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Data on the Shrimp Fishery at East Greenland
in 1980 and 1981

by

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INTRODUCTION

The shrimp fishery at East Greenland grew to a commercial size in 1980, when approximately 7,000 tons of shrimp was being reported caught throughout the year. For 1981 EEC set a quota of 8,000 tons, of which about 4800 tons was reported taken at the end of October.

In 1980 four Danish and two trawlers of the Royal Greenland Trade Department were performing an exploration shrimp fishery at East Greenland, their fishery being planned in cooperation with the Greenland Fisheries Investigations. Data in the present paper is based on logbook information and shrimp samples from this fishery. Also logbook information from the fishing of two other Greenland trawlers in 1980 and from three Danish and two Greenland trawlers in 1981 (one of the Greenland trawlers belonging to the Royal Greenland Trade Department) is included.

Data on Catch and Effort

As in the case in the shrimp fishery in NAFO Subarea 1, all trawlers above 80 GRT participating in the shrimp fishery at East Greenland must report their position and catch to Greenland authorities once a week. Table 1 shows the total reported catches in 1980 and 1981 on a monthly basis, Table 2 the corresponding no. of trawlers joining the fishery. In 1980 the main proportion of the catches were taken in the period from March to June, in 1981 from April to June.

Fig. 1a and 1b show the geographical distribution of the fishery in the two years, based on the above mentioned logbook information, and fig. 2a and 2b the corresponding distribution of catches. Fig. 3 shows the no. of hauls and mean catch rates on a monthly basis. In both years the main fishing area is limited by 65°50'N to the south, 67°30'N to the north, 30°30'W to the west and the midline to Iceland to the east; some parts of this area however not being fished (see Fig. 1).

Although the present information originates from trawlers varying in size from 132 to 722 GRT, no attempts have been made to split data based on vessel tonnage, due to the relatively scarce data and the short periods each vessel joined the fishery. Fig. 4, showing the monthly mean catch per hour fished in the main fishing area calculated from logbook information, is thus based on vessels with a great variety in fishing power, but however it reflects the significant decrease in catch rates throughout the first months of the fishery in each year (Table 3 shows the corresponding no. of hours trawled). Table 4, which shows the monthly mean catch per hour in a south to north grid reflects the same, (Table 5 showing the corresponding no. of hours trawled), but also shows a northeastward shift in the fishery in 1980 (1981 data too limited to show a similar shift), catch rates in each year decreasing significantly.

Diurnal Variation in Catches

In Table 6 are shown the diurnal variation in mean catch rate as per cent of the highest mean catch rate in the day on a monthly basis based on data from the main area fished. The data do not show the expected picture with highest catch rates around noon as generally found in the West Greenland shrimp fishery. This may be explained by the broad range of fishing power and the restricted number of data available, but also strong currents and hard ice conditions at East Greenland may influence diel variability in catches.

Table 7 represents the by-catches recorded in the logbooks. Redfishes and capelin are the most important by-catch species, other species occurring in smaller quantities.

Discussion

The present information shows that the fishery in both 1980 and 1981 in April to the beginning of June is concentrated in the area around 66°15'N, 29°45'W with high catch rates around this position, but very small catches off the area (e.g. Fig. 3 May 1980, May 1981). The fishery is at this time exploiting concentrations of berried female shrimps (Carlsson, 1980). Later in the year, the fishery moves to the northeast and spreads over a wider area, probably reflecting a spreading of the shrimps as indicated by the low catch rates. After very low catch rates in June to August mean catch per hour becomes higher in the autumn, however not reaching the level obtained in the spring. Although ice conditions may influence the distribution of the fishery heavily, this picture emerges clearly from the available data.

In spite of the limited data available and the lack of concise knowledge of the actual ice and weather conditions during the period considered here, the facts that spring catch rates in 1981 are considerably lower than the year before and that total catches in 1981 - although a larger number of vessels participated in the fishery - are lower may lead to the conclusion that a more cautious TAC should be set for 1982 than has been the case for 1981. Thorough analysis of biological samples combined with more complete catch and effort data from the fishery is needed before a maximum sustainable yield for the East Greenland shrimp stock may be estimated.

References

Carlsson, D. M., 1980. Observations on the shrimp fishery at East Greenland in 1980. NAFO SCR Doc. 80/XI/164.

Table 1. Catches of shrimp (tons) at East Greenland by month and nation as reported to the Greenland authorities in 1980 (a) and 1981 (Jan-Oct :b).

a.	<u>1980</u>												<u>Total</u>
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	
Greenland	-	-	-	24	107	6	-	-	10	46	7	-	200
Denmark	-	-	-	-	294	151	70	-	68	84	35	-	702
Faroe Islands	-	-	259	1187	1180	1266	-	-	-	128	213	-	4233
Norway	-	-	484	130	244	107	16	31	350	376	181	-	1919
France	-	-	-	-	-	-	-	-	9	41	-	-	50
Total	0	0	743	1341	1825	1530	86	31	437	675	436	0	7104

b.	<u>1981</u>											<u>Total</u>
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>		
Greenland	-	-	-	625	379	-	-	-	-	-		1004
Denmark	-	-	-	364	199	4	-	14	-	-		581
Faroe Islands	-	-	-	41	430	215	-	-	22	5		713
Norway	-	-	25	1042	745	273	-	56	-	-		2141
France	-	-	-	48	201	104	-	-	-	-		353
Total	0	0	25	2120	1954	596	0	70	22	5		4792

Table 2. No. of vessels in the shrimp fishery at East Greenland by month and nation as reported to the Greenland authorities in 1980 (a) and 1981 (Jan-Oct :b).

a.	<u>1980</u>												<u>In Year</u>
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	
Greenland	-	-	-	1	2	1	-	1	1	2	1	-	4
Denmark	-	-	-	-	3	2	1	-	2	2	2	-	4
Faroe Islands	-	-	2	12	13	15	-	-	-	8	4	-	17
Norway	-	-	7	7	7	5	2	1	12	15	6	-	23
France	-	-	-	-	-	-	-	-	1	1	-	-	1
Total	0	0	9	20	25	23	3	2	16	28	13	0	49

b.	<u>1981</u>											<u>In Year (incl.Oct)</u>
	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sept</u>	<u>Oct</u>		
Greenland	-	-	-	6	7	-	-	-	-	-		7
Denmark	-	-	-	2	3	1	-	1	-	-		3
Faroe Islands	-	-	-	3	10	6	-	-	1	1		11
Norway	-	-	1	14	17	7	-	3	-	-		19
France	-	-	-	1	2	2	-	-	-	-		2
Total	0	0	1	26	39	16	0	4	1	1		42

Table 3. Number of hours trawled per month and year from April 1980 to June 1981 in the main fishing area at East Greenland from logbooks of 8 trawlers in 1980 and 5 trawlers in 1981.

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>
1980	0	0	0	35	1297	315	59	31	482	1148	464
1981	0	0	0	1343	908	7	0	0	0	0	0

Table 4. Mean catch per hour (kg/hour) on a monthly basis in the main fishing area at East Greenland as reported in logbooks of eight trawlers in 1980 and five trawlers in 1981 in a south to north grid (7½ degree latitude scale - see fig. 1).

	8004	8005	8006	8007	8008	8009	8010	8011	8104	8105	8106
KN	-	-	-	-	-	-	-	97	-	-	-
KM	-	-	-	-	-	-	-	163	-	-	-
KL	-	-	-	-	-	-	232	119	-	-	-
KK	-	-	-	-	-	-	148	86	-	-	-
KJ	-	-	-	-	-	-	62	76	-	-	-
KH	-	-	-	-	-	130	168	80	189	-	-
KG	-	-	-	-	80	243	100	42	354	-	-
KF	-	-	162	91	14	173	101	81	332	-	-
KE	-	-	143	59	-	148	104	117	317	123	215
KD	311	337	120	85	-	250	34	195	588	331	-
KB	-	411	191	-	13	-	9	97	512	278	30
KA	724	414	127	-	-	-	-	-	446	249	-
JZ	768	357	118	-	-	-	-	-	417	254	-
JX	-	362	120	-	10	-	-	-	120	278	-
JV	-	276	-	-	-	-	-	-	-	266	-
JT	-	-	-	-	-	-	-	-	-	162	-
JS	-	-	-	-	-	-	-	-	-	225	-
JH	-	-	-	-	-	-	-	48	-	-	-

Table 5. No. of hours trawled per month in the main fishing area at East Greenland based on logbook recordings (see Table 4.)

	8004	8005	8006	8007	8008	8009	8010	8011	8104	8105	8106
KN	-	-	-	-	-	-	-	3	-	-	-
KM	-	-	-	-	-	-	1	29	-	-	-
KL	-	-	-	-	-	-	19	16	-	-	-
KK	-	-	-	-	-	-	13	6	-	-	-
KJ	-	-	-	-	-	-	10	4	-	-	-
KH	-	-	-	-	1	5	11	2	2	-	-
KG	-	-	-	-	1	31	105	1	3	2	-
KF	1	1	2	6	1	57	127	7	17	1	-
KE	-	-	8	13	-	52	66	20	27	2	1
KD	1	16	7	1	-	13	6	43	121	35	-
KB	-	109	22	-	2	-	3	8	167	35	1
KA	4	176	34	-	-	-	2	-	133	51	-
JZ	6	111	22	-	1	-	1	-	31	40	-
JX	-	40	9	-	4	-	1	-	1	29	-
JV	-	1	-	-	-	-	-	-	-	80	-
JT	-	1	-	-	-	-	-	-	-	20	-
JS	-	-	-	-	1	-	-	-	-	1	-
JL	-	-	-	-	1	-	2	-	-	-	-
JH	-	-	-	-	1	-	-	1	-	-	-
JF	1	-	-	-	-	-	-	-	-	-	-
JD	-	-	-	-	1	-	-	-	-	-	-
HZ	-	-	-	-	1	-	-	-	-	-	-
HX	-	-	-	-	1	-	-	-	-	-	-
HT	-	-	-	-	1	-	-	-	-	-	-
HK	-	-	-	-	1	-	-	-	-	-	-

Table 6. Diurnal variation in mean catch rate (kg/hour) by month and 2-hours period. The figures are monthly mean catch rates in percent of the highest mean catch rate of the month.

time period	8004	8005	8006	8007	8008	8009	8010	8011	8104	8105	8106
0	-	68.1	52.2	14.2	-	-	47.1	100.0	64.9	40.9	-
2	-	78.5	55.3	-	-	5.0	47.7	64.8	82.1	100.0	-
4	30.8	75.9	85.6	100.0	-	59.5	54.1	96.9	74.1	60.8	28.7
6	-	92.8	95.7	9.4	50.0	79.8	65.0	95.8	81.4	80.4	-
8	70.6	88.8	84.0	13.7	-	81.0	73.2	90.6	85.3	59.1	100.0
10	-	96.8	79.8	35.2	-	84.7	86.0	38.5	66.6	78.7	-
12	100.0	100.0	70.2	27.0	-	70.2	100.0	74.5	69.8	52.7	-
14	55.7	82.1	100.0	34.3	-	100.0	72.0	74.0	70.1	80.1	-
16	58.5	87.3	60.6	58.8	-	87.2	68.8	76.0	68.7	85.6	-
18	46.6	80.2	70.7	-	100.0	54.1	60.5	65.1	83.4	71.5	-
20	-	73.0	75.5	42.9	-	-	84.8	78.6	75.7	66.0	-
22	-	58.6	43.6	-	-	-	66.9	48.4	100.0	82.1	-
Max. mean catch rate (kg/hour) (=100 percent):											
	1281	474	188	233	80	242	157	192	613	347	108

Table 7. Bycatch (tons) by month and species reported in logbooks of shrimp trawlers fishing at East Greenland (eight trawlers in 1980 and five trawlers in 1981).

Species	Apr	May	1980				1981	
			Jun	Aug	Sep	Oct	May	
Redfishes	0.8	4.0	0.1	1.1	0.2	0.4	10.5	
Capelin	2.2	22.7						
Sand eel		2.7	2.0					
Mixed species		1.4	0.8		0.2	0.5		
All species	3.0	30.8	2.9	1.1	0.4	0.9	10.5	

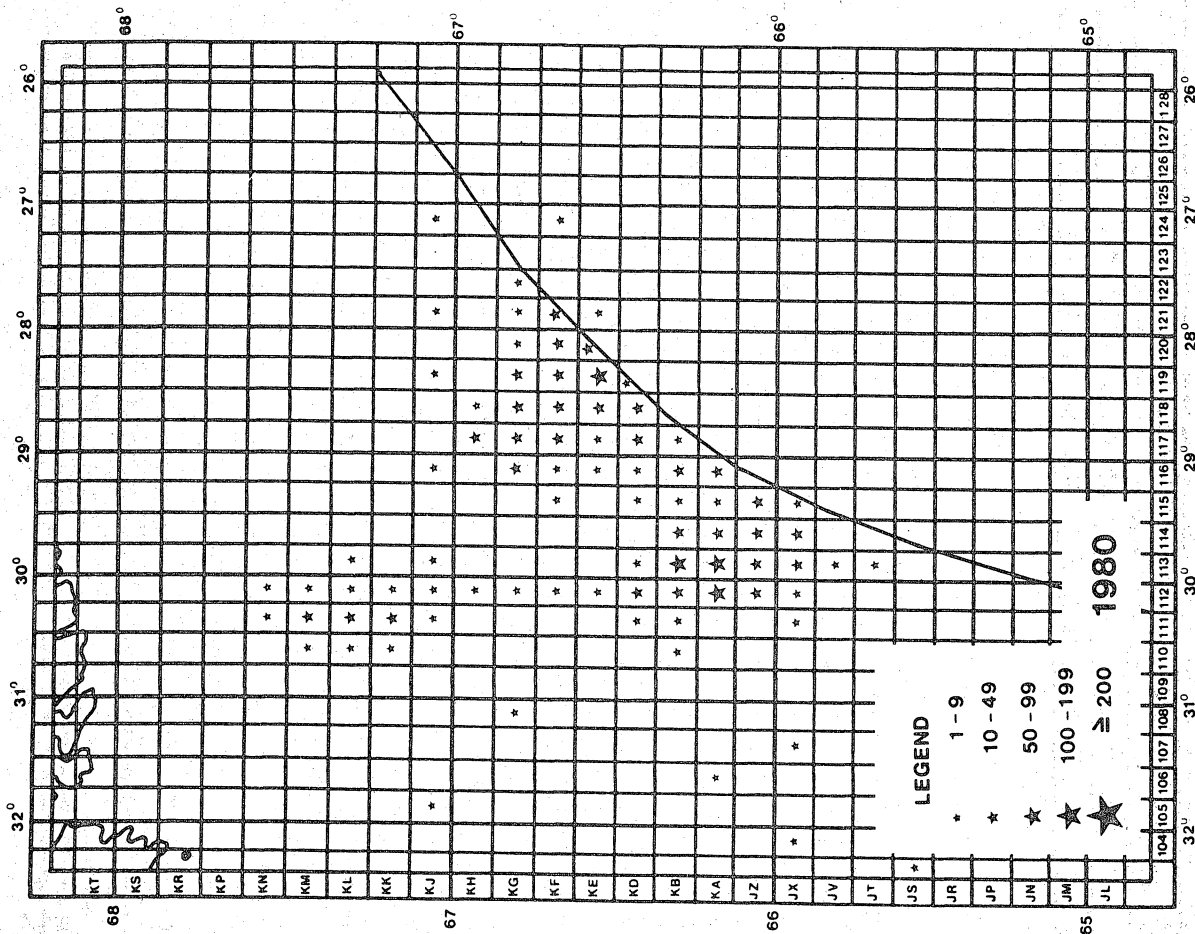


Fig. 1a Distribution of effort in the shrimp fishery at East Greenland in 1980, based on logbook information from 8 trawlers, excluding 13 hauls outside the map.

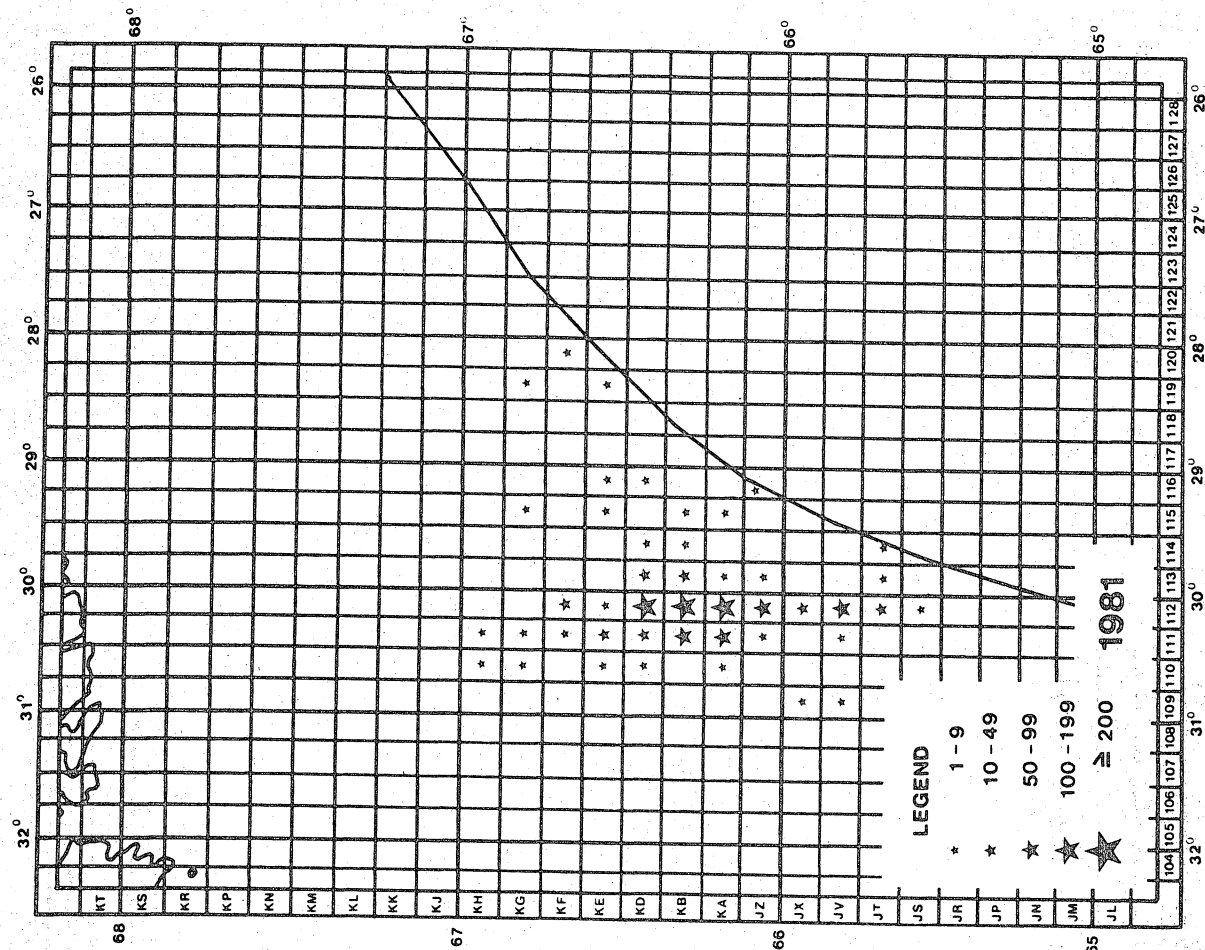


Fig. 1b Distribution of effort in the shrimp fishery at East Greenland in 1981 (April to May), based on logbook information from 5 trawlers.

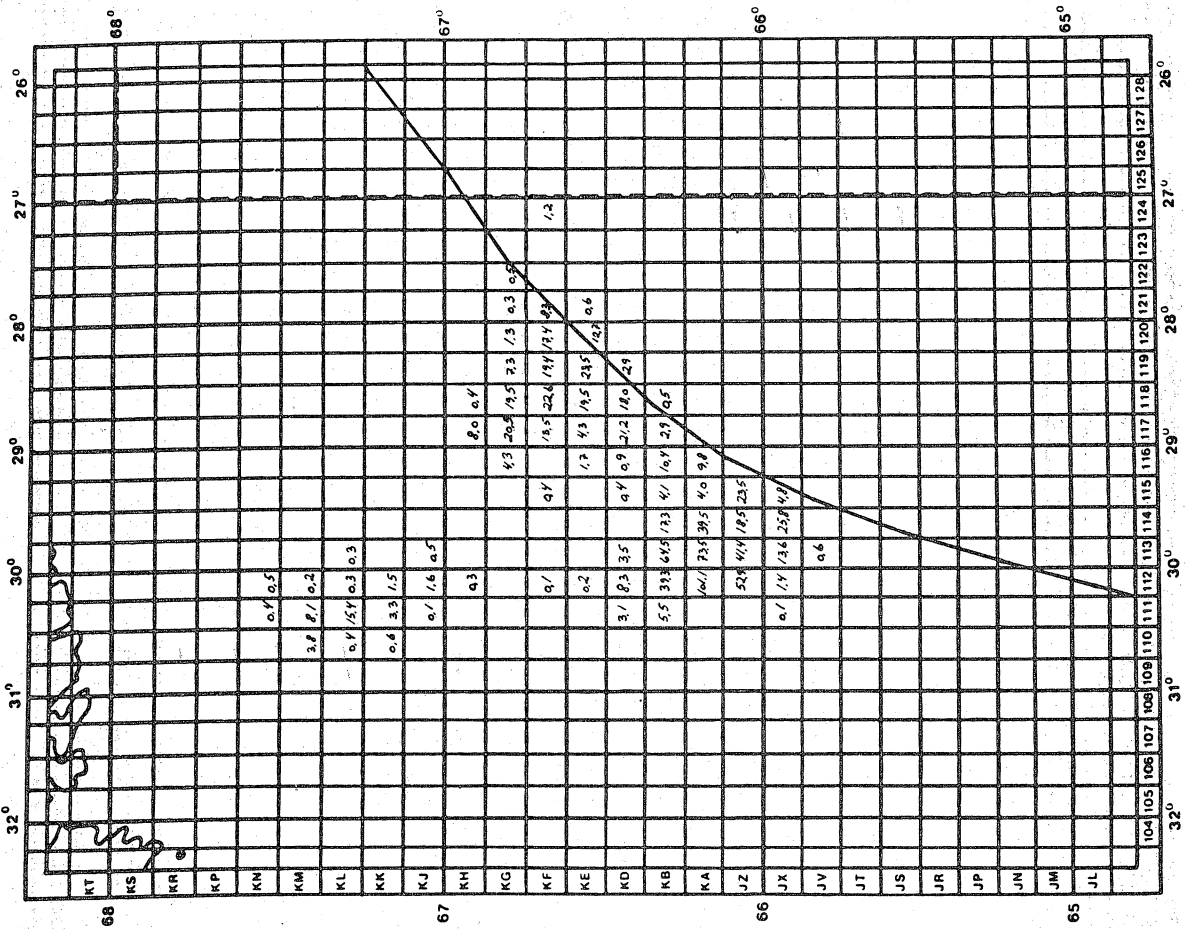


Fig. 2a Distribution of total catches in tons in the shrimp fishery at East Greenland in 1980, based on logbook information from 8 trawlers, excluding 13 hauls outside the map.

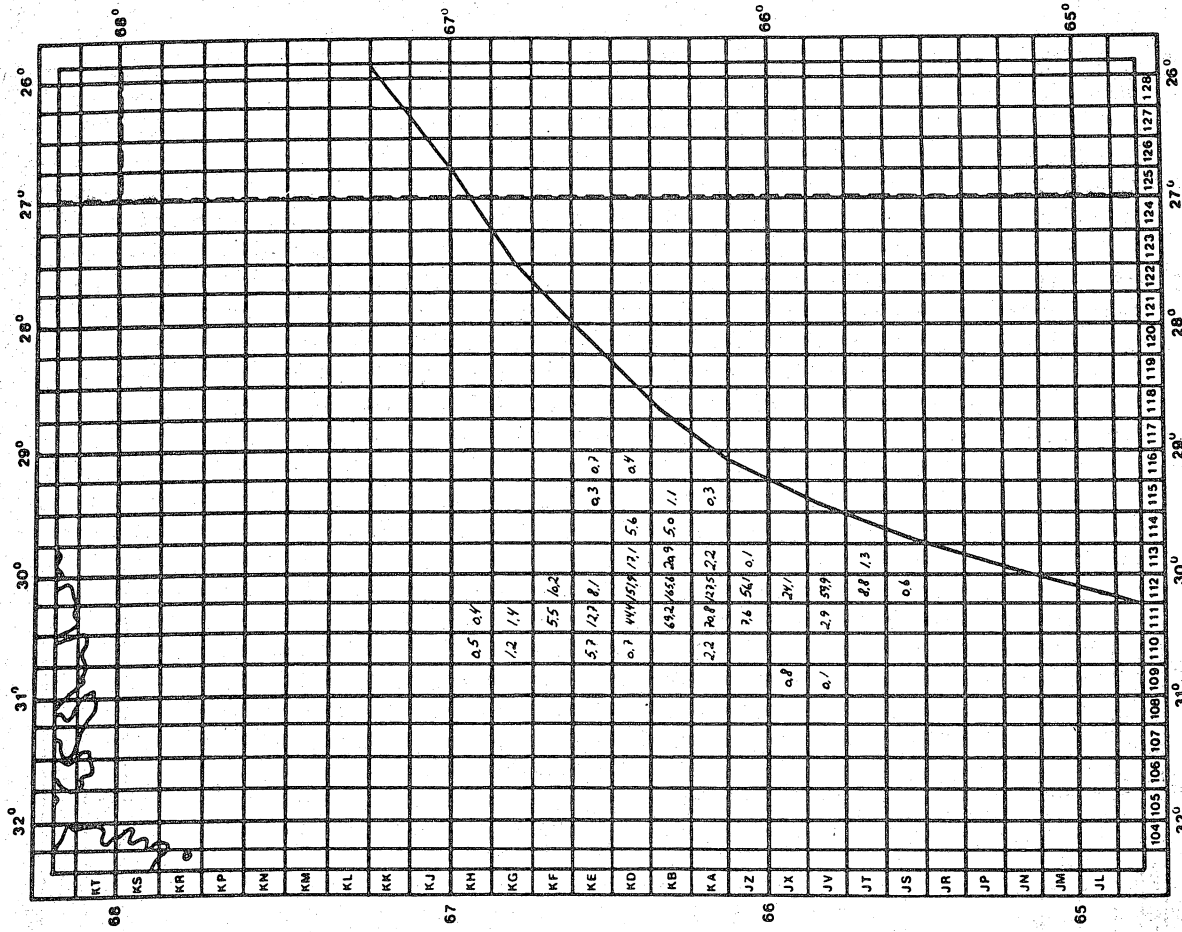


Fig. 2b Distribution of total catches in tons in the shrimp fishery at East Greenland in 1981 (April to May, based on logbook information from 5 trawlers).

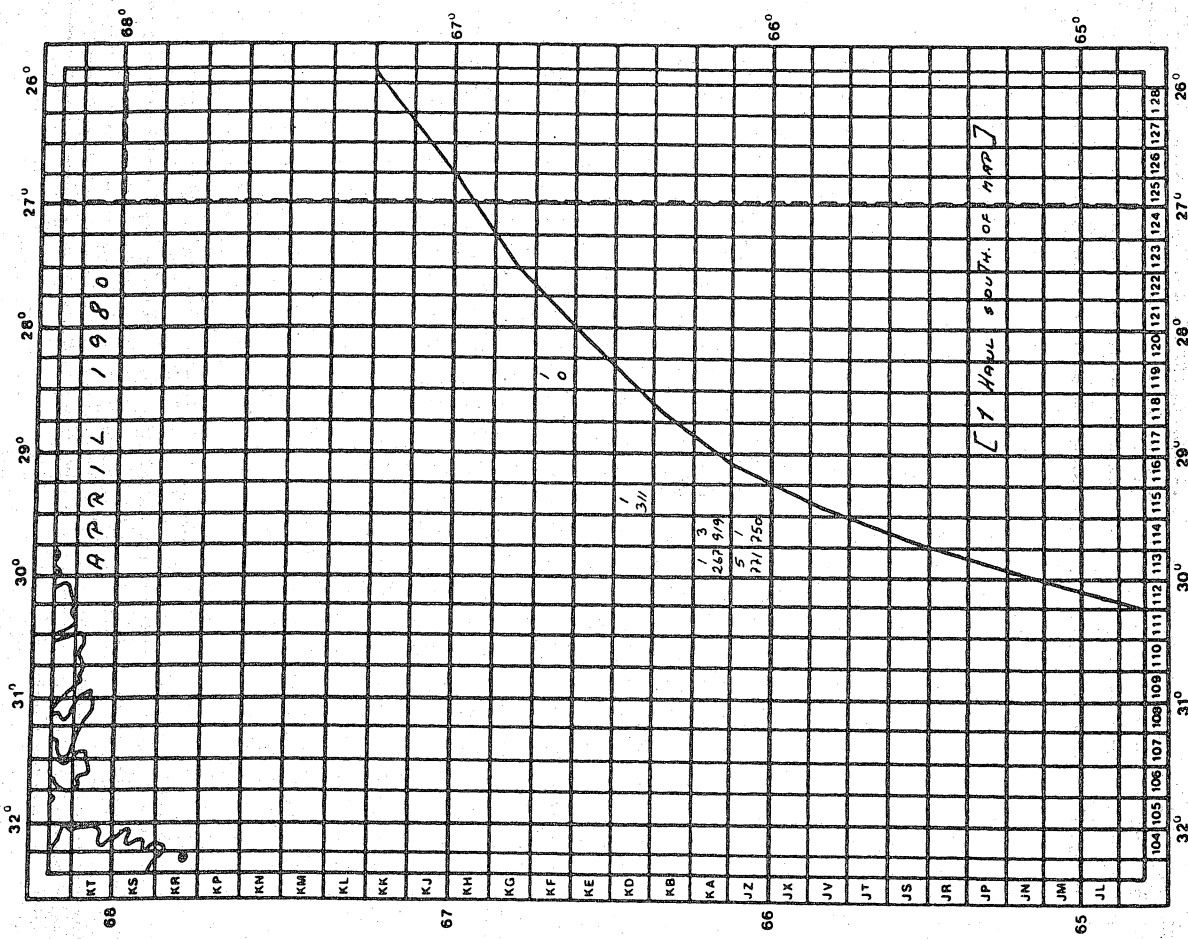


Fig. 3 No. of hauls and mean catch per hour (kg/hour) in the shrimp fishery at East Greenland in April 1980 as reported in log-books of eight Greenland shrimp trawlers. Upper figure in each statistical unit shows no. of hauls, lower figure mean catch rate (kg/hour).

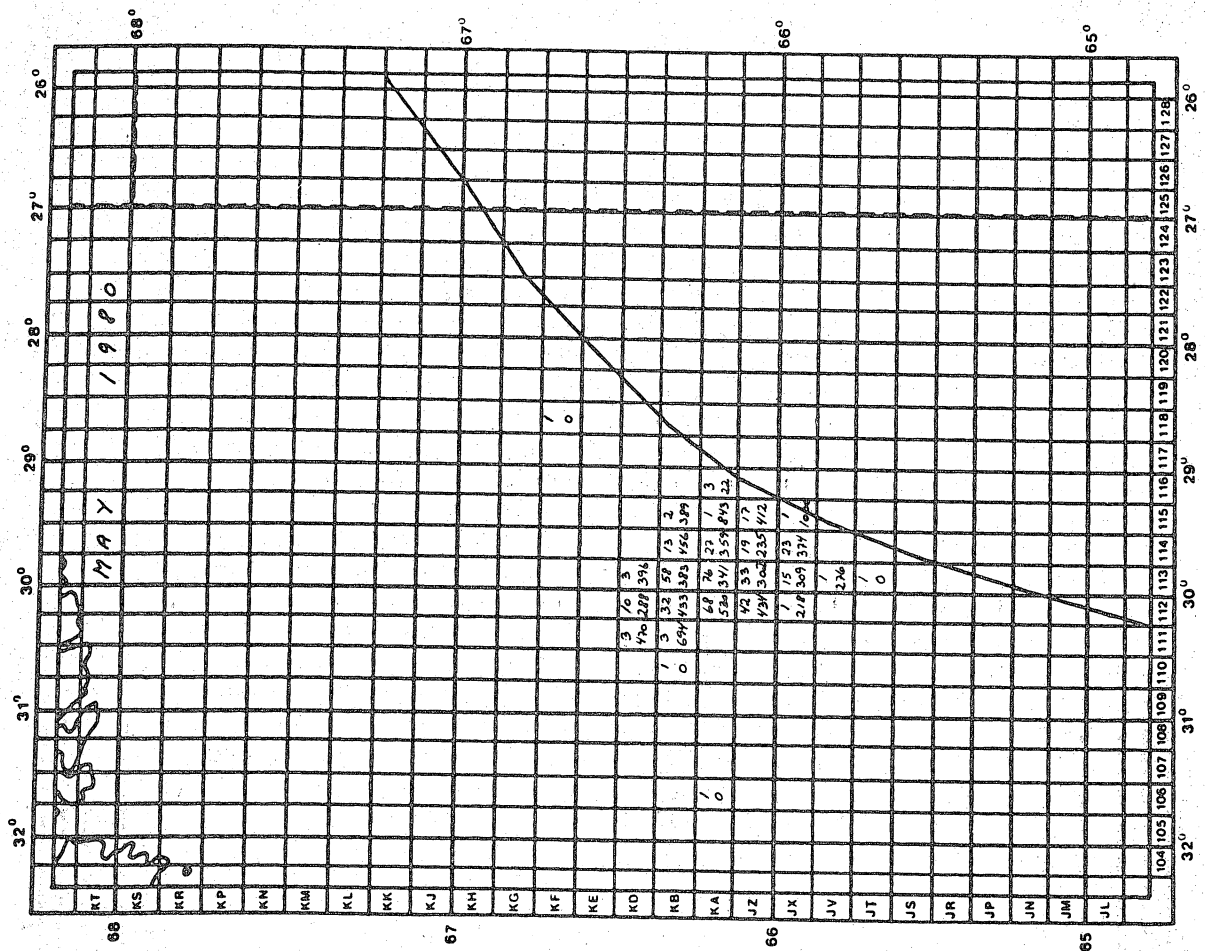


Fig. 3 Cont'd - MAY 1980.

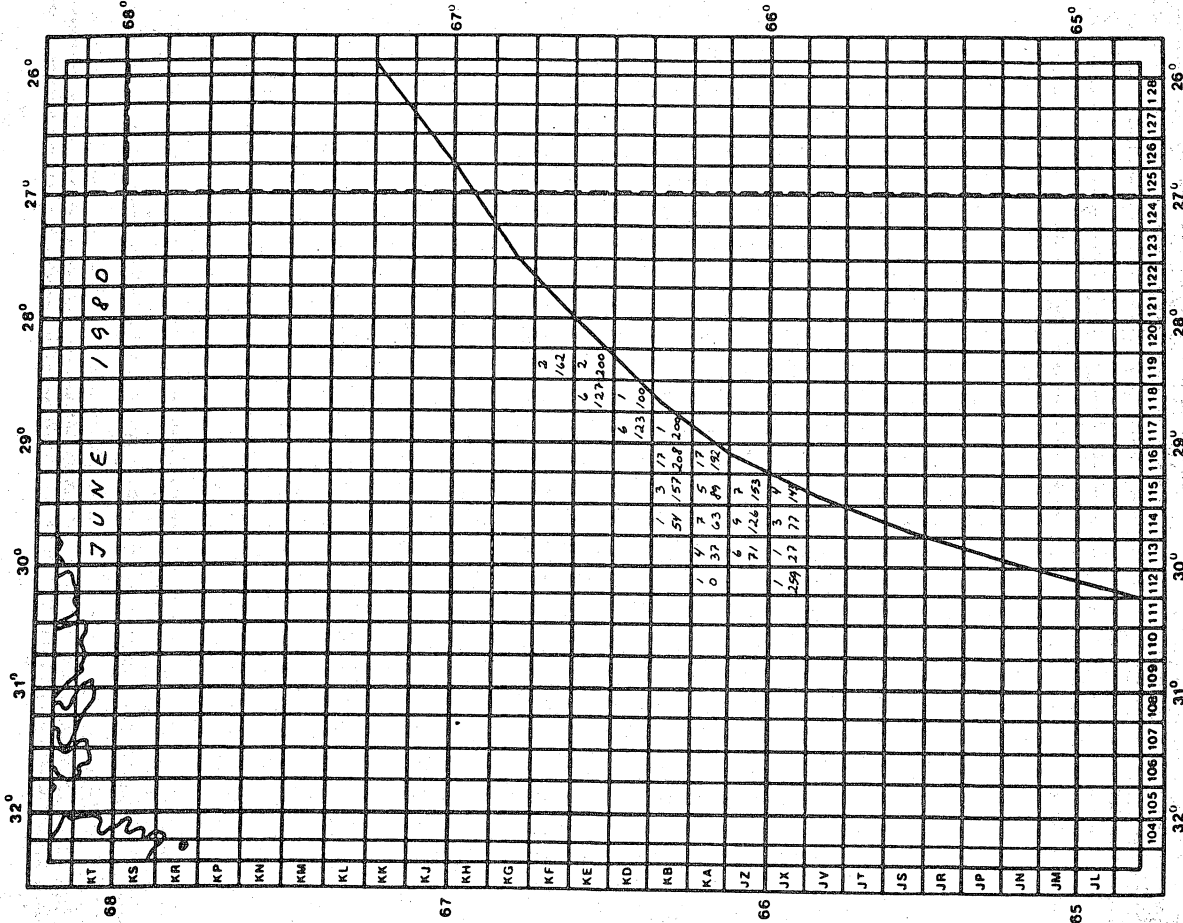


Fig. 3 Cont'd JUNE 1980.

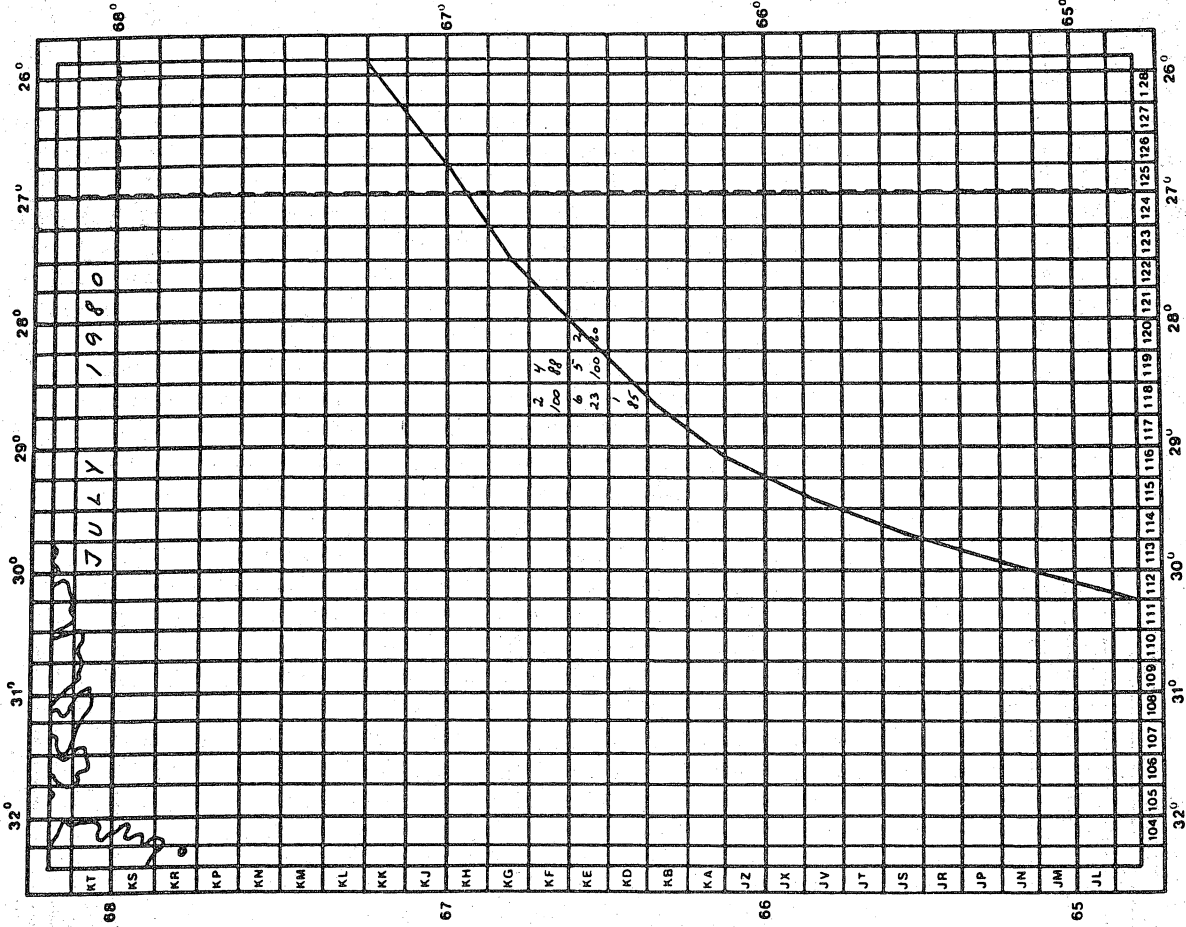


Fig. 3 Cont'd - JULY 1980.

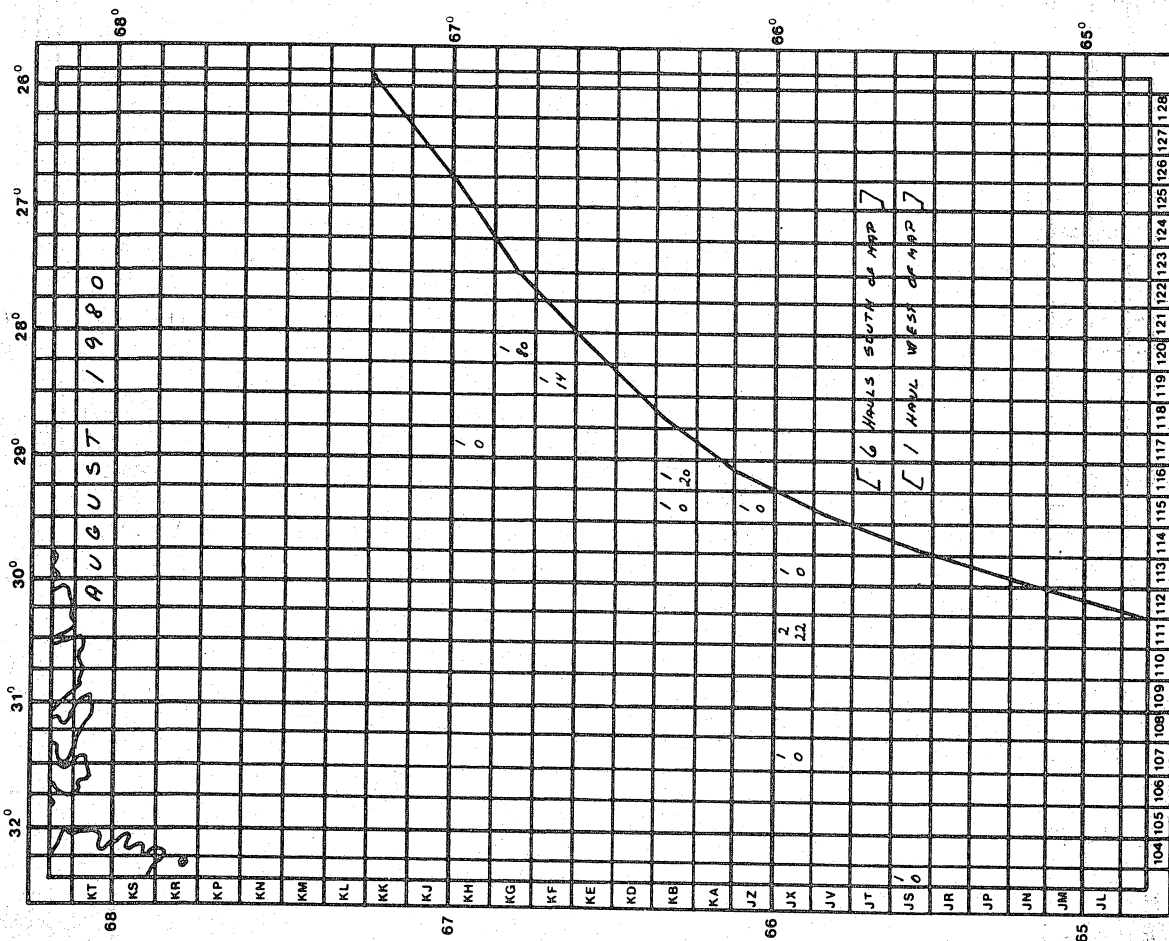


Fig. 3 Cont'd - AUG. 1980.

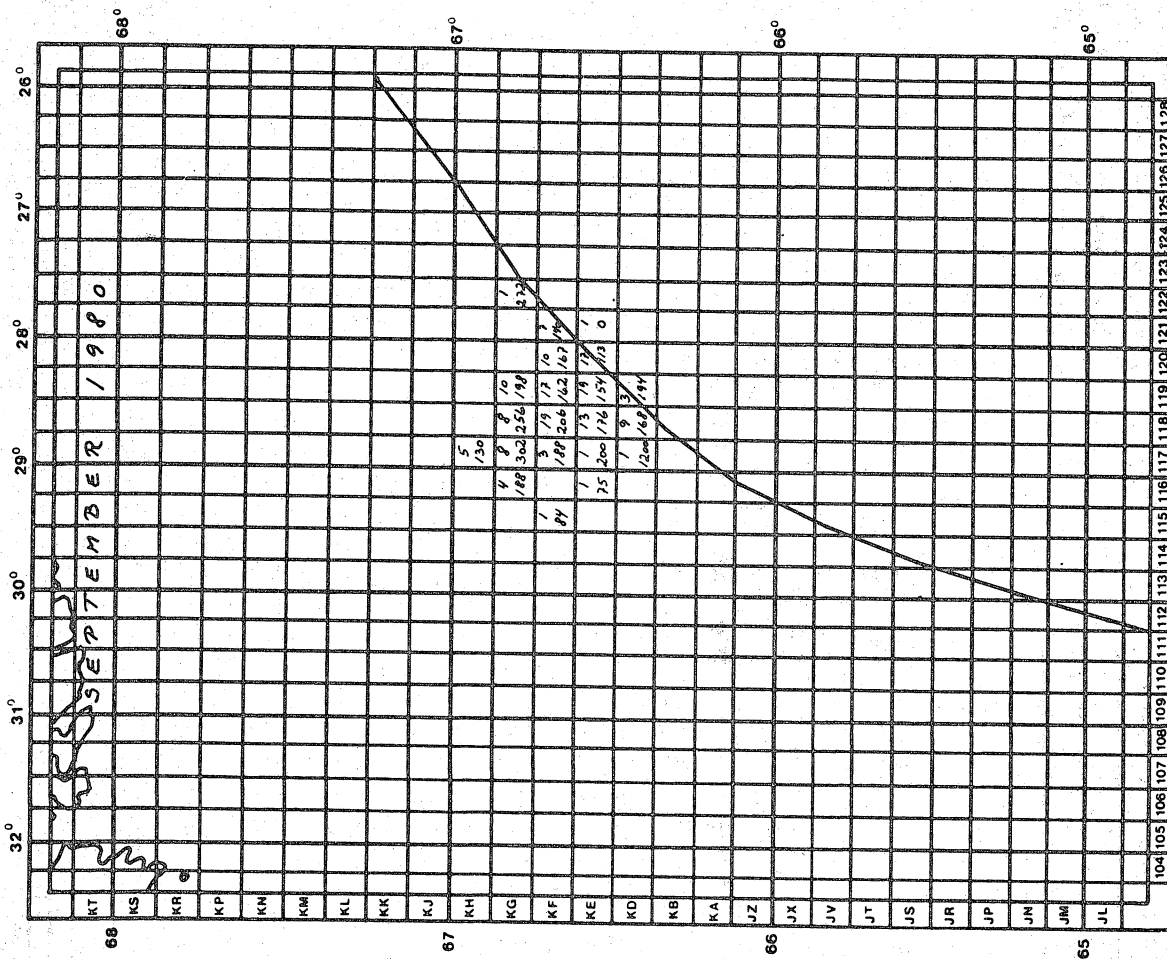


Fig. 3 Cont'd - SEPT. 1980.

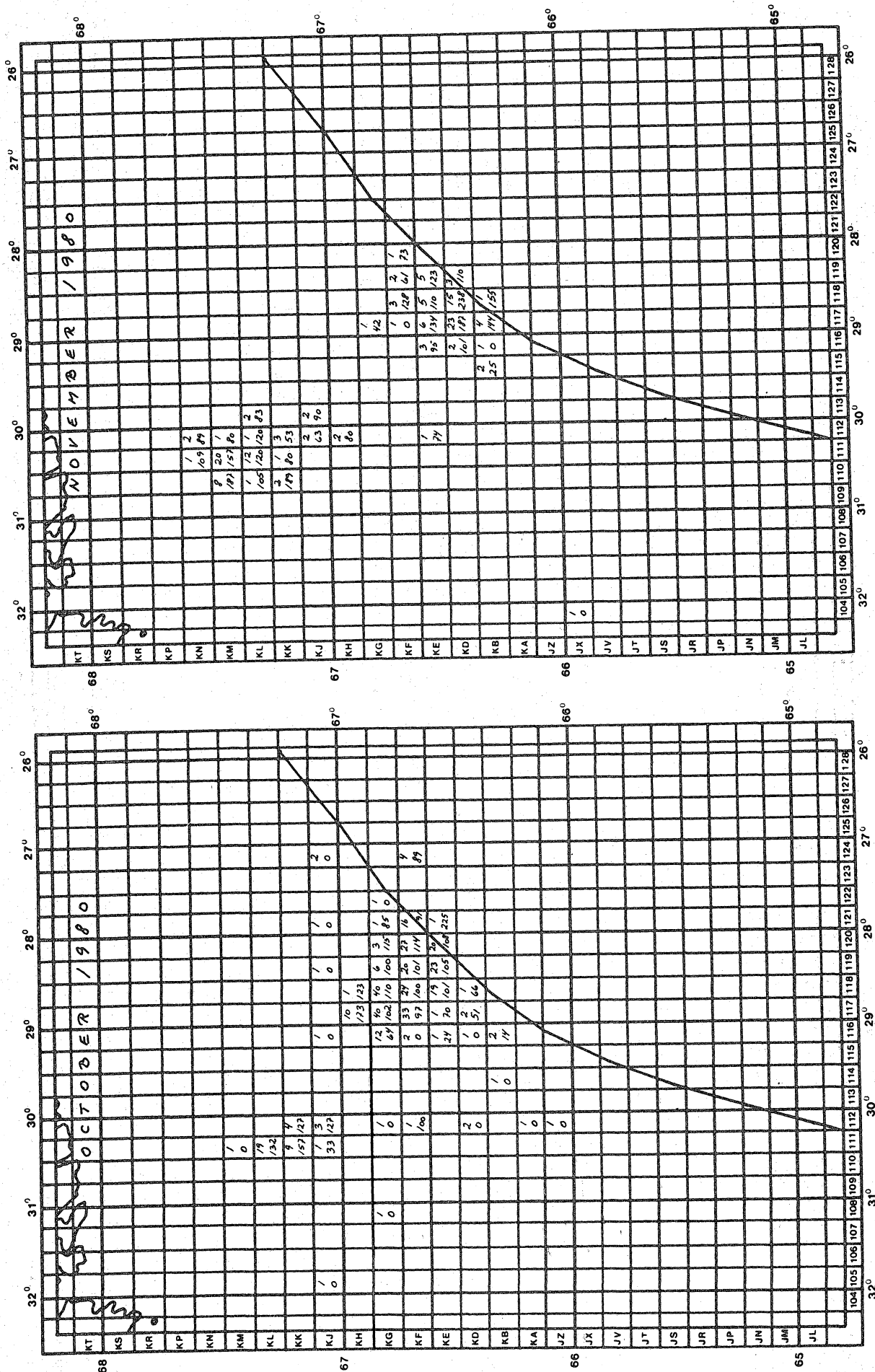


Fig. 3 Cont'd - NOV. 1980.

Fig. 3 Cont'd - OCT. 1980.

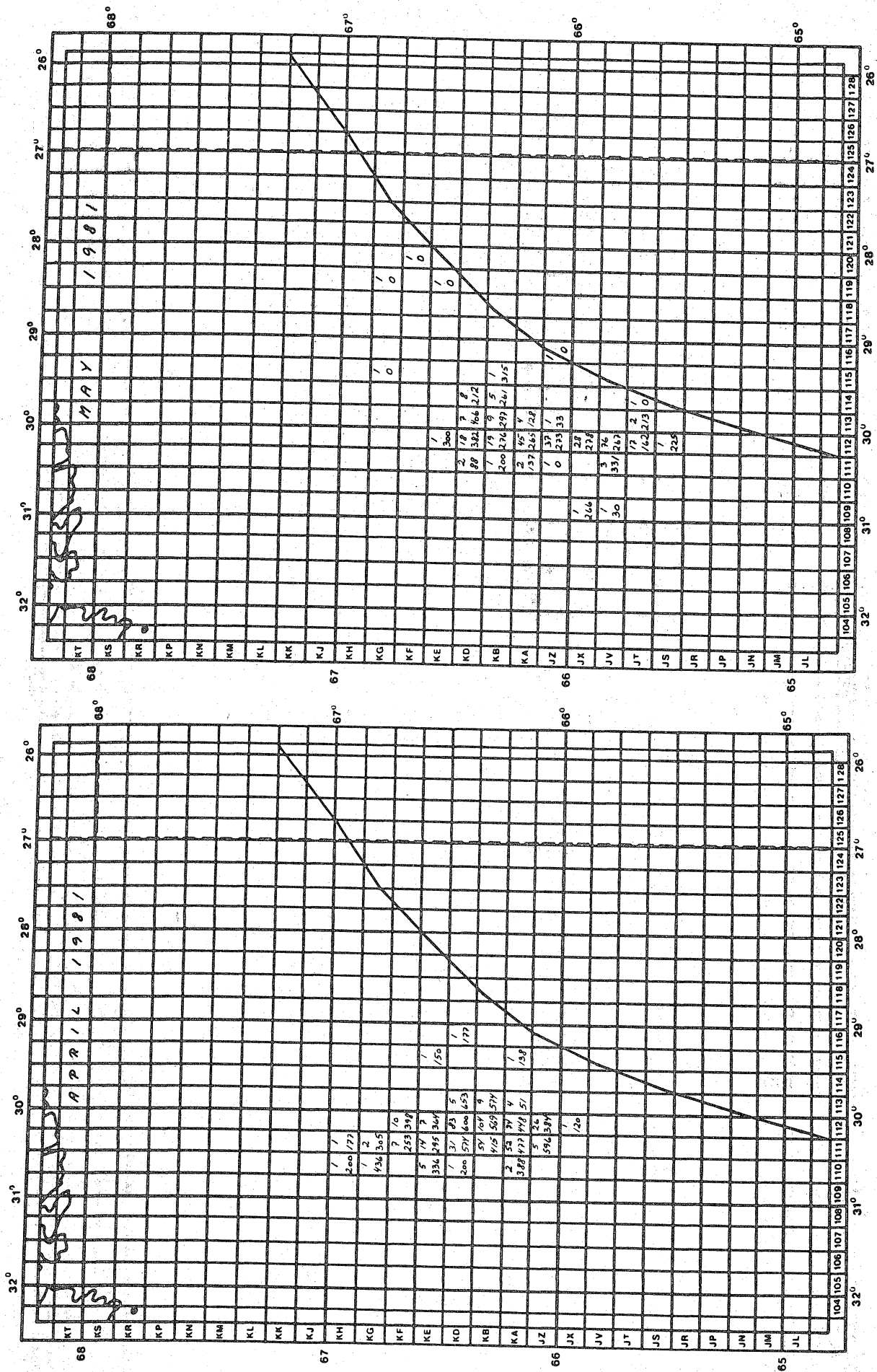


Fig. 3 Cont'd - APRIL - 1981 - 5 trawlers.

Fig. 3 Cont'd - MAY - 1981 - 5 trawlers.

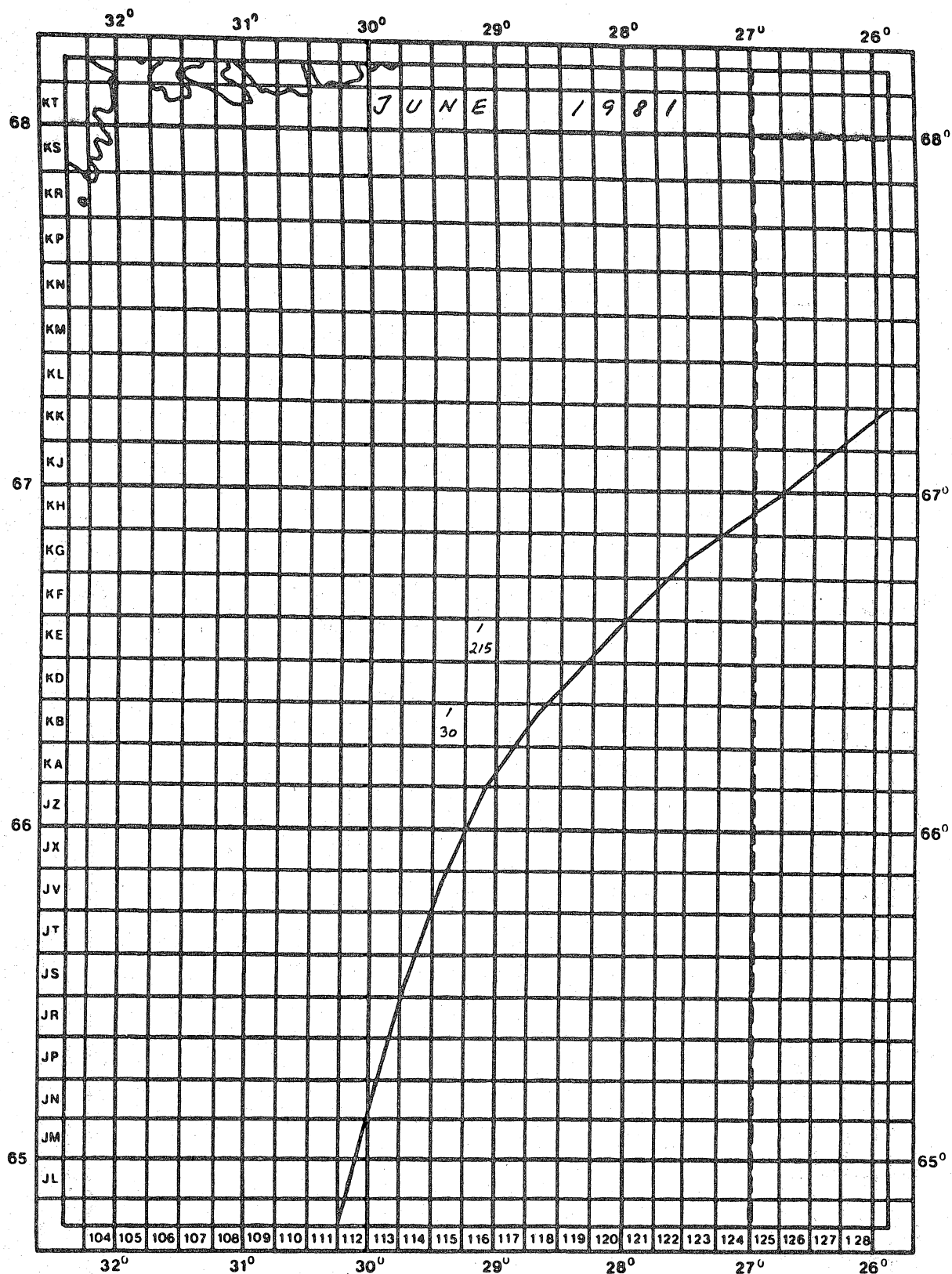


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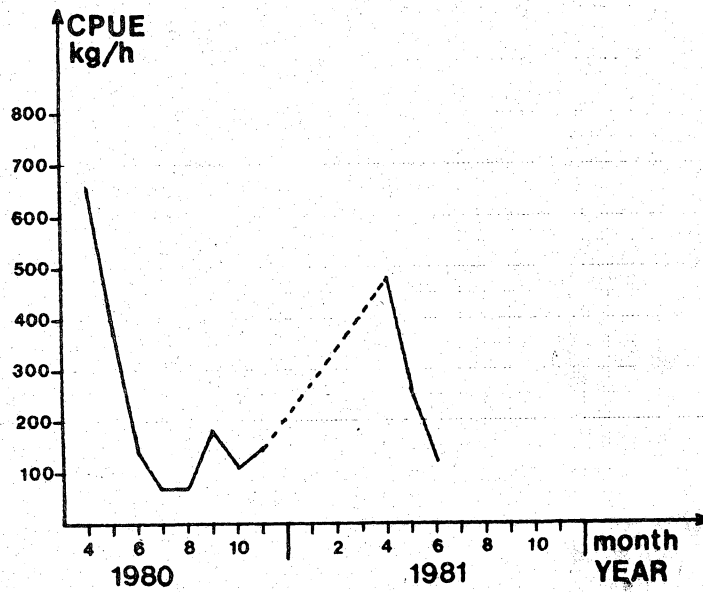


Fig. 4. Monthly mean catch per unit effort (kg/hour) in the main fishing area (see text) at East Greenland from April 1980 to June 1981 based on logbook information from 8 trawlers in 1980 and 5 trawlers in 1981 (Table 3 shows the corresponding number of hours trawled).