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The Commercial Shrimp Fishery in the Denmark Strait in 1987

by

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INTRODUCTION

STACFIS has not been able to advise on a total allowable catch for the shrimp fishery in the Denmark Strait area (including fishing grounds on the Icelandic side of the mid-line) for the years 1986, 1987 and 1988. In 1987 Greenland authorities first fixed a regulatory TAC of 7,525 tons for the traditionally exploited area in the Greenland part of the Denmark Strait. Later in the year, however, this amount was raised by 700 tons. In the area from 66°30'N to 67°30'N there were no quota restrictions for the Greenland fleet. Trial fishery without quota restrictions was carried out north and south of these areas. The total reported catches from the Greenland zone in East Greenland waters reached 10.614 tons, the highest catch reported till now.

In 1987 about 80% of the reported catches were taken in the first four months of the year.

Logbook data from 27 trawlers fishing at East Greenland from January to December in 1987 have been available to the Greenland Fisheries Research Institute.

The present paper updates the information given by Carlsson (1983; 1984; 1985; 1986) and Carlsson and Kannevorff (1987) on catches and analysis of commercial fishery data.

MATERIALS AND METHODS

Total catches and numbers of vessels in the shrimp fishery were compiled by nation and month based on the compulsory weekly reporting to Greenland authorities by all vessels above 80 GRT. Logbook data from 27 trawlers fishing from January to December 1987 were analysed to show the overall distribution of effort and monthly distribution of effort and mean catch-rates. Monthly mean catch-rates together with rates of by-catches from 1980 to December 1987 were calculated from available logbook data.

No shrimp samples were available from East Greenland waters in 1987.

RESULTS AND DISCUSSION

Reported catches in 1987.

Table 1 shows reported catches of shrimp by division, nation and month in 1987, and Table 2 the corresponding numbers of reporting vessels. Vessels smaller than 80 GRT were not participating in the fishery, and the tables therefore represent the total shrimp fishery on the Greenland side of the mid-line. There was some exploratory fishing north of 67°30'N and south of 65°30'N, but no catches reported.

As in 1985 and 1986 the fishery in 1987 was more evenly distributed over the year compared to earlier years, with about 20% of the catches taken in the second half of the year compared with 0, 14.9 and 1.6% in 1982, 1983 and 1984 respectively (in 1985 and 1986 about 25%). In 1987 the highest catches were taken in January and February. A total of 60 vessels joined the fishery in 1986 compared to 59 in 1988 and 47 in 1985. In 1987 the highest numbers of vessels on the fishing grounds were found in February, March and April.

Geographical distribution of the fishery.

Figure 1 shows the distribution of effort (in number of hours trawled) by statistical unit in 1987 based on logbook data, and Figure 2 the distribution of total catches. Figure 3 shows the distribution of effort and cpue by month.

The overall distribution of the fishery in the area is very similar to the map of the shrimp fishing grounds at East Greenland given by Carlsson (1985) based on logbook data from 1980 to 1984. Highest total catches (Figure 2) were obtained around statistical units JS109-JS110 and KE112, approximately the same areas as in earlier years.

It is well known that the distribution of the fishing activity in the Denmark Strait is highly dependent on environmental conditions, i.e. ice cover, and early in the year also on the distribution of concentrations of berried female shrimp. This may explain the changes in the distribution of the fishery throughout the year as seen in Figure 3.

Catch and effort.

As expected the highest catch-rates were obtained in January and February (Figure 3). They are distributed along and east of 31°W, the highest values being found in the northern part around 67°N. Later in the year the fishing is more scattered with lower mean catch-rates. As mentioned above ice conditions may hinder the access to areas with high shrimp density, and furthermore catch-rates may be influenced by variation in vessel sizes represented in the log-book data from month to month. Also the introduction of more efficient gears (high-opening trawls, new net material with less water resistance) and trawl-positioning systems in 1985 and 1986 (Carlsson and Kanneworff, 1987) may bias catch-rates upwards. However, the general trend in the data is similar to that found in earlier years.

Table 4 shows the mean catch-rates of shrimp by month in a north to south grid (7.5 minute latitude scale) based on logbook data from 1987, Table 5 shows the corresponding numbers of hours trawled. The data show the same trends as mentioned above.

Figure 5 shows the monthly mean catch-rates based on logbook data in the main fishing area (Carlsson, 1987), updated with data from 1987. Table 3 shows the corresponding number of hours trawled. Similar to earlier years peak catch-rates are found in spring 1987 (January to March) followed by a decline. However, another peak occurs in September at the same level as spring-peaks - followed by a decline throughout the year. The high peak found in December 1986 does not occur in 1987, although the fishery was widely distributed in this month.

By-catches.

By-catches reported in the available logbook data are shown in Table 6 and compared to logbook-catches of shrimp. In 1987 reported by-catches remain at a very low level as in 1985 and 1986, redfish still being the most frequently reported species.

CONCLUSIONS

Reported catches of shrimp in 1987 from the Greenland part of the Denmark Strait totalled 10,614 tons, which is the highest catch figure since the fishery began in 1980. In 1987 60 vessels joined the shrimp fishery, with a (reported) mean catch of 177 tons per vessel compared to 166 tons in 1986 and 134 tons in 1985. The fishery took place throughout the year, with about 20% being taken in the second half of the year.

Logbook data from 1987 indicate - as in 1986 - a more evenly distribution of the fishery over the fishing grounds compared to earlier years. Data for 1986 and 1987 do, however, include a larger proportion of the fishery.

Logbook data show spring peak catch-rates in January to March 1987, followed by a decline as in earlier years, but with a new peak occurring in September, followed by another decline.

As in 1985 and 1986 reported by-catches in the East Greenland shrimp fishery were at a very low level in 1987.

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Table 1. Catches of shrimp (tons) at East Greenland by division, nation and month as reported to Greenland authorities in 1987.

ICES DIVISION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
XIVB	DENMARK	-	99	173	141	18	-	-	-	4	26	20	74	555
	FAROE ISL.	84	184	70	-	37	-	-	-	-	1	80	139	595
	FRANCE	-	-	-	382	244	-	-	-	94	59	17	-	796
	GREENLAND	2023	1919	1065	403	106	-	-	11	121	133	290	515	6586
	NORWAY	-	154	511	691	167	-	-	29	276	159	54	-	2041
	TOTAL	2107	2356	1819	1617	572	-	-	40	495	378	461	728	10573
VA	GREENLAND	31	-	-	-	-	-	-	-	-	-	-	10	41
	TOTAL	31	-	-	-	-	-	-	-	-	-	-	10	41
TOTAL	DENMARK	-	99	173	141	18	-	-	-	4	26	20	74	555
	FAROE ISL.	84	184	70	-	37	-	-	-	-	1	80	139	595
	FRANCE	-	-	-	382	244	-	-	-	94	59	17	-	796
	GREENLAND	2054	1919	1065	403	106	-	-	11	121	133	290	525	6627
	NORWAY	-	154	511	691	167	-	-	29	276	159	54	-	2041
	TOTAL	2138	2356	1819	1617	572	-	-	40	495	378	461	738	10614

Table 2. No. of vessels in the shrimp fishery at East Greenland by division, nation and month as reported to Greenland authorities in 1987.

ICES DIVISION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
XIVB	DENMARK	-	1	2	2	1	-	-	-	1	1	1	2	2
	FAROE ISL.	1	3	2	-	1	-	-	-	-	1	3	3	8
	FRANCE	-	-	-	3	3	-	-	-	1	1	1	-	4
	GREENLAND	18	22	14	9	1	-	-	2	1	3	10	16	25
	NORWAY	-	5	14	14	4	-	-	2	6	4	5	-	21
	TOTAL	19	31	32	28	10	-	-	4	9	10	20	21	60
VA	GREENLAND	1	-	-	-	-	-	-	-	-	-	-	1	2
	TOTAL	1	-	-	-	-	-	-	-	-	-	-	1	2
TOTAL	19	31	32	28	10	-	-	4	9	10	20	21	60	

Table 3. No. of hours trawled by year and month from April 1980 to December 1987 in the main fishing area at East Greenland as reported in available logbooks.

	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	-	-	488	469	-	-	-	-	-	-	-	-	957
1984	105	312	281	-	-	-	-	-	-	-	-	-	698
1985	647	579	570	625	-	-	-	-	51	360	300	-	3132
1986	759	1314	1801	725	505	-	-	-	-	271	113	-	5488
1987	3256	4306	2816	861	355	-	13	59	386	698	1685	3473	17908

Table 4. Mean catch of shrimp (kg/hour) by month at East Greenland in a north to south grid (7.5 minute latitude scale) based on available logbooks.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LG	-	-	-	-	-	0	-	-	-	-	-	0
KS	790	-	-	-	-	-	-	-	-	-	-	0
KR	-	-	-	-	-	0	-	-	-	-	-	0
KP	-	-	-	-	-	0	-	-	-	-	-	0
KN	-	-	-	-	-	0	-	-	-	-	-	0
KM	-	-	-	-	-	-	-	-	-	-	0	120
KL	132	-	-	-	-	-	0	134	0	252	0	191
KK	705	529	-	-	-	-	-	-	-	0	168	148
KJ	543	629	-	-	-	-	-	-	0	192	179	109
KH	321	818	372	-	-	-	-	-	0	230	202	91
KG	117	440	366	-	-	-	0	54	0	254	217	93
KF	263	477	264	-	-	-	0	124	116	151	70	105
KE	374	368	361	82	578	-	0	125	263	98	88	116
KD	298	205	290	230	662	-	-	-	-	0	68	112
KB	323	271	186	-	558	-	-	-	-	0	75	83
KA	272	331	304	206	320	-	-	-	-	0	78	113
JZ	405	346	180	199	177	-	-	-	-	-	0	110
JX	385	260	67	72	-	-	-	-	-	-	-	0
JV	361	317	88	140	200	-	-	-	-	-	0	70
JT	308	291	250	223	260	-	-	-	-	-	0	238
JS	319	294	247	220	216	-	-	-	-	-	-	0
JR	-	28	-	-	-	-	-	-	-	-	-	0
JN	-	400	-	-	-	-	-	-	-	-	-	0

Table 5. No. of hours trawled by month in a north to south grid at East Greenland based on logbook information (see Table 4).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
LG	-	-	-	-	-	6	-	-	-	-	-	6
KS	23	-	-	-	-	-	-	-	-	-	-	23
KR	-	-	-	-	-	3	-	-	-	-	-	3
KP	-	-	-	-	-	5	-	-	-	-	-	5
KN	-	-	-	-	-	18	-	-	-	-	-	18
KM	-	-	-	-	-	-	-	-	-	-	6	6
KL	11	-	-	-	-	-	16	-	6	-	119	152
KK	131	91	-	-	-	-	-	-	-	85	283	590
KJ	95	64	-	-	-	-	-	-	28	163	202	552
KH	71	20	12	-	-	-	-	-	132	238	313	786
KG	22	226	149	-	-	-	6	-	275	440	540	1658
KF	44	162	155	-	-	-	35	25	238	159	389	1207
KE	112	136	1082	6	22	-	13	375	59	489	736	3030
KD	130	34	358	19	22	-	-	-	-	12	130	705
KB	516	27	206	-	23	-	-	-	-	56	230	1058
KA	698	112	218	82	75	-	-	-	-	141	443	1769
JZ	385	149	95	85	9	-	-	-	-	-	111	834
JX	424	225	15	25	-	-	-	-	-	-	-	689
JV	302	197	14	54	77	-	-	-	-	-	11	655
JT	305	1173	281	328	109	-	-	-	-	-	116	2312
JS	105	1792	350	337	47	-	-	-	-	-	-	2631
JR	-	21	-	-	-	-	-	-	-	-	-	21
JN	-	25	-	-	-	-	-	-	-	-	-	25

Table 6. By-catches by species and month reported in logbooks from the Denmark Strait shrimp fishery, compared to the corresponding shrimp catches.

SPECIES	8601	8602	8603	8604	8605	8611	8612	8701	8702	8703	8704	8705	8708	8709	8710	8711	8712
Redfishes	0.3	0.9	5.0	0.9	0.4	-	-	2.8	20.2	7.9	3.1	2.1	-	-	0.1	8.2	5.9
Mixed	0.3	0.6	-	-	-	-	-	0.2	0.7	1.3	-	-	0.2	1.4	2.4	0.8	1.3
Total bycatch	0.6	1.5	5.0	0.9	0.4	-	-	3.0	20.9	9.2	3.1	2.1	0.2	1.4	2.5	9.0	7.2
Corresponding shrimp catch	146	279	684	314	60	126	86	1161	1403	849	187	108	7	100	144	258	400
Bycatch in % of shrimp catch	0.4	0.5	0.7	0.3	0.7	-	-	0.3	1.5	1.1	1.7	2.0	3.0	1.4	1.7	3.5	1.8

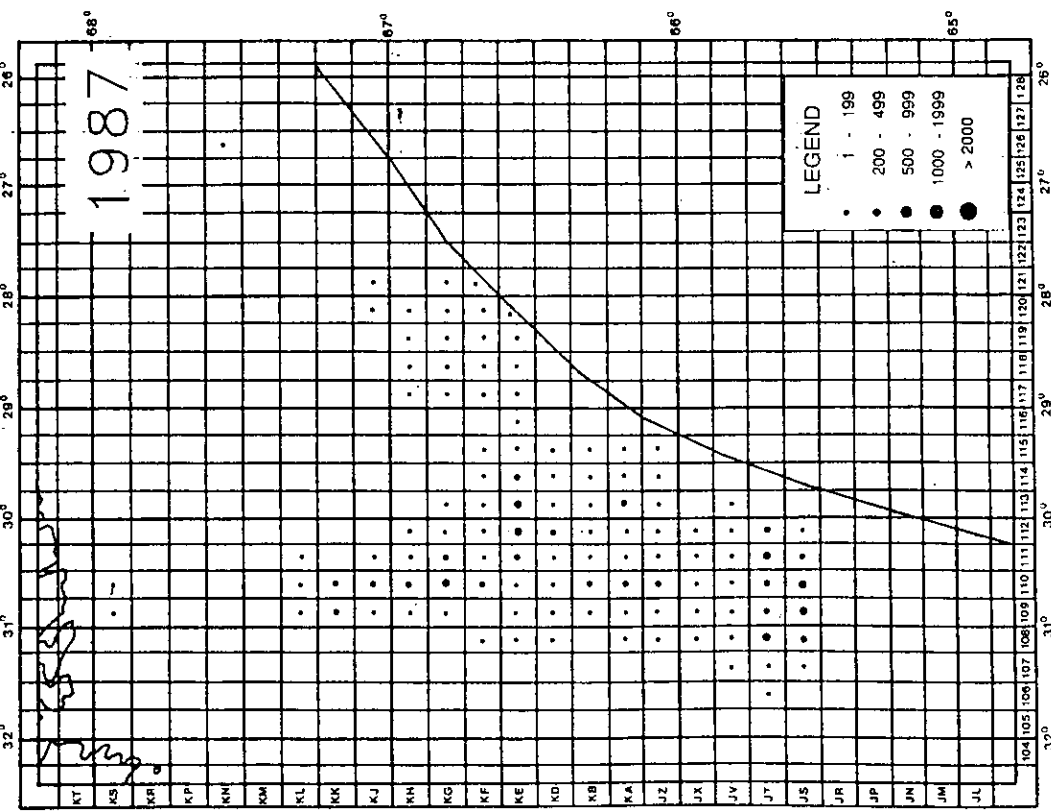


Figure 1. Distribution of effort (in no.s of hours trawled) in the shrimp fishery at East Greenland in 1987, based on available logbook information.

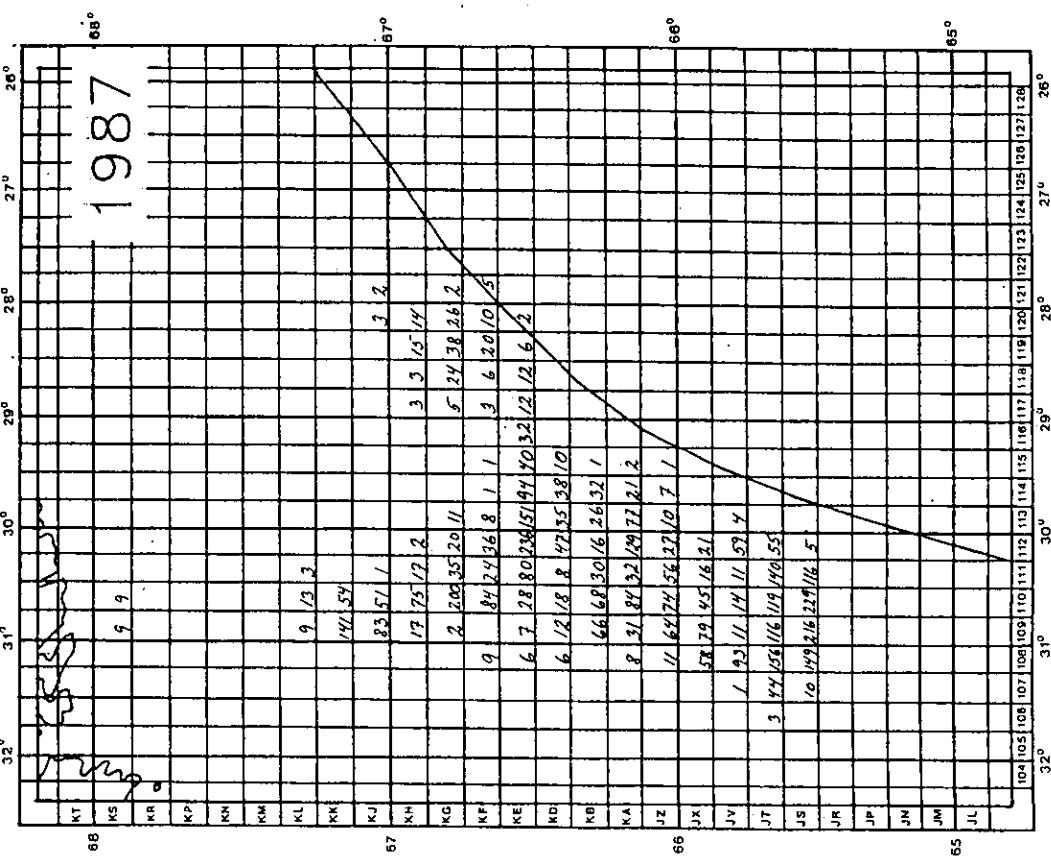


Figure 2. Distribution of catches of shrimp (tons) in the shrimp fishery at East Greenland in 1987, based on available logbook information.

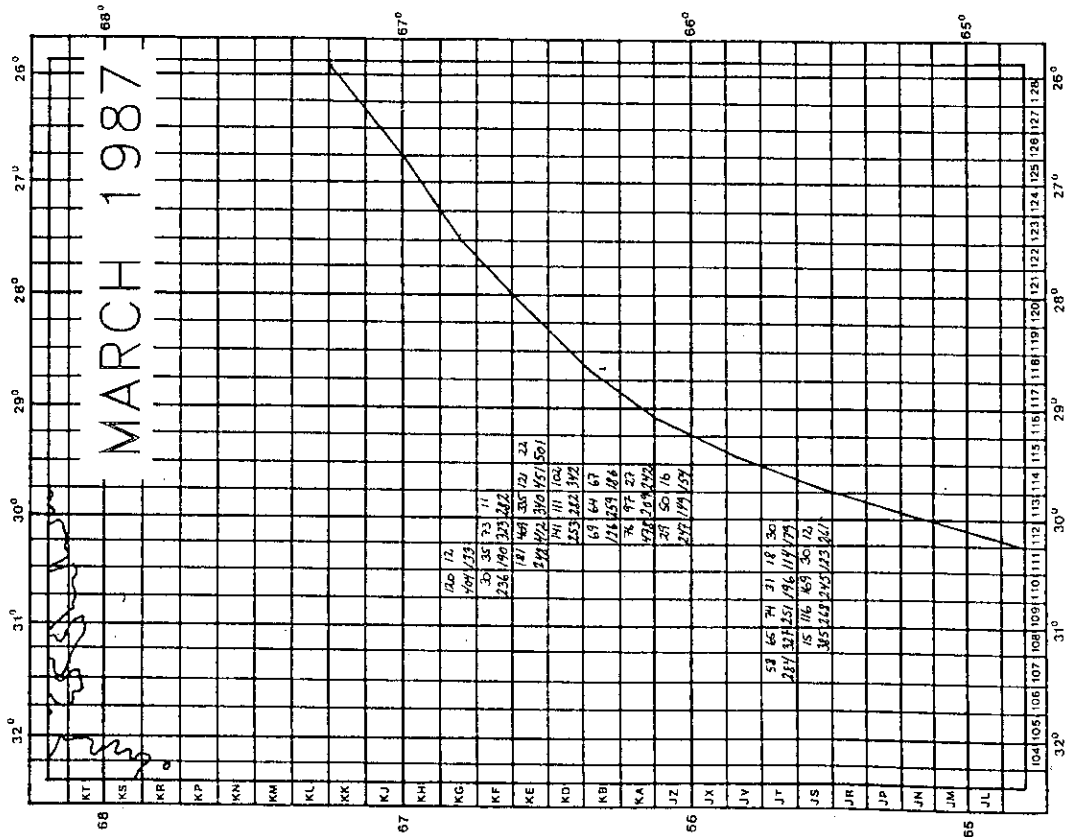


Figure 3 continued, March 1987.

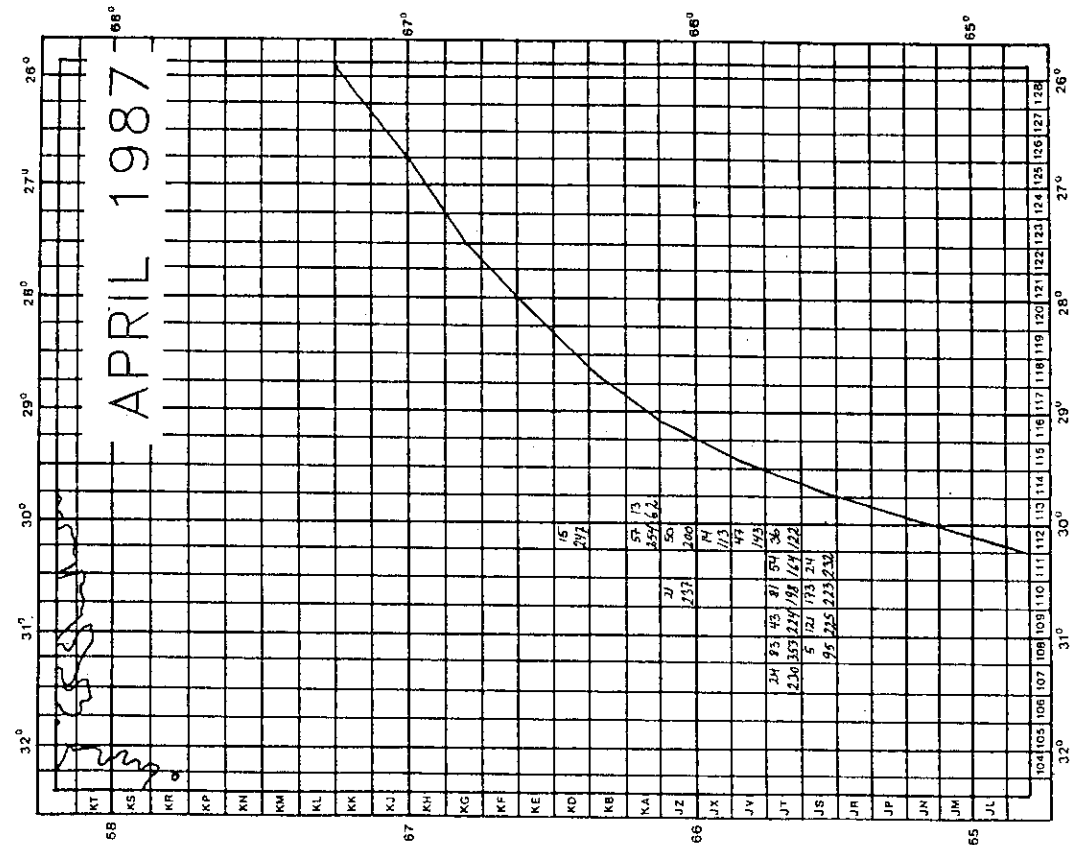


Figure 3 continued, April 1987.

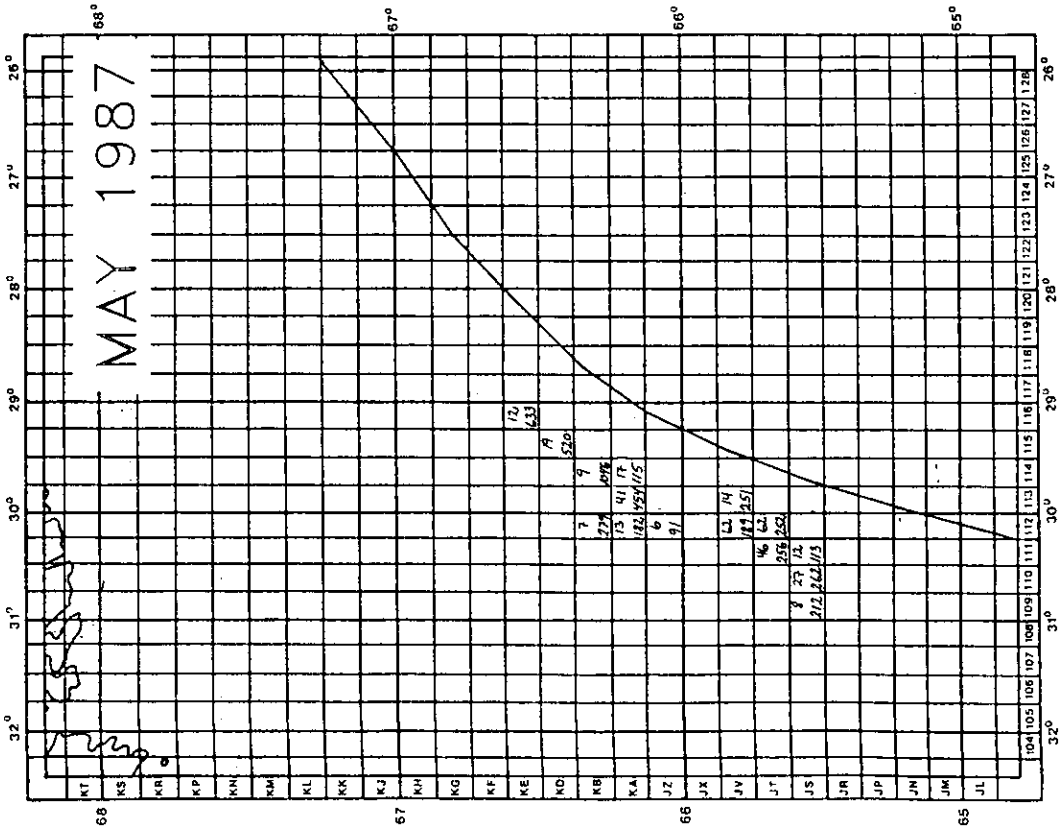


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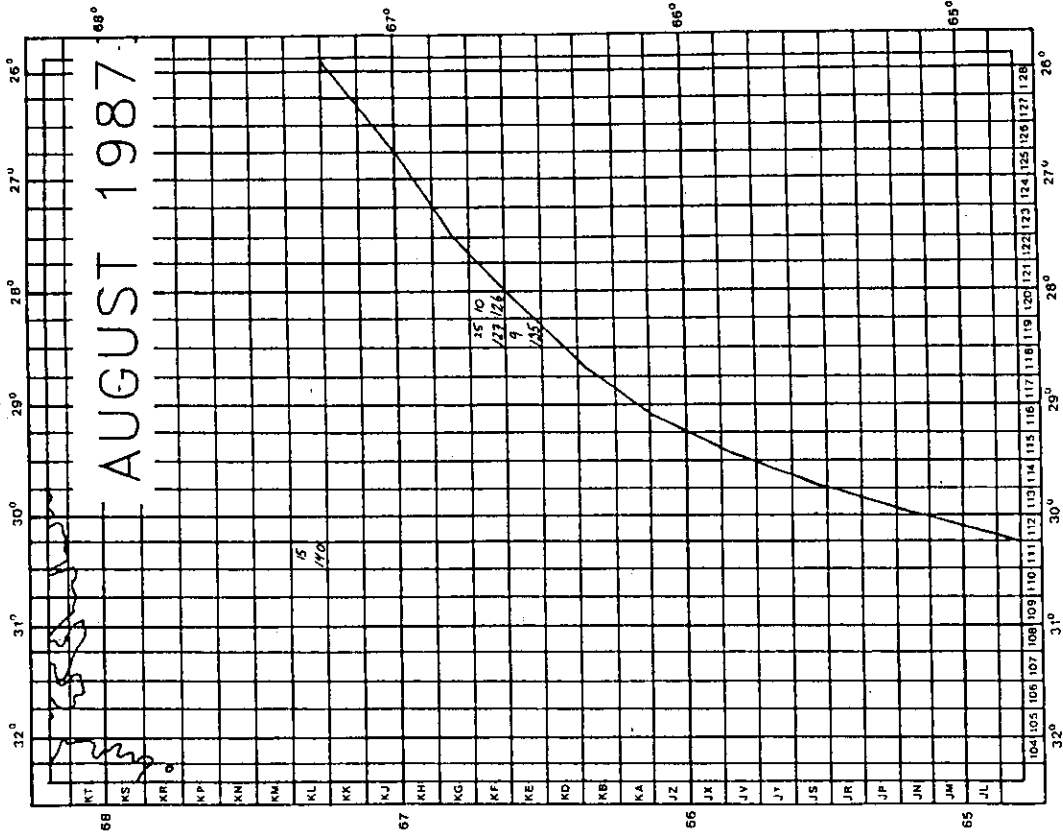


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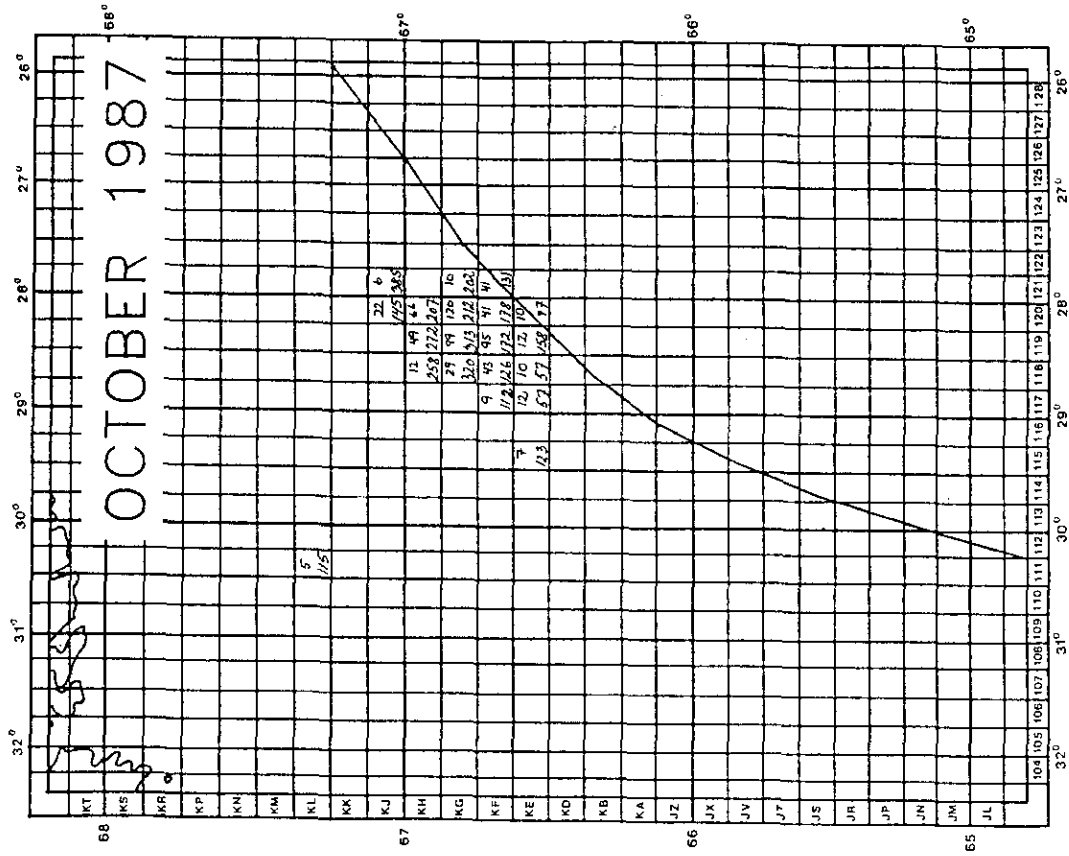


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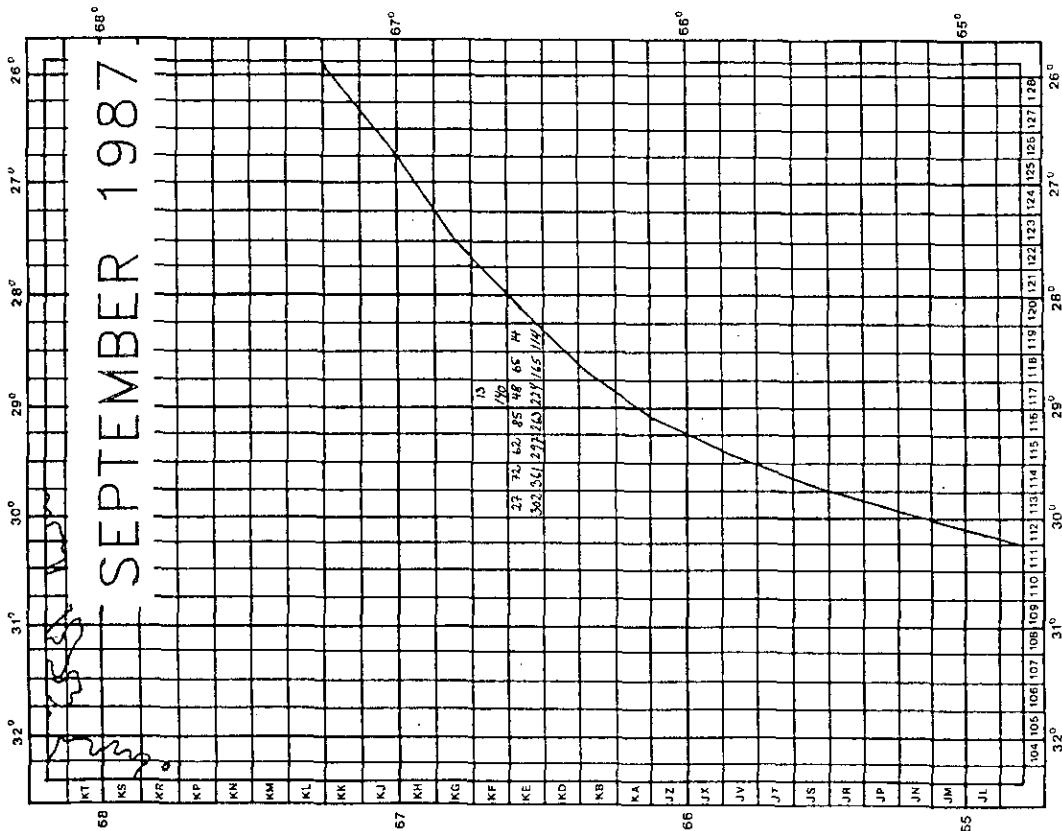


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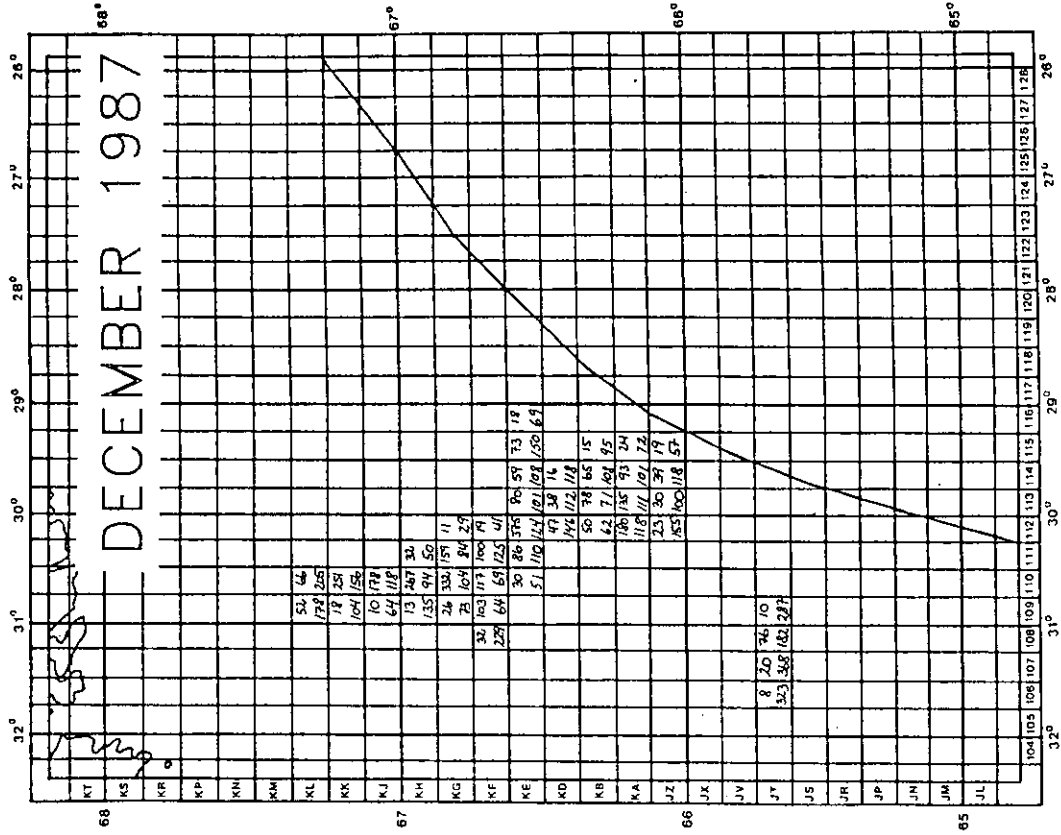


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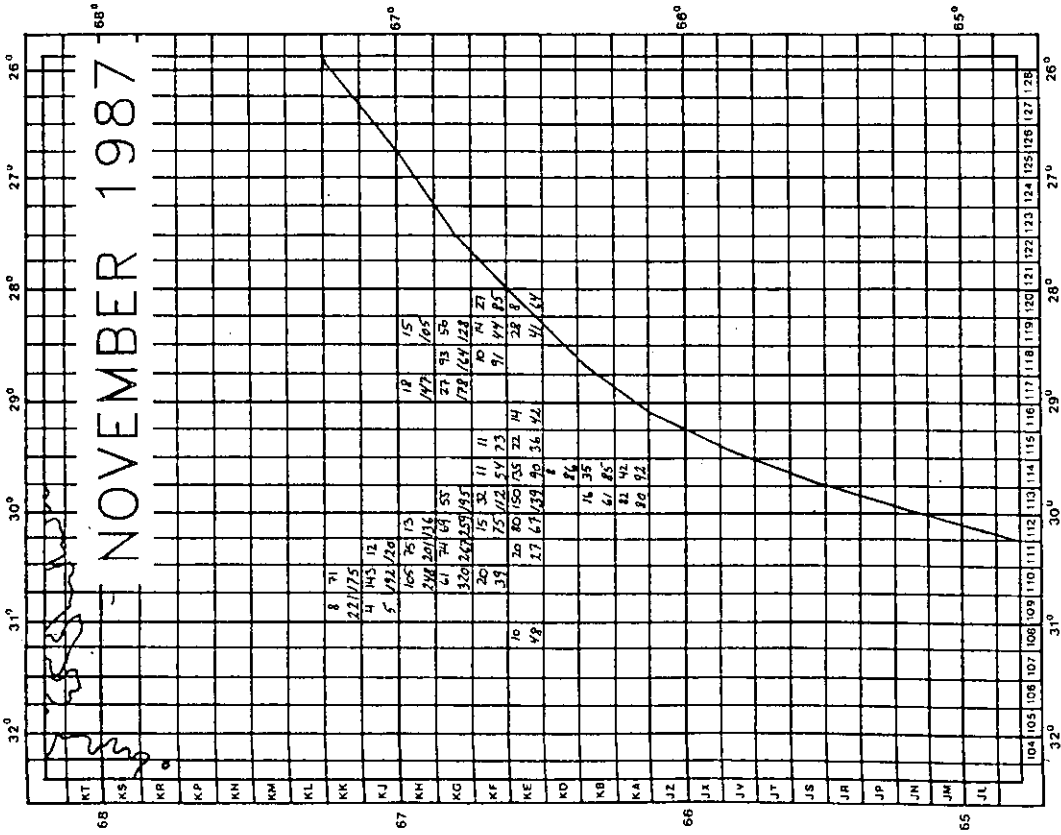


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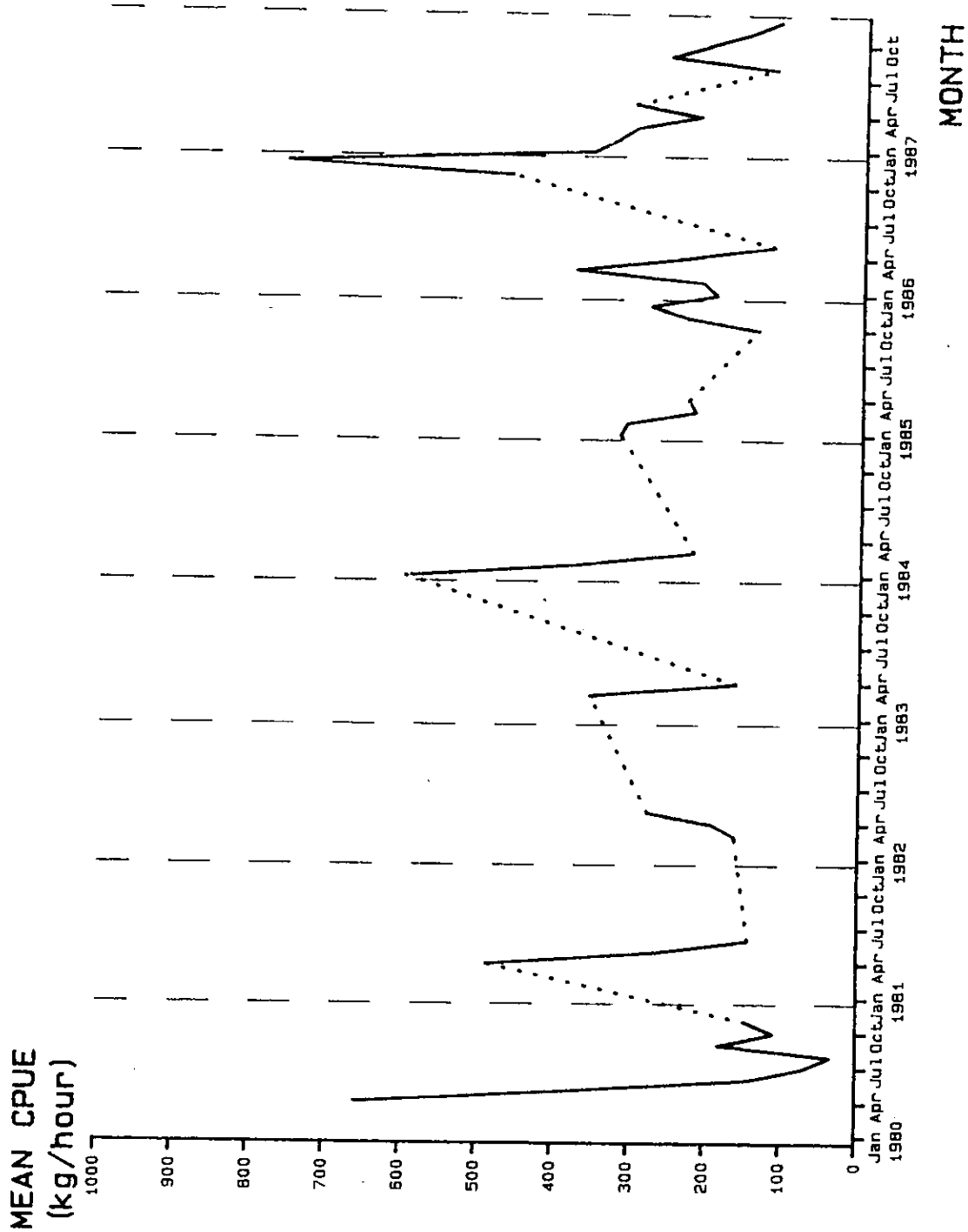


Figure 4. Monthly mean catch rate of shrimp (kg/hour) in the main fishing area at East Greenland from April 1980 to December 1986 based on available logbook information (Table 3 shows the corresponding no. of hours trawled).