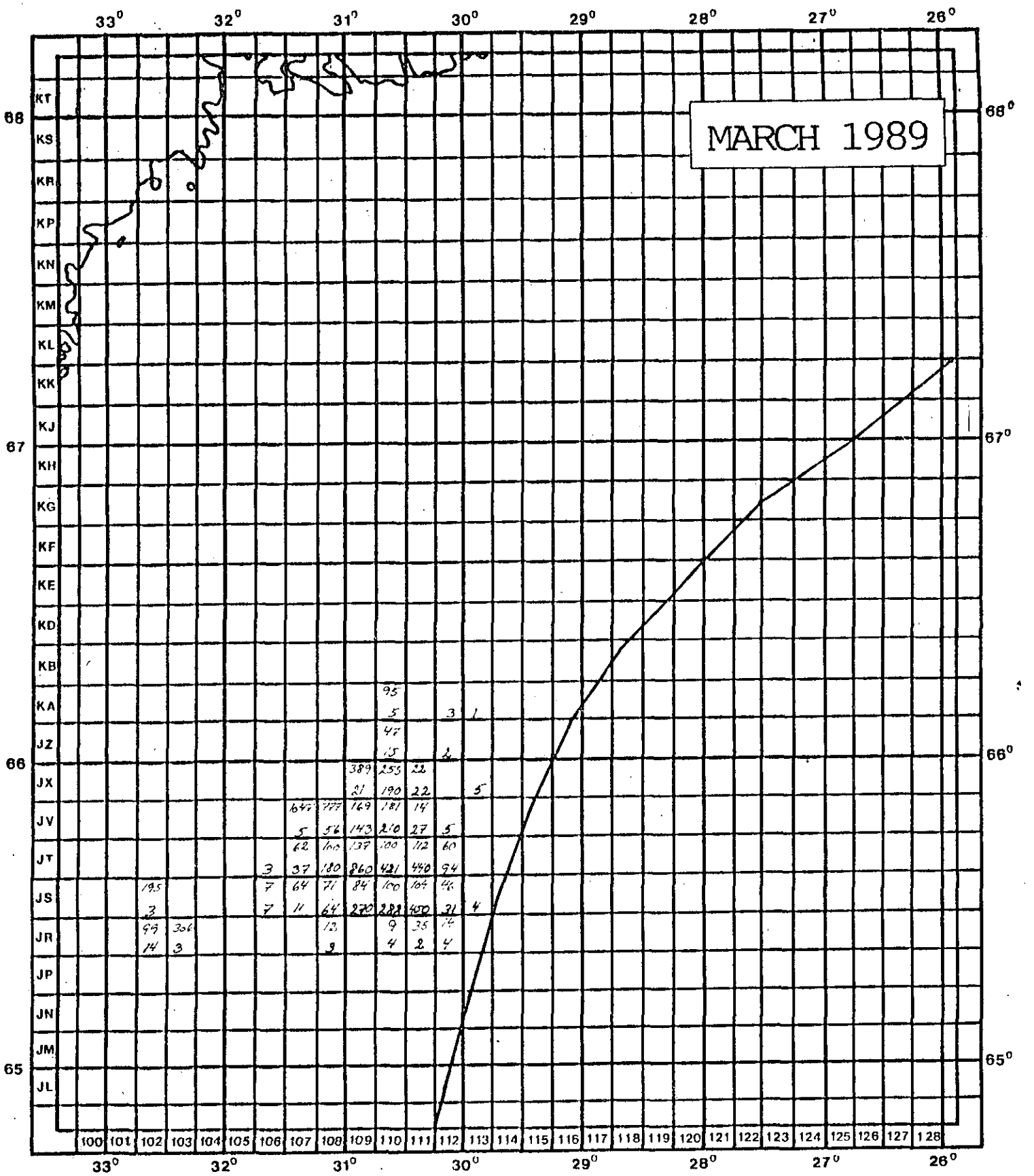


Figure 5 continued. Data from March 1989.

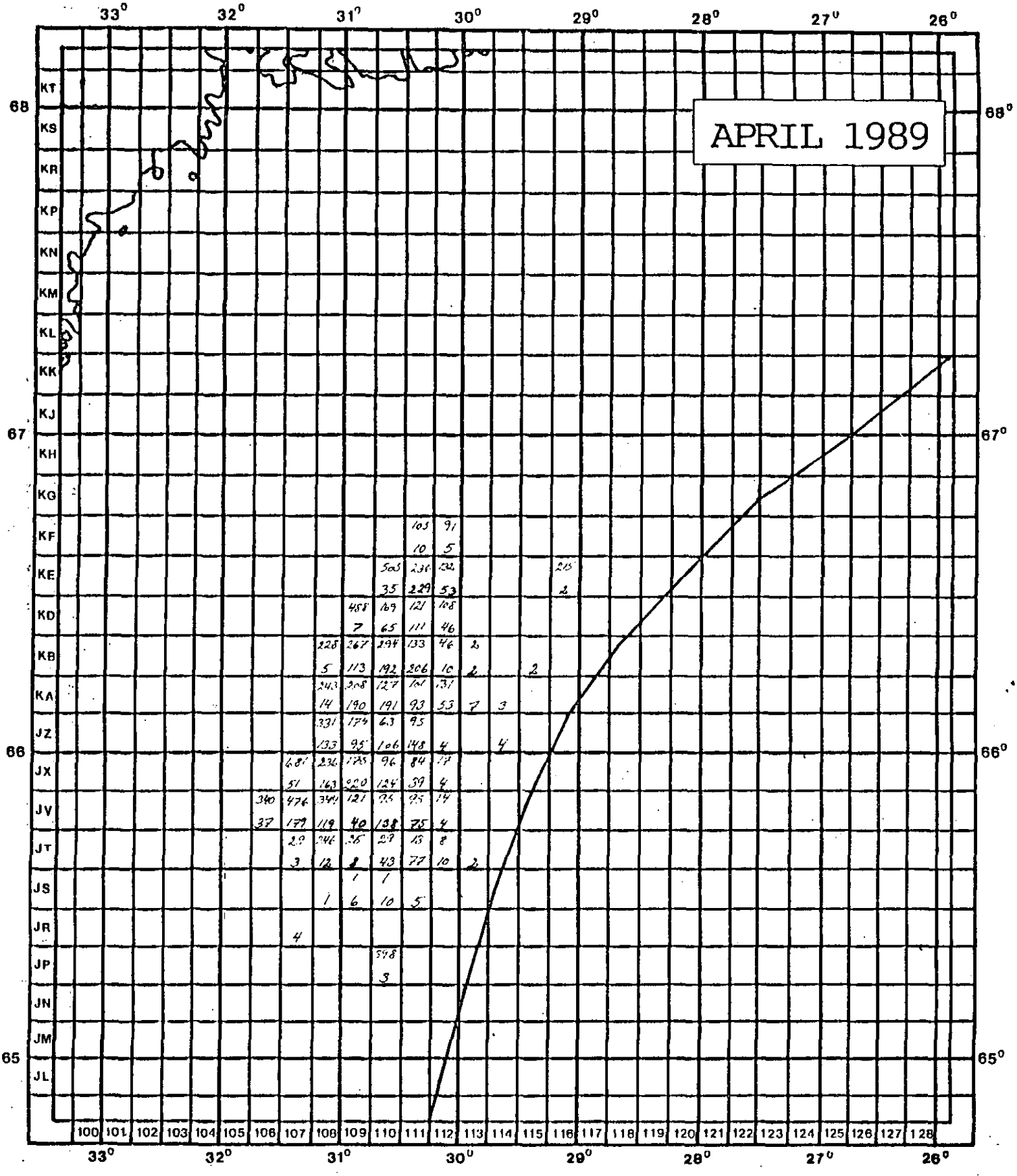
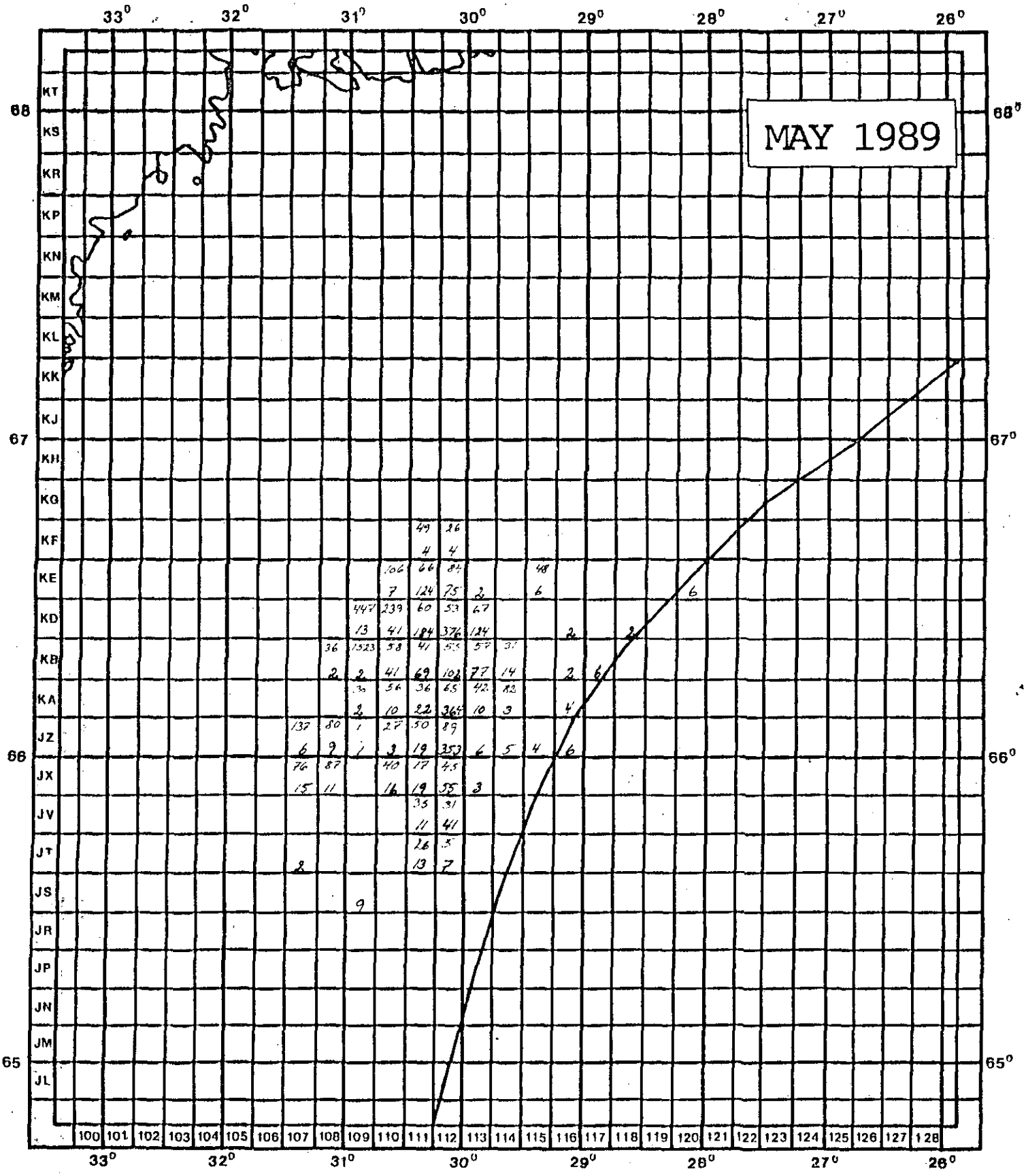


Figure 5 continued. Data from April 1989.



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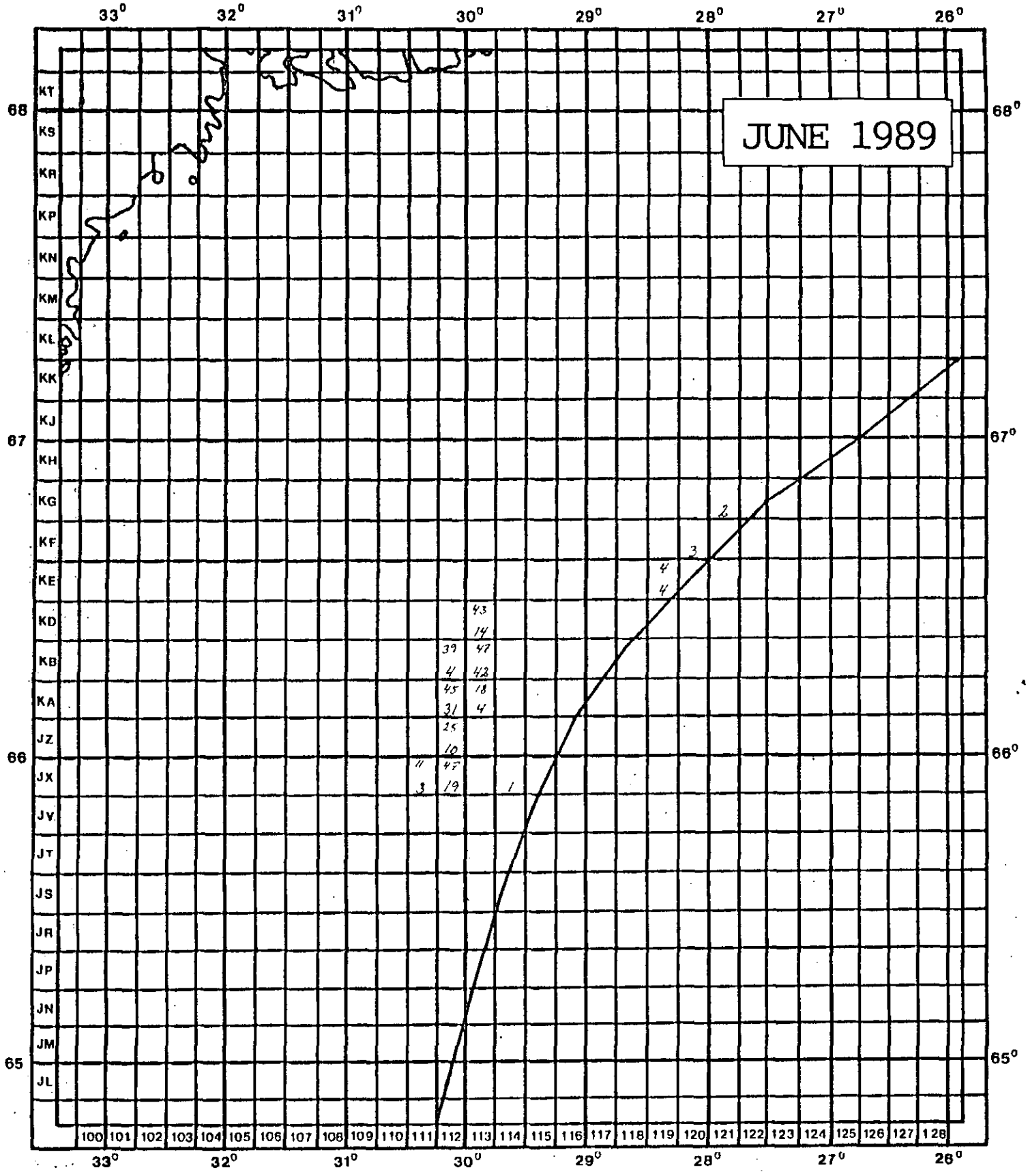

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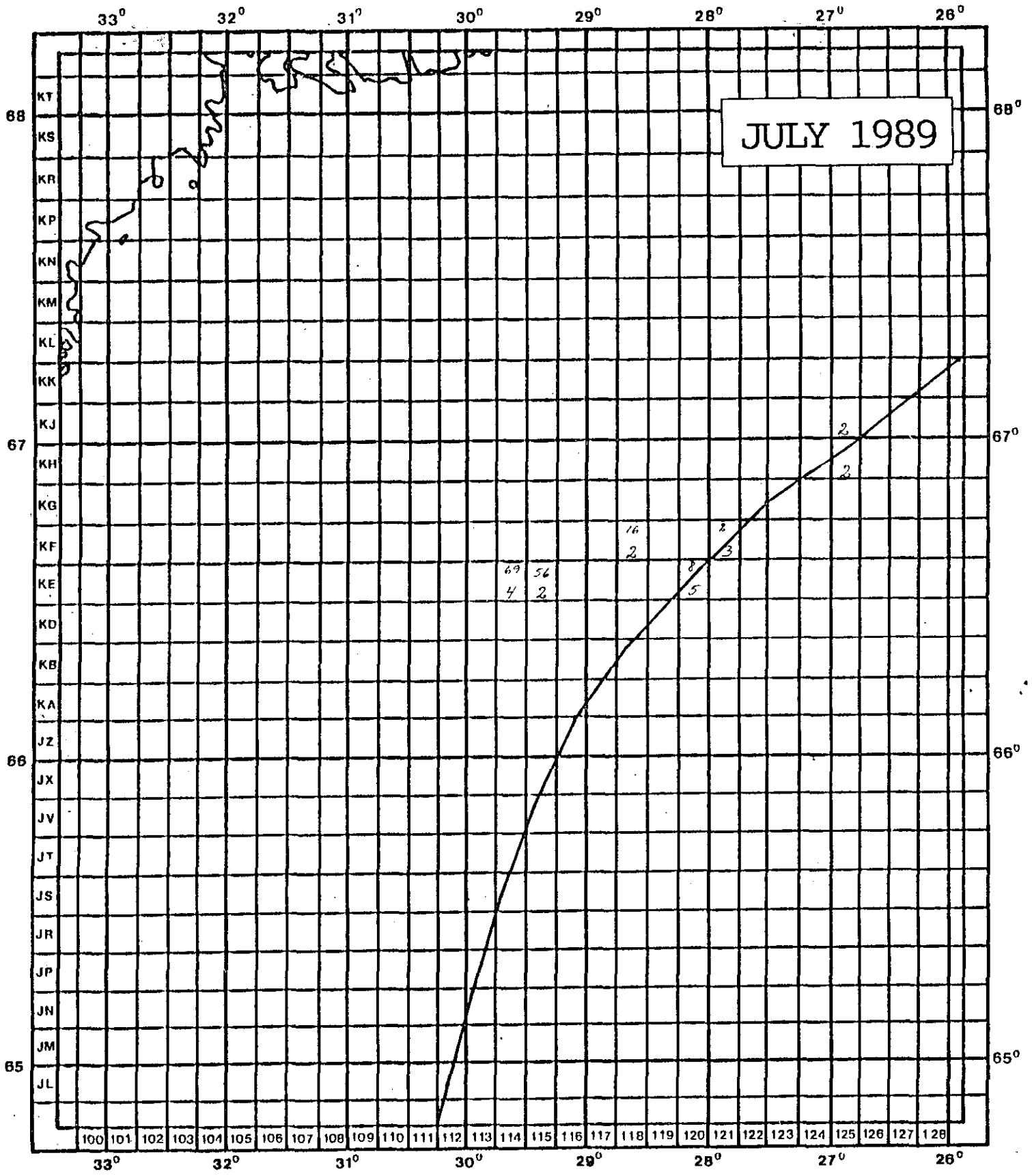

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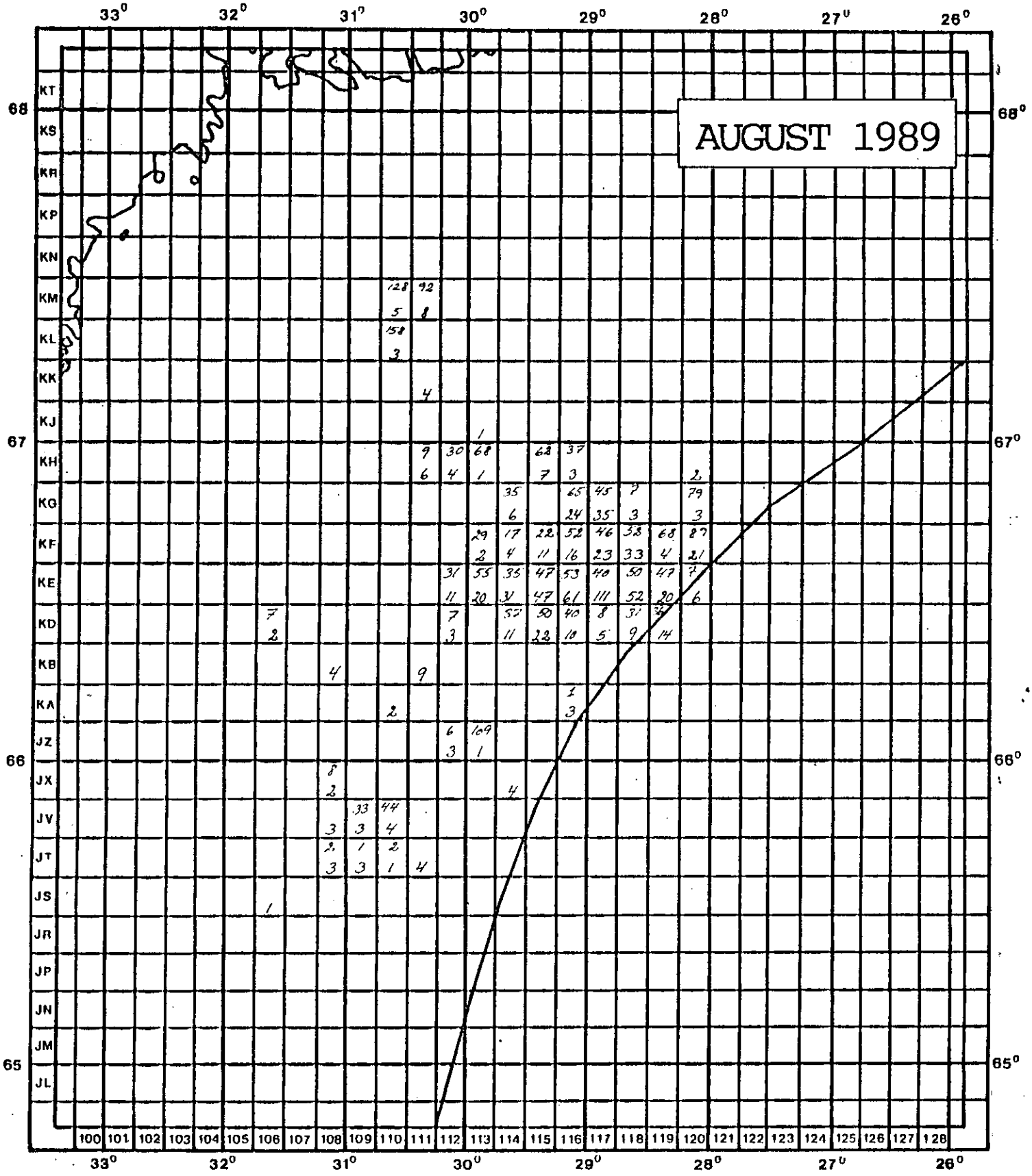

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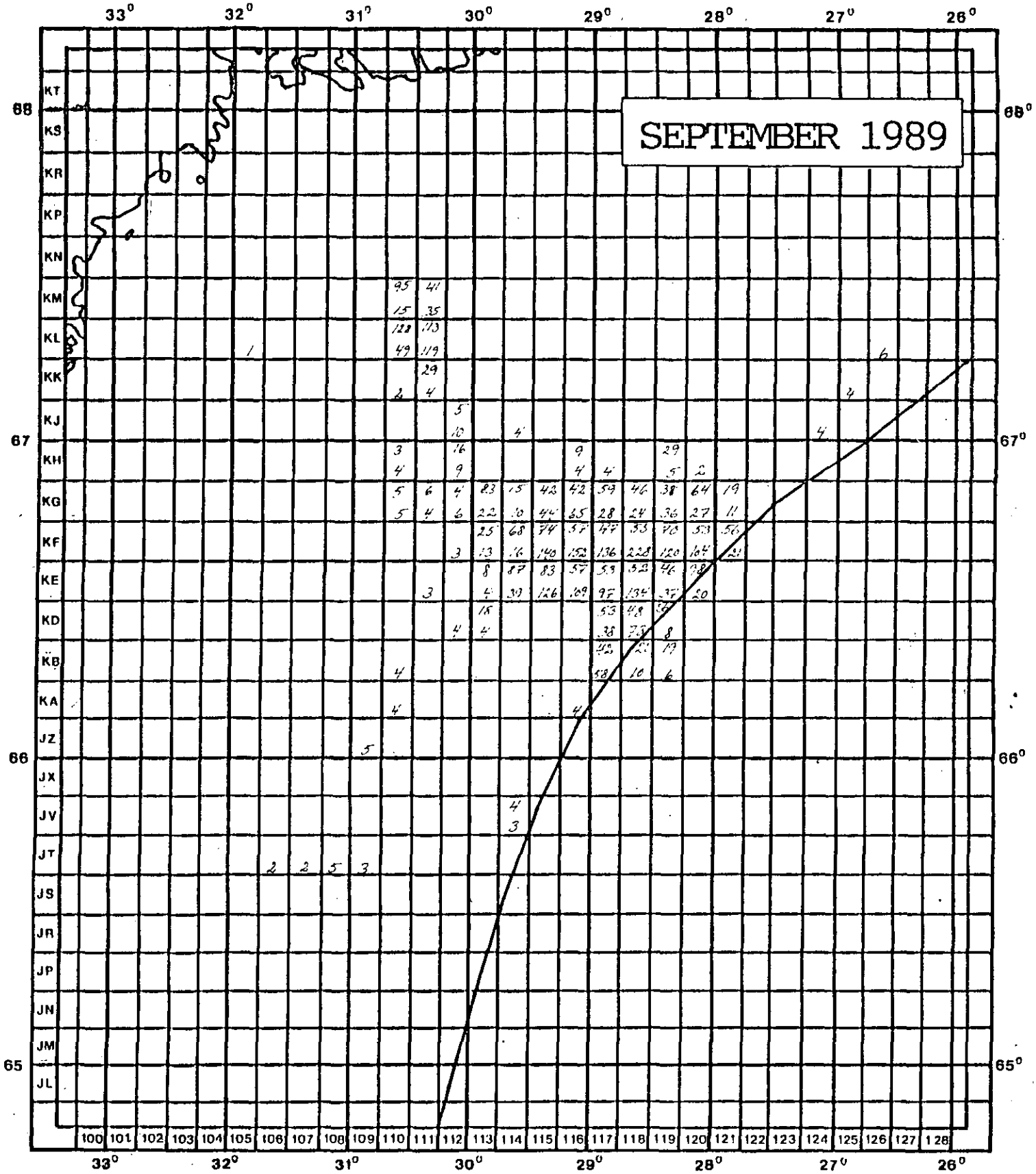

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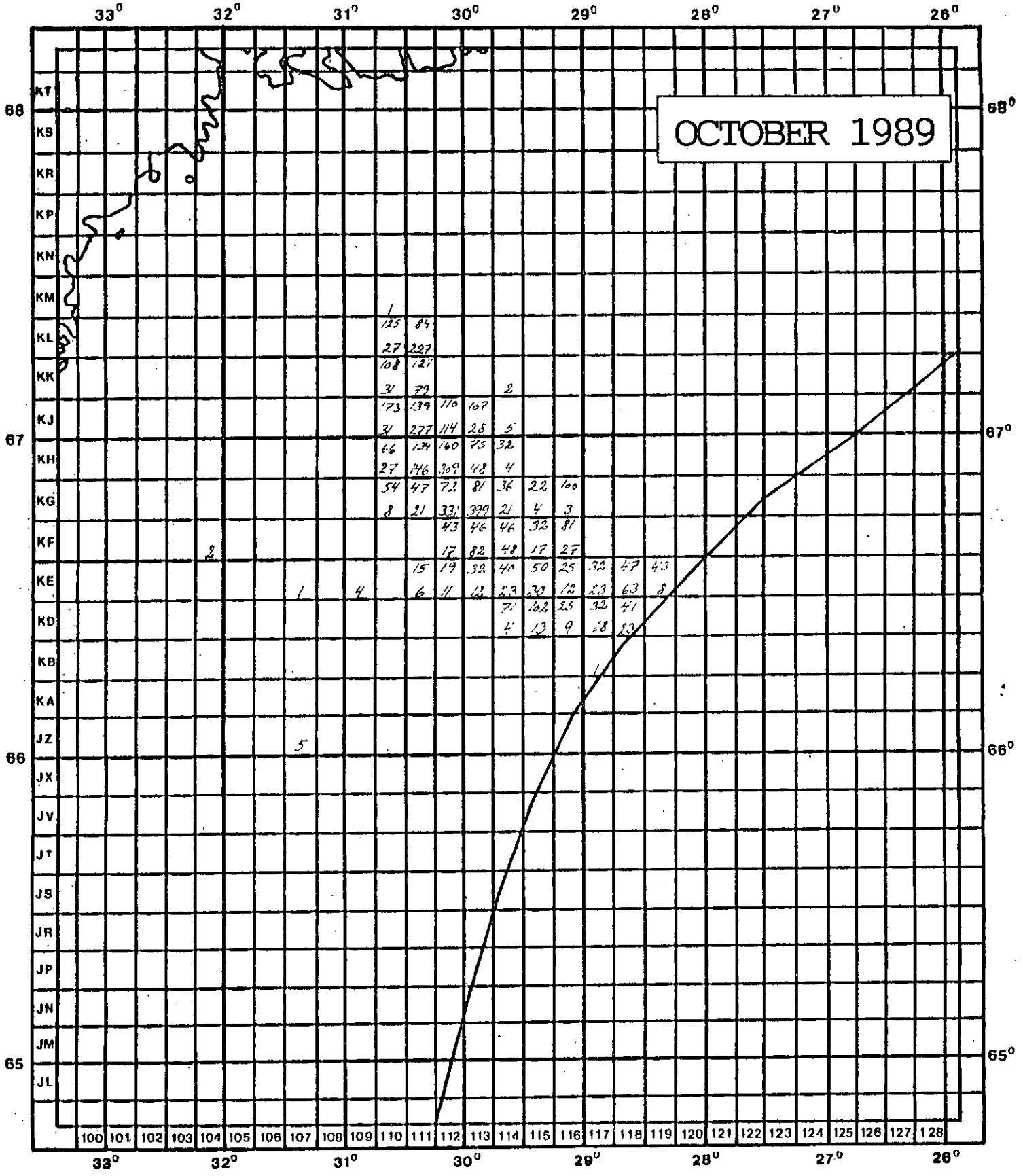

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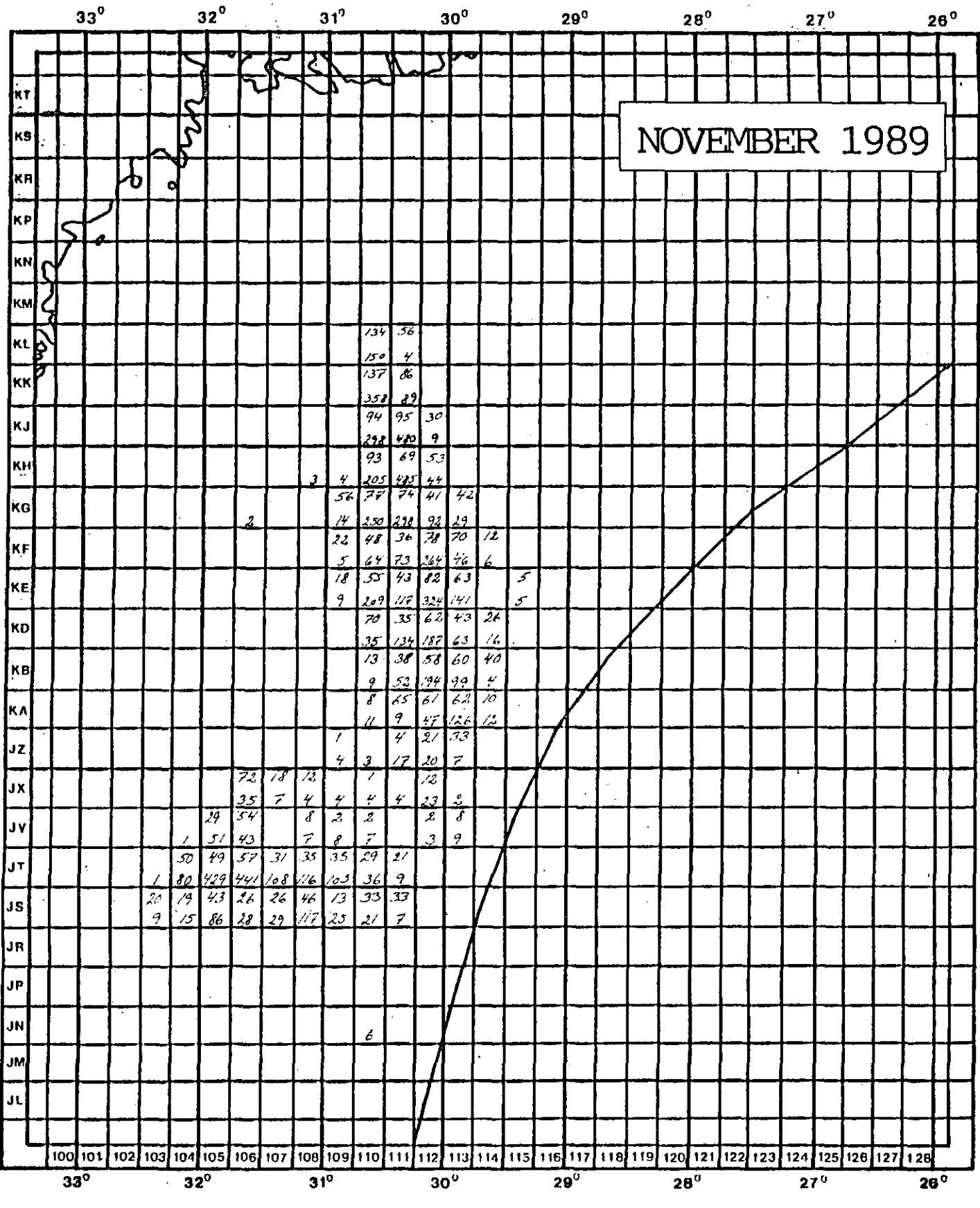

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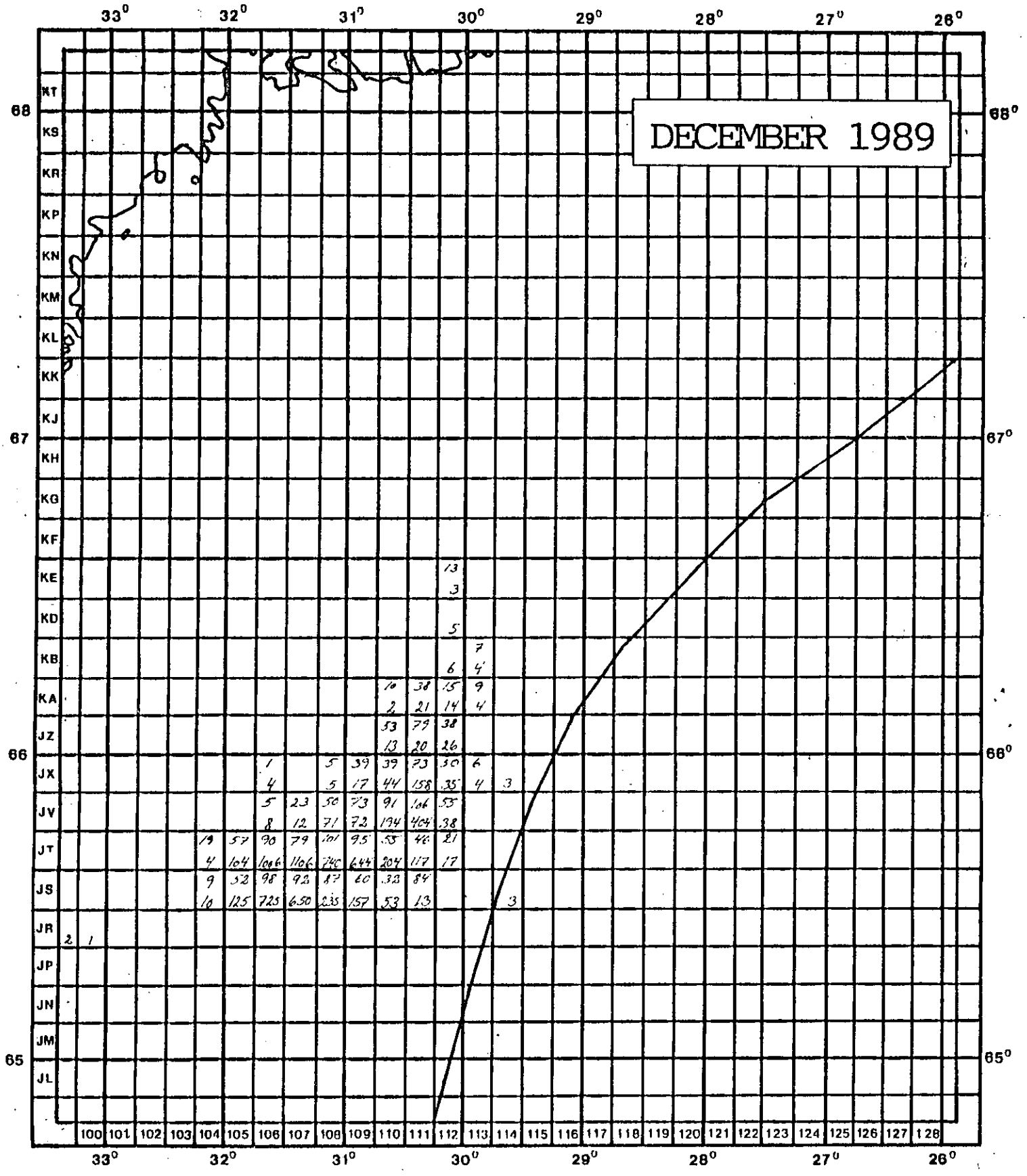

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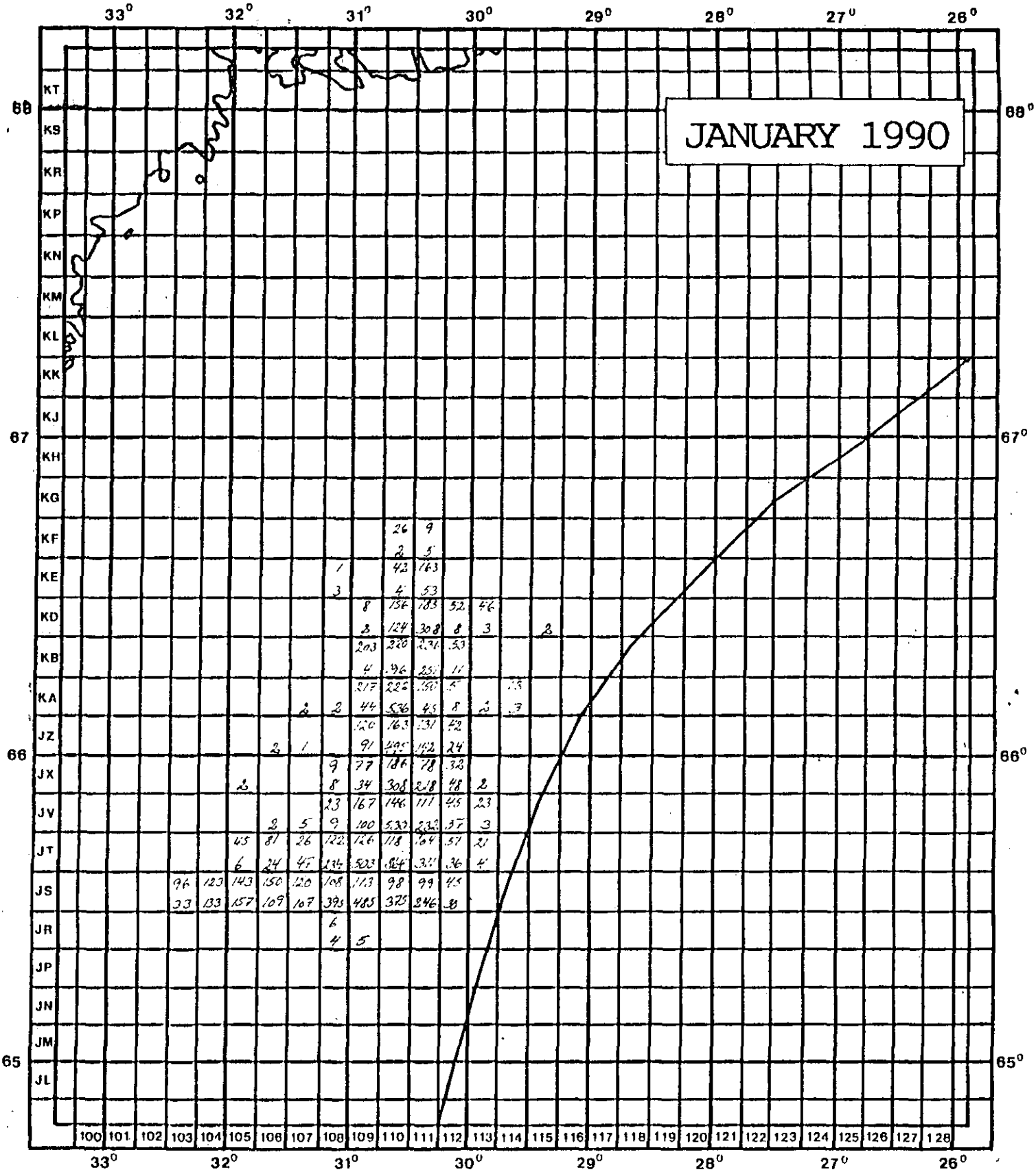

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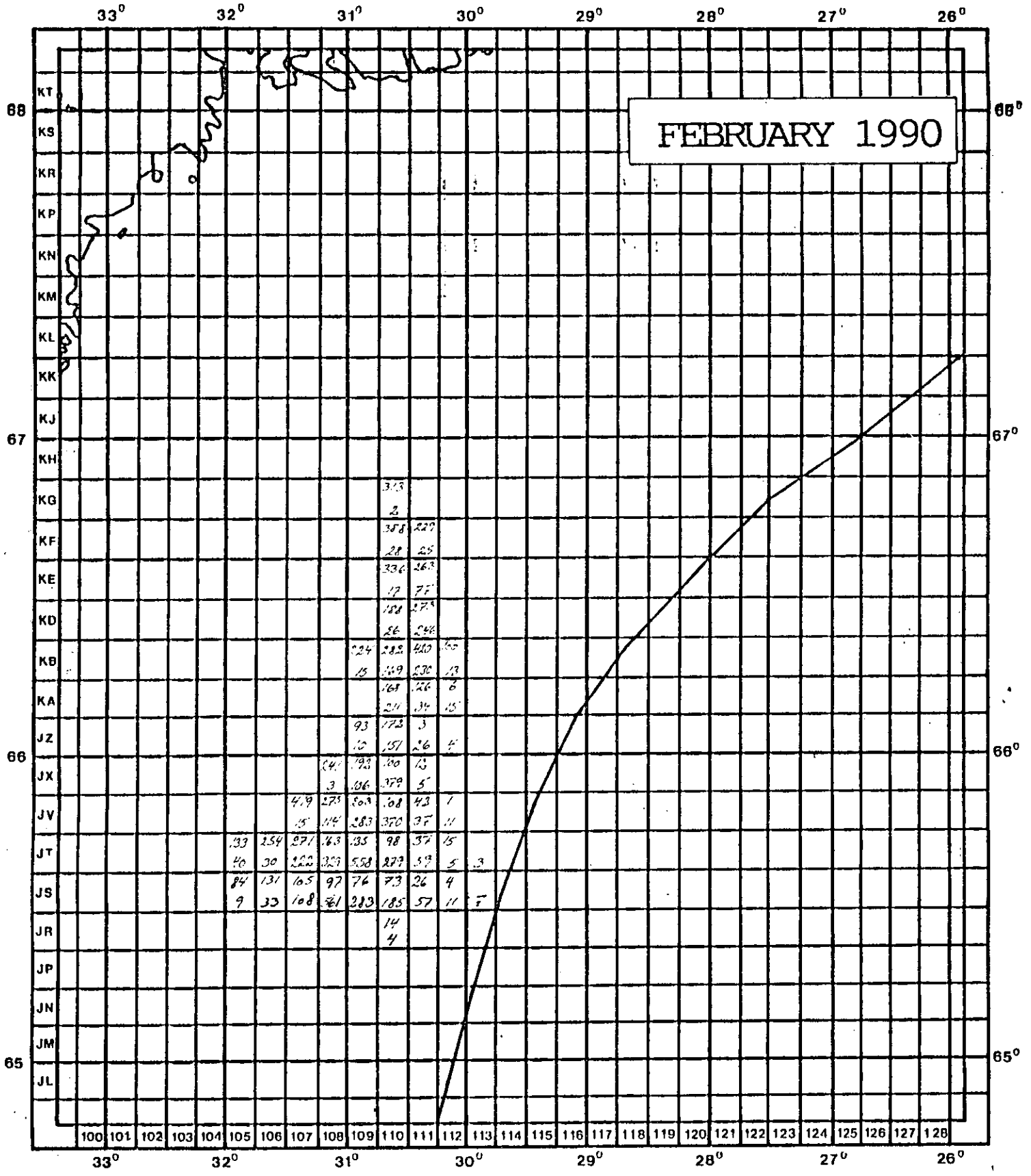

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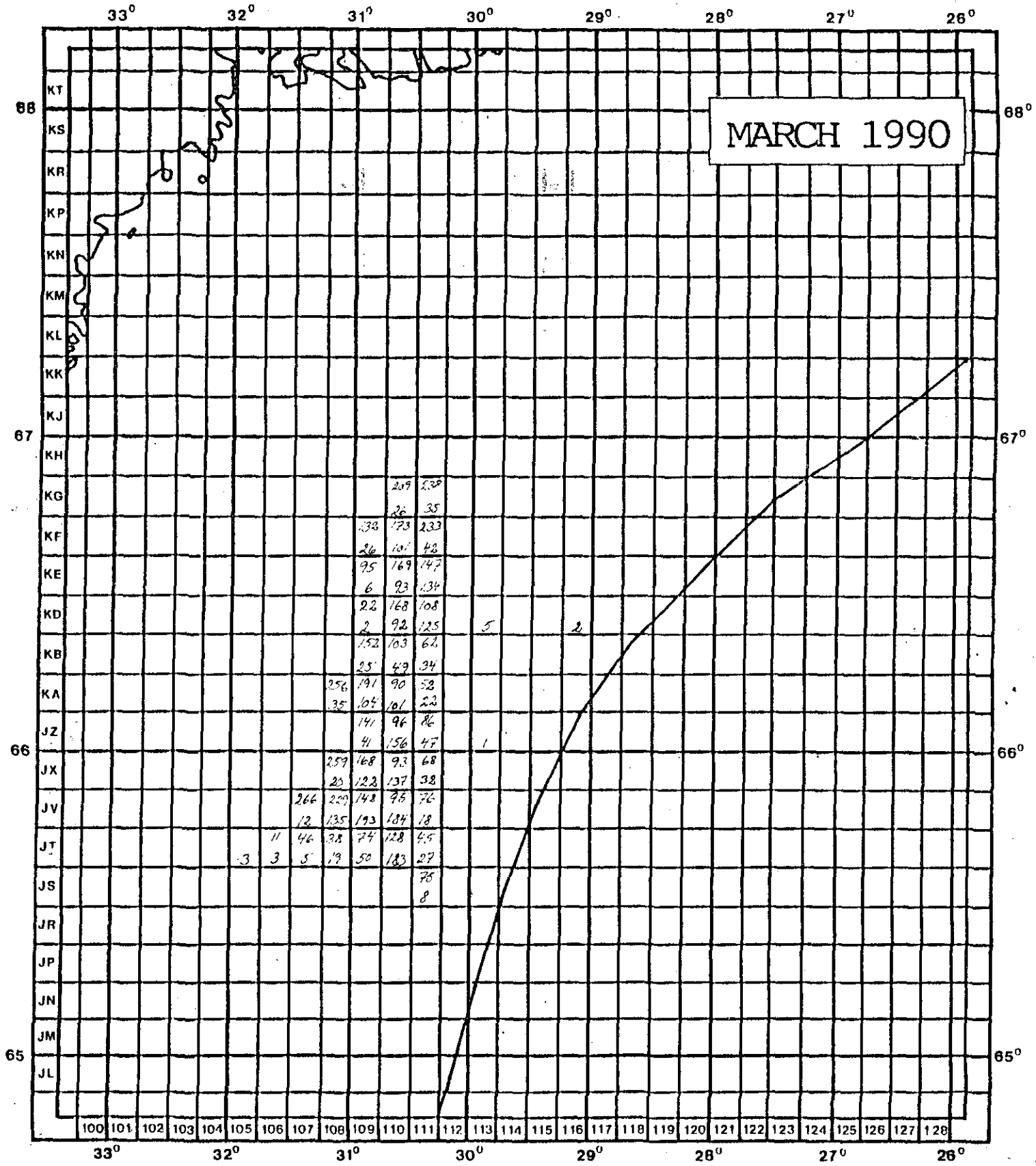

Figure 5 continued. Data from March 1990.

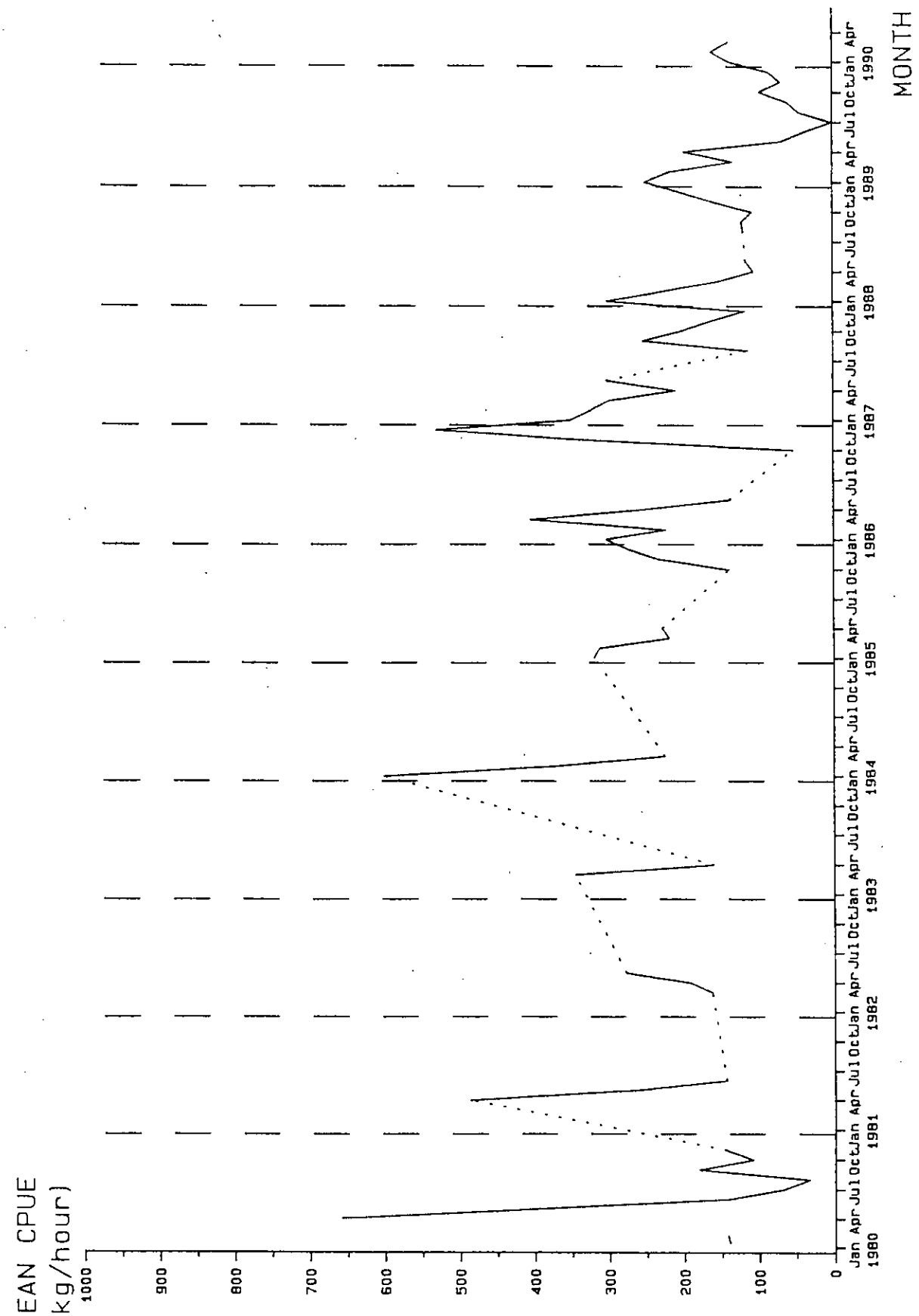

Figure 6. Monthly mean catch rate of shrimp (kg/hour) in the main fishing area at East Greenland from April 1980 to March 1990 based on available logbook information. Table 5 shows the corresponding number of hours trawled.