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Data on the Shrimp Fishery in NAFO Subareas 0 and 1 in 1981 and 1982

by

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INTRODUCTION

Since 1979 the scientific advice for the total yearly catch of shrimp in the offshore parts of NAFO Subareas 0 and 1 has been 29,500 tons. While nominal catches were below this figure in 1979 and 1980, they have been close to 35,000 tons in 1981 and 1982, when the EEC had set a TAC of 30,000 tons for Subarea 1 and Canada a TAC of 5,000 tons for Subarea 0. Totals of 27,000 and 27,250 tons respectively have been allocated to Greenland in those years.

In 1982, as in earlier years, the eight trawlers of the Royal Greenland Trade Department have taken a considerable part of the Greenland quota, in 1982 (through November) about 27%. Haul-by-haul logbook information from all fishing activity by these trawlers since 1975 is available in an ADP file at the Greenland Fisheries Investigations.

Information on the distribution of the shrimp fishery, on catch rates and by-catches in 1980 and 1981 drawn from these logbooks is presented in this paper, together with reported catches of all nations fishing shrimp in Subarea 1 in these two years.

THE OFFSHORE SHRIMP FISHERY IN SUBAREA 1 IN 1981 AND 1982

The management of the offshore shrimp fishery in Subarea 1 is based on the obligatory reporting by all vessels above 80 GRT once a week of the catch to the Greenland authorities. Table 1 shows the reported catches of shrimp by month and country in 1981 and 1982. Catch figures from small Greenland vessels in the offshore region are not available, but are assumed to be 1,000-2,000 tons per year. The total offshore shrimp catch in Subarea 1 in 1981 was thus a few thousand tons higher than the TAC of 30,000 tons.

In 1982 severe ice conditions almost closed the offshore shrimp fishery in February to April. As it was not possible for the Greenland fleet to use all of the Greenland allocation, two Danish shrimp trawlers were allowed to fish on the Greenland quota under the condition that they landed part of their catch for processing at Greenland shrimp industries. These catches are included in the Greenland figures in Table 1. Including assumed offshore catches of vessels smaller than 80 GRT, the total offshore catch in 1982 is about the same size as in 1981 and above the TAC of 30,000 tons.

The decline in the number of vessels about 80 GRT in the shrimp fishery from 65 in 1981 to 56 in 1982 (Table 2) is due to a smaller number of Norwegian and Faroese boats.

GEOGRAPHICAL DISTRIBUTION OF THE OFFSHORE SHRIMP FISHERY IN SUBAREA 1

Figures 1a-1e show the geographical distribution of the shrimp fishery of seven trawlers of the Royal Greenland Trade Department in 1981 and 1982 (through November). While the shrimp grounds off the northern entrance to the Disko Bay were heavily exploited in 1980 (Carlsson, 1981) and 1981, these grounds were visited only once by one trawler in October 1982. This year the fishery concentrated around the slopes of Store Hellefiske Bank, in the Holsteinsborg Deep and especially chose to the base line between 68°N and 69°N (Fig. 1e). Figures 2 shows the distribution of the fishery month by month in 1981 and 1982 (through November), including number of hauls and mean catch rate (kg/hour) in 7.5 x 15 minute statistical units. As mentioned above, severe ice conditions in early 1982 hampered the shrimp fishery and forced the main activity south of Holsteinsborg in February to May. Not until June did the exploitation pattern go back to normal around the Store Hellefiske Bank.

Since 1977, there has been a significant northward shift from year to year in the shrimp fishery in Subarea 1 (Carlsson 1980, 1981). The distribution of the fishery in 1982 was similar to the 1979 situation, and although the exploitation of the shrimp stock was low in the spring period due to ice conditions, this alone can not explain the sustained high catch rates found around Store Hellefiske Bank.

Due to spring ice conditions, the especially set quota for the area off the Disko Bay (offshore from 68°N to 69°15'N, limited to the west by 56°W) had not as in earlier years been fished by mid-year. This introduces a difference in geographical distribution of the fishing activity, but does not explain the lack of exploitation of the northern areas off the Hareoe.

TRENDS IN CATCH RATES

Figure 3 shows the variation in mean catch rates from October 1975 to November 1982 in NAFO Division 1B on a monthly basis by six trawlers (722 GRT) of the Royal Greenland Trade Department (Table 3 shows the number of hours trawled, on which the catch rates are based). In 1982, the expected spring peak rate was found in May, being the highest since 1977. Table 4 shows the mean catch rates by month and NAFO Division in a south to north 7.5' latitude grid for 1981 to November 1982, Table 5 the corresponding number of hours trawled. As in earlier years, there was a northward shift in the fishery throughout the year and declining catch rates. However, the northward shift was not as significant and catch rates were generally higher.

In earlier years it has been agreed by advising scientists that catch rates from the period July to September are less influenced by ice conditions and quota regulations. Mean catch rates and the corresponding number of hours trawled for the six 722 GRT trawlers of the Royal Greenland Trade Department in Division 1B from 1976 to 1982 are:

	1976	1977	1978	1979	1980	1981	1982
Hours trawled	1,005	2,966	3,446	3,588	1,872	5,285	3,543
kg/hour	740	548	499	378	468	438	550
Index	1.00	0.74	0.67	0.51	0.63	0.59	0.74

The mean catch rate in July-September in 1982 is the highest since 1977, being approximately 25% above the 1981 figure. While catch rates from 1981 and 1982 may not be directly comparable to those of the years before due to the introduction of more efficient gears in 1980, comparability between 1981 and 1982 is assumed, reflecting an increase in fishable biomass in Division 1B.

BY-CATCHES IN THE SHRIMP FISHERY

Table 6 shows the reported by-catches from logbooks of 7 trawlers of the Royal Greenland Trade Department by year and division. The total by-catch per year in SA 0+1 is compared to the corresponding catch of shrimp and a steady decline in by-catch since 1978 is seen.

In Table 7 is given the reported by-catch per month and division of the same trawlers in 1981 and 1982. In both years highest by-catch rates are found in May in Division 1B, in 1981 being mostly redfish, in 1982 mostly cod. Last time cod was reported as by-catch in Division 1B was in 1980; in that year and in 1982, it was taken in the Holsteinsborg Dyb in the southern most part of Division 1B.

REFERENCES

CARLSSON, D. M. 1980. Data on the Greenland shrimp fishery in NAFO Subareas 0+1 in 1980 compared to earlier years. NAFO SCR Doc., No. 80/XI/174, Ser. No. N261.

1981. Data on the shrimp fishery in NAFO Subareas 0+1 in 1980 and 1981. NAFO SCR Doc., No. 81/XI/151, Ser. No. N458.

Table 1. Catches of shrimp (tons) by trawlers above 80 GRT in NAFO Subarea 1 by month and nation as reported to the Greenland authorities in 1981 (A) and 1982 (B).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
A. 1981													
GREENLAND	1690	2322	1999	1422	4234	1896	2302	3191	2201	1897	1732	1841	26727
DENMARK	-	244	289	-	182	125	-	118	17	-	-	20	995
FAROE ISLANDS	-	-	-	-	56	112	301	39	56	122	-	-	686
NORWAY	-	10	53	-	-	183	670	148	-	-	-	-	1064
FRANCE	-	-	-	-	-	-	273	231	40	-	-	-	544
TOTAL	1690	2576	2341	1422	4472	2316	3546	3727	2314	2019	1732	1861	30016
B. 1982													
GREENLAND	2134	557	53	606	3297	3530	3542	2411	3355	3384	3652	1301	27822
DENMARK	-	-	-	-	-	357	212	11	-	8	105	160	853
FAROE ISLANDS	-	-	-	-	31	370	128	-	-	-	-	-	529
NORWAY	-	-	-	-	52	191	576	-	-	-	-	-	819
FRANCE	-	-	-	-	-	-	269	344	64	-	-	-	677
TOTAL	2134	557	53	606	3380	4448	4727	2766	3419	3392	3757	1461	30700

Table 2. Number of vessels above 80 GRT in shrimp fishery in NAFO Subarea 1 by month and country as reported to the Greenland authorities in 1981 (A) and 1982 (B).

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
A. 1981													
GREENLAND	22	23	21	21	25	23	24	24	22	22	15	15	35
DENMARK	-	2	2	-	2	3	-	3	1	-	1	-	3
FAROE ISLANDS	-	-	-	-	2	4	8	5	5	5	-	-	11
NORWAY	-	2	2	-	-	6	14	7	-	-	-	-	14
FRANCE	-	-	-	-	-	-	2	2	1	-	-	-	2
TOTAL	22	27	25	21	29	36	48	41	29	27	15	16	65
B. 1982													
GREENLAND	17	13	3	9	21	28	25	24	22	26	29	21	34
DENMARK	-	-	-	-	-	2	3	2	-	1	2	-	3
FAROE ISLANDS	-	-	-	-	1	6	4	-	-	-	-	-	6
NORWAY	-	-	-	-	3	8	6	1	-	-	-	-	11
FRANCE	-	-	-	-	-	-	2	2	1	-	-	-	2
TOTAL	17	13	3	9	25	44	40	29	23	27	31	21	56

Table 3. No. of hours trawled per month and year from October 1975 through November 1982 in NAFO Divisions 1A, 1B and 1A+B in the shrimp fishery of six trawlers (722 GRT) of the Royal Greenland Trade Department.

DIV.	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1A	1975	-	-	-	-	-	-	-	-	-	-	-	-
	1976	-	-	-	-	-	-	-	2	-	-	-	-
	1977	-	-	-	-	-	-	-	4	58	-	-	-
	1978	-	-	-	-	-	-	-	10	-	-	-	100
	1979	77	-	-	91	65	143	-	-	-	-	-	-
	1980	39	118	93	46	70	979	171	199	255	319	-	-
	1981	187	-	13	71	369	178	66	209	82	72	-	19
	1982	6	-	-	-	6	-	35	14	-	20	13	-
DIV.	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1B	1975	-	-	-	-	-	-	-	-	-	50	331	183
	1976	12	-	-	-	7	252	326	309	370	329	-	-
	1977	104	84	245	391	643	839	874	1053	1039	1297	1293	957
	1978	233	-	-	13	948	1209	1226	1326	894	1282	1199	626
	1979	27	18	823	752	991	972	1191	1521	876	911	922	891
	1980	771	627	685	670	1330	131	469	822	581	254	-	-
	1981	857	172	366	729	1059	1167	1915	1816	1554	1436	1254	692
	1982	169	-	-	220	711	1001	1301	1302	940	1258	608	-
DIV.	YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1A	1975	-	-	-	-	-	-	-	-	-	50	331	183
+ 1976	12	-	-	-	-	7	252	326	311	370	329	-	-
1B	1977	104	84	245	391	643	839	874	1057	1097	1297	1293	957
	1978	233	-	-	13	948	1209	1226	1336	894	1282	1199	726
	1979	104	18	823	842	1058	1115	1191	1521	876	911	922	891
	1980	810	745	778	716	1400	1110	640	1021	776	573	-	-
	1981	1044	172	379	800	1428	1345	1981	2025	1636	1508	1254	711
	1982	175	-	-	220	717	1001	1336	1316	940	1278	621	-

Table 4. Mean catch of shrimp per hour (kg/hour) per month in NAFO Subarea 0+1 in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in 1981 and 1982 in a south to north grid (7.5' latitude scale, see Fig. 1).

Table 5. No. of hours trawled per month in NAFO Subarea 0+1 in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in 1981 and 1982 in a south to north grid (7.5' latitude scale, see Fig. 1).

Table 6. Reported by-catches in shrimp fishery in NAFO Subarea 0 and 1 by seven trawlers (473 - 722 GRT) of the Royal Greenland Trade Department from 1976 to 1982 and a comparison with the corresponding total shrimp catches.

	SPECIES	1977	1978	1979	1980	1981	1982
DIV 0A	REDFISHES	4.2	9.2	132.7	106.9	0.1	0.3
	OTHERS	-	-	-	-	-	-
- 1A	REDFISHES	0.1	4.1	5.8	18.3	0.6	-
	OTHERS	-	-	-	-	-	-
- 1B	REDFISHES	102.3	1035.5	903.8	360.1	63.4	22.4
	OTHERS	1.2	19.9	8.4	1.6	-	21.0
- 1C	REDFISHES	2.8	15.6	39.3	40.4	6.9	1.9
	OTHERS	4.2	-	1.4	20.5	-	-
SA 0+1	REDFISHES	109.4	1064.4	1081.6	525.7	71.0	24.6
	OTHERS	5.4	19.9	9.8	22.1	-	21.0
-	TOTAL BYCATCH	114.8	1084.3	1091.4	547.8	71.0	45.6
-	SHRIMP CATCH	5487	4695	6464	8435	9229	6681
-	BYCATCH IN % OF TOTAL SHRIMP CATCH	2.1	23.1	16.9	6.5	0.8	0.7

Table 7. Reported by-catches in shrimp fishery in NAFO Subareas 0 and 1 by seven trawlers (473-722 GRT) of the Royal Greenland Trade Department by month and species in 1981 and 1982 and a comparison with the corresponding shrimp catches.

	8101	8102	8103	8104	8105	8106	8107	8108	8109	8110	8111	8112	8201	8202	8204	8205	8206	8207	8208	8209	8210
0A REDFISH	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	0.3
1A REDFISH	0.4	-	-	0.1	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1B REDFISH COD	3.3	6.8	0.1	4.5	16.5	6.0	5.4	1.1	2.6	8.7	7.0	1.4	0.7	-	0.5	0.8	5.5	2.1	3.6	-	9.2
1C REDFISH	2.3	2.5	0.4	-	0.4	0.4	-	0.1	-	-	0.8	0.4	0.3	0.4	0.8	-	-	-	-	-	-
TOTAL BYCATCH	6.0	9.3	0.5	4.6	16.9	6.5	5.4	1.2	2.7	8.7	7.0	2.2	1.1	0.3	0.9	22.6	5.5	2.1	3.6	-	9.5
SHRIMP CATCH	647	646	539	783	1417	861	1095	1039	763	527	537	385	395	72	367	1162	993	895	911	534	880
BYCATCH IN % OF TOTAL SHRIMP CATCH	0.9	1.4	0.1	0.6	1.2	0.8	0.5	0.1	0.4	1.7	1.3	0.6	0.3	0.4	0.2	1.9	0.6	0.2	0.4	-	1.1

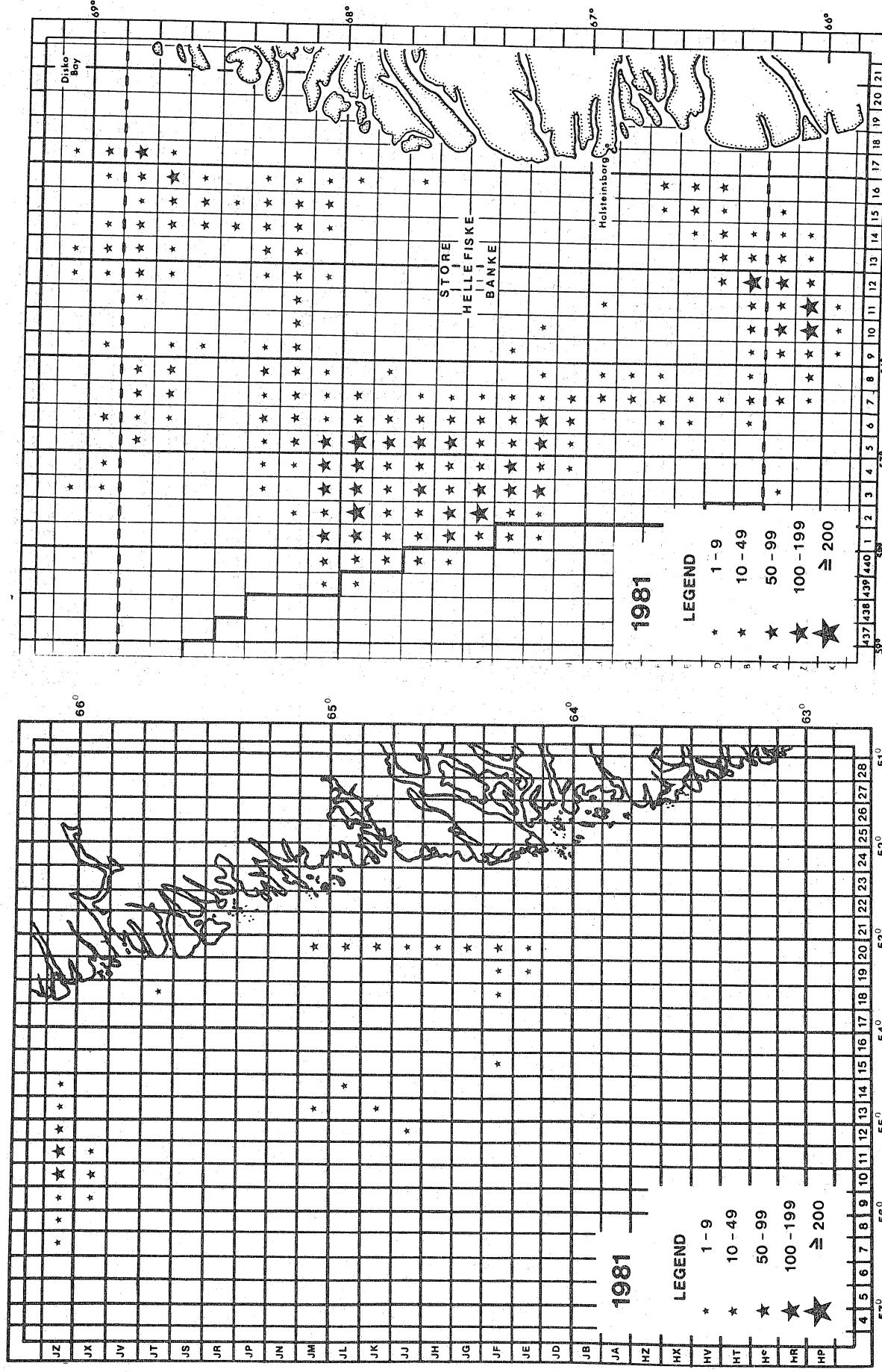
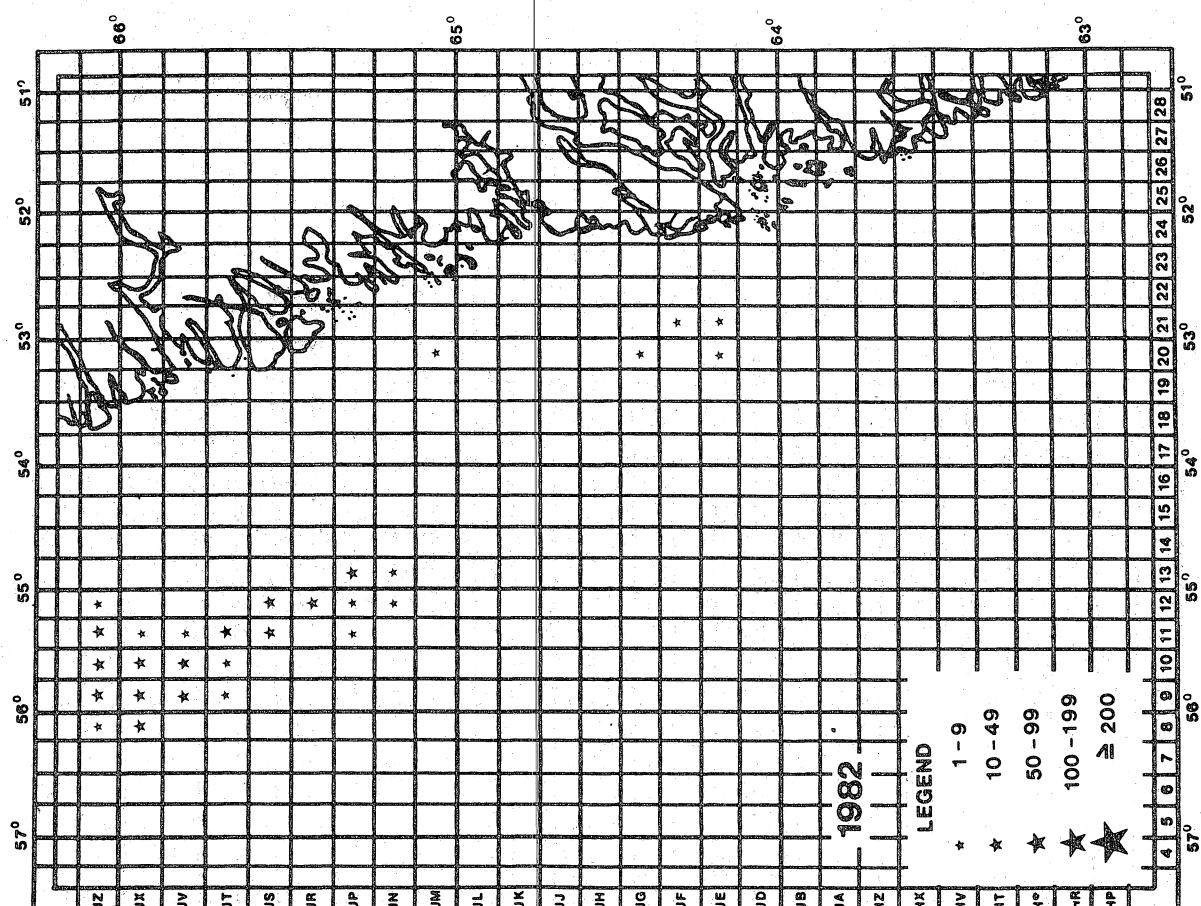
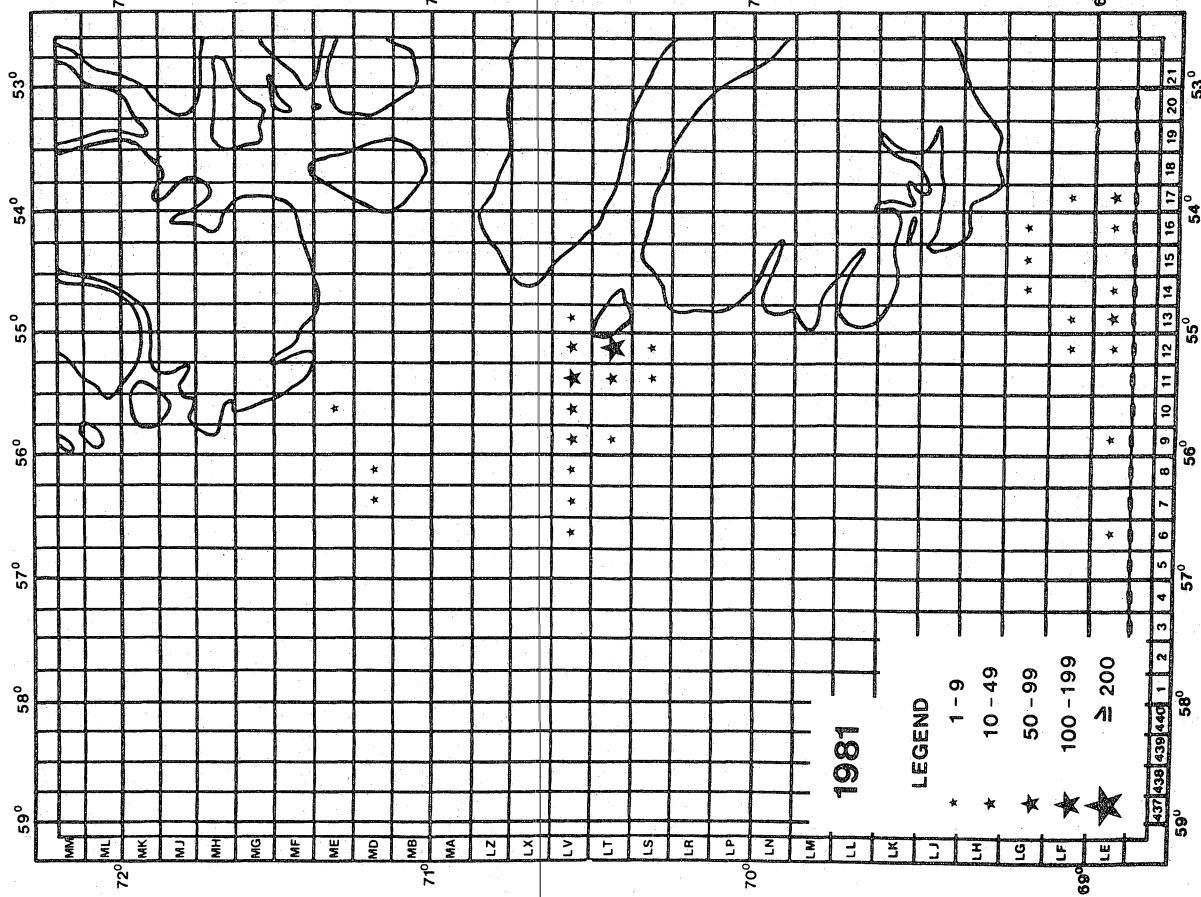


Fig. 1a. Distribution of hauls in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in NAFO Subarea 1 between 69°50'N and 66°10'N in 1981.

Fig. 1b. Distribution of hauls in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in NAFO Subarea 1 between 65°50'N and 66°10'N in 1981.



Distribution of hauls in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in NAFO Subarea 1 between 68°50'N and 72°10'N in 1981.

Fig. 1d. Distribution of hauls in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in NAFO Subarea 1 between 62°50'N and 66°10'N in 1982.

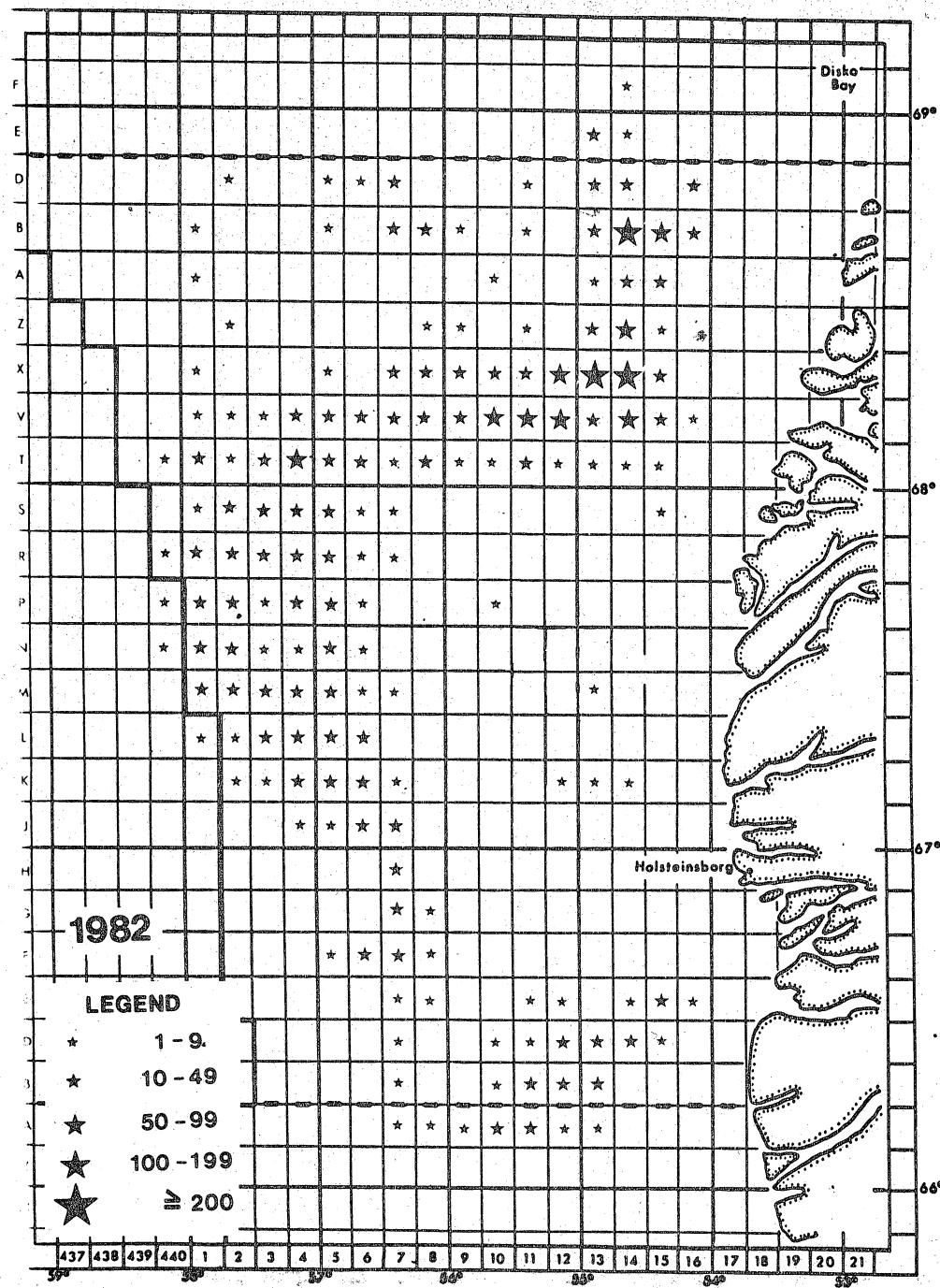


Fig. 1e. Distribution of hauls in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department in NAFO Subarea 1 between 65°50'N and 69°10'N in 1982 (only 5 hauls north of map).

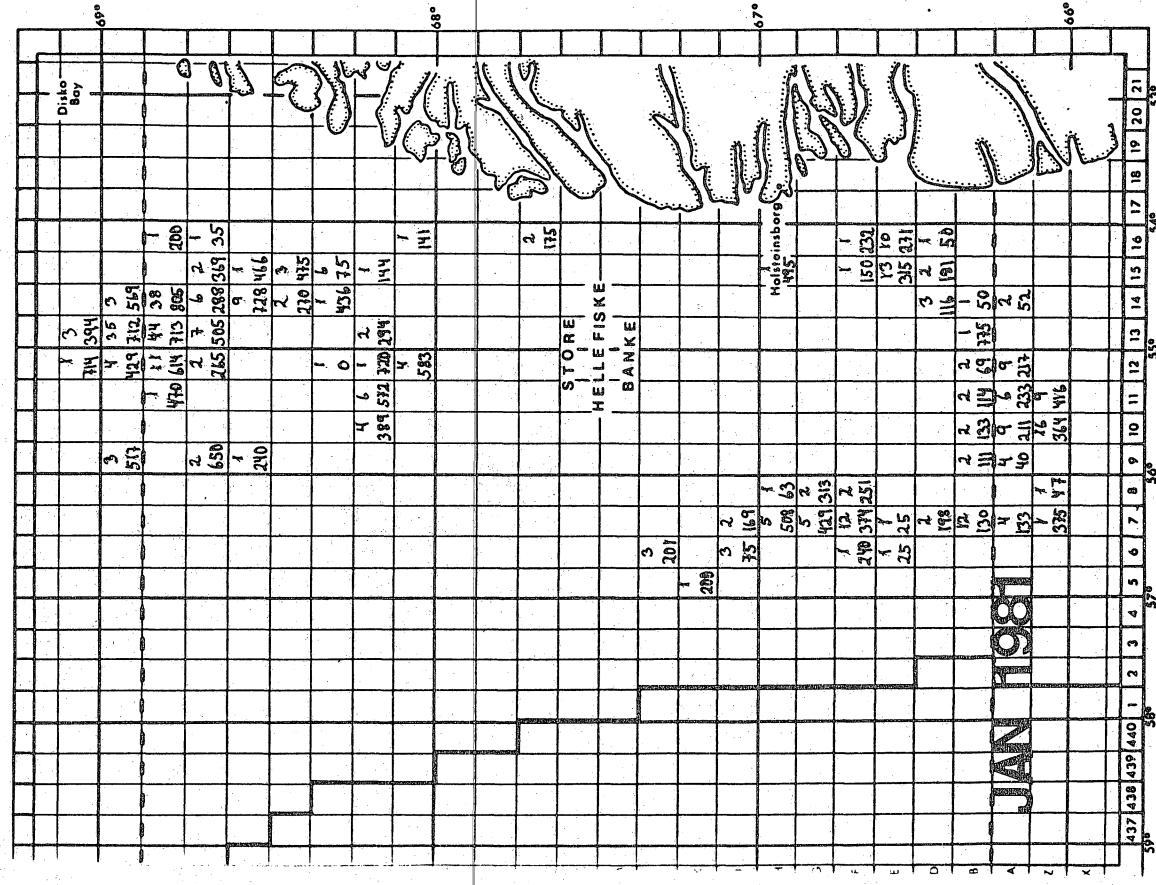
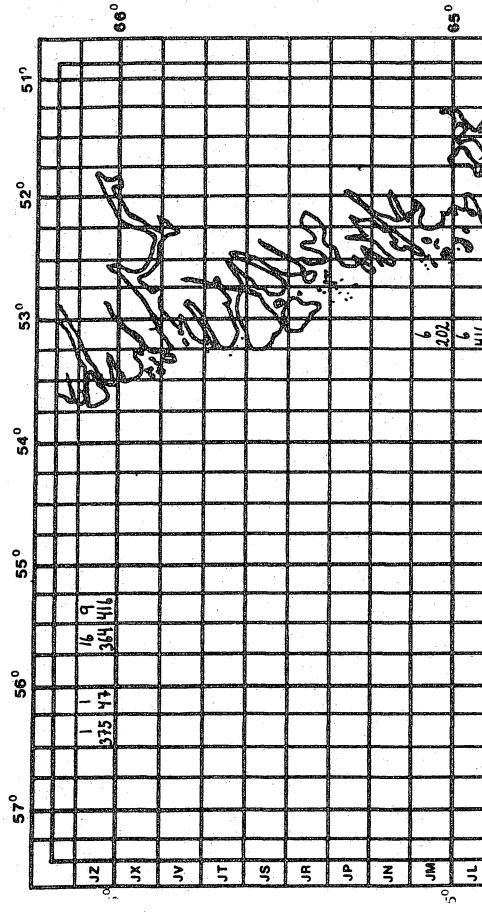


Fig. 2. Distribution of effort and mean catch of shrimp per hour in January 1981 in NAFO Subarea 1 in the shrimp fishery of seven trawlers (473-722 GRT) of the Royal Greenland Trade Department. Upper figure in each statistical square unit is no. of hauls, lower figure is the mean catch per hour (kg/hour).

Fig. 2. Continued. January 1981 (5 hauls north of map).

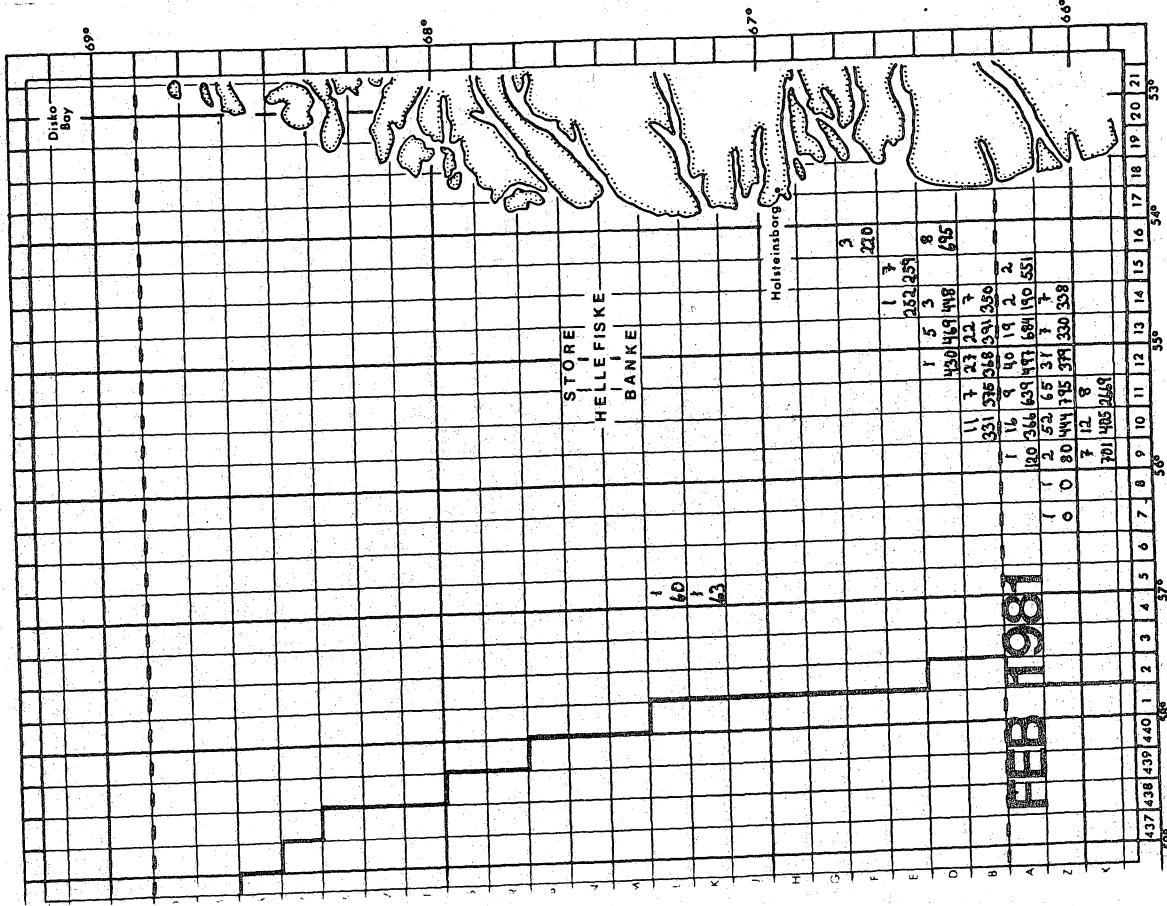
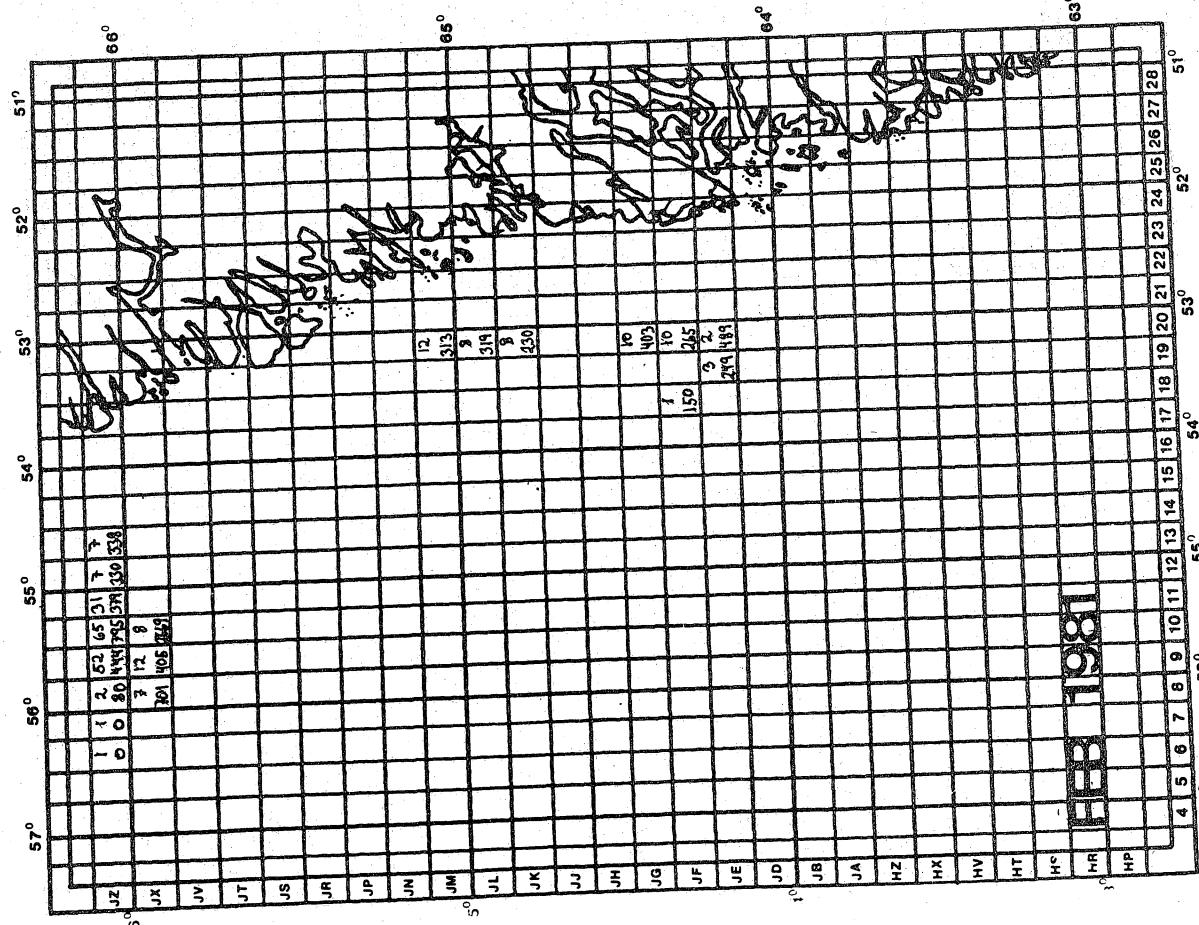


Fig. 2. Continued. February 1981.

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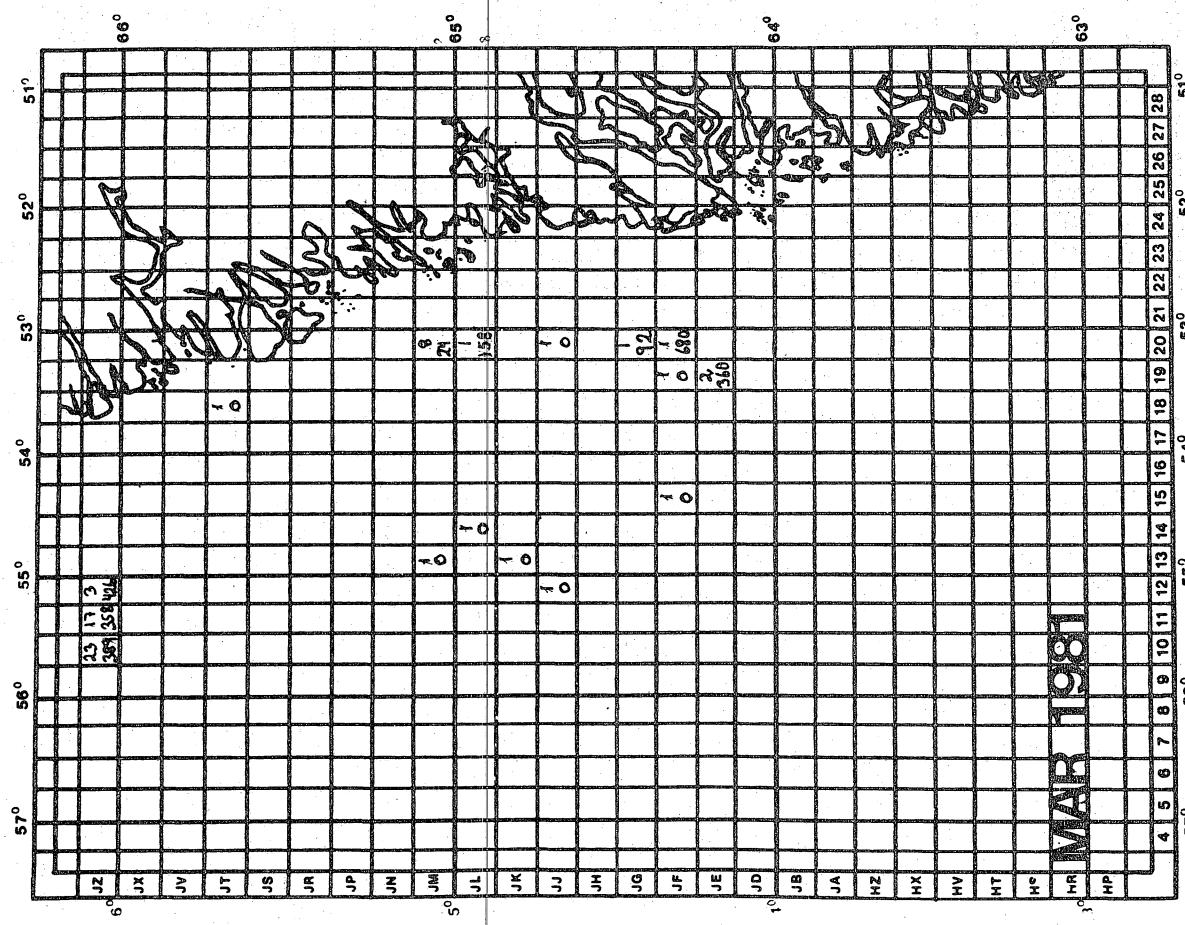


Fig. 2. Continued. March 1981.

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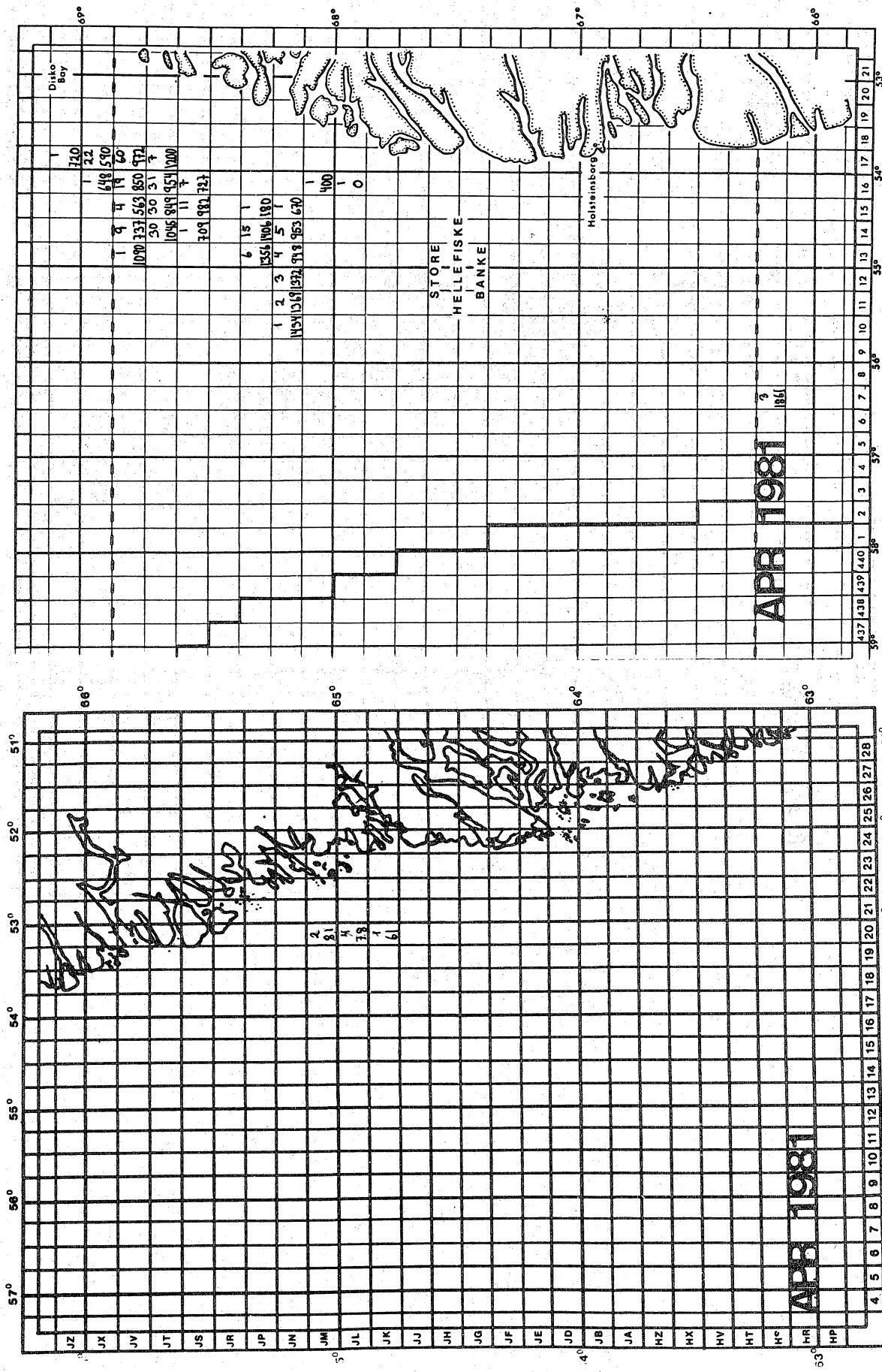


Fig. 2. Continued. April 1981.

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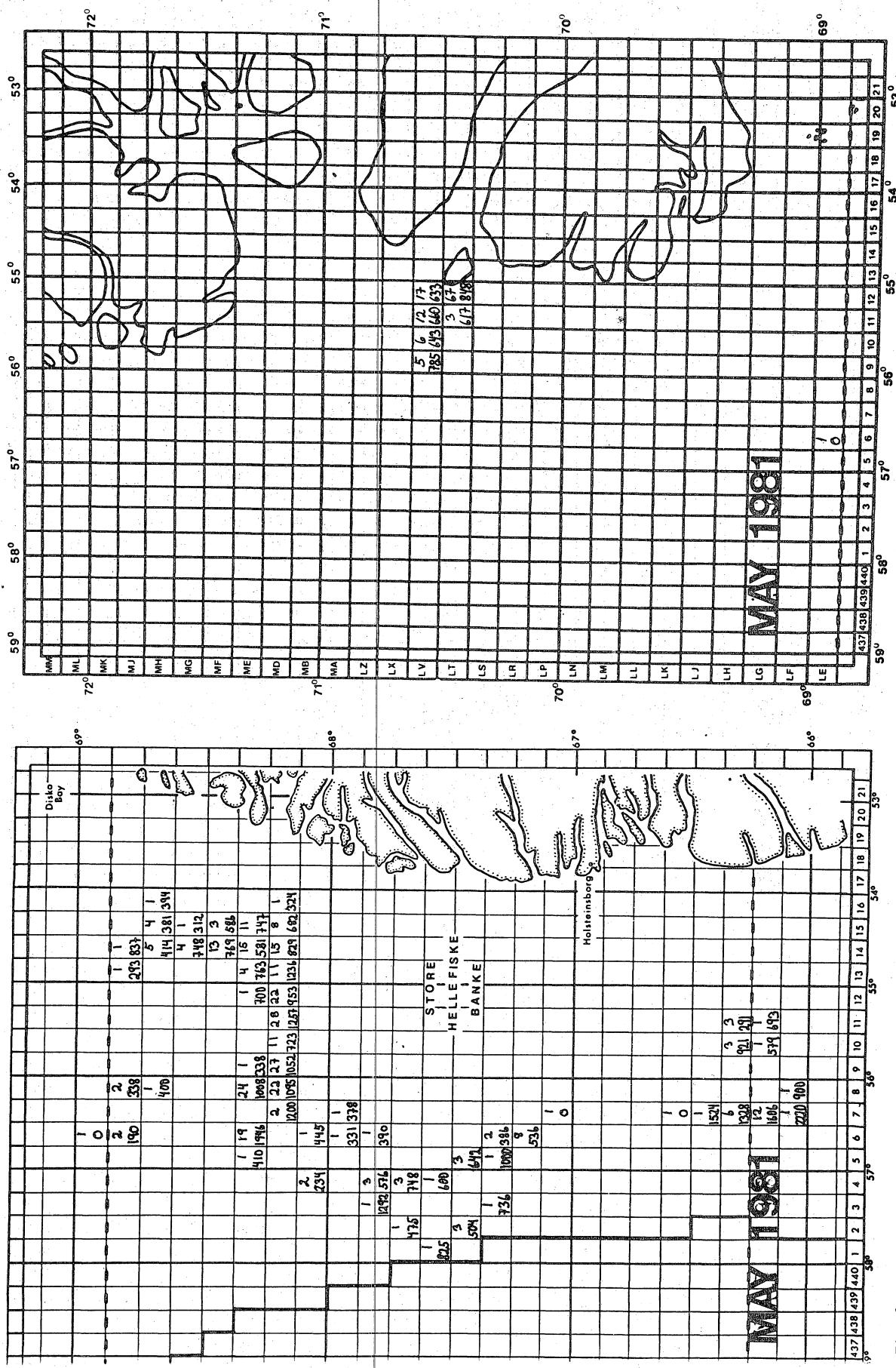


Fig. 2. Continued. May 1981.

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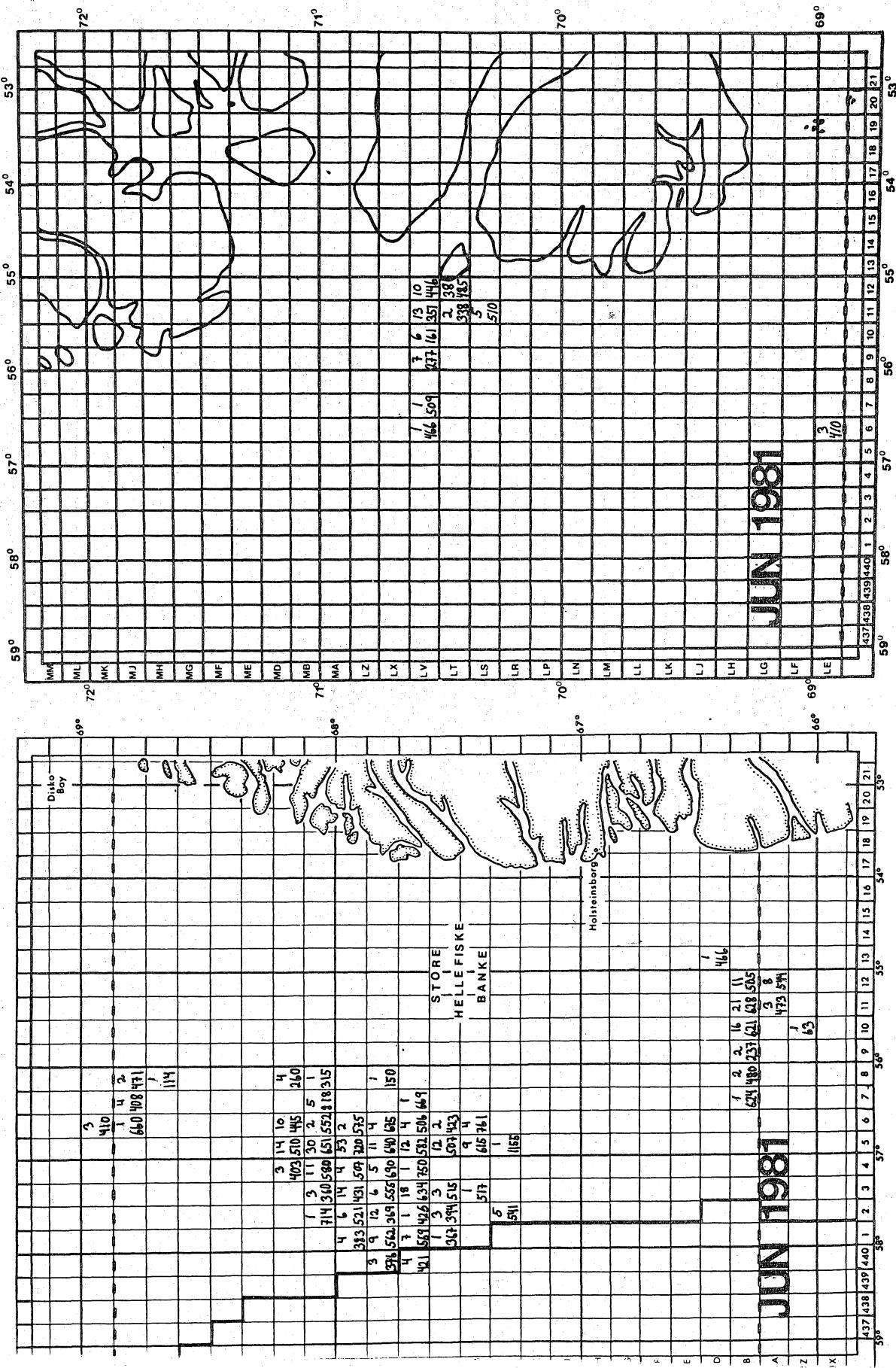


Fig. 2. Continued. June 1981 (1 haul south of map).

Fig. 2. Continued. June 1981.

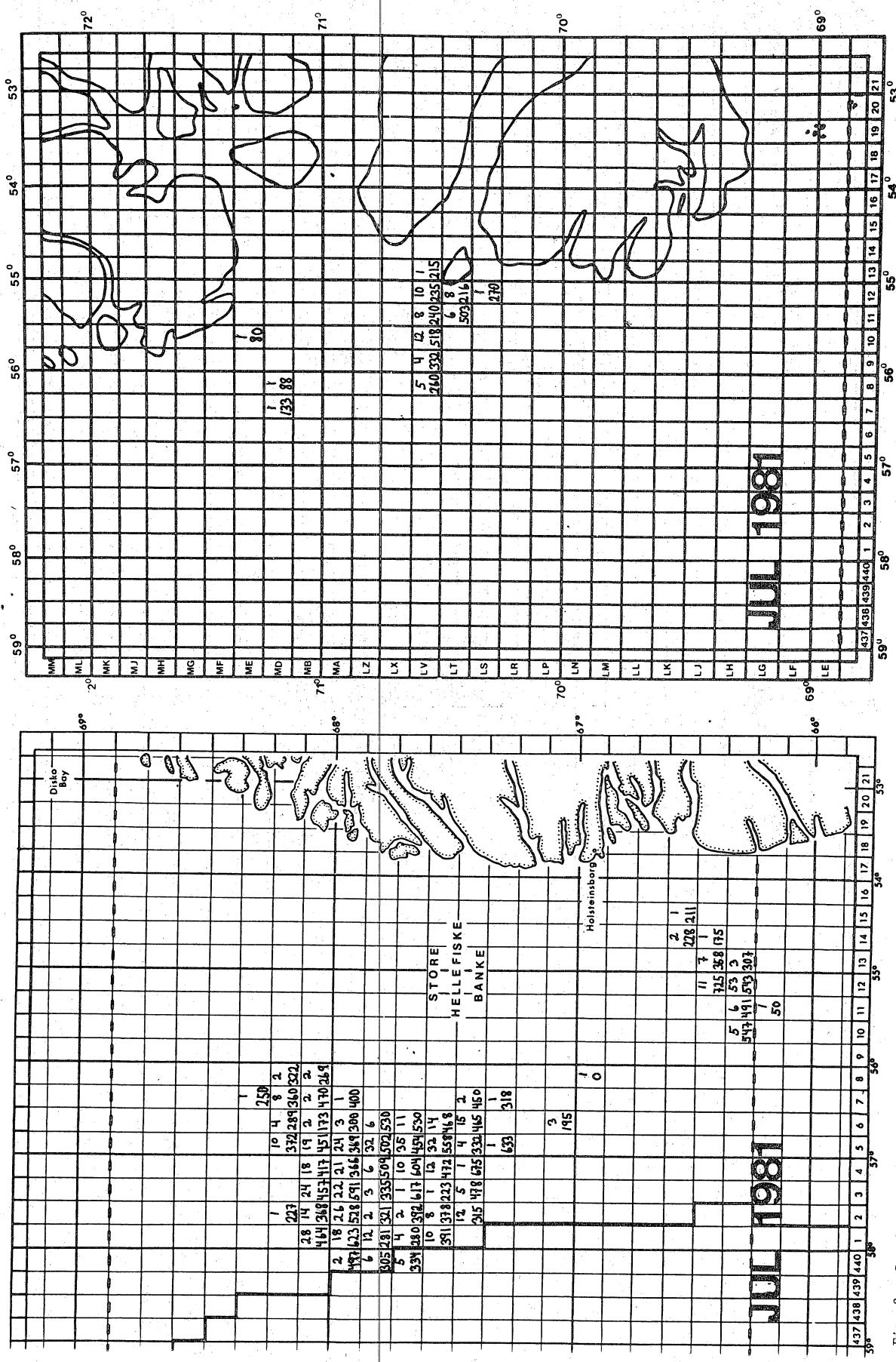


Fig. 2. Continued. July 1981.

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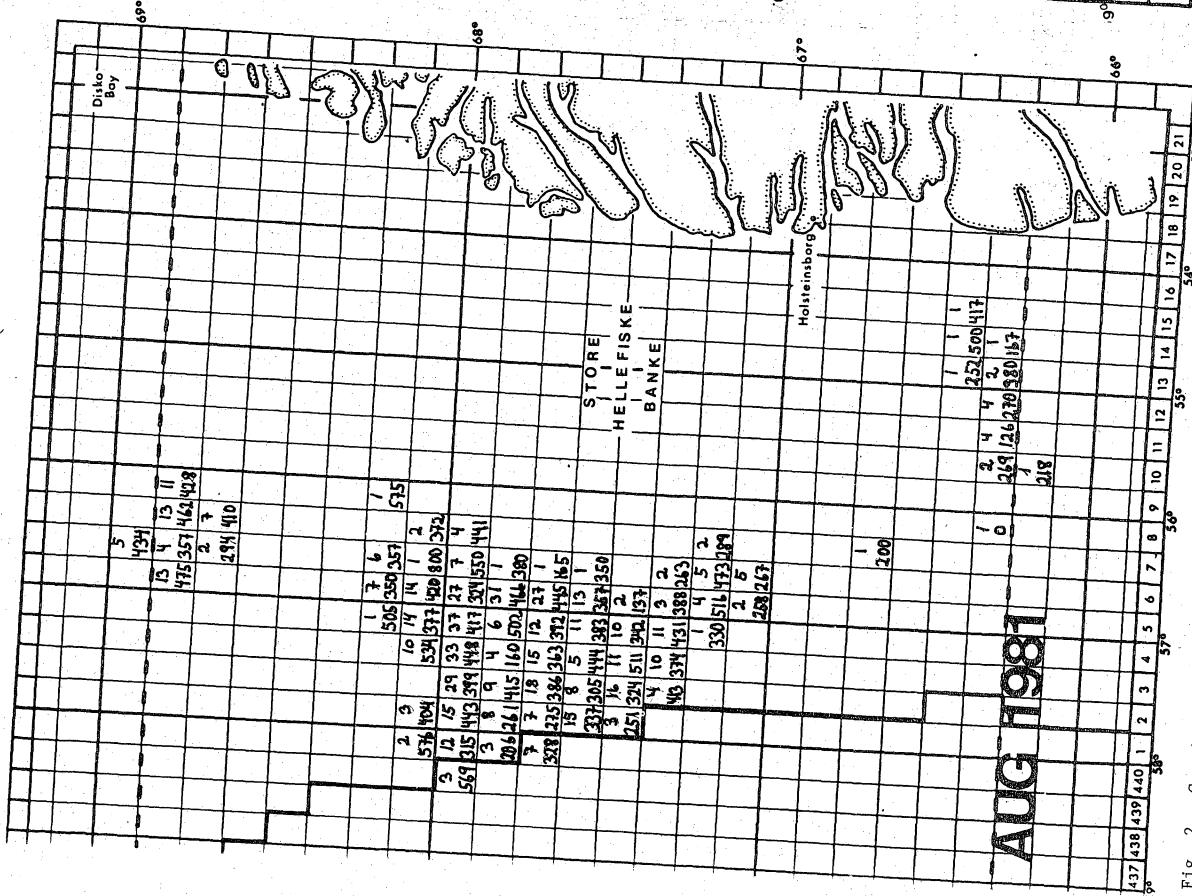


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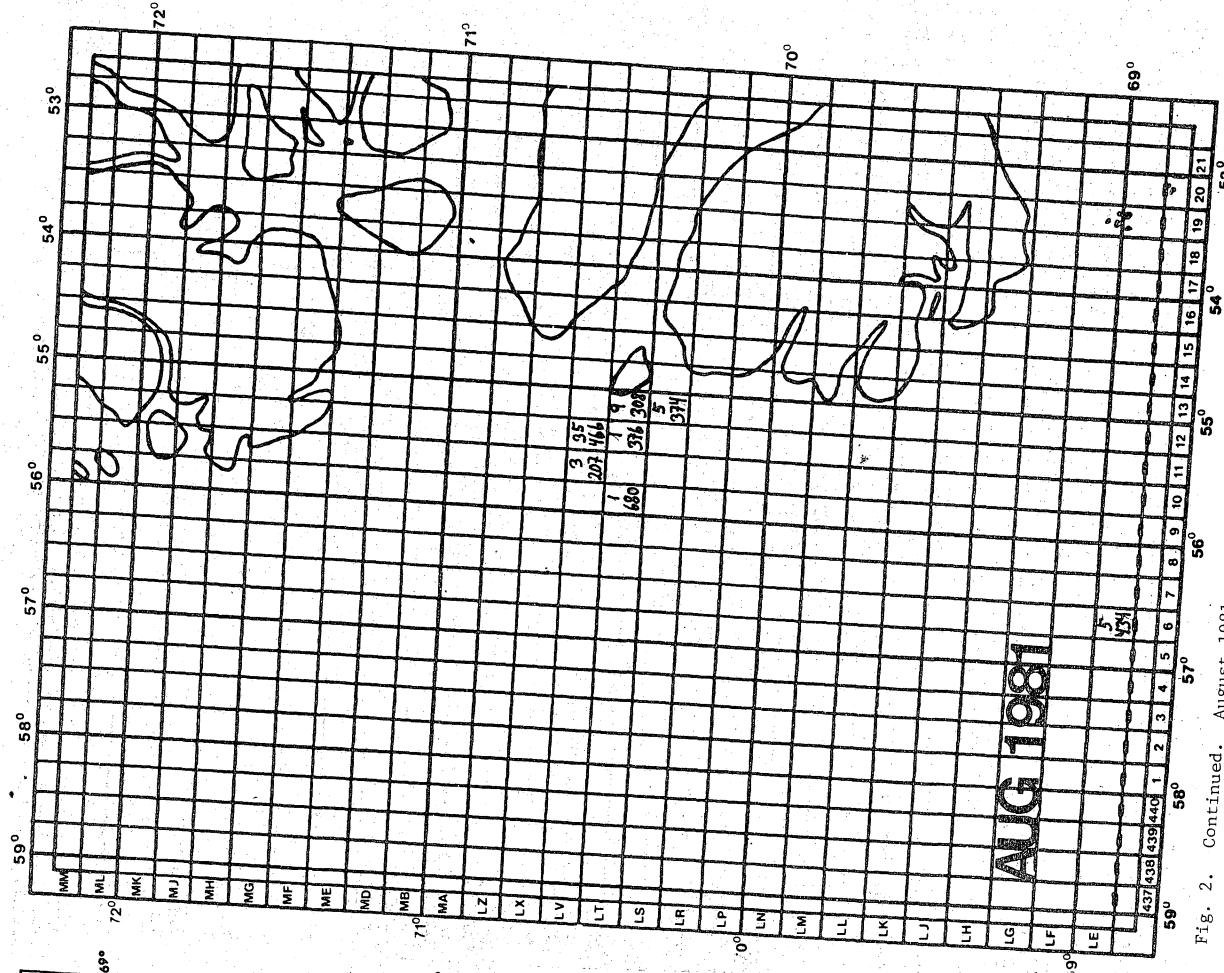


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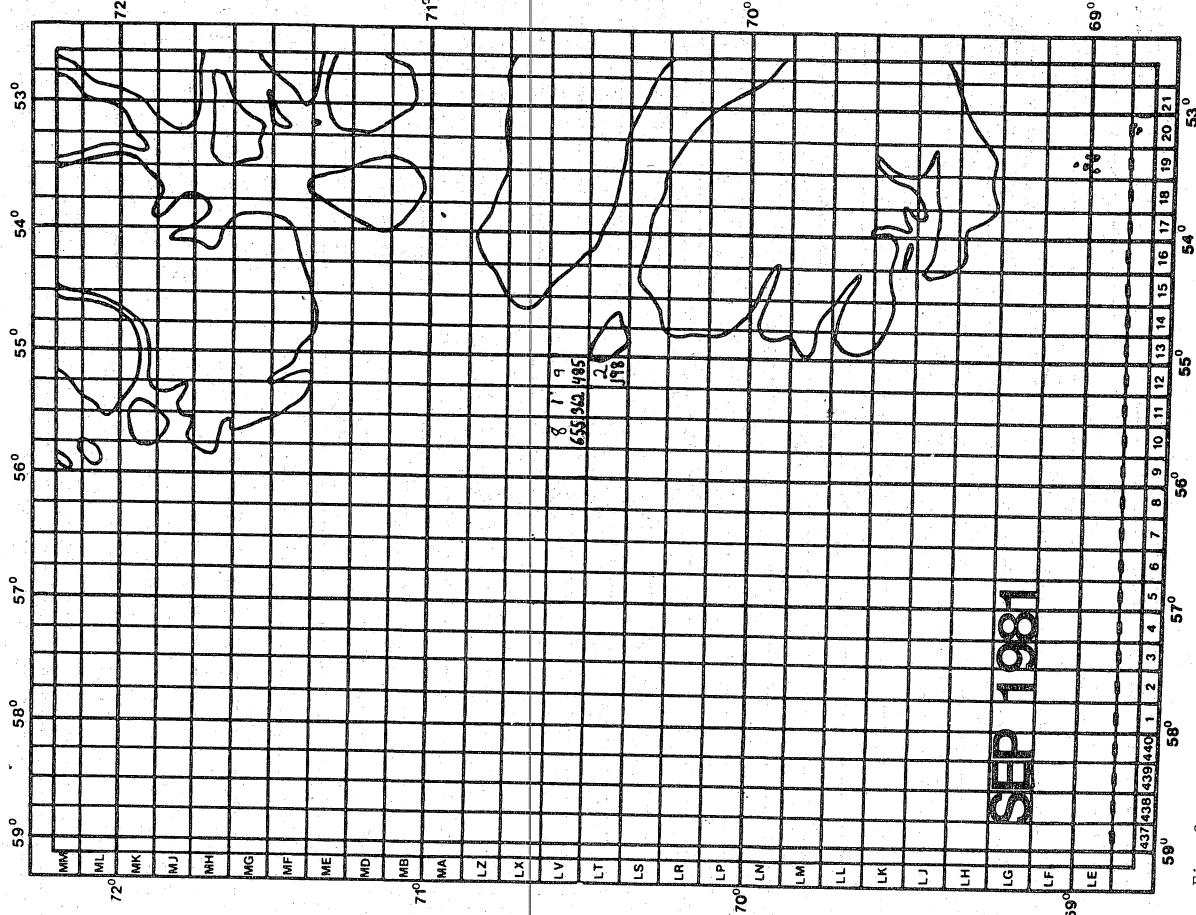
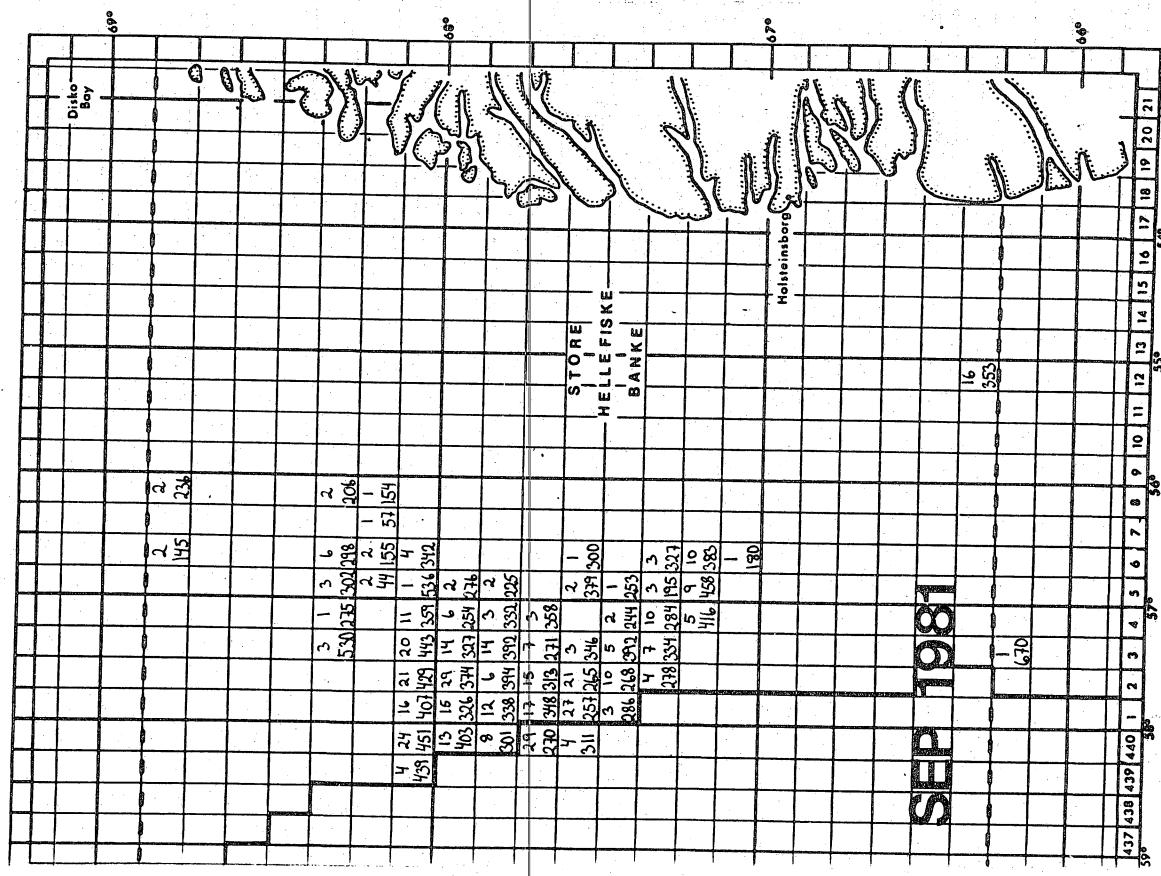


Fig. 2. Continued. September 1981.

Fig. 2. Continued

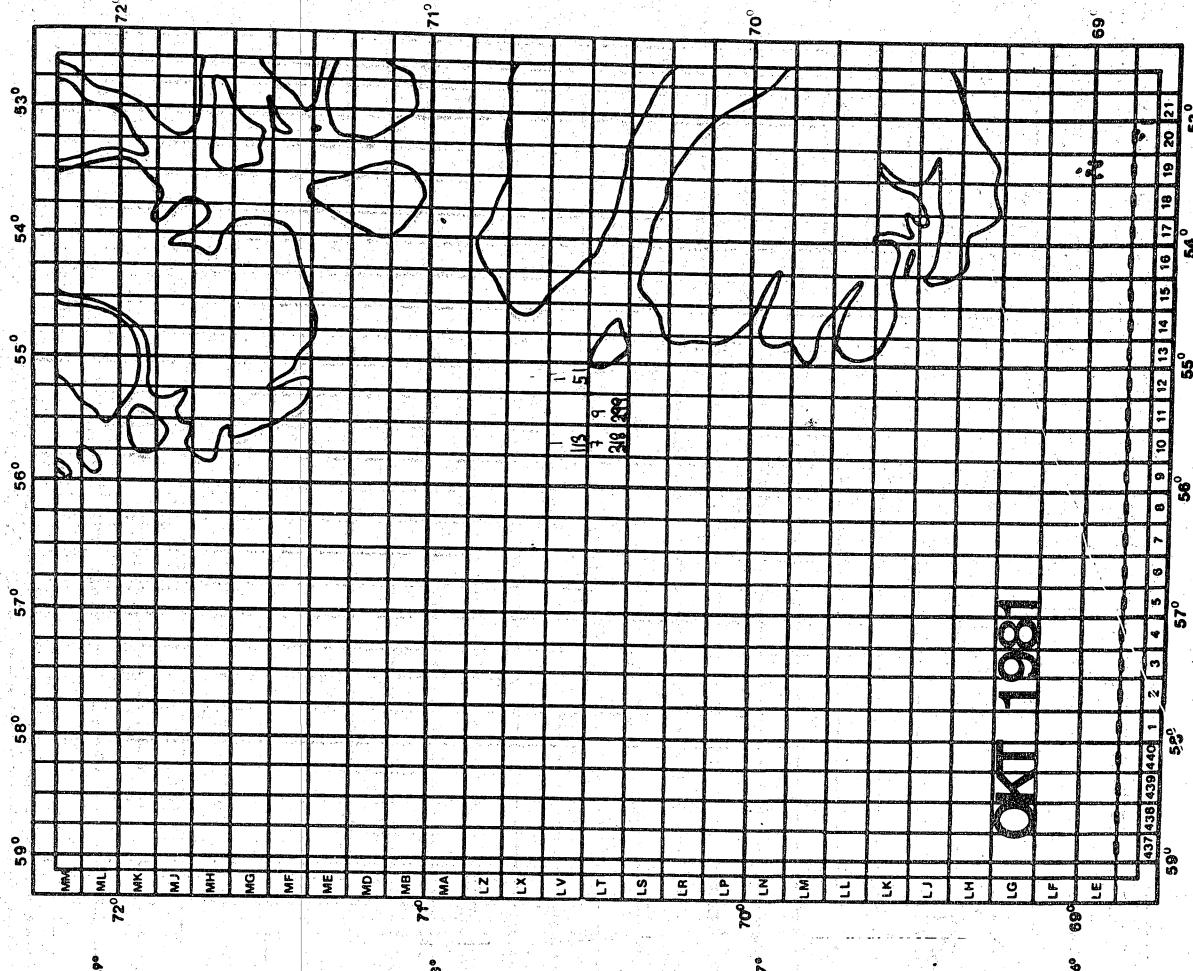
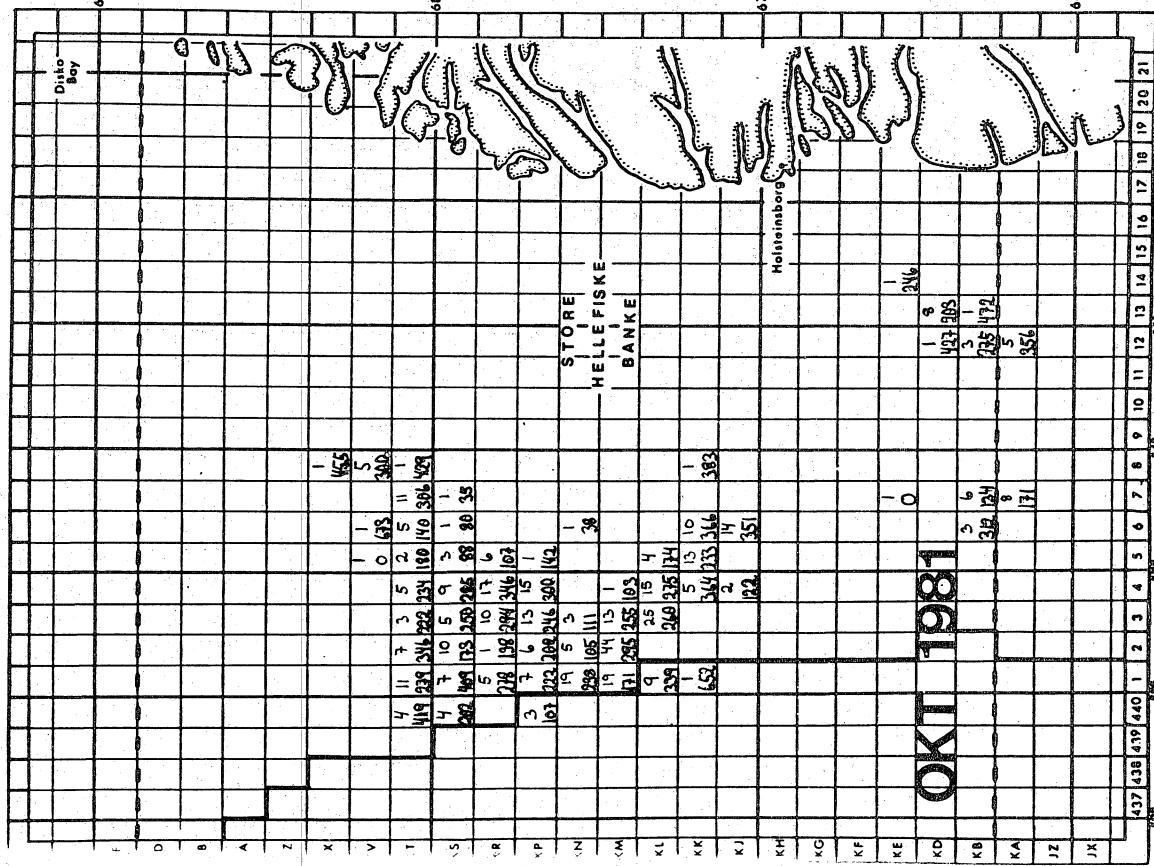


Fig. 2. Continued. October 1981 (1 haul south of map).

Fig. 2. 59° 55° 57°

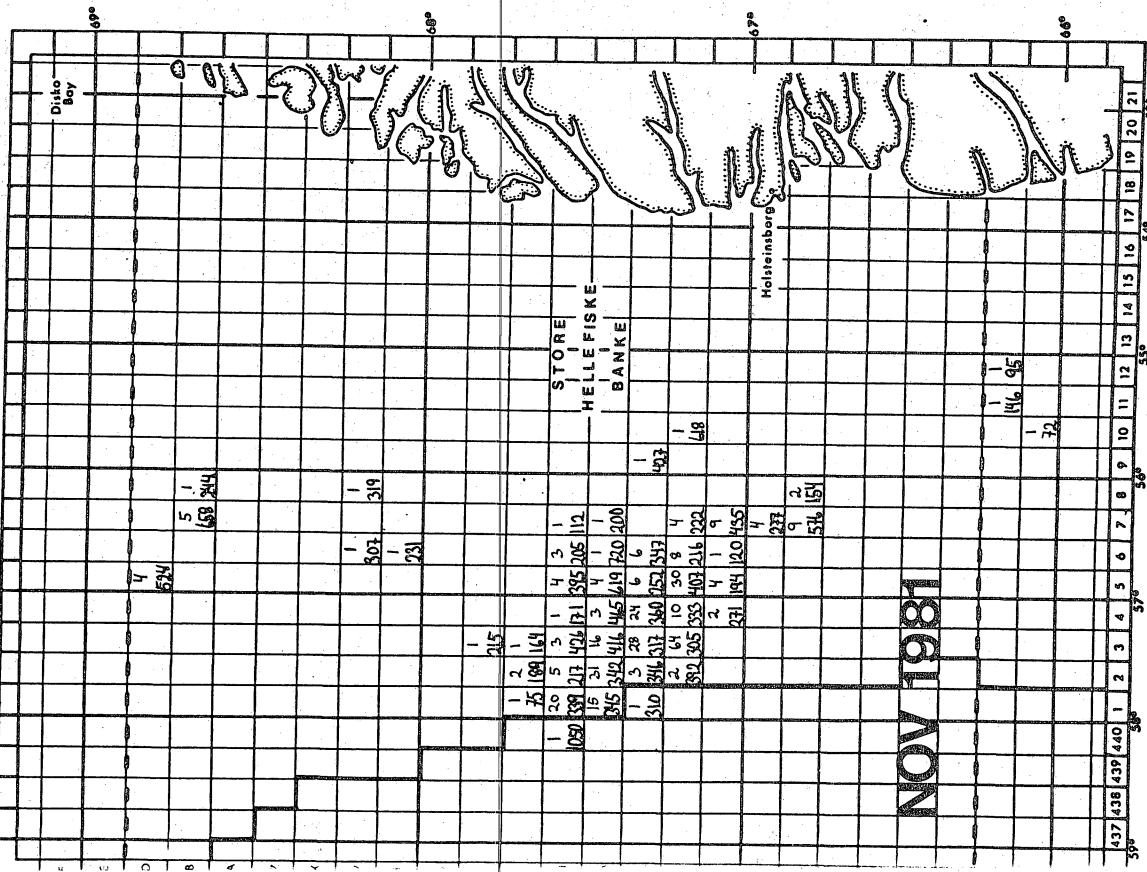


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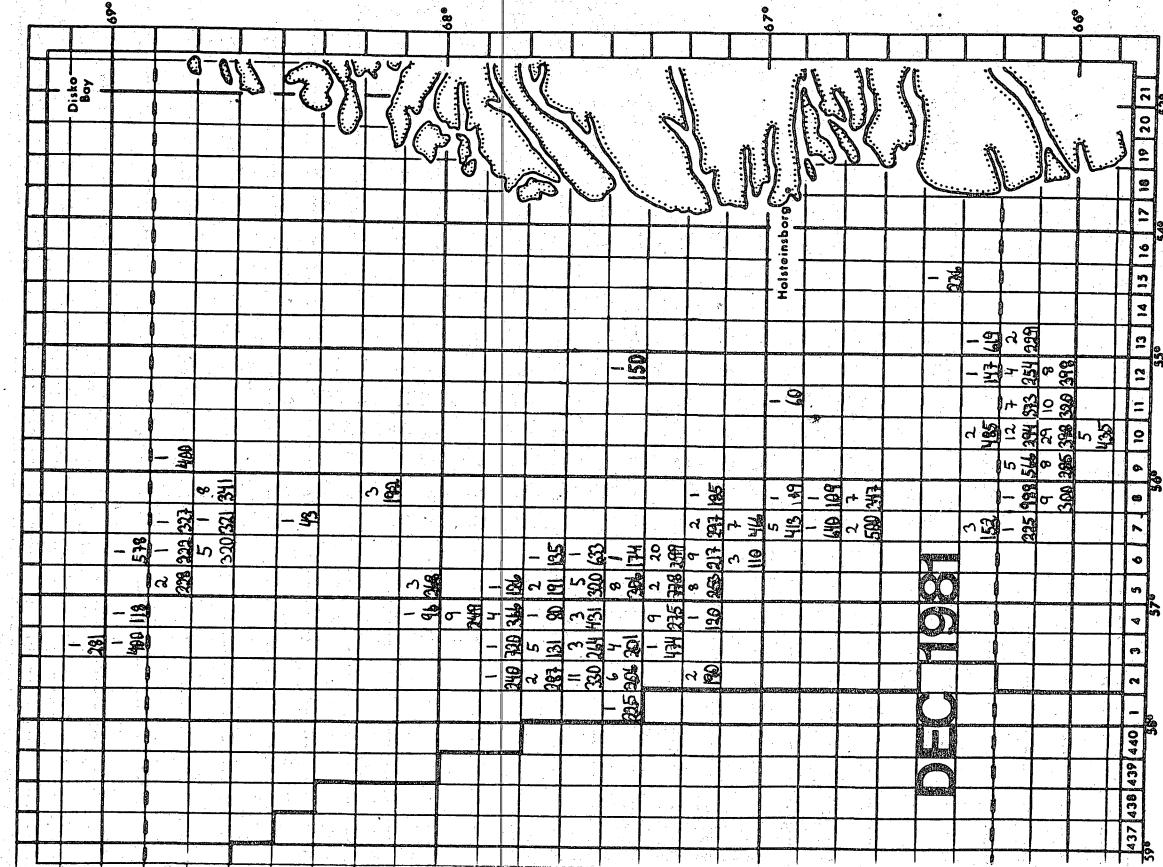


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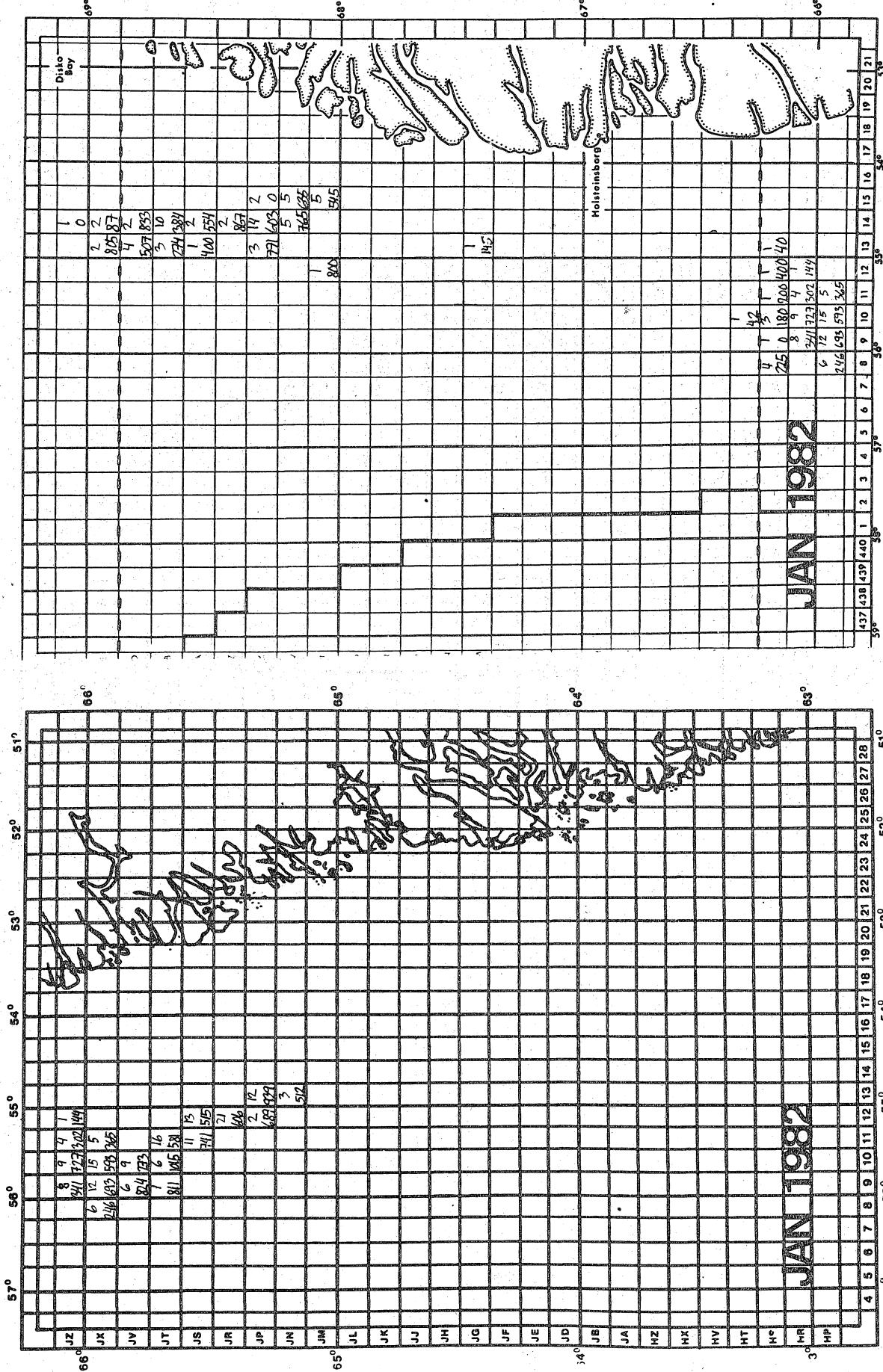


Fig. 2. Continued. January 1982.

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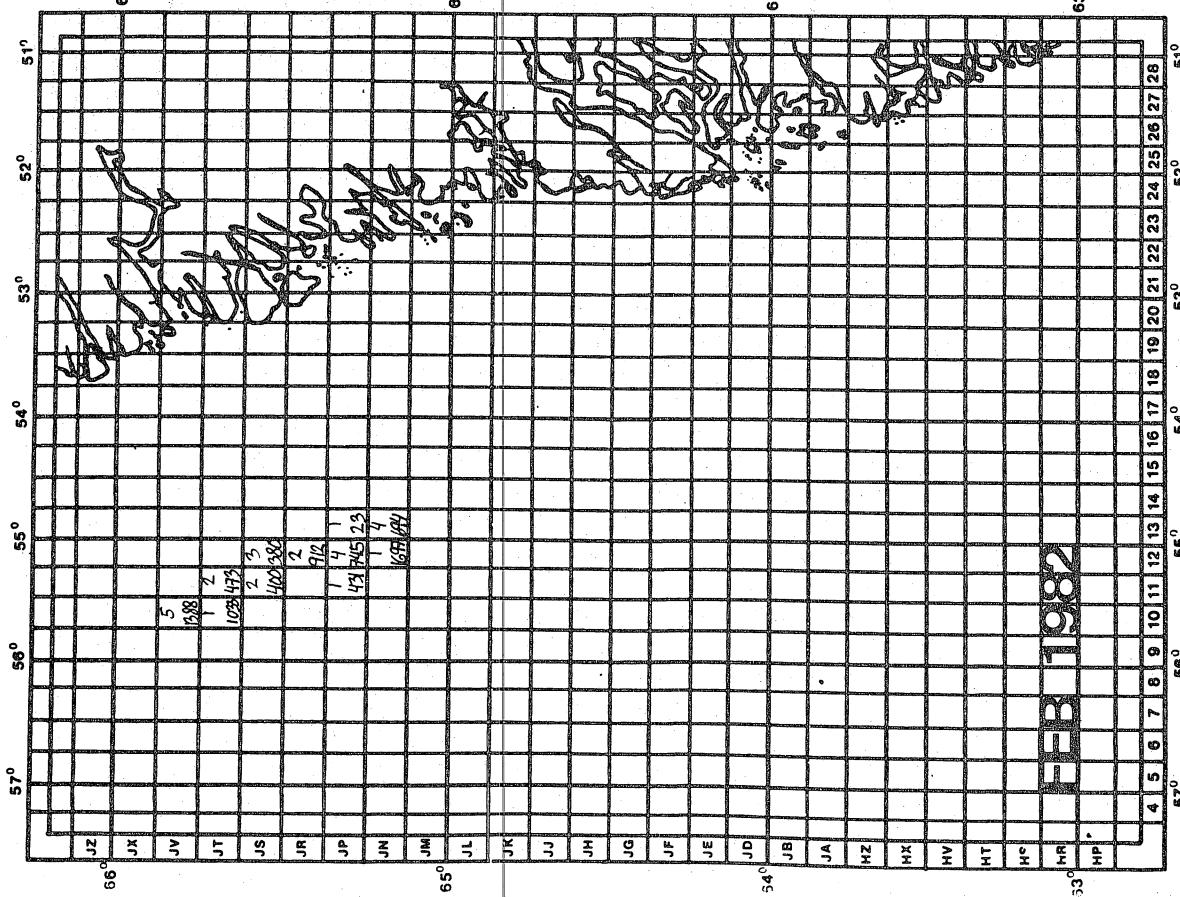


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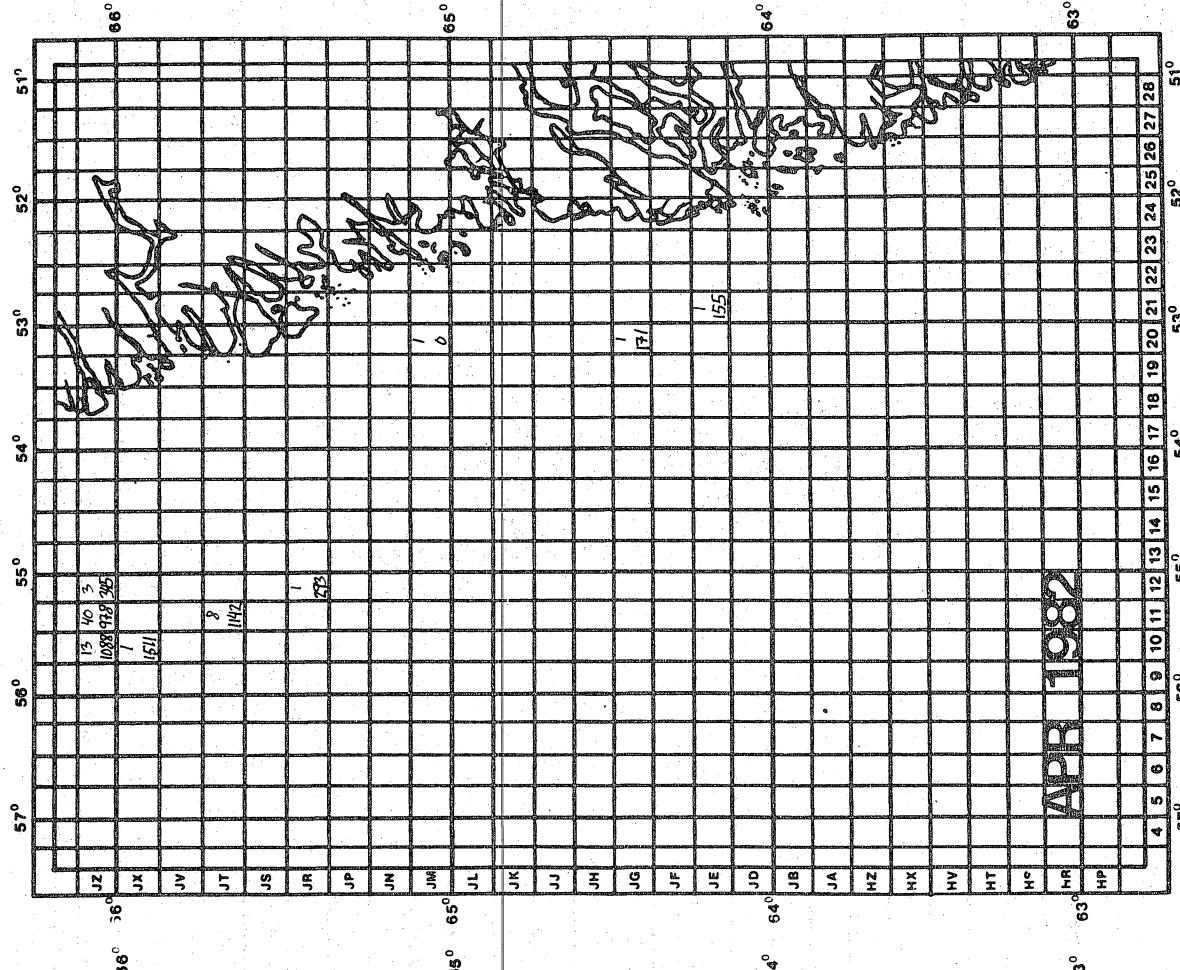


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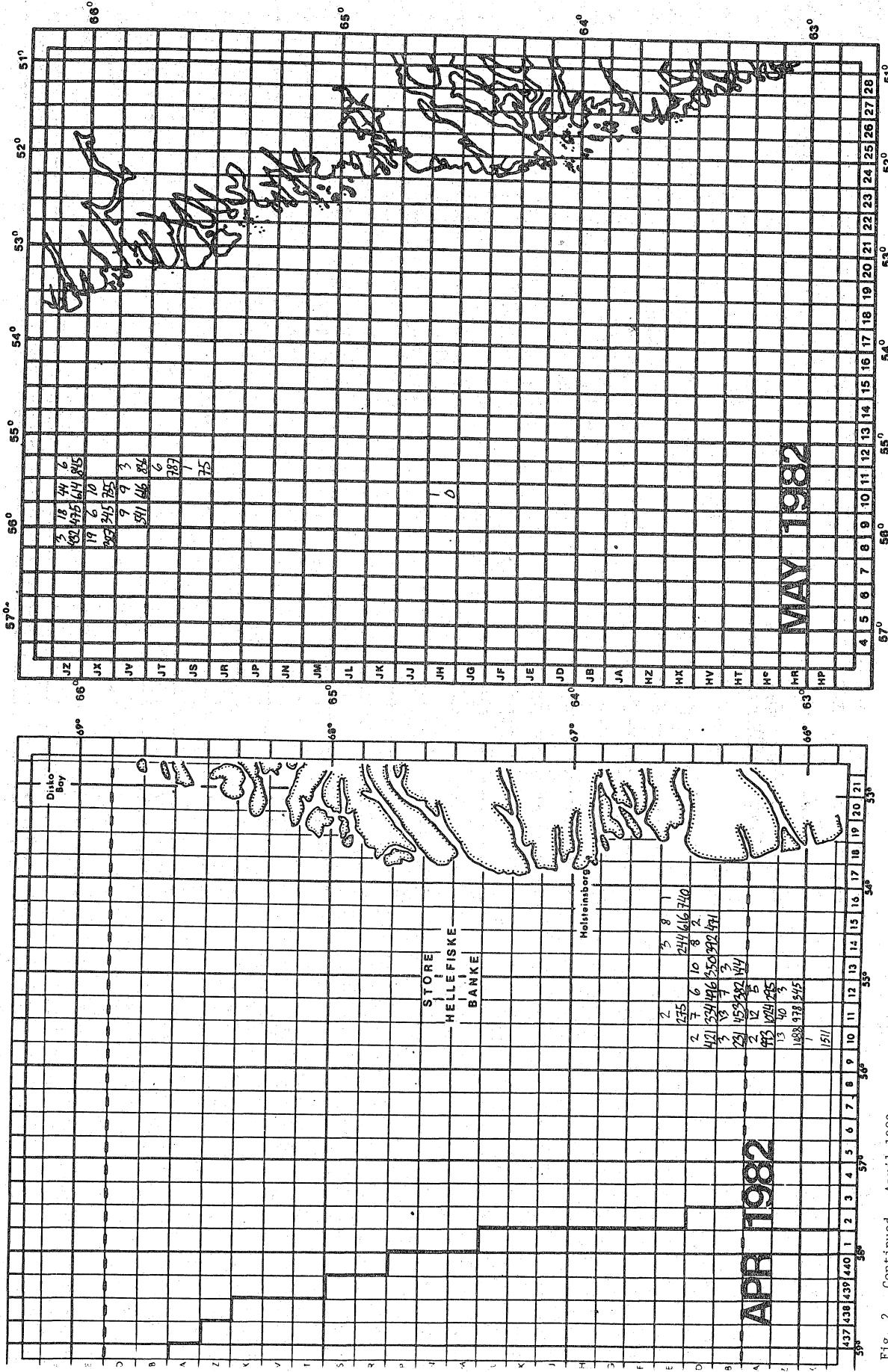


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Fig. 2. Continued. May 1982.

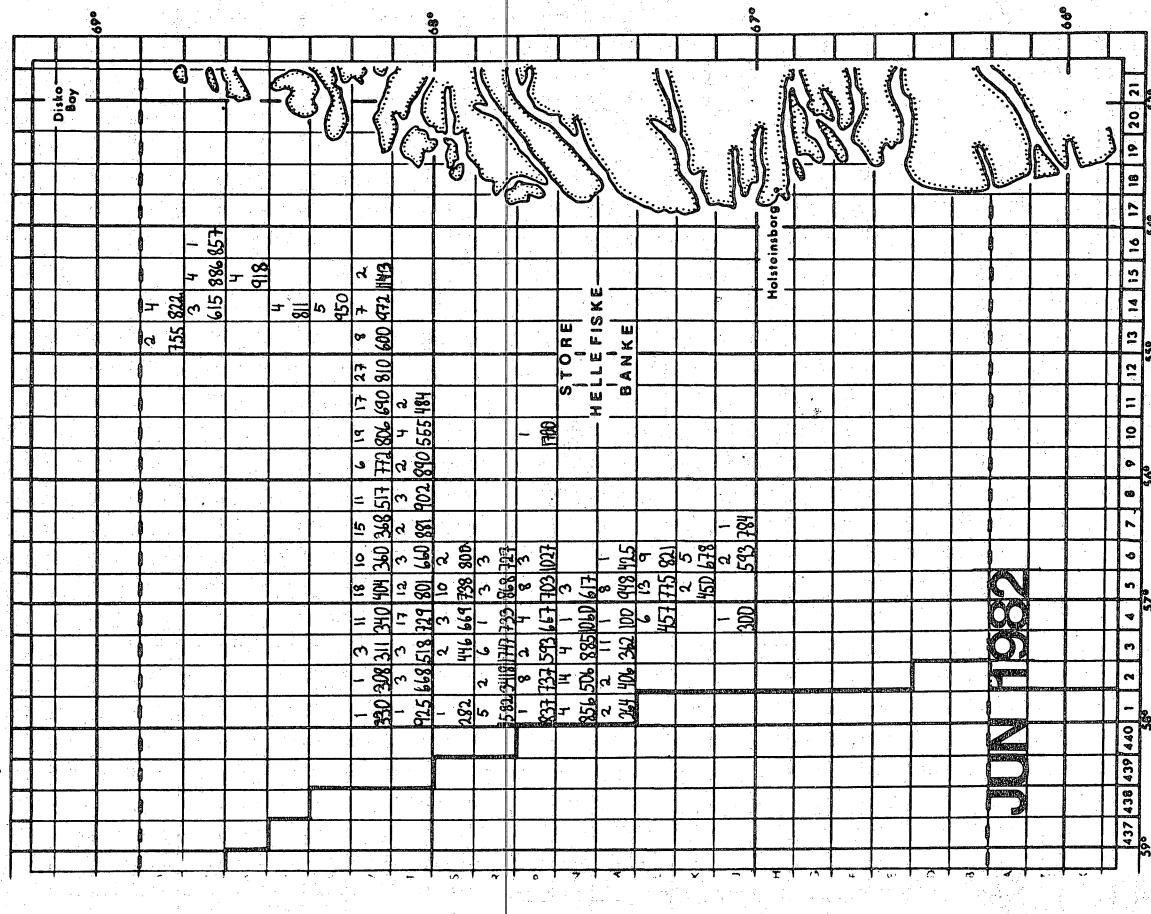
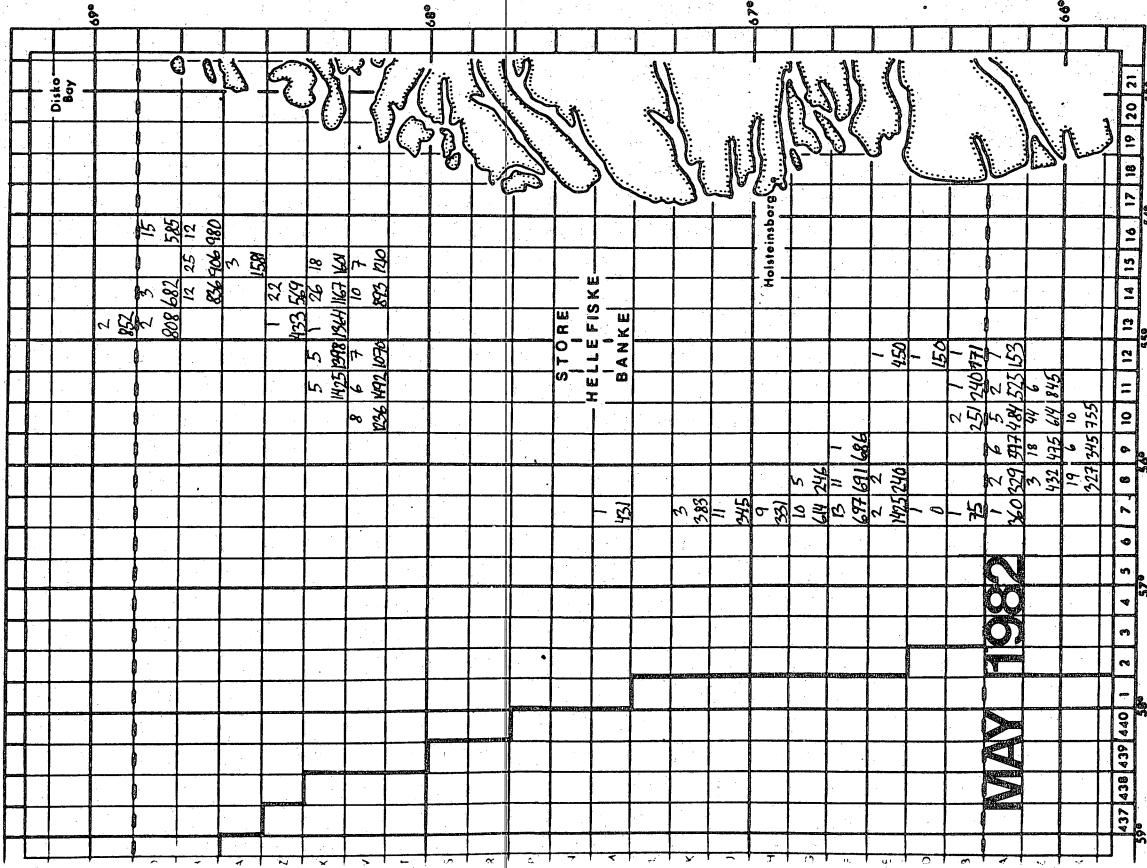


Fig. 2. Continued. May 1982 (1 haul north of map).

Fig. 2. Continued.

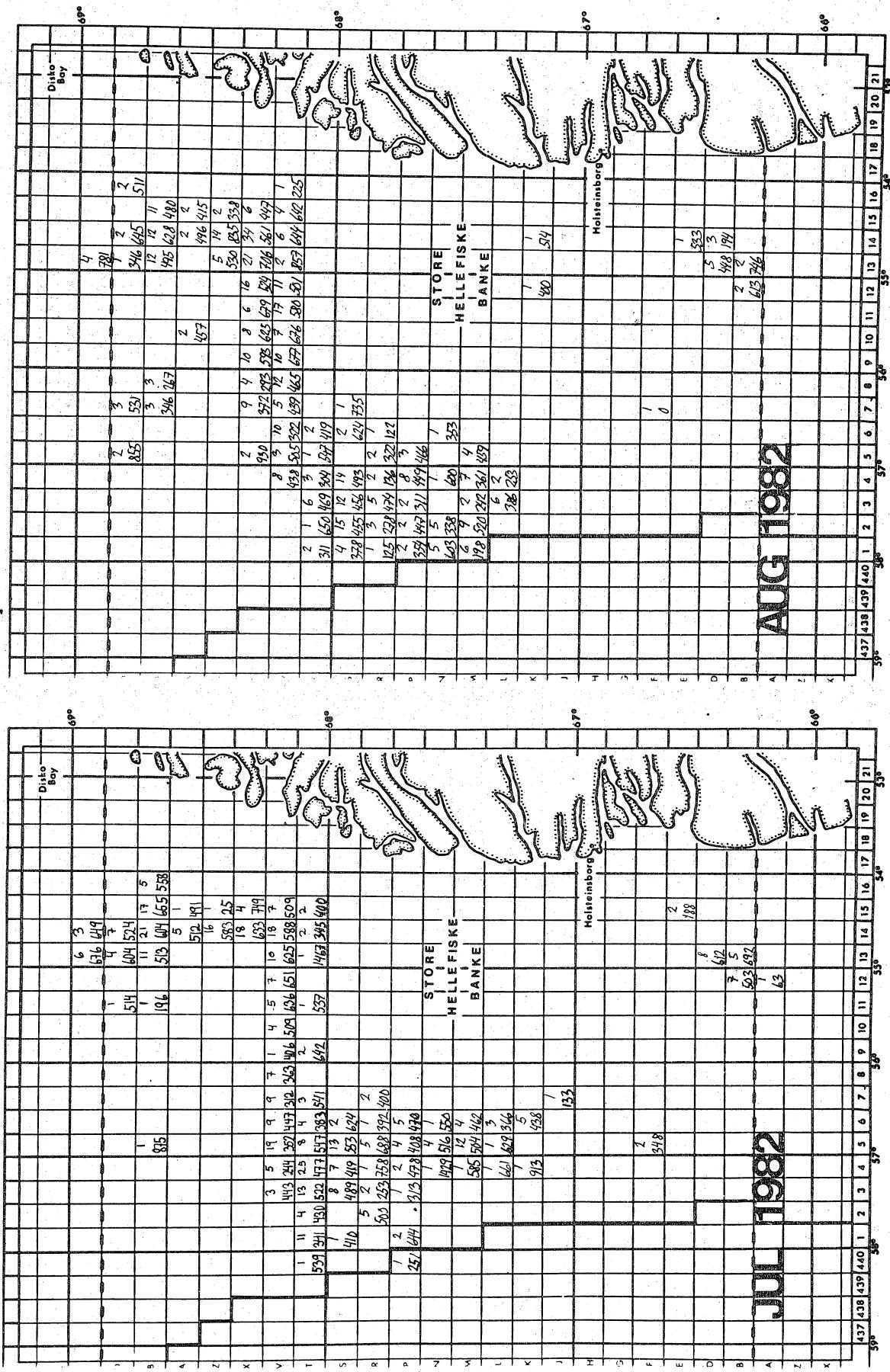


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Fig. 2. Continued. August 1982.

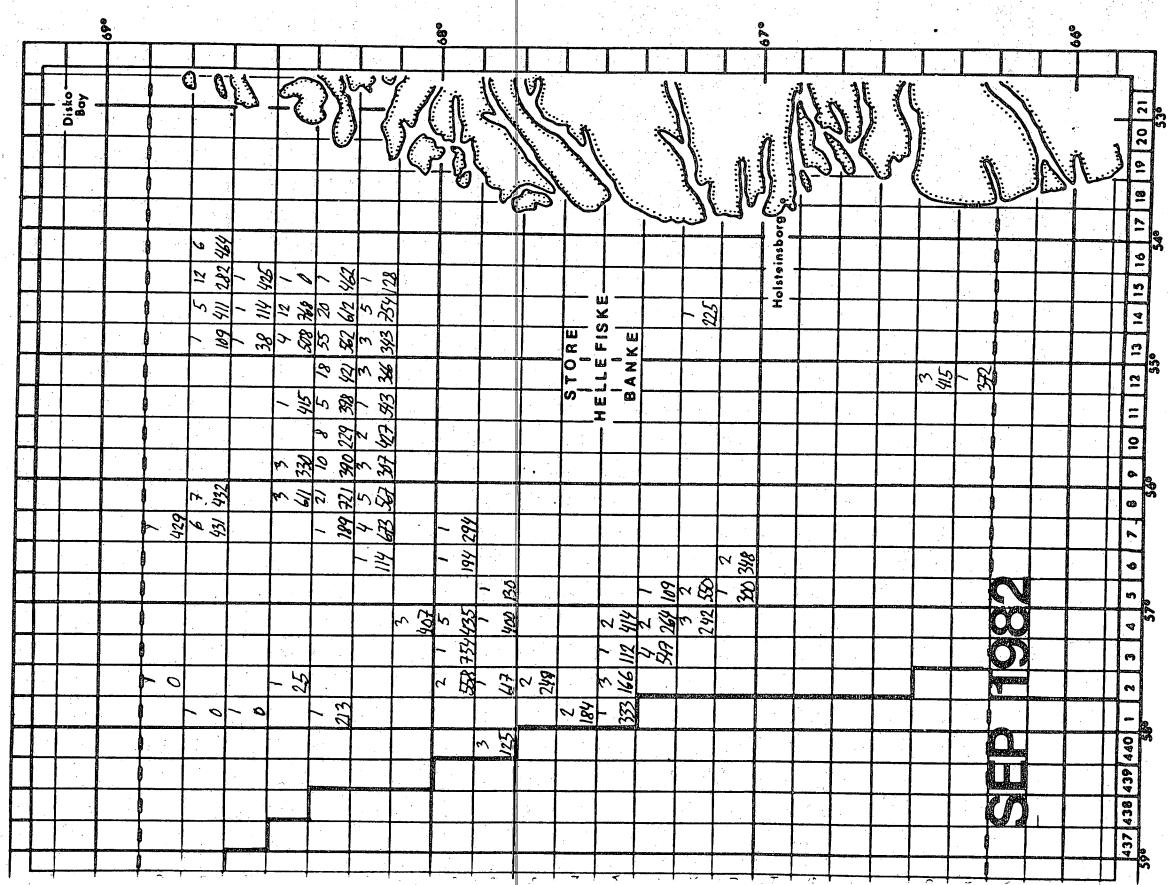
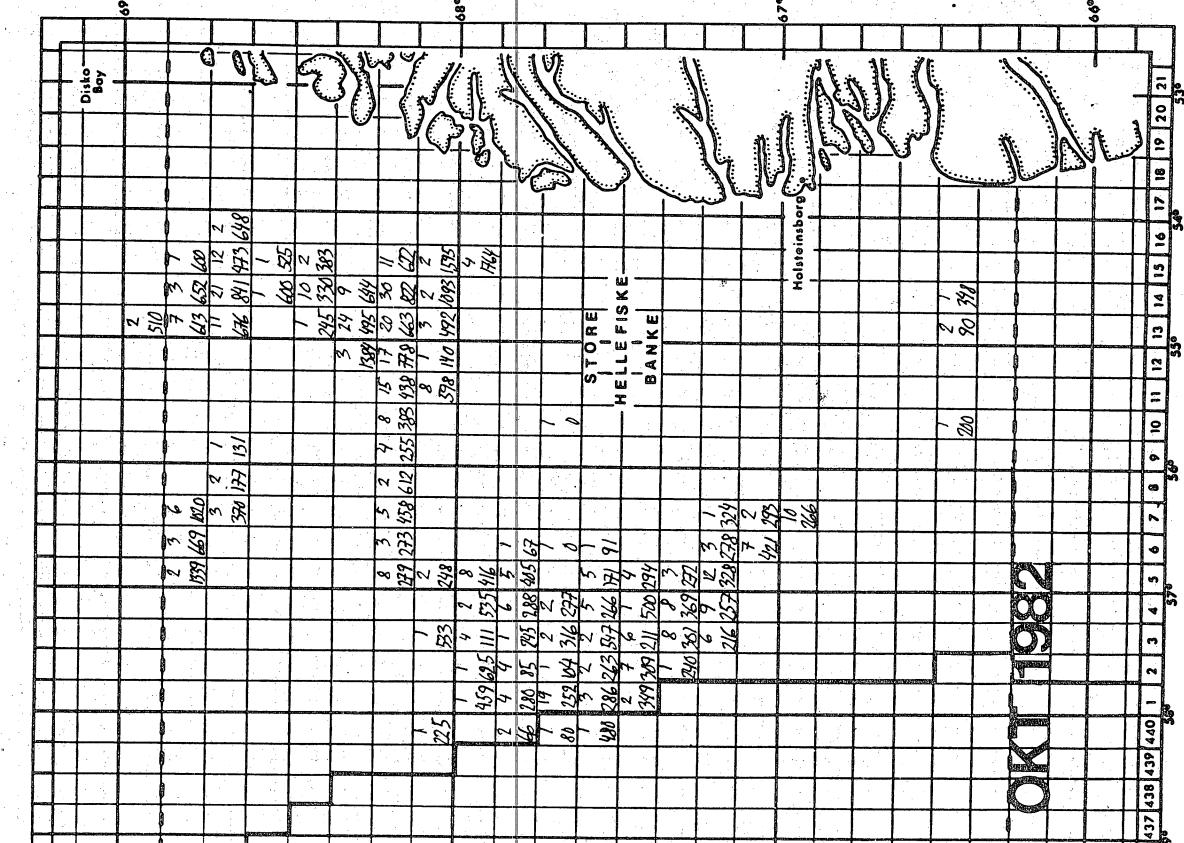


Fig. 2. Continued. September 1982.



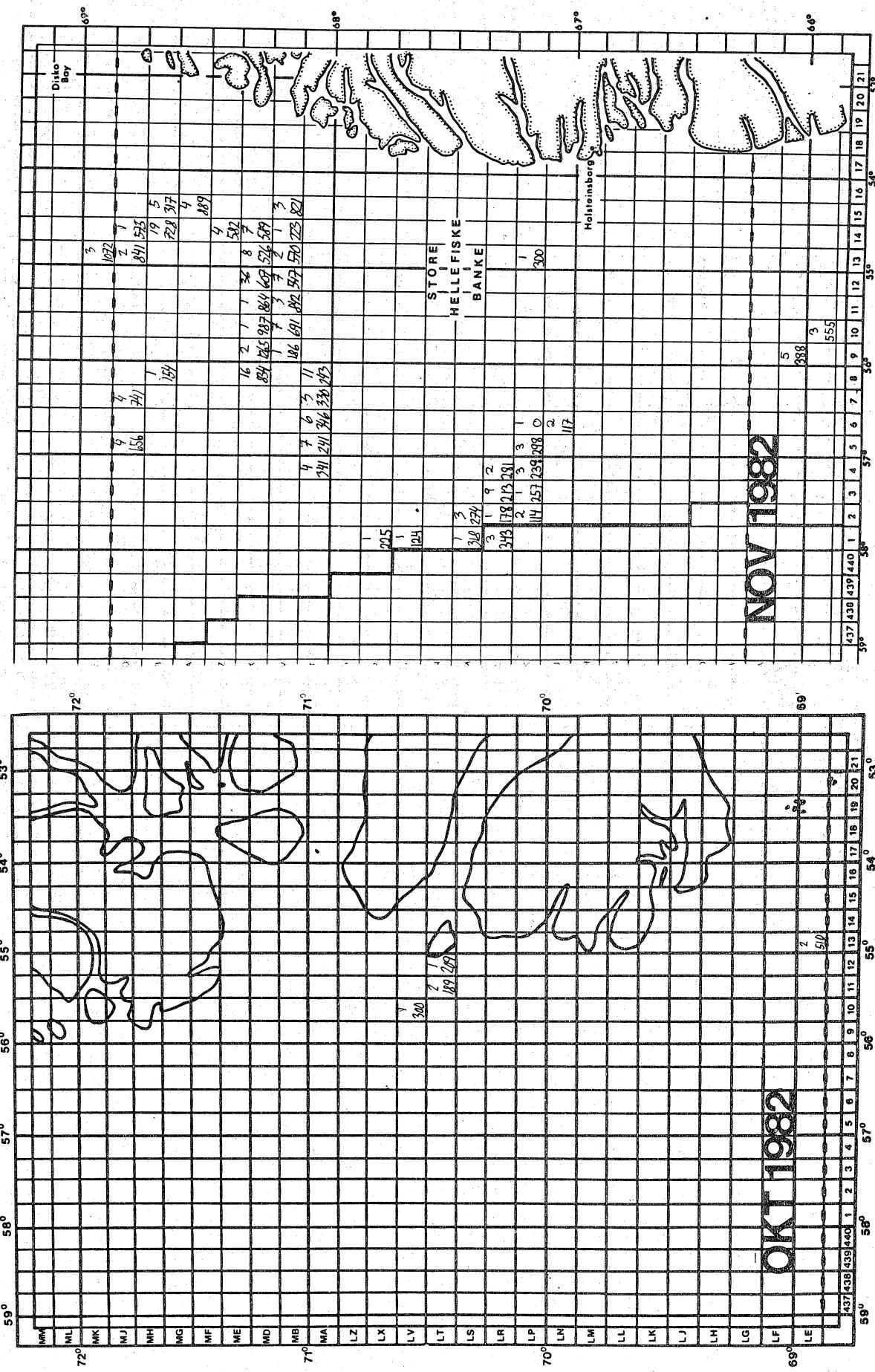


Fig. 2. Continued. October 1982.

Fig. 2. Continued. November 1982.

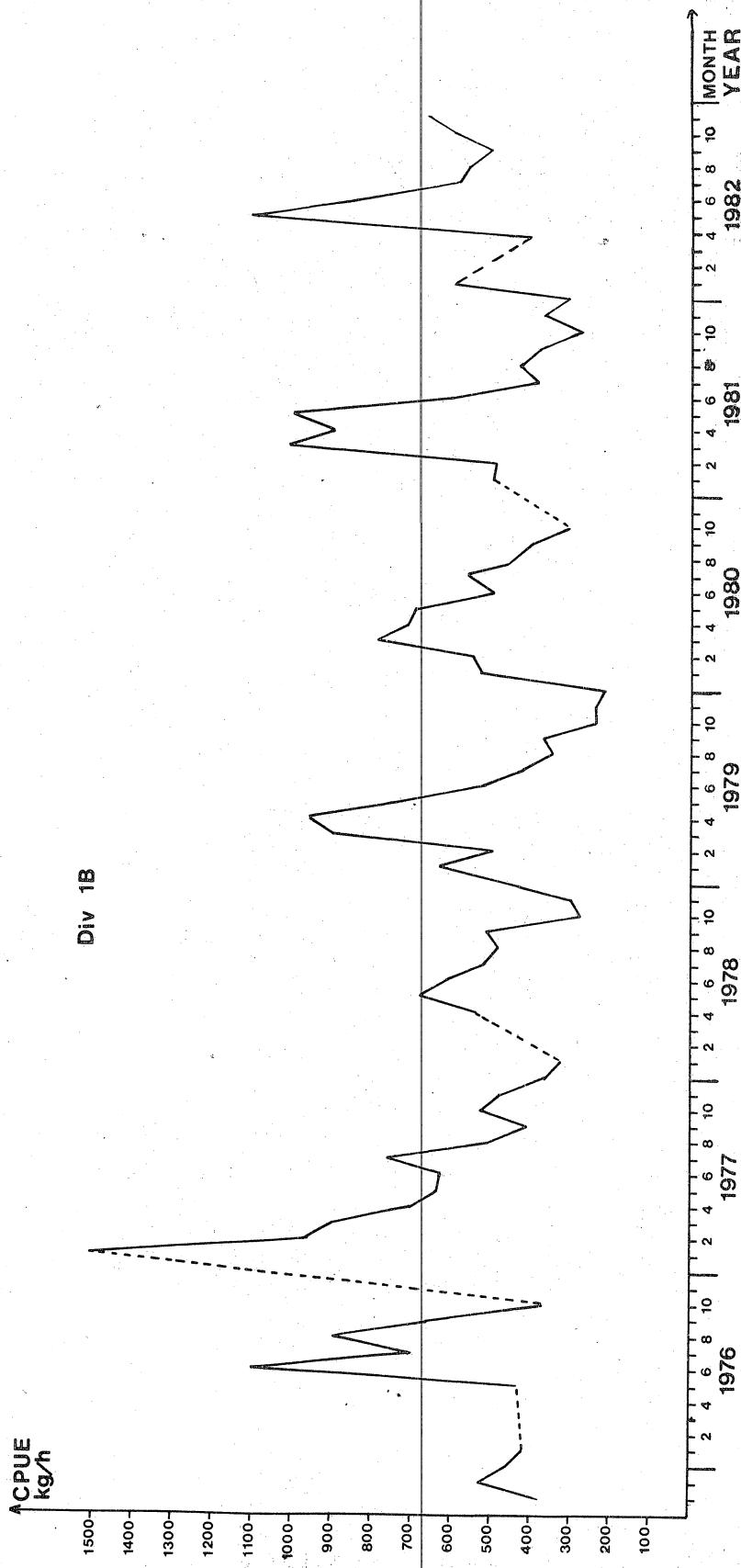


Fig. 3. Monthly mean catch of shrimp per unit effort (kg/hour) in Division 1B from October 1975 to November 1982 based on logbook information and landings from six trawlers (722 GRT) of the Royal Greenland Trade Department (corresponding numbers of hours trawled are given in Table 5).

