

Northwest Atlantic Fisheries Organization



Serial No. N2087

NAFO SCR Doc. 92/39

SCIENTIFIC COUNCIL MEETING - JUNE 1992

Distribution of Hake, Other Fish Species and Short-finned Squid
on the Scotian Shelf in 1991, Based on Data of Soviet Observers

by

V. A. Rikhter and V. F. Turok

Atlantic Scientific Research Institute of Marine Fisheries
and Oceanography (AtlantNIRO)
5 Dm. Donskoy Str., 236000, Kaliningrad, Russia

ABSTRACT

Distribution of hake, some other fishes and short-finned squid was analysed in catches from the Scotian shelf area, accessible for foreign fishery in May and June 1991. The similarity of hake distribution and behaviour was revealed as compared with the same period of 1990. Hake abundance seems to decrease within the fishing area during the above mentioned years as compared with 1985/89. Some differences in density of other fishes aggregations was found as compared with 1990, which could be explained by environmental factors specific effect during observation period and sharp decrease of sample numbers, taken in the latest year of fishery

INTRODUCTION

Present scientific paper extends the series of such kind papers while the first one had appeared in 1980. The sufficient amount of information have been compiled to provide some conclusions. Certainly, it will require to perform appropriate materials treatment and to analyse the data obtained during the entire period of observation. Realization of the plan outlined seems to take significant period of time. That is why this paper seems to become the final one in the above mentioned series. In future short information on the results of observers' activity is supposed to be included into the National Report.

MATERIAL AND METHODS

In 1991 sampling was carried out from one fishery vessel during two months (May and June). In April, for some technical reasons, observers were unable to get into the Scotian Shelf area while being in NAFO regulation region, which considerably decreased the amount of material collected. A total of 43 thous. hake specimens were measured and 460 otolith pairs were taken for age determination. The sample numbers and distribution by areas and time periods are shown in Table 1. Methods of data treatment and analysis remained the same as in previous years. Numbers in Figures (at denominator) and Table 2 (in brackets) denotes number of hauls with appropriate species caught. Data in Tables 2 and 3 are based on information obtained from observers. Note that information for 1991 is of low value due to incomplete coverage of silver hake fishing season and area.

RESULTS AND DISCUSSION

Silver hake (Merluccius bilinearis). Fishery of this species was started in March. Fishing was carried out by 5 vessels of BMRT-type. Hake aggregations were fished in the depth range from 250 to 600 m at 61°30'-63°00'W. Catches-per-an-hour haul amounted to about 2 tons. It could be supposed that another hake species (Merluccius albidus) occurred at maximum depth. Unfortunately no scientific observations were carried out during that period.

In April the fishery extent was increased. Fishing was performed at depth of 160-380 m between 60°00' and 63°00'W. Catches-per-an-hour haul were slightly above 2 tons. The entire situation resembles that one of the previous year (Rikhter, Turok and Istomina, 1991). Relatively high catches during the first two decades of April were followed by a permanent drop, preserved during the remaining fishing period with inevitable variations by days. In May hake aggregations were caught at depths of 150-360 m between 59°00' and 63°00'W (Fig.1). Average catch-per-an-hour haul never reached 3000 kg in each square, covered during observations. In June the fishery situation had not changed significantly, except that hake aggregations moved to the less depth (100-250 m). Hake distribution based on observers' data is shown in Fig. 2.

Sharp catch increase, though short-term, was revealed early in July due to dense spawning aggregation formed. Later on the sharp drop occurred and then vessels left the Scotian Shelf area. Catches-per-an-hour haul (observers' data) by years and months are presented in Table 2. The similarity of hake behaviour, distribution and catch trends in April through July 1990 and 1991 supposed that environmental conditions of the investigation area were the same during those years, but differed significantly from those in 1989, which was confirmed by the comparative analysis of oceanographic factors on the Scotian shelf (Sigaev, 1991).

Haddock (Melanogrommus aeglefinus). Haddock abundance in the area of observations (59-62°W) seemed to be insignificant (Fig. 3,4), as was the case in the previous year (Rikhter, Turok, 1991). In May and June the by-catch amounted to less than 1% (Table 3).

Pollack (Pollachius virens). Distribution of pollack was characterized by extreme unevenness. In some restricted areas several dense aggregations occurred, though in general abundance of pollack was low (Fig. 5,6). It resulted in increased by-catch as compared with 1990 (Table 3).

Cod (Gadus morhua). According to observers' data in May cod occurred only in 3 hauls as an insignificant by-catch. In June the latter appeared to become more common in catches. The by-catch size remained low though it exceeded the level of the previous year (Table 3).

Red hakes (Urophycis shuss, Urophycis tenuis). In May and June red hakes appeared to become the more abundant species in the fishery area, than in 1990 (Fig. 8,9). According the by-catch of the latter increased but did not reach the level of 1% during the entire period in general (Table 3).

Flounders (Hippoglossoides platessoides, Limanda terruginea, Glyptocephalus cynoglossus). The abundance of flounders slightly increased as compared with the latest years. This species occurred over the whole area of observation, though in small numbers (Fig. 10, 11).

Atlantic herring (Clupea harengus). This species occurred in catches rarely and at lower numbers, as compared with 1990 (Fig. 12,

13). Accordingly, the by-catch size appeared to be lower (Table 3).

Mackerel (Scomber scombrus). As compared with the previous year, this species abundance in the fishery area was extremely low in 1991. Mackerel was fished occasionally and in low numbers (Table 3).

Squid (Illex illecebrosus). Figures 14 and 15 show squid distribution in catches. In June, as it could be expected, abundance of the latter increased, but still remained significantly lower than in 1990.

CONCLUSION

The observers' data seemed to evidence the relatively low silver hake abundance in the area southwards of St.GZ in May-June 1991. As to the other species, some differences in catches-per-hour as compared with 1990, could be explained by specific effect of environmental factors during observation period, as well as by sharp decrease of sampling intensity in the latest fishing year.

ACKNOWLEDGEMENT

The authors thank the specialists of Zapribpromrazvedka, provided sampling from commercial catches in 1991.

REFERENCES

1. Rikhter V.A., V.F.Turok and N.K.Istomina. 1991. Distribution of silver hake, other abundant fish species and short-finned squid on the Scotian shelf slope in 1990 from data obtained by USSR observers. NAFO SCR Doc. 91/13, 18p.
2. Sigaev I.K. 1991. Review of hydrographic conditions in some areas of the Northwest Atlantic, 1990. NAFO SCR Doc. 91/4, 12 p.

Table 1

Distribution of hake samples, collected by soviet observers
in 1991 by areas and periods of fishery

Coordinates W	Month and decade						Total
	May			June			
	I	II	III	I	II	III	
59°20					1		1
30	1				3		4
40		1			4		5
50		2			5		7
60°00	1	2			5		8
10				1			1
20				1			1
30				1			1
40	1			2			3
50	1			1			2
61°00				4			4
10				2			2
20	1			3	1		5
30				1			1
40			1	1			2
50		2					2
62°00		3	2				5
10		2	5				7
20		3	7				10
30			1				1
40							
Total	5	15	16	17	19		72

Table 2

Hake catches per hour haul (kg) by month and year

Year	M o n t h s			
	April	May	June	July
1981	-	2368 (33)	1121 (69)	1909 (68)
1982	-	8654 (34)	5471 (103)	1724 (99)
1983	-	2771 (160)	2778 (105)	-
1984	-	5738 (90)	2783 (57)	3298 (125)
1985	-	3094 (131)	3635 (195)	3994 (208)
1986	-	-	4469 (174)	4372 (170)
1987	-	5988 (47)	2957 (74)	3610 (77)
1988	4260 (61)	3671 (103)	2085 (114)	-
1989	6426 (84)	3324 (115)	2173 (161)	3901 (83)
1990	2796 (93)	1918 (110)	817 (112)	2587 (70)
1991	-	1474 (36)	2147 (36)	-

Table 3

Species proportions (%) in catches , analyzed by observers
in 1991

Species	M o n t h s		
	May	June	May+June
Silver hake	91.4	91.8	91.5
Haddock	0.6	0.5	0.6
Cod	0.2	0.4	0.3
Pollack	3.6	5.1	4.3
Red hake	1.4	0.4	0.8
Flounder	0.7	0.5	0.6
Herring	1.4	0.8	1.1
Mackerel	0.1	0.1	0.1
Squid	0.6	0.8	0.7

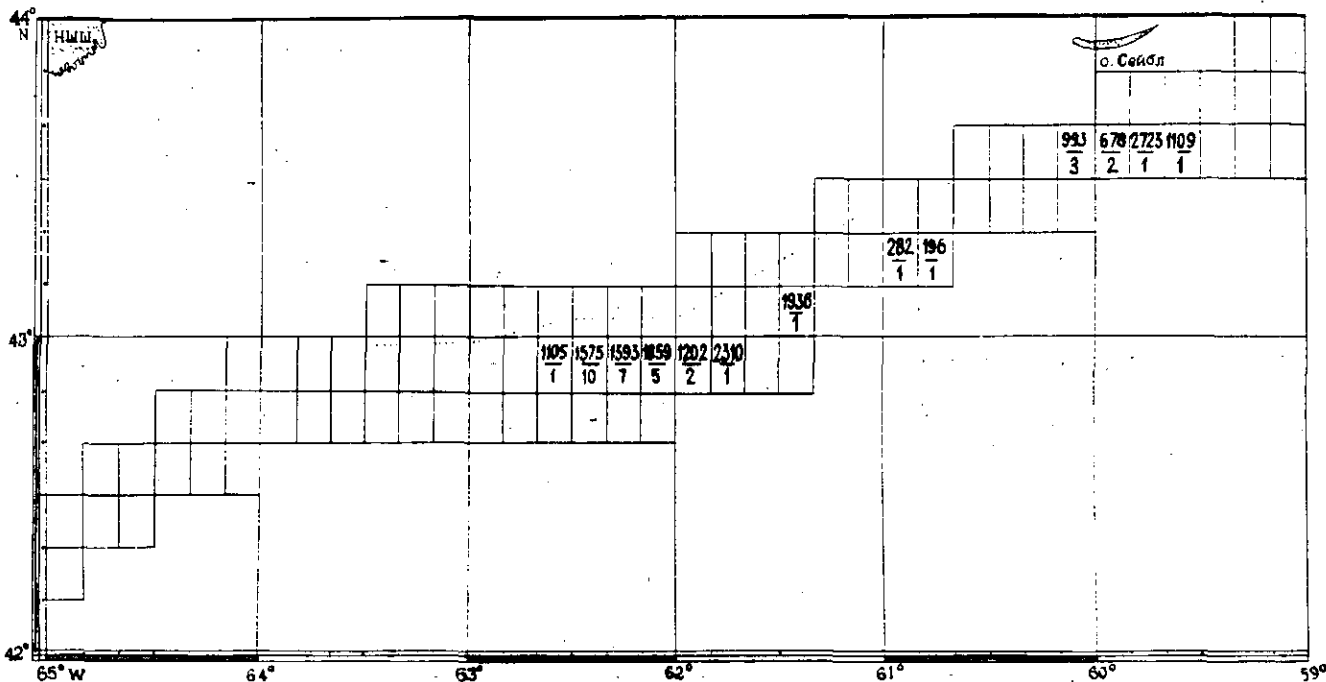


Fig. 1. Distribution of silver hake catches-per-an-hour (kg) in May 1991.

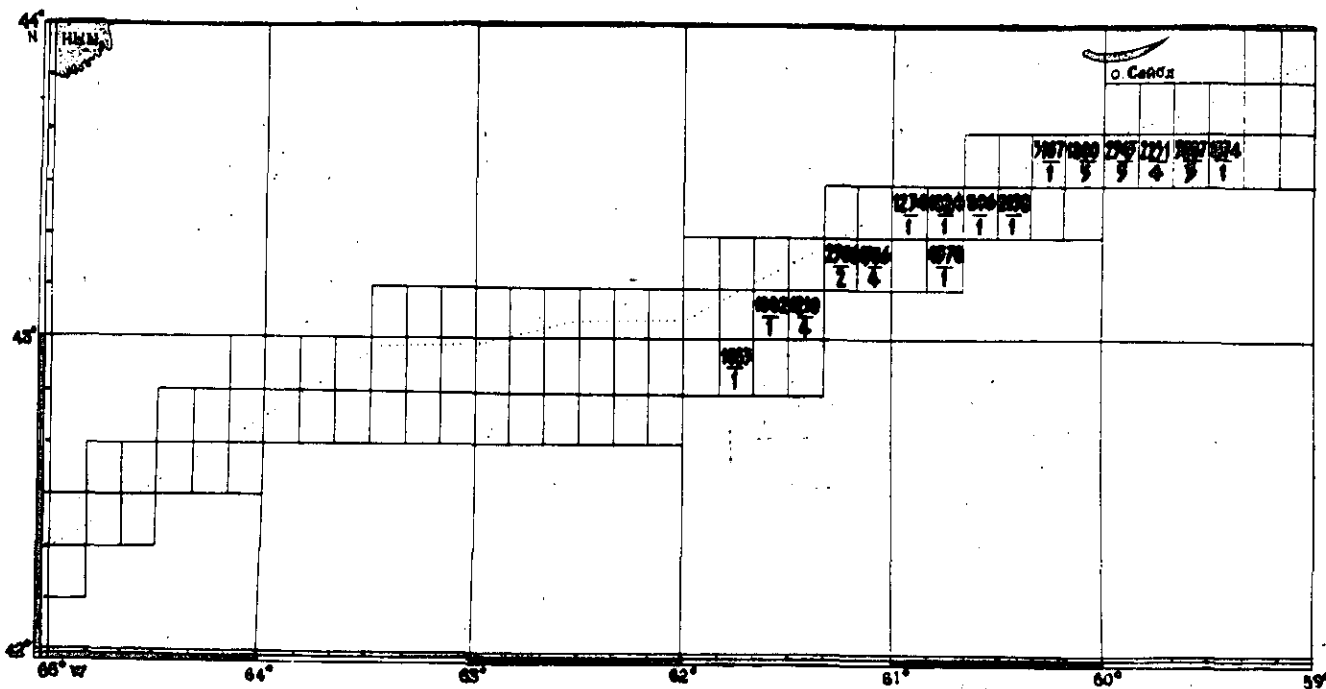


Fig. 2. Distribution of silver hake catches-per-an-hour (kg) in June 1991.

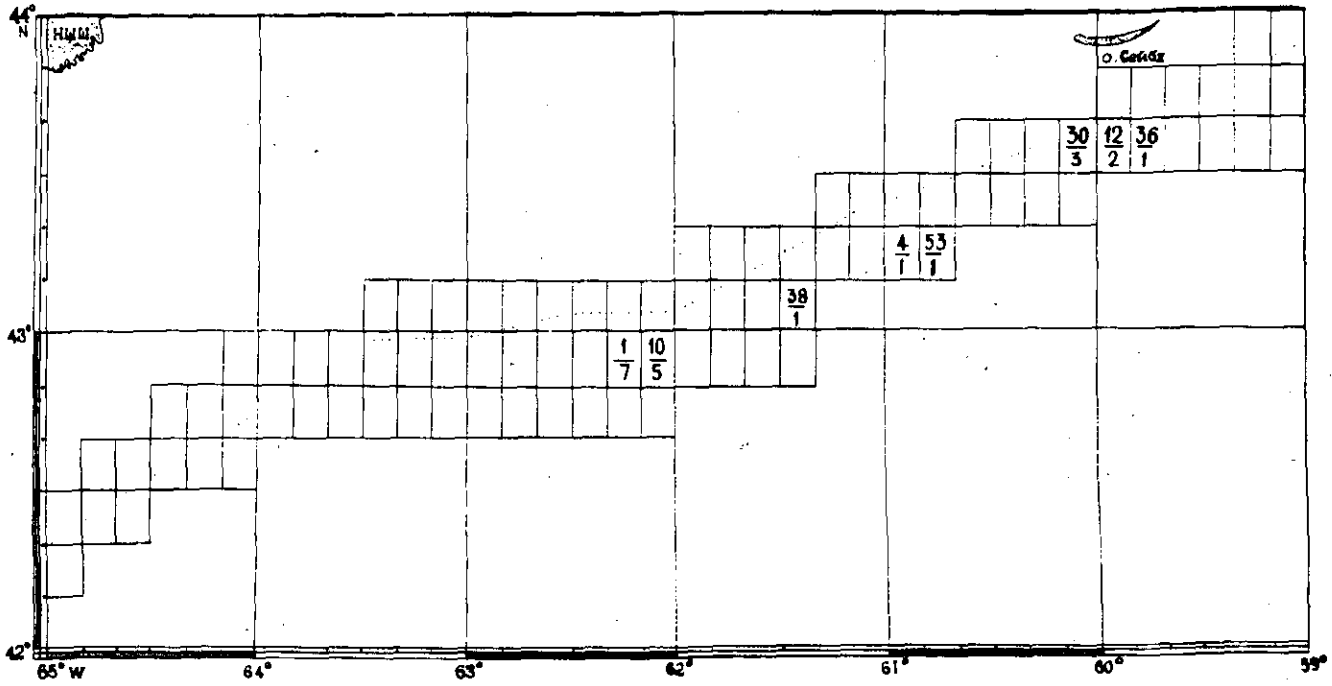


Fig. 3. Distribution of haddock catches-per-an-hour (kg) in May 1991.

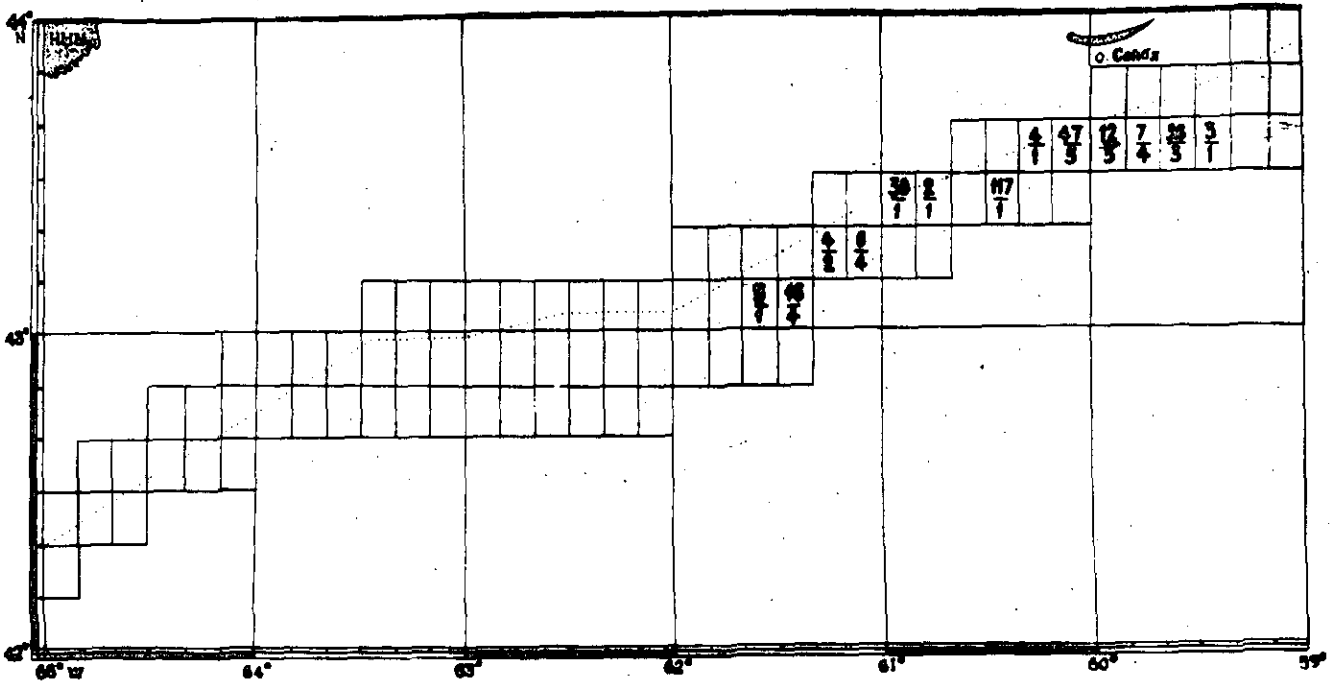


Fig. 4. Distribution of haddock catches-per-an-hour (kg) in June 1991.

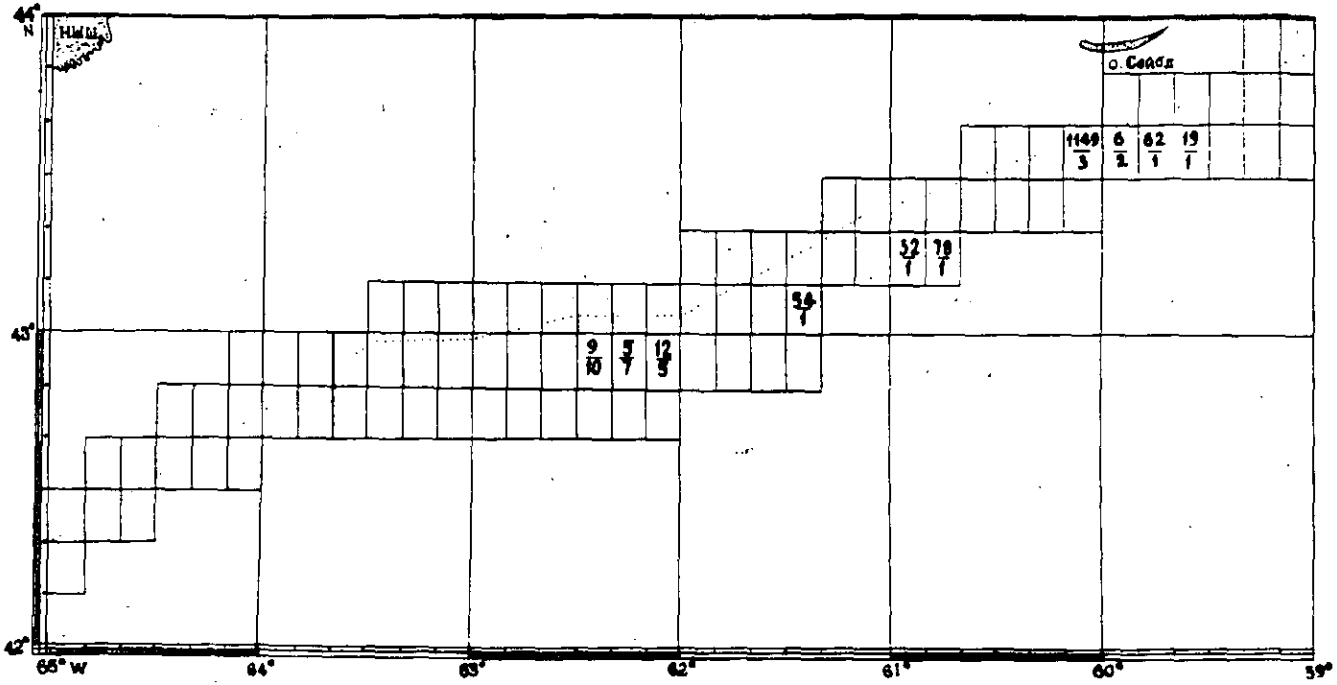


Fig. 5. Distribution of pollack catches-per-an-hour (kg) in May 1991.

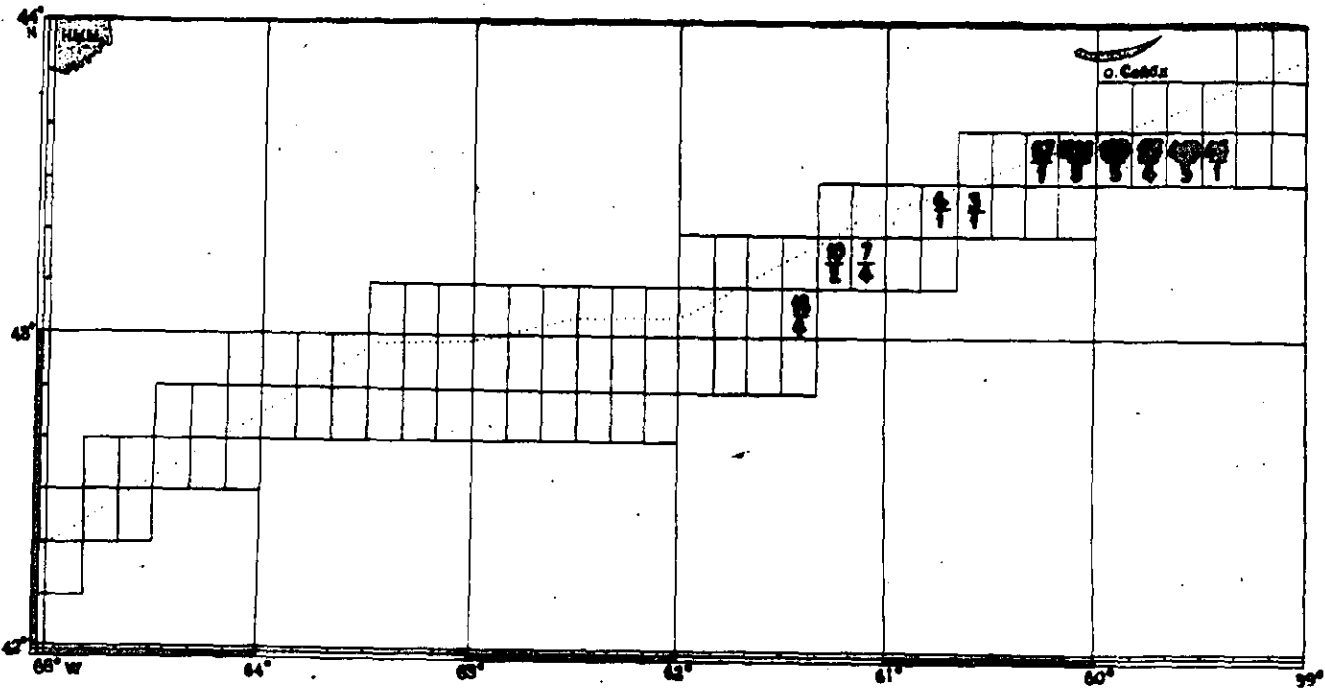


Fig. 6. Distribution of pollack catches-per-an-hour (kg) in June 1991.

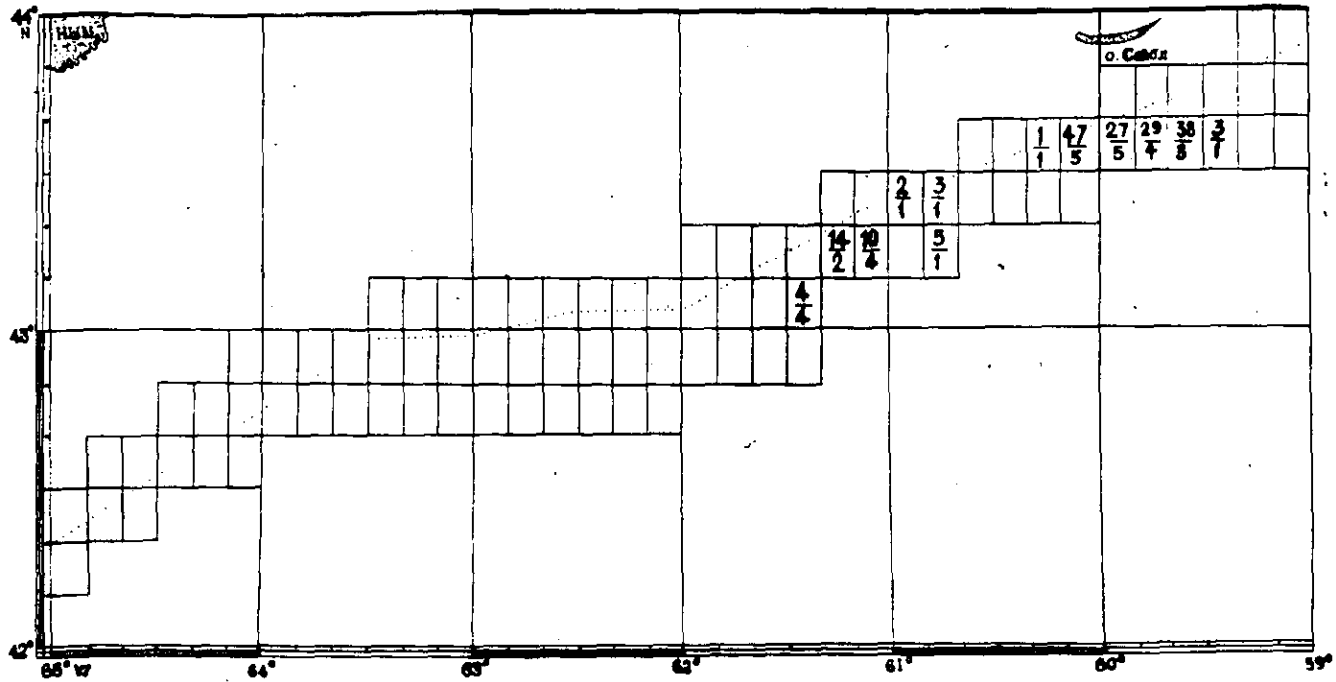


Fig. 7. Distribution of cod catches-per-an-hour (kg) in June 1991.

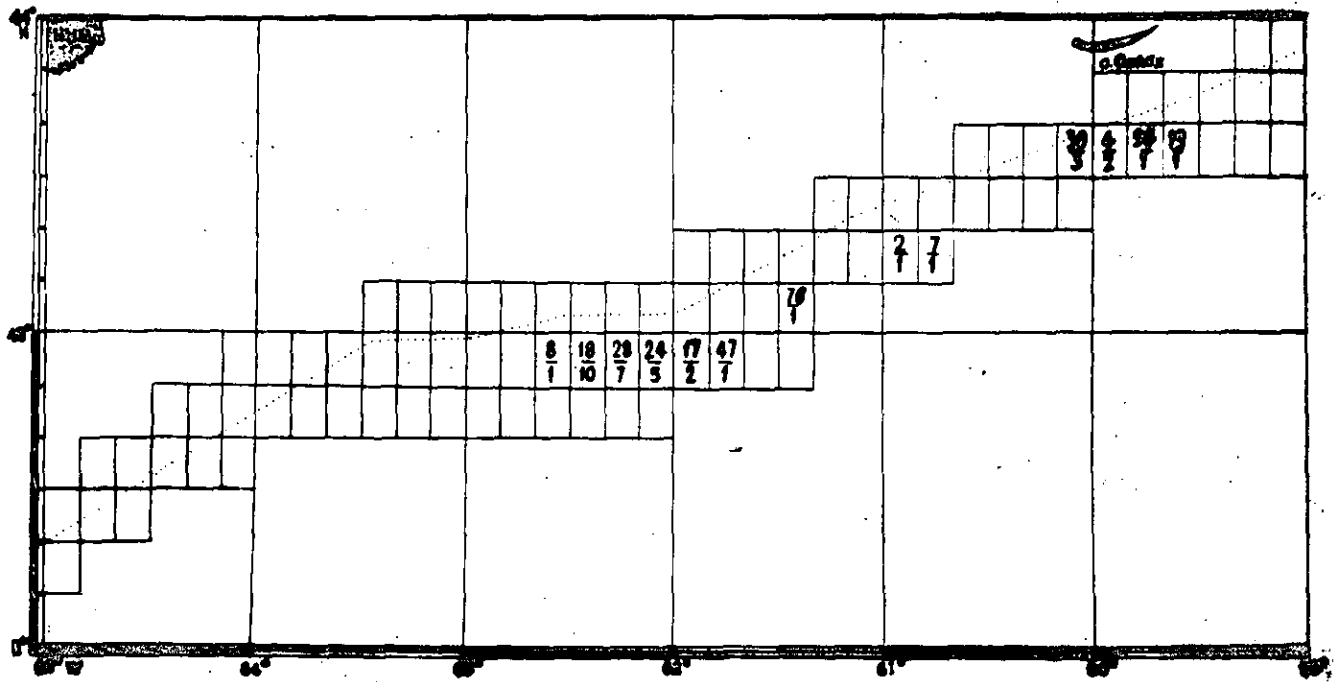


Fig. 8. Distribution of red hakes catches-per-an-hour (kg) in May 1991.

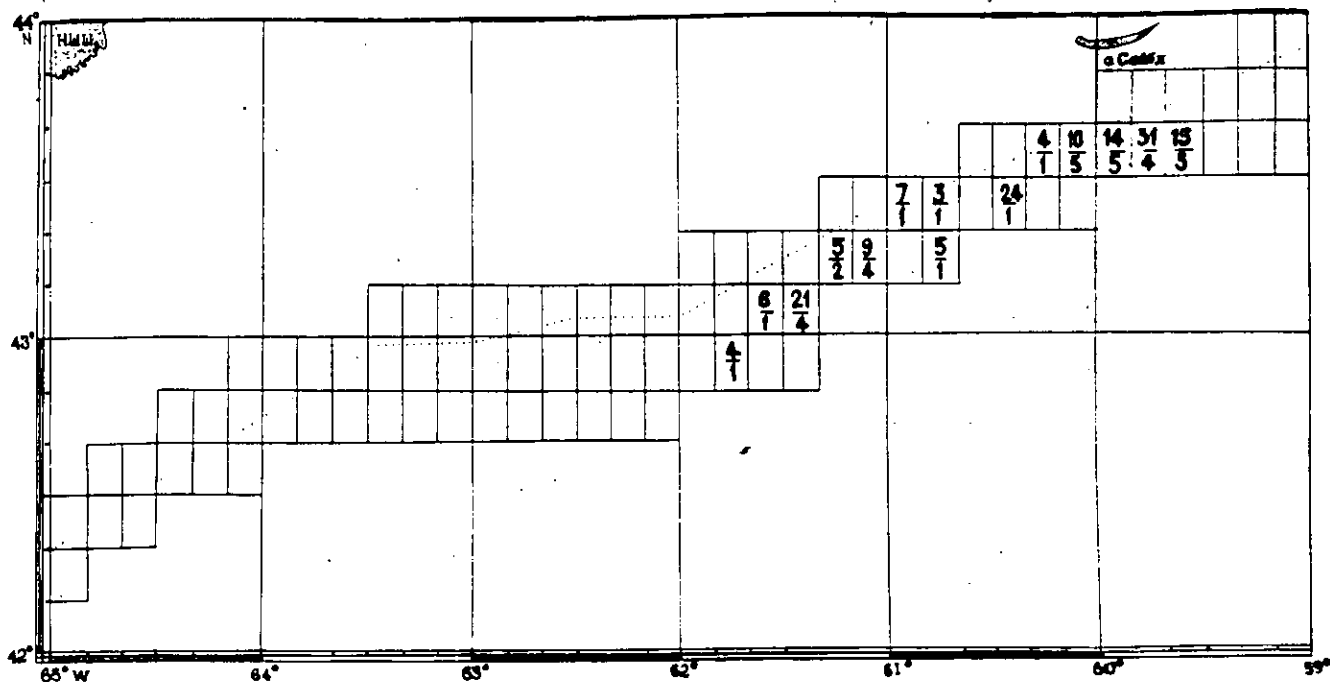


Fig. 9. Distribution of red hake catches-per-an-hour (kg) in June 1991.

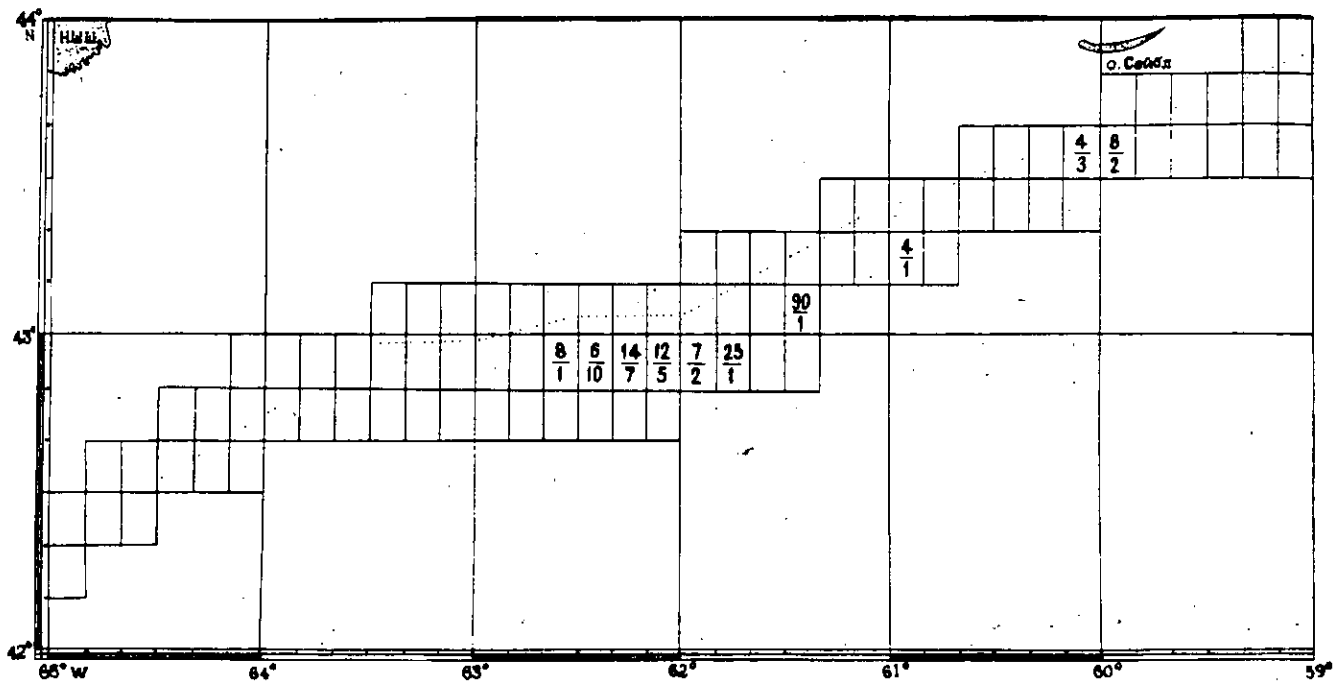


Fig. 10. Distribution of flounder catches-per-an-hour (kg) in May 1991.

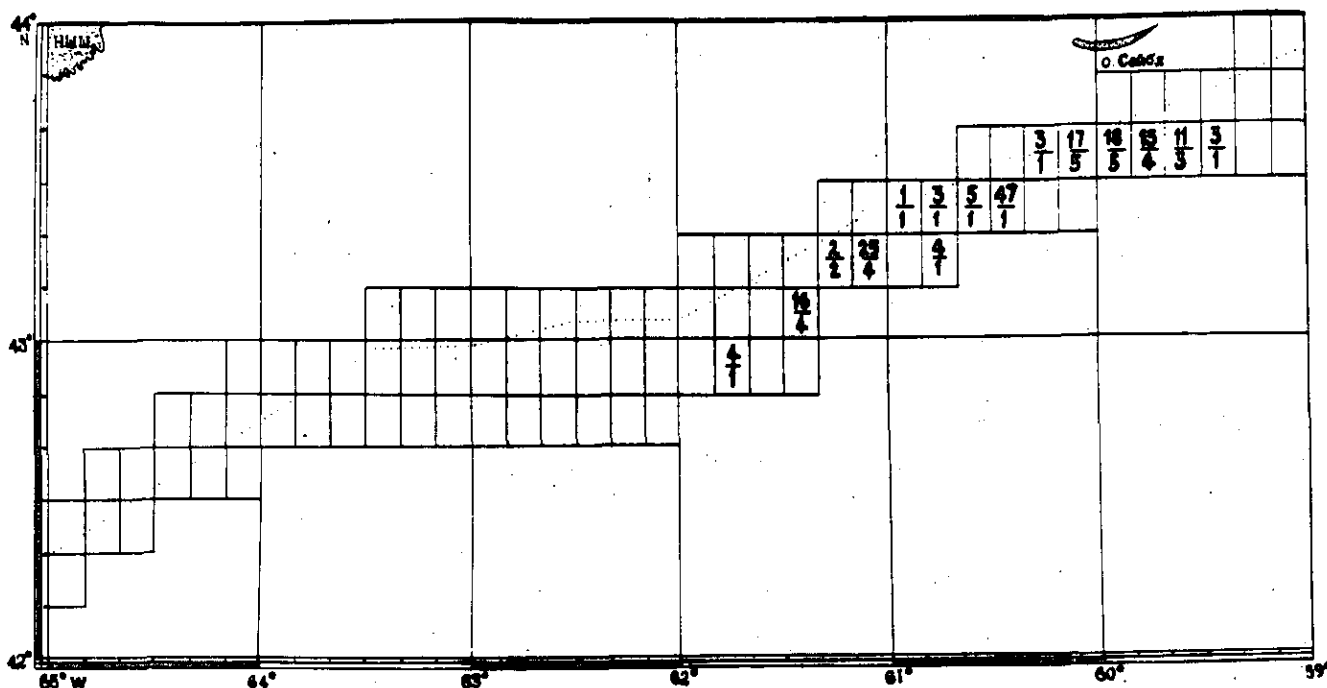


Fig. 11. Distribution of flounders catches-per-an-hour (kg) in June 1991.

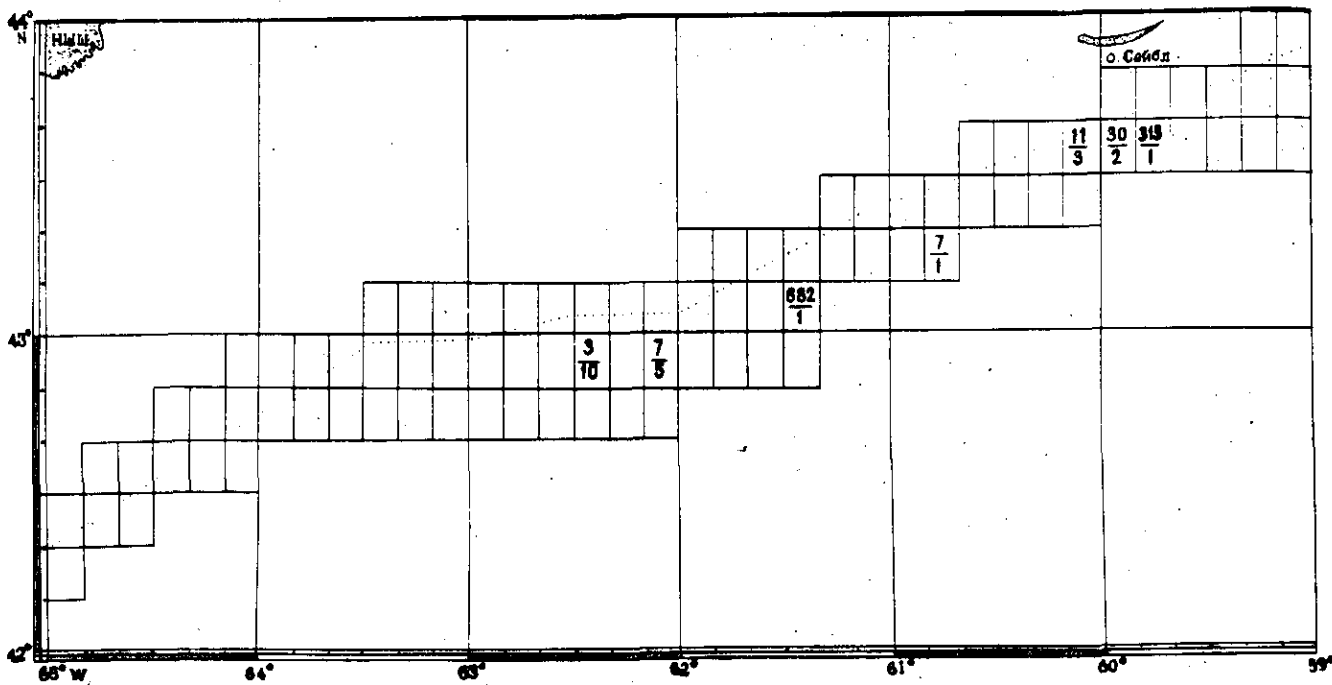


Fig. 12. Distribution of herring catches-per-an-hour (kg) in May 1991.

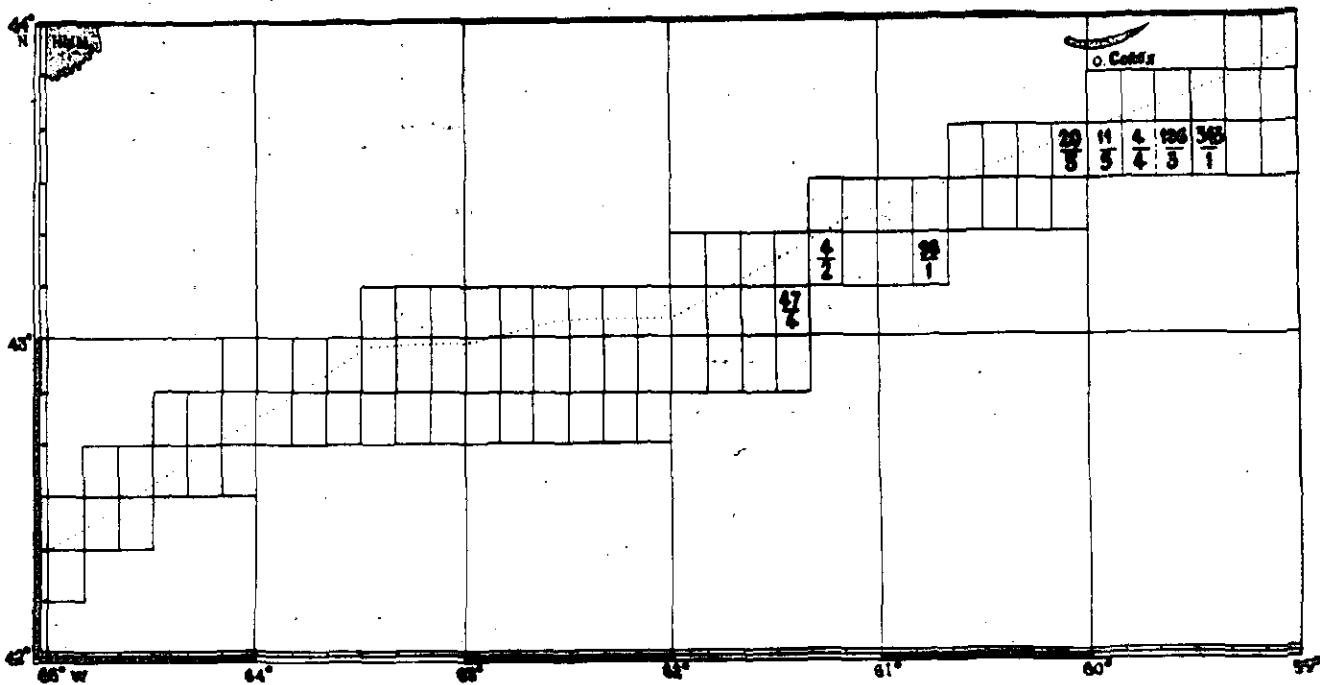


Fig. 13. Distribution of herring catches-per-an-hour (kg) in June 1991.

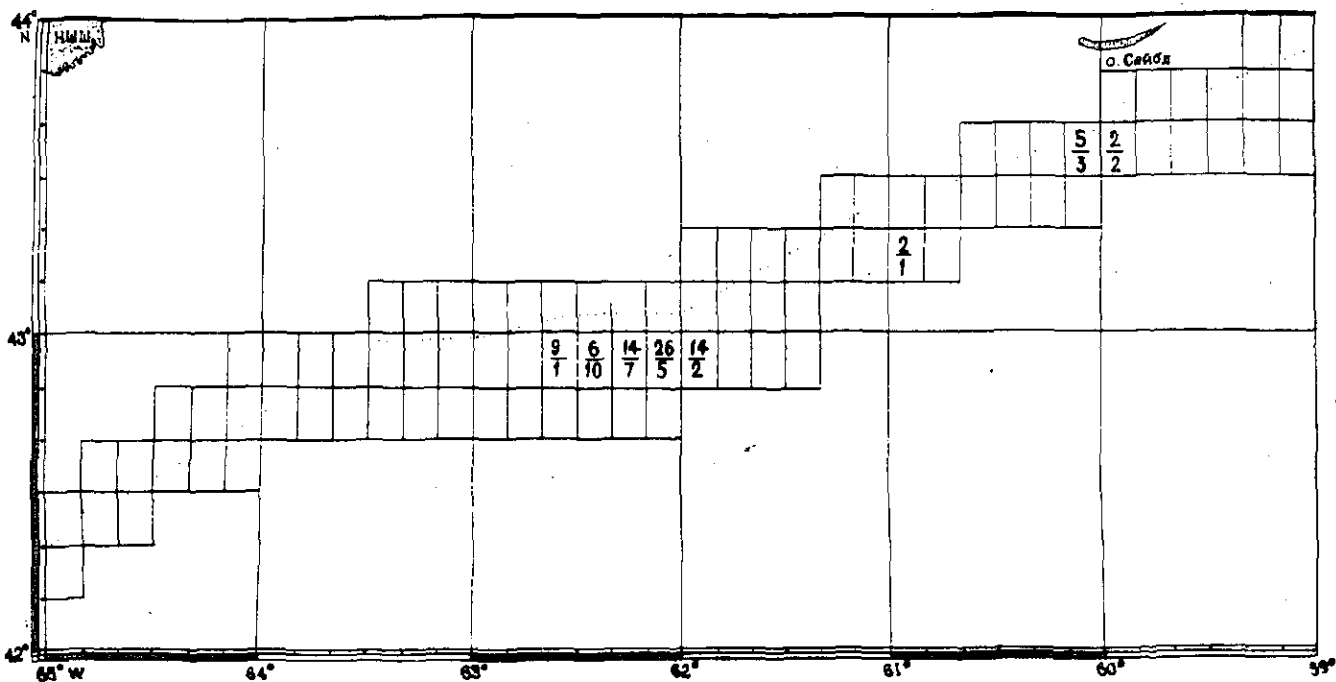


Fig. 14. Distribution of squid catches-per-an-hour (kg) in May 1991.

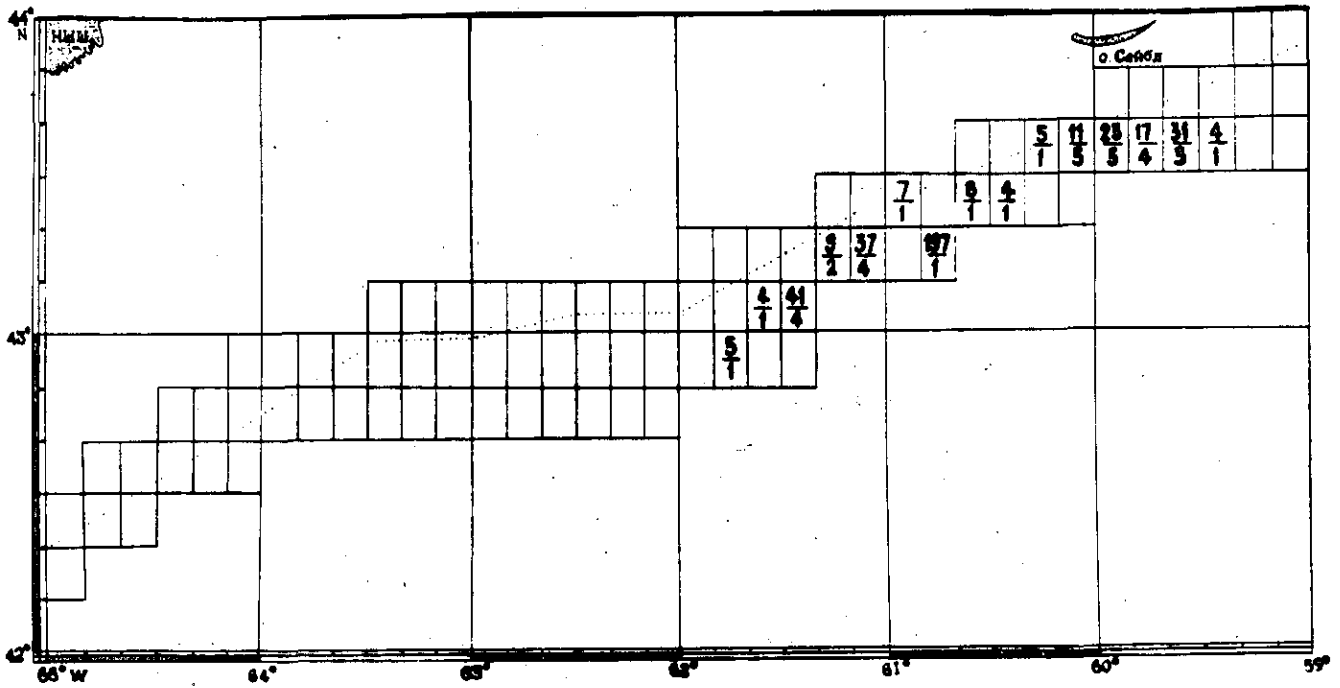


Fig. 15. Distribution of squid catches-per-an-hour (kg) in June 1991.