Northwest Atlantic Fisheries Organization

Serial No. N1438 NAFO SCR Doc. 88/03

SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1988

Distribution of Silver Hake, Other Fish Species and Squids in 1987 on the Scotian Shelf Slopes from the Soviet Observers Data

by

V. A. Rikhter and V. F. Turok

Atlantic Research Institute of Marine Fisheries and Oceanography (AtlantNIRO)
5 Dmitry Donskoy Street, Kaliningrad, 236000, USSR

ABSTRACT

Distribution of silver hake, some other bottom fish species and shortfin squids in May-August 1987 in the area open for the foreign fishery was studied. Differences in the distribution and behaviour of the considered fish species during the summer period compared with 1986 have been revealed which may be attributed to the variation of oceanographical conditions observed in 1984-1986.

MATERIALS AND METHODS

In 1987 the sampling was made on commercial ships in May, June, July and early in August. Methods used for material processing and data analysis were the same as in the previous years. Numerals in figures (in denominator) and tables (in brackets) indicate the number of trawlings with the catches of corresponding species. The distribution of the hake of genus Urophycis was studied without identification by species. The observers measured 41427 specimens and collected 780 pairs of silver hake otoliths for ageing. The amount of samples collected in 1987 by area and fishing period is presented in table 1. As is evident from these data, the sampling intensity in 1987 appeared to be lower than in the previous year (Rikhter and Turok, 1987) despite the fact that the period covered by observations in 1987 was more extensive.

RESULTS AND DISCUSSION

Silver hake (Merluccius bilinearis)

In May very dense silver hake aggregations occurred throughout the area between 59°00' and 62°00W (Fig. 1). In June the density of aggregations markedly decreased (Fig. 2). Accordingly the catches per hauling hour considerably reduced compared with those taken in June 1986 (Rikhter and Turok, 1987). In July relatively large numbers of silver hake could be found between 61°00' and 63°00'W (Fig. 3).

However in the third ten-day period the aggregations began to collapse and the fishing equation sharply grew worse early in August. During that period no dense silver hake aggregations could be found in the area open for the foreign fishery (Fig. 4). Obviously the silver hake migrated in mass to the north of the SMGL. The catches per hauling hour by month are given in table 2 compared with the previous years.

From the analysis of peculiarities of the silver hake distribution for the entire observation period it can be suggested that in summer 1987 the oceanological conditions were close to those of the 1979-1980 period, when the massive migration of the silver hake from the Shelf slopes evidently also occured late in July - early in August (Rikhter et al., 1980, 1981). It should be said that, according to the observers data, the rate of silver hake maturation in 1987 was rather slow and, consequently, could not cause earlier spawmimg migration.

Haddock (Melanogrammus aelefinus)

The distribution of this species on the shelf slope in May-July is shown in Figs. 5,6 and 7. Between 59°00' and 63°00'W the haddock occurred in small numbers. In July the haddock, as well as other studied species, was almost exclusively caught in the western part of the fishing ground, which can be attributed to dislocation of the fishing fleet to that area in search of silver hake aggregations. The comparison of the haddock catches per hauling hour in summers of 1986 and 1987 suggests that its abundance on the Shelf slopes in 1987 was lower than in the previous year. The haddock bycatch consti-

tuted just 0.4% of the total catch recorded by the observers (tabl.3).

Saithe (Pollachius virens)

If in summer of 1986 the saithe was rather numerous on the Shelf slopes from time to time, in 1987 it did not form any considerable aggregations anywhere (Figs. 8, 9). The saithe bycatch constituted 0.4% (table 3).

Urophycis sp.

The representatives of this genus occurred in the catches throughout the fishing season (Figs. 10, 11, 12). However their abundance, like that of the saithe, was obviously considerably lower than during the same period of 1986. The bycatch constituted 1.1% (table 3).

Redfish (Sebastes mentella)

Like in the previuos years, this species was found in the catches only in May-June in very small numbers (Figs. 13, 14).

Squid (Illex illecebrosus)

For the first time after a long interval the squids, though in small quantities, were quite common in the catches taken in June-July (Figs. 15, 16). The fact of appearance of the squids on the Shelf slopes may be indicative of a change that began to show in oceanographic processes and caused the onset of conditions favourable for increasing abundance of the squids in Subarea 4.

Other species

The quantities of the flounders, mackerel and herring in the catches taken during the considered period were negligible (table 3). This also makes a considerable difference compared with the situation in 1986, when the mackerel and herring bycatch fluctuated between 2 and 4%, the distribution range of these species covering almost the entire fishing area (Rikhter and Turok, 1987).

SUMMARY

In 1987, according to the gained data, the distribution and behaviour of the silver hake, and, most likely, of the other studied fish species, differed from those in 1986. It can be assumed that the above-stated peculiarities were caused by the changes that began to show in oceanographic conditions approaching those observed in late seventies.

Table 1. Distribution of silver hake size samples by area and fishing period in 1987 from the Soviet observers' data.

Positions (W)	Months and ten-day periods								Total
	May		June		July			August	
	I	II	I	II	I	II	III	IV	
59°10'			I	I					2
20'		I	4	4					9
30'		5	1	4					10
40'		5		2		I			8
50'	I	3	2	8					14
60°00'				3					3
10'	I	I							2
20'		2		2					4
30'		2	1	2		2			7
40'		5		1					6
50'				1					1
61°00'	3		5					3	11
10'	5		6	1		1		1	14
20'	3	9	2	3	1			2	20
30'		1	3	1	3	2			10
40'			2	4	1	3			10
50'				4	5	5			14
62°00'				3	2	5			10
10'				3	1	6			10
20'					1	1	1	2	5
30'					11	3	7	2	23
40'					9		6	1	16
50'					2	1			3
63°00'									
Total	13	34	27	47	36	30	14	11	212

Table 2 Catch per hauling hour (kg) by species, month and year

Species	Months	Year						
		1981	1982	1983	1984	1985	1986	1987
Silver hake	May	2368 (33)	8654 (34)	2771 (160)	5738 (90)	3094 (131)	-	5988 (47)
	June	1121 (69)	5471 (103)	2778 (105)	2783 (57)	3635 (195)	4469 (174)	2957 (74)
	July	1909 (68)	1724 (99)	-	3298 (125)	3994 (208)	4372 (170)	3610 (77)
	August	-	-	-	-	-	-	476 (11)
Haddock	May	3 (10)	22 (23)	17 (81)	6 (37)	28 (123)	-	21 (39)
	June	20 (46)	-	40 (90)	17 (53)	54 (190)	43 (119)	18 (60)
	July	8 (37)	10 (74)	-	-	37 (204)	42 (129)	16 (60)
Saithe	May	-	-	-	-	38 (105)	-	22 (46)
	June	-	-	-	-	22 (123)	417 (63)	25 (57)
Urophycis sp.	May	-	-	-	-	39 (125)	-	53 (42)
	June	-	-	-	-	25 (188)	191 (153)	42 (73)
	July	-	-	-	-	-	-	39 (73)
Redfish	May	106 (3)	-	34 (118)	7 (51)	-	-	50 (17)
	June	1 (2)	96 (41)	49 (53)	-	-	-	13

Table 3 Ratio of species (%) in catches examined by Soviet observers in May-July 1987

Species	Months			
	May	June	July	May-July
Silver hake	97.3	95.0	97.2	96.7
Haddock	0.3	0.6	0.4	0.4
Saithe	0.3	0.8	0.2	0.4
Urophycis sp.	0.9	1.4	1.0	1.1
Redfish	0.8	0.4	0.3	0.6
Flounders	0.1	0.2	0.1	0.1
Mackerel	0.2	0.2	0.3	0.2
Herring	-	-	0.1	-
Squid	0.1	1.4	0.4	0.5

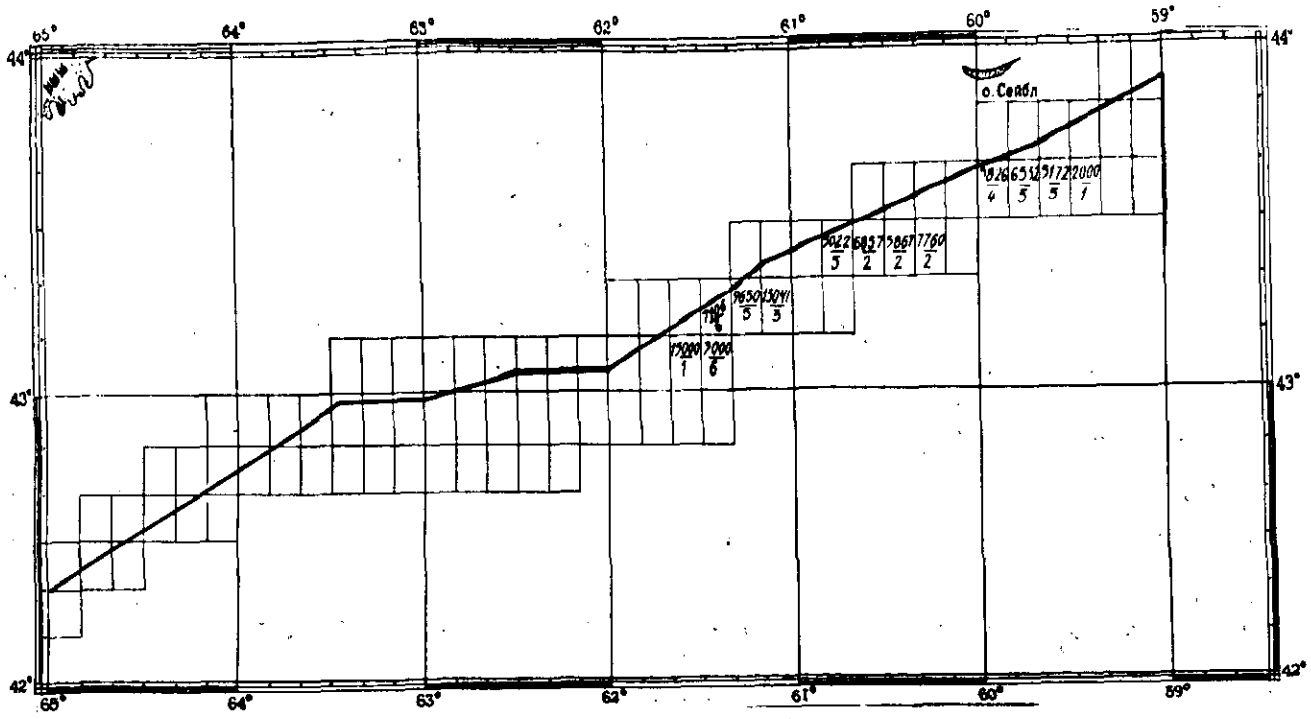


Fig.1. Silver hake catches per hauling hour (kg) in May 1987.

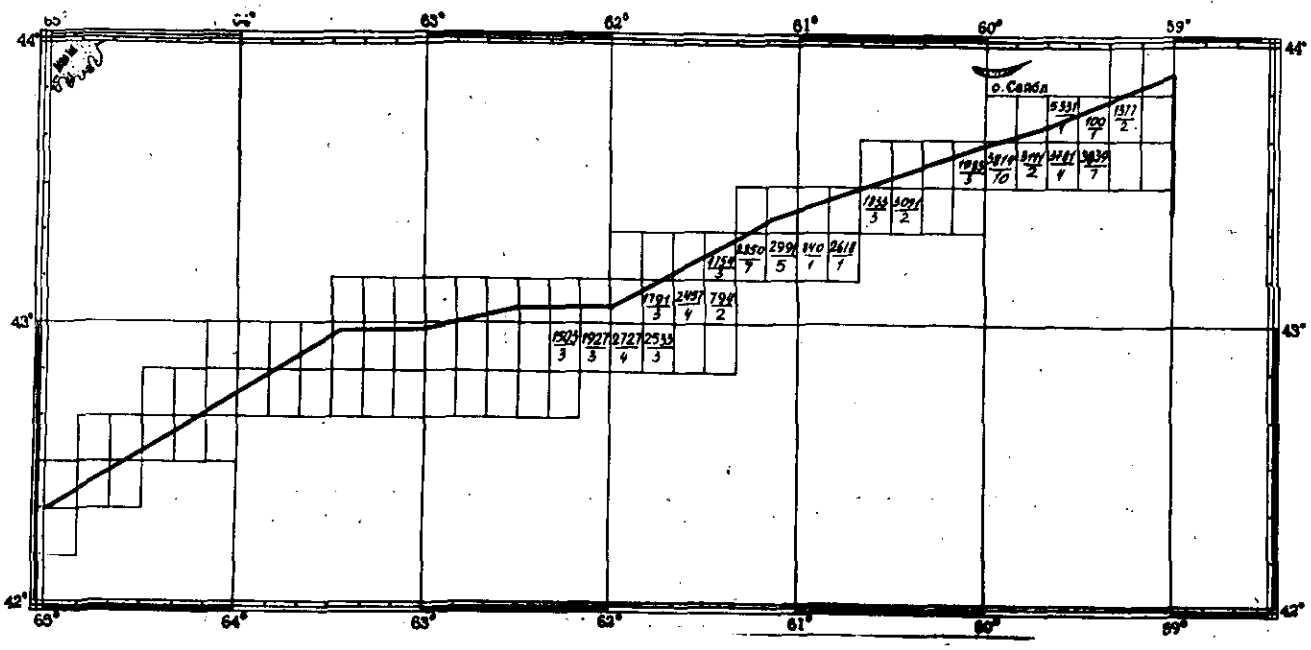


Fig. 2. Silver hake catches per hauling hour (kg) in June 1987.

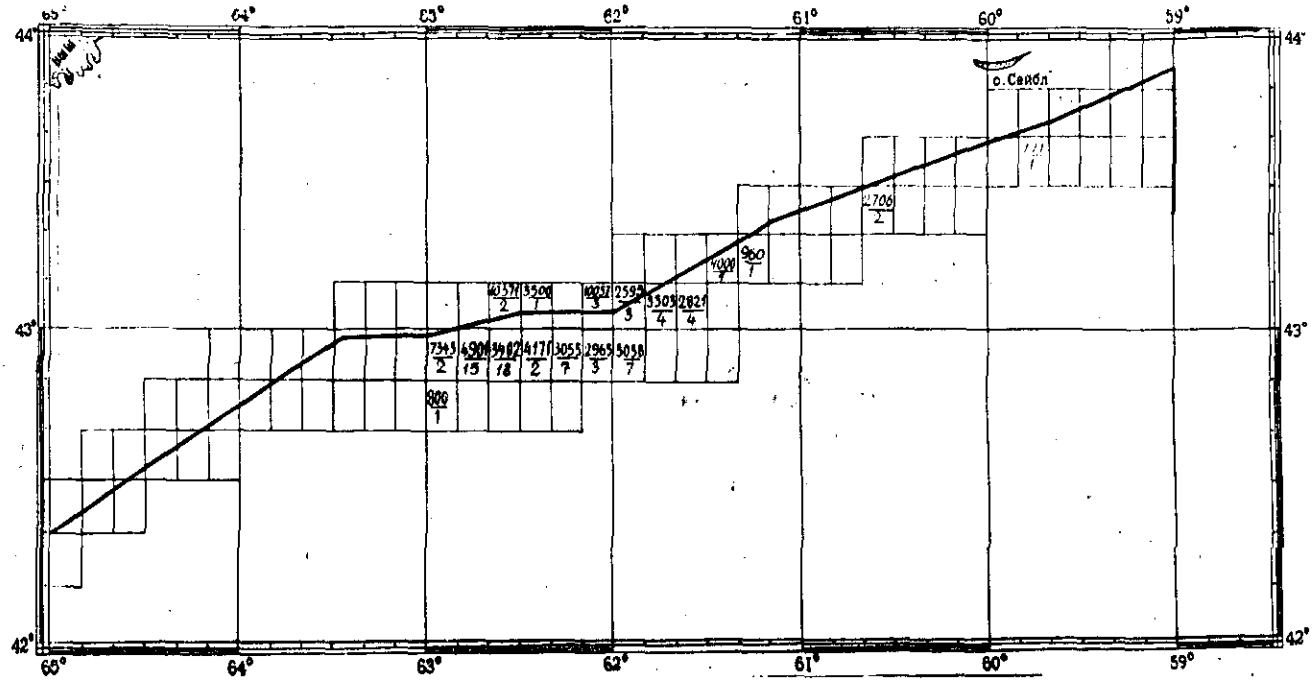


Fig. 3. Silver hake catches per hauling hour (kg) in June 1987.

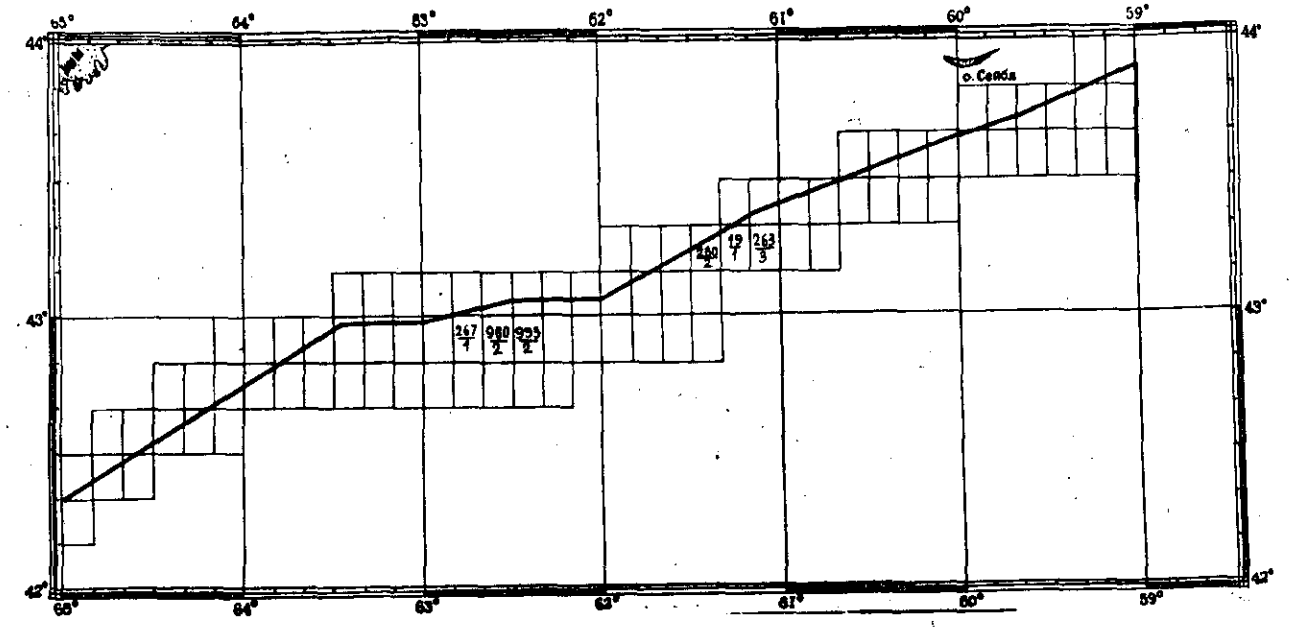


Fig. 4. Silver hake catches per hauling hour (kg) in June 1987.

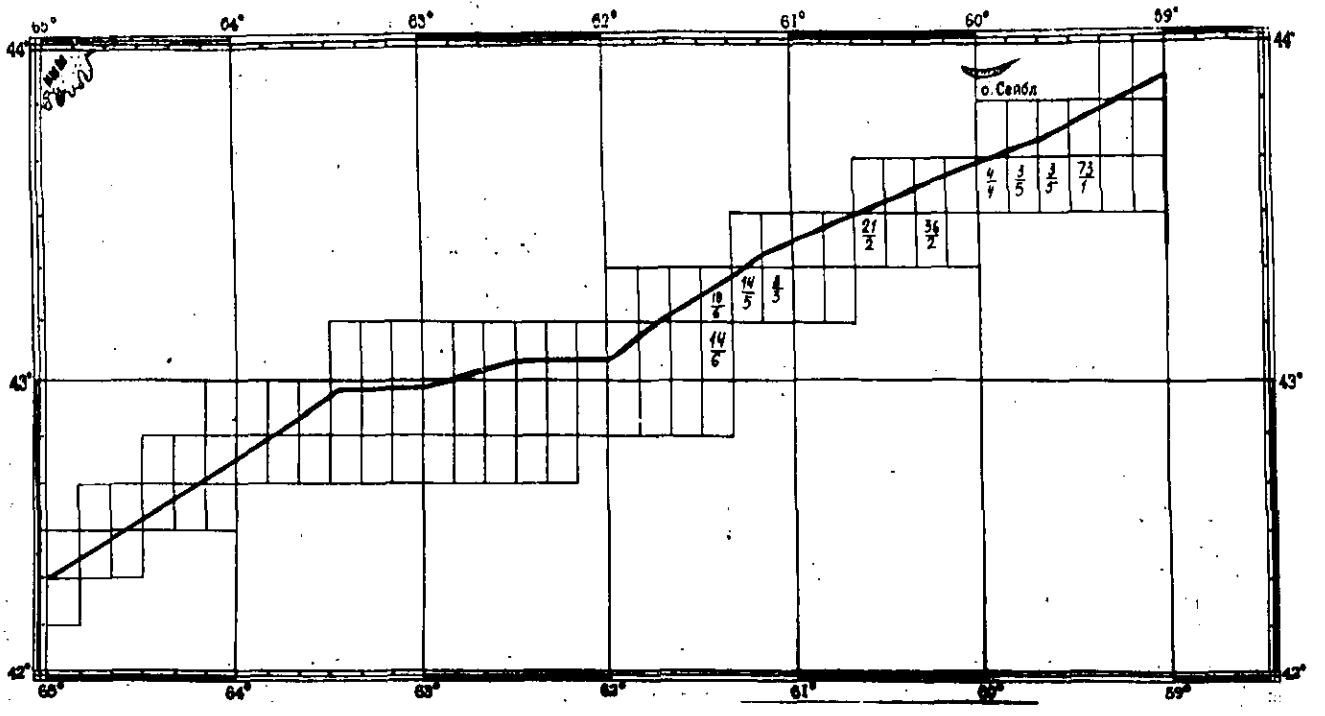


Fig. 5. Haddock catches per hauling hour (kg) in May 1987.

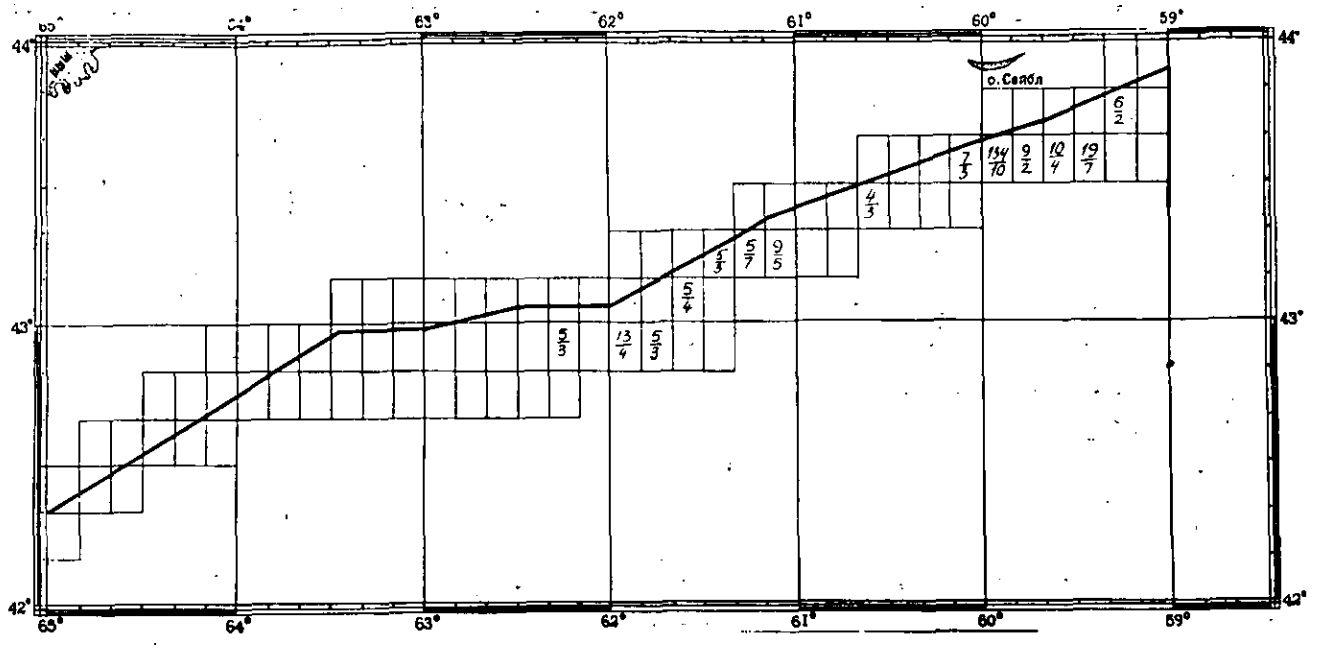


Fig. 6. Haddock catches per hauling hour (kg) in June 1987.

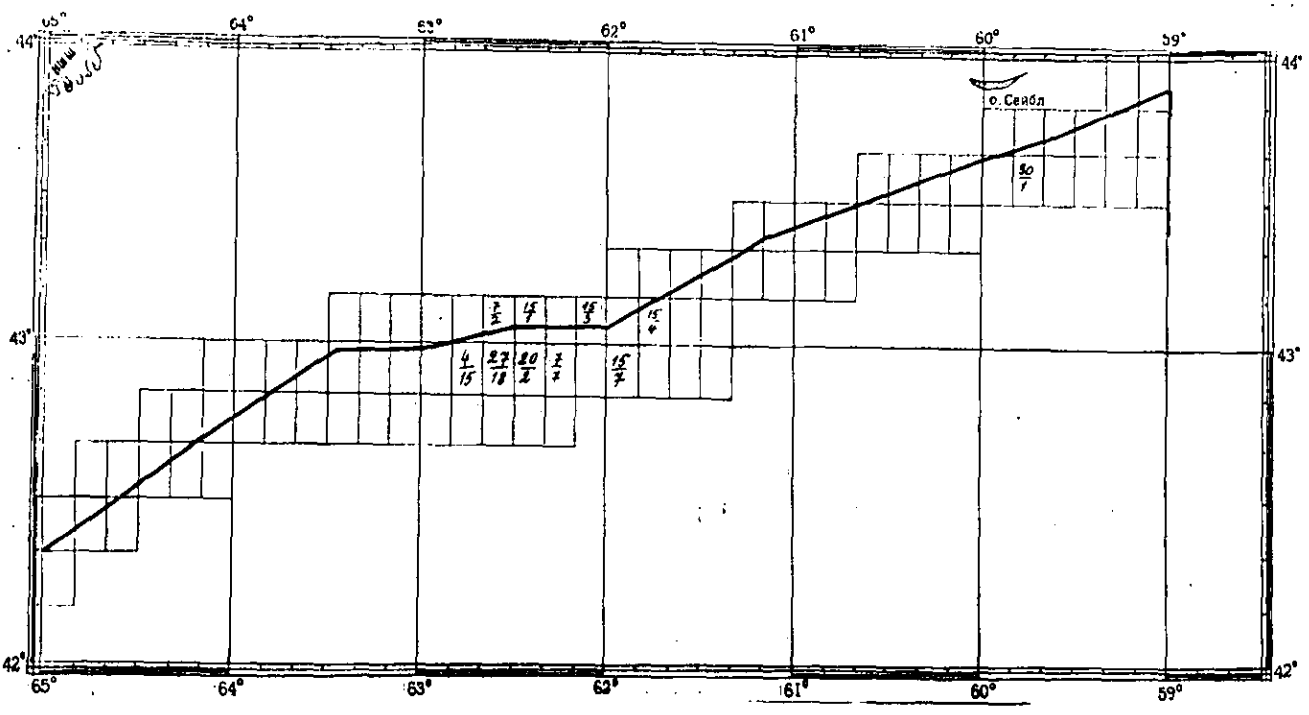


Fig. 7. Haddock catches per hauling hour (kg) in July 1987.

Fig. 8. Saithe catches per hauling hour (kg) in May 1987.

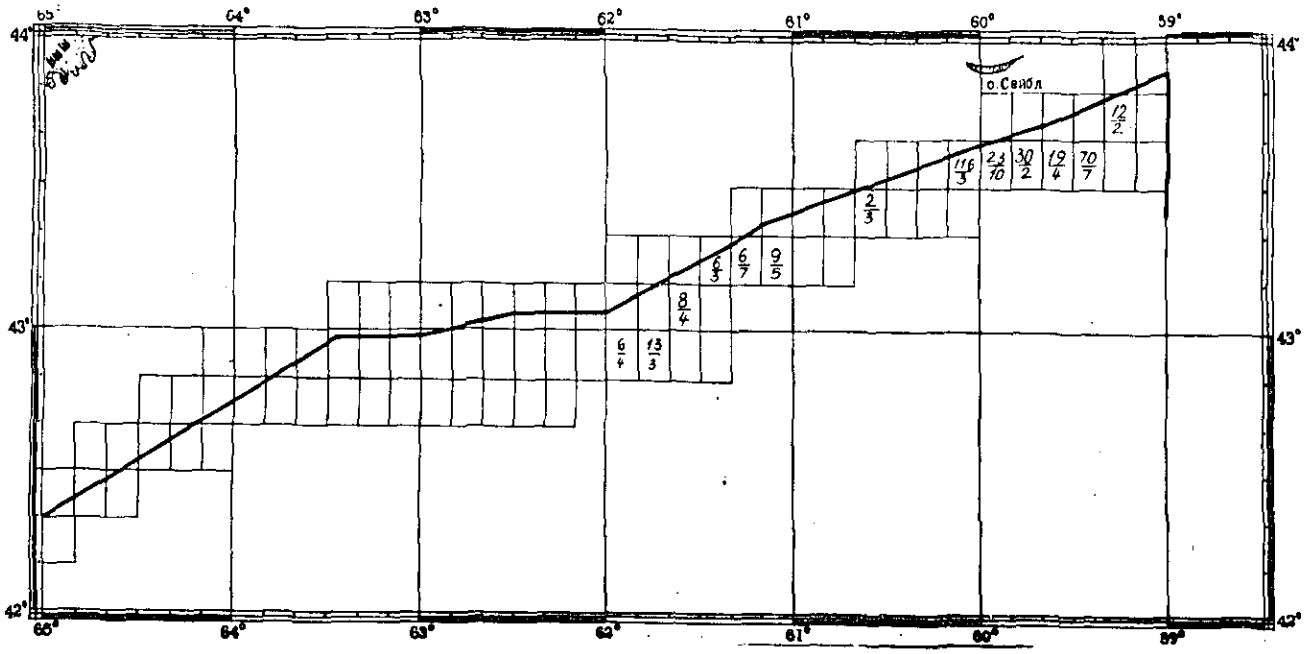


Fig. 9. Saithe catches per hauling hour (kg) in June 1987.

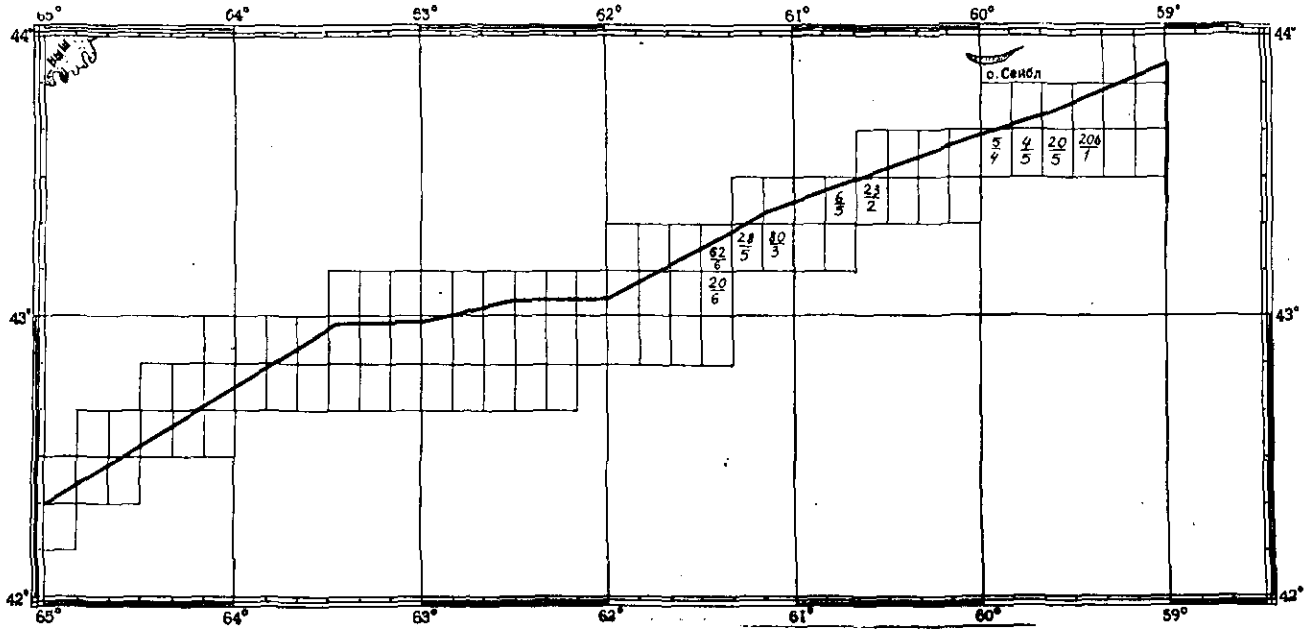


Fig. 10. Urophycis sp. catches per hauling hour (kg) in May 1987.

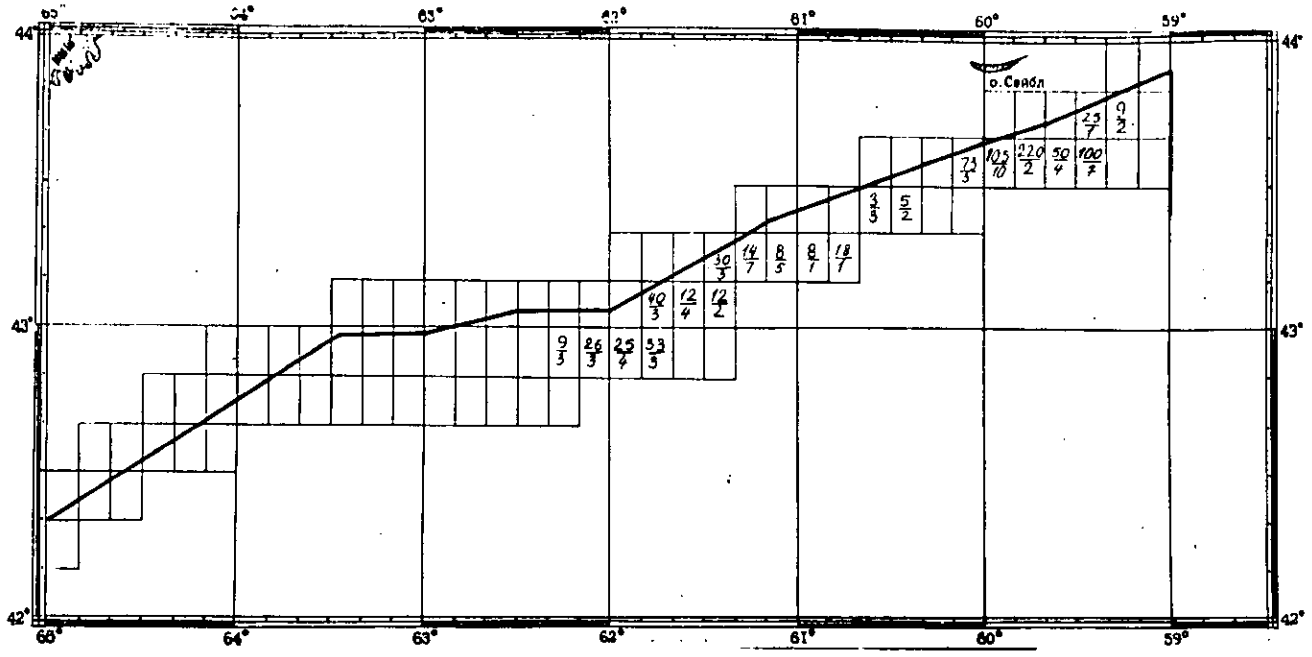


Fig. 11. Urophycis sp. catches per hauling hour (kg) in June 1987.

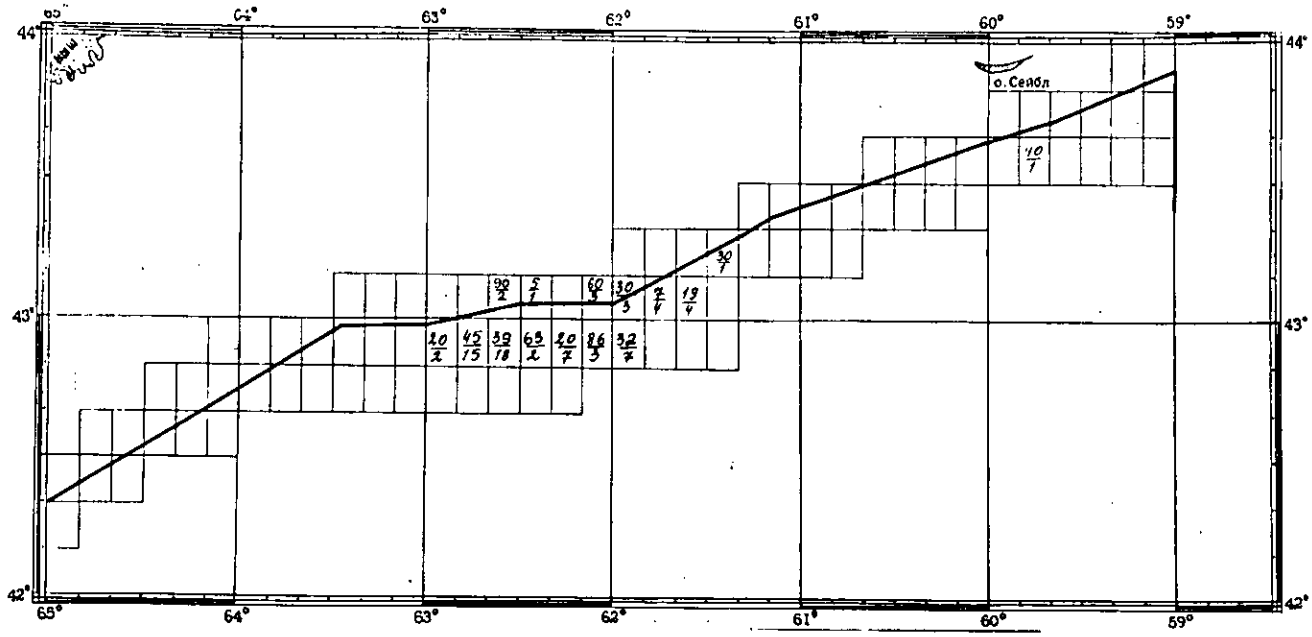


Fig. 12. Urophycis sp. catches per hauling hour (kg) in July 1987.

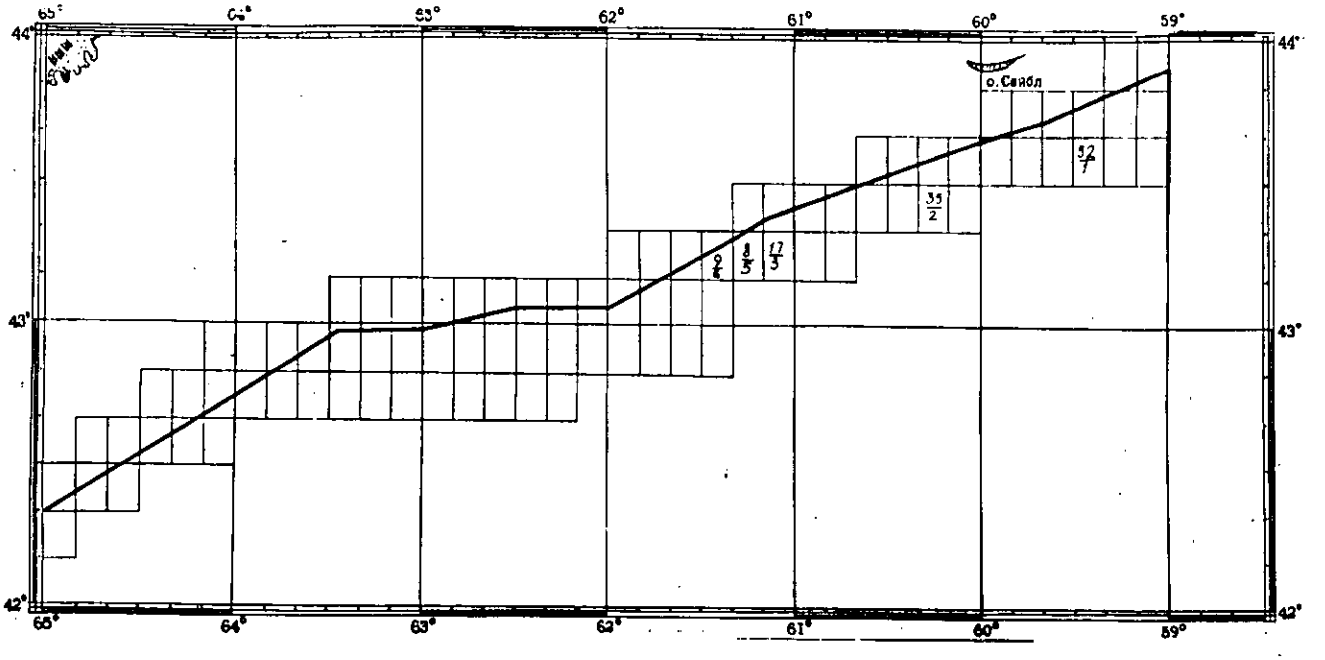


Fig. 13. Redfish catches per hauling hour (kg) in May 1987.

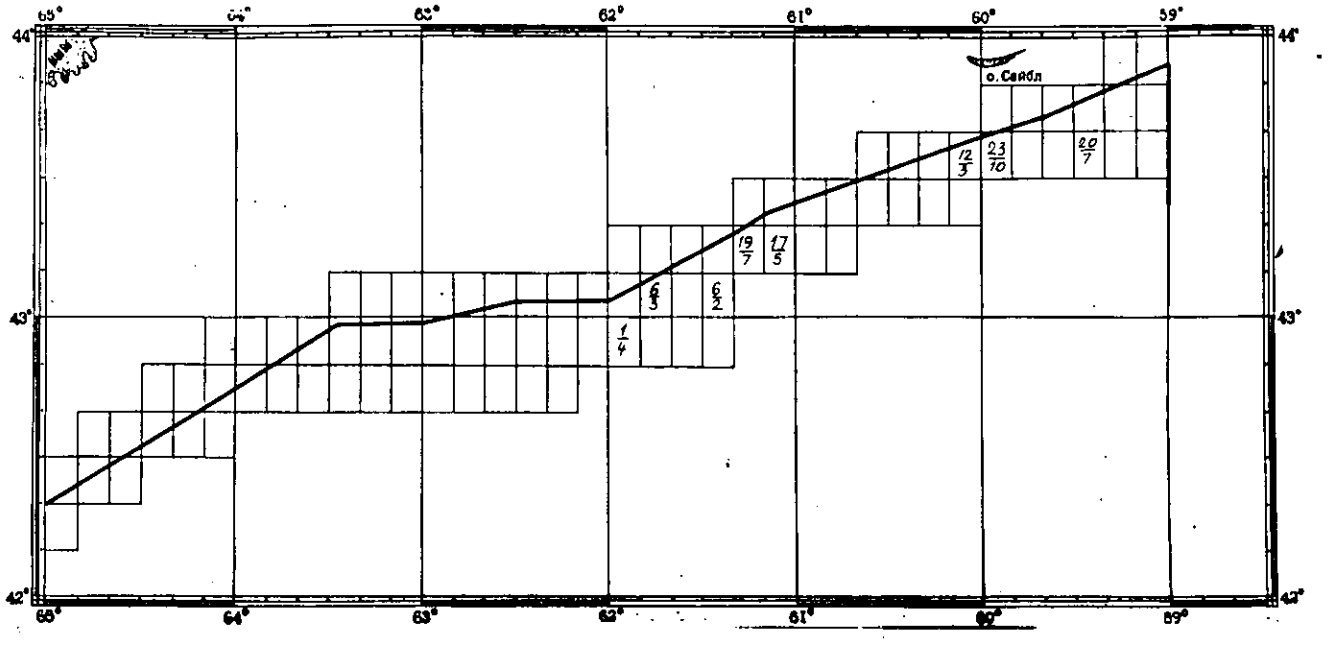


Fig. 14. Redfish catches per hauling hour (kg) in June 1987.

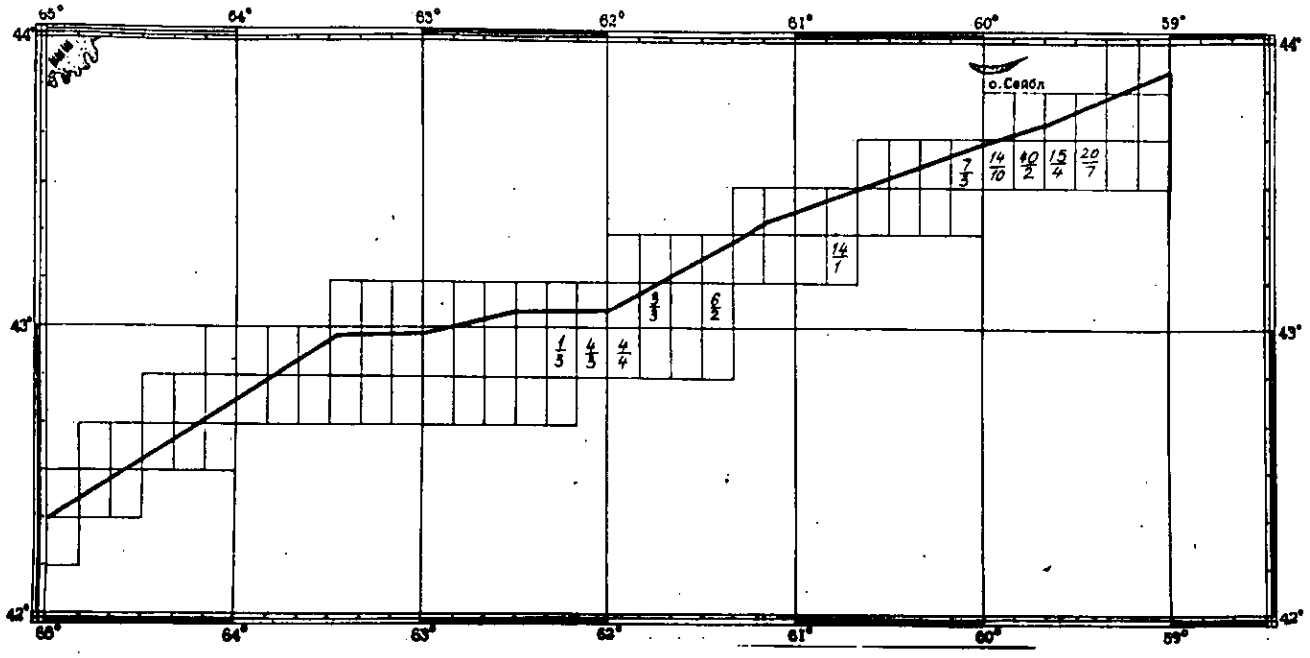
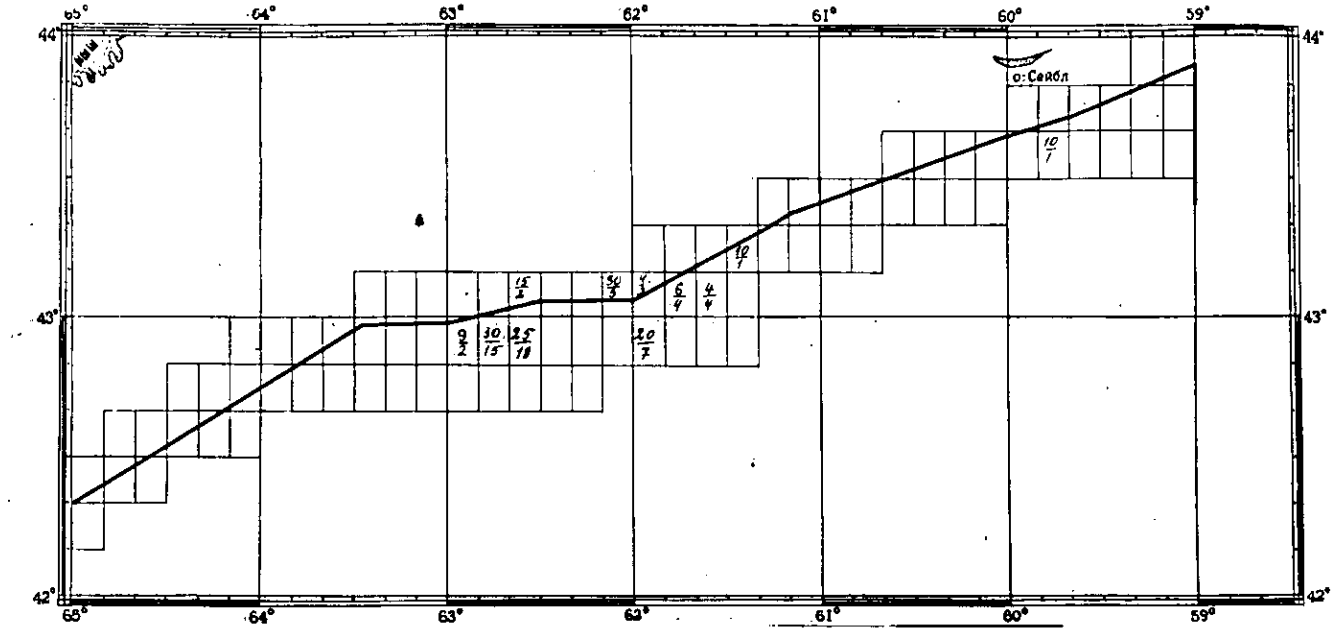


Fig. 15. Shortfin squid catches per hauling hour (kg) in June 1987.



Fig, 16. Shortfin squid catches per hauling hour (kg) in July 1987.