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Russian Research Report for 2002

Part I - Research carried out by AtlantNIRO in NAFO Subarea 4
Part II - Research carried out by PINRO in NAFO Subareas 1, 2, 3 and 4

PART I.

Research carried out by AtlantNIRO in NAFO Subarea 4

By

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A. Status of the Fisheries

In 2002 Russian silver hake fishery was carried out by one mid-tonnage vessel (TSM) southwards of SMGL during March-June inclusive mainly in Div. 4W. The mean catch per fishing day amounted to 30.6, 32.6, 25.6 и 20.9 t in March, April, May and June respectively, while the total catch according to preliminary data was about 2300 t. Judging from the fishery results, the dense hake aggregations at the slope of the Nova Scotia shelf retained actually during the whole period.

Apparently in 2004 a noticeable reduction of fishable hake biomass should be expected as compared to the level of 2002, since according to Canadian survey data (DFO, 2002), and oceanographic researches carried out by AtlantNIRO, the year-classes of 2000, 2001 and 2002 constituting the fishery basis, are assessed as weak or at least average in size.

B. Special Researches

1. Environmental researches

a) Hydrographic studies

In 2002 monitoring of sea surface temperatures at 13 selected points located on the shelf of Labrador, Newfoundland, Nova Scotia and adjacent ocean areas (Fig.1) and of hydrological fronts dynamics from the area southwards of the New England shelf and Nova Scotia shelf between 55° and 70° W was continued.

The analysis of mean monthly SST anomalies evidences that during most part of the year water temperature in the adjacent areas of the Labrador Sea and North-Atlantic current were higher than long-term mean for 1977-1996, but lower than in 2001 (points 2, 3, 5 on Fig. 1). In some locations of the Labrador Current (points 1, 4, 6) the seasonal trend of temperature was of unsustainable sinuosity pattern with fluctuations above and below the norm. During most months SST in these areas was lower than in 2001. Eastwards of the Grand Bank and northwards of Flemish Cape Bank (points 7, 8) mean monthly SST values either exceeded the norm or were close to the long-term

mean. In the shallow area of the Grand Bank (point 9) SST was close to the norm and similar to that of 2001 both in the seasonal trend pattern and in value. During 2002 both positive and negative SST anomalies were observed in the eastern self of the Nova Scotia (point 10). Similar to 2001 SST reduction was observed in this area from January to May with subsequent increase up to August and gradual decrease by December. At the same time mean monthly SST in winter and spring exceeded the level of 2001, while summer and autumn values were significantly lower than in 2001. On the contrary, at the Scotian shelf slope and seawards in the Slope water mass (points 11, 12) SST values were mostly higher than long-term mean and higher than in 2001. In the area near the Gulf Stream front (point 13) mean monthly SST were higher than the norm and close to these in 2001, while in winter period these significantly exceeded the level of 2001. Therefore, sea surface temperature in the most areas selected remains higher than the norm or close to it. At the same time the trend to SST reduction continues on the shelf.

In 2002 the boundaries of 3 water masses (the Cool shelf water mass, the Slope water mass, and the Northern edge of Gulf Stream front) were most often shifted northwards of their mean monthly location, with the exception of the Gulf Stream front in the area of 'New England' (66°-70°W), where its northern boundary was shifted southwards of the mid-line during the year.

The more detailed description of hydrological conditions in 2002 will be presented in a special report.

C. Miscellaneous Studies

The analysis of TAC value correspondence to the status of the following stocks - 2+3KLMNO Greenland halibut, 3M beaked redfish, 3LNO American plaice, 3LNO yellowtail flounder, 2J3KL, 3NO, 3M cod and 4VWX silver hake – was carried out. The series of TACs, abundance indices of trawling surveys and estimates based on the analytical methods for the period 1973 - 2000 inclusive were used as the basic data. Introduction of the stock status categories compared to the actual TACs in respective years became the methodic basis of the retrospective analysis. In most cases the correlation between the values considered was weak. This required searching the ways of TAC accuracy improvement in terms of their better correspondence to the fish population status.

The results allowed to propose a new approach for TAC prediction a year in advance, based on the conservative property of the stock status categories and conventionally named the “Conservative Approach” (CA) The examples were presented of the latter application in practice and the terms of this application were determined. It could be assumed that if appropriate terms are observed, CA application will reduce probability of gross errors in TAC assessment for a year in advance.

A detailed description of the researches performed is presented in SCR Doc., submitted to this Scientific Council meeting.

References

DFO, 2002. Updates on Selected Scotian Shelf Groundfish Stocks in 2002. DFO Sci. Stock Status Report A3-35 (2002).

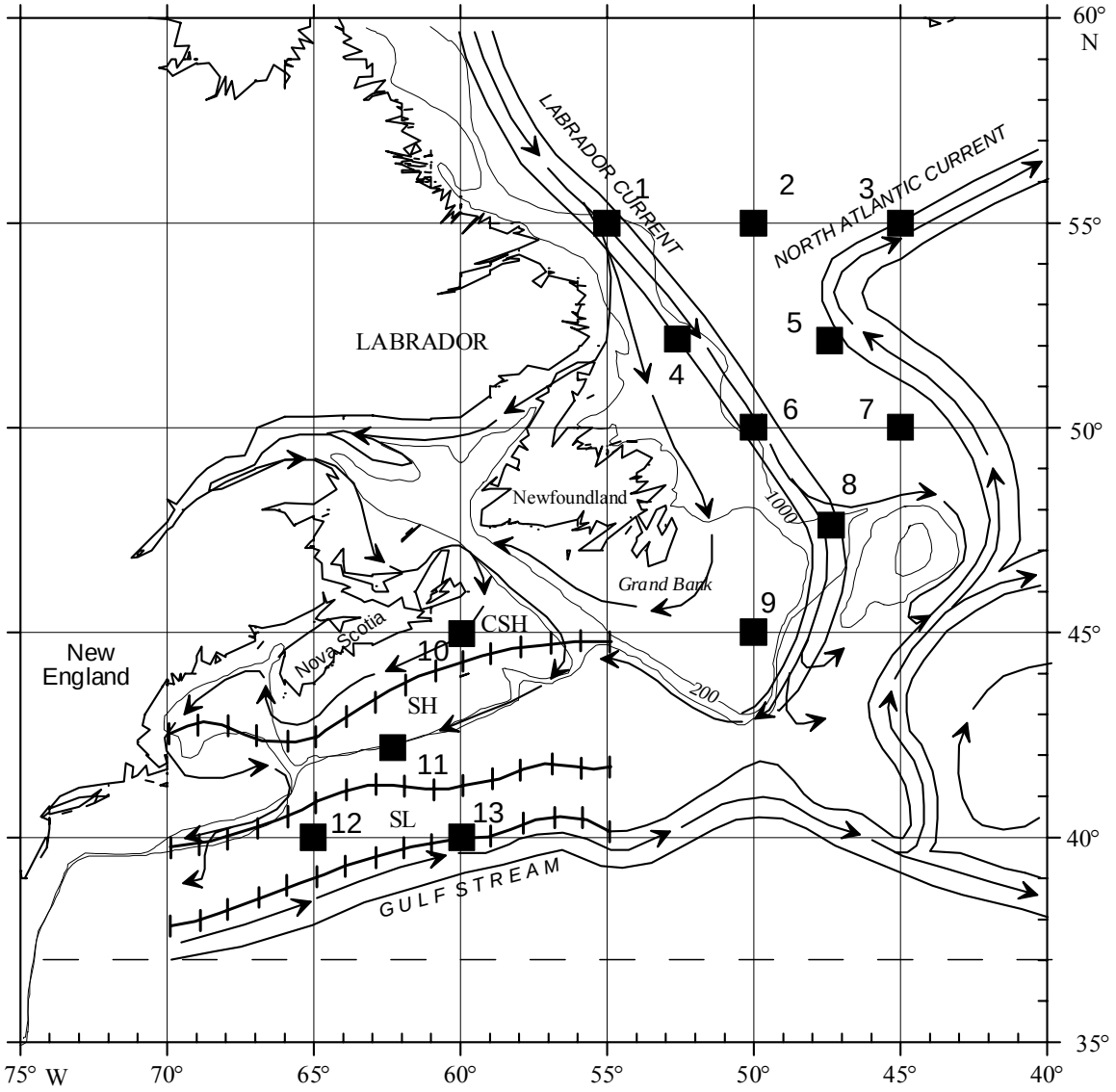

Fig.1. Map of SST monitoring at 13 points and water masses boundaries dynamics in the Labrador Current system and Gulf Stream. CSH – the Cold shelf water mass, SH – the Warm shelf water mass, SL – the Slope water mass.

Part II - Research carried out by PINRO in NAFO Subareas 1, 2 , 3 and 4

by

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Subareas 1 and 2

A. Status of fishery

Greenland halibut. In 2002, in the area of the West Greenland, Russian quota for Greenland halibut amounted to 1100 t. The fishery was executed at 700-1500 m depth, from August to December.

Participating in fishery were three trawlers and one long-liner. The mean daily catch rate of the trawlers was about 8 t, of the long-liner – 0.5 t.

According to the preliminary data, in the area, the total catch of halibut equaled to 933 t (Table 1).

Redfish. In Divs. 1F, 2J, Russian fishery of pelagic beaked redfish was carried out in July-October, at the depth of 240-380 m. It was executed by 1-7 vessels of the different types. The vessels operated with the highest catch rate in August-September, when the catch amounted to 20.5-22.0 t per a fishing-day. According to the preliminary data, in the NAFO Regulatory Area, the total catch of pelagic redfish was estimated at 7677 t, of which 2857 t were caught in Div. 2J.

The other fish species. There was no specialized fishery of the other fish species. The by-catch of grenadier, skate and wolffishes in specialized fishery of halibut was equal to 1%.

B. Special Investigations

Greenland halibut. Biological data were collected by one fishing vessel from 13 August to 6 September. In Div. 1A, the halibut length varied from 20 to 100 cm, the mean length of males amounted to 45.4 cm, of females – to 51.2 cm (Table 2). In catches, the modal length of individuals was 38-46 cm, with the sex ratio of 1:1. In Div. 1D, recorded were the larger halibut, as long as 28-105 cm, with 49.2 cm average size of males and 56.8 cm – of females and the modal length of 44-50 cm. The number of males was greater than females in 1.8 times.

In Divs. 1AD, halibut age varied from 2 to 18 years, the individuals aged 5-7 years prevailed (Table 3).

Investigated fish were, mainly, immature.

Redfish. While fishing, the biological data on beaked redfish in Div. 1F, 2J were collected by the specialists from PINRO working as NAFO observers aboard the five fishing vessels.

The length of 56 193 individuals was measured, feeding and maturity of 5 076 fish were analyzed, the age of 890 specimens was determined. In Div. 1F, in the catches, the redfish length varied from 23 to 45 cm, the average one equaled to 34.5 cm (Table 4). The bulk of the catches was made up by the individuals 34-36 cm in length, at the age of 13-15 years (Table 5). The sex ratio was 1.3:1. About 11% of fish were immature. The redfish fed moderately. The mean index of stomach fullness amounted to 1.1. The food ration, primarily, consisted of zooplankton: *Calanus* and *Themisto*.

In Div. 2J, the mean length of the redfish was equal to 34.6 cm. Catches were, mainly, consisted of the individuals as long as 34-36 cm, aged 13-15. The sex ratio was 1.9:1. The portion of immature fish amounted to 18%. The

redfish fed moderately. Mean index of stomach fullness was estimated at 1.1. Predominating in feeding were *Calanus*, euphausiids, *Themisto*.

Subarea 3

A. Status of fishery

Greenland halibut. In 2002, in Div. 3LMNO, the Russian Greenland halibut quota amounted to 4 157 t. During the year, 1-6 vessels performed specialized fishery. Halibut occurred in by-catches while harvesting redfishes, skates and red hake. In 2002, the Russian catch of Greenland halibut amounted to 3 482 t (Table 1).

The fleet operated in the continental shelf areas adjacent to the deep-water Flemish Pass (Div. 3L and the adjacent areas) at the depth of 300-1 800 m. The average catch rate was equaled to 0.3 t of halibut per a fishing hour. In that area, 89% of halibut caught were taken. Occurred in the catches were: grenadiers – 3, redfishes – 3, red hake – 2, American plaice – 1, skates – 1 and other fish species – 1%.

Redfish. In 2002, on the Flemish Cap Bank, the specialized fishery of redfishes took place from May to August. The Russian vessels fished redfish on the south and south-west slopes of the bank, at the depth of 300-550 m. The main catch of redfish was taken in July. On the whole, in the period of fishery, the catch rate of the vessels ranged from 7.8 t to 10.6 t per a fishing day. The by-catches were made up by Greenland halibut, American plaice, cod and wolffishes. According to the preliminary data, the catch of redfish was estimated at 1 155 t.

In Div. 3O, redfish were fished from January to December. Vessels worked at 300-600 m depth. Red hake, American plaice and cod prevailed in by-catches while harvesting redfish. As a whole, in the period of fishery, the catch rate of the vessels ranged from 16.5 t to 21.0 t per a fishing day. In compliance with the preliminary data, the total catch of redfish equaled to 11 182 t.

Skates. In Divs. 3NO, specialized fishery of skates was executed by the two vessels (1 000-2 000 kW). The main catch was taken in Div. 3N at 50-200 m depth. Thorny skate (*Raja radiata*) was a main object to be fished. In Div. 3NO, the total catch of skates was estimated at 3 052 t. As a whole, in a specialized fishery, the catch rate amounted to 22.3 t per a fishing day.

In Div. 3LM, the skates were only registered as by-catches in fishing halibut.

By preliminary data, in Div. 3LMNO, the total catch of skates was estimated at 3 165 t.

White hake. In Div. 3O, specialized fishery for the white hake took place from June to October. The two vessels (1 000-2 000 kW) worked at 140-400 m depth. As a whole, in the period of fishery, the capacity of the amounted to 15.2 t per a fishing day. In Div. 3O, the preliminary catch of the white hake was equal to 1 060 t.

Other fish species. There was no specialized fishery for the other fish species. During the specialized fisheries the by-catch of the other fish species equaled to 1-10%.

B. Special Investigations

Hydrographic observations were made aboard RV "Remøyfjord". In all, 31 hydrographic stations were made within the depth range of 130-1075 m (Fig. 1).

Vertical distribution of water temperature in the section along 47°N (Fig. 2) shows the variation of temperature within the range from 5°C at the surface to 3.5°C at 100-150 m depth. In the section, the bottom temperature fluctuated from 3.4°C to 3.9°C. The salinity varied from 34.3 in the surface layers to 34.9 near the bottom and at the depth of over 400 m (Fig. 2).

In the surface layer, water temperature gradually increased from the north-west (3.0°C) to the south-east (6.7°C) (Fig. 3). Salinity distribution on the surface was of more complicated character due to the precipitation and winds.

On the surface, the salinity varied within the range of 33.6-34.5. The waters with higher salinity were located in the eastern area (Fig. 3).

At 100 m horizon, as well as on the surface, the temperature increased from the north-west (2.7°C) to the south-east (4.8°C) (Fig. 3). There, the minimal values of salinity were registered in the central area of the bank.

In the bottom layer, the variations of temperature were negligible – from 3.3°C to 3.9°C. At every station with the depth of over 900 m, the bottom temperature was 3.3-3.5°C. The minimal values of salinity – 34.4 -were recorded in the shallow bank, at the depth of under 200 m.

The comparative analysis of water temperature distribution in the Flemish Cap area for 2002 and 2001 showed the following peculiarities:

- in 0-50 m, 0-100 m, 0-200 m layers, to the north of 47°N, the mean temperature was higher by 0.2-0.6°C, than in 2001;
- in the section along 47°N, water temperature and salinity practically remained unchanged in all the layers;
- in the section along 46°30', in 0-50m, 0-100 m, 0-200 m, the water temperature was higher by 1.9-2.2°C, than in 2001, the salinity – lower, than the last year one by 0.3-0.4;
- in the layers under 300 m, the values of temperature and salinity negligibly differed from the last year ones;
- in the bottom layer, over all the bank area, the values of water temperature and salinity, practically, remained unchanged;
- in 2002, found was the lack of the zone with higher horizontal gradients of temperature and salinity, which was recorded from the surface to 300m horizon in the southern part of the bank in 2001.

In the period from 31 May to 10 June 2002, the multispecies trawl research survey was conducted aboard RV "Remøyfjord" in Div. 3M. In Div. 3LMNO, in the fishery, the biological information was collected by the observers from PINRO aboard the fishing vessels.

Length and age composition of bottom fish species mentioned in the present paper relate to measured individuals from the catches.

Greenland halibut. In Div. 3M, the stock status was estimated by the results from the trawl research survey in May-June. The halibut occurred in the catches at 127-1280 m depth. In the strata surveyed with the area of 15.8 x 10^2sq.miles, the index of abundance was equal to 10.1 x 10^6ind., the biomass – to 9.8 x 10^3t.

In April-May and in June-September, aboard one of the fishing vessels, conducted were the investigations to estimate a comparative selectivity of the trawl bags with 130, 136, 145 and 149 mm mesh size in the fishery for Greenland halibut.

In Div. 3LMNO, in the catch of fishing vessels, occurred was the halibut 12-96 cm in length with the average one of 44.4 cm (Tables 6-9). Individuals from 42-44 cm length groups, aged 6-7, from the 1995-1996 year-classes, prevailed (Table 10). Small immature fish made up the bulk of the catch. The by-catch of the undersized halibut (30 cm) was less than 0.9%.

Roughhead grenadier. The species was one of the most abundant by-catch object in the fishery for Greenland halibut. In Div. 3L, in the catch, the total length of the roughhead grenadier varied from 24 to 90 cm, the mean length was equal to 42.8 cm (Table 11).

In Div. 3M, the roughhead grenadier with the length of 27-90 cm occurred. In Div. 3N, the fish length varied from 24 to 84 cm.

As a whole, in Divs. 3LMNO, the bulk of catches was made up by fish 39-45 cm in length.

Redfish. In Div. 3L, while fishing halibut, in by-catch,, the length of redfish varied from 19 to 45 cm, the mean length was 31.1 cm (Table 12). Predominating were the individuals with the length of 31-33 cm.

By the results from the trawl research survey conducted in May-June 2002, on the Flemish Cap Bank, the total abundance of redfishes from genus *Sebastes* amounted to 71.2 x 10^6 individuals, the biomass – to 7.8 x 10^3t. The research was performed in the area of 15 760 miles^2 to 1280 m depth, according to the area stratification adopted by NAFO.

In Div. 3M, the redfish size distribution combining the data on by-catch and from the special fishery, fluctuated from 8 to 41 cm (Table 13), fish age varied from 2 to 16 (Table 14). The bulk of catch was made up by fish 28-30 cm in length.

The length distribution of redfish from Div. 3N was characterized by fish 17-44 cm in length with the mean size of 30.0 cm (Table 15). Redfish with the length of 33-35 cm predominated in catch.

In Div. 3O, redfish length varied from 11 to 52 cm, the average size was 24.1 cm (Table 16). Fish as long as 23-24 cm, aged 7-8, made up the bulk of catch (Table 17).

American plaice. Table 18 presents the length characteristics of American plaice by divisions.

In Div. 3L, American plaice length distribution was characterized by fish as long as 25-54 cm. The individuals 38-39 cm in size prevailed.

In Div. 3N, fish length fluctuated from 22 to 70 cm, the average one was 42.0 cm.

In Div. 3O, when fishing skate, the length distribution of American plaice varied from 22 to 72 cm, the mean length equaled to 40.3 cm. The individuals 42-43 cm in length were predominating.

In Subarea 3, the American plaice with 30-72 cm length occurred.

Witch flounder. The length of fish caught in Divs. 3LMNO varied from 22 to 58 cm, the mean size was 39.6 cm (Table 19). The bulk of catch was made up by fish 38-39 cm in length.

Yellowtail flounder. Biological data were collected in the period of fishing skates, in Div. 3N. The length of caught fish varied from 24 to 55 cm, the mean length was 36.8 cm (Table 20). Fish 36-39 cm in size were predominating in catches.

Cod. In Div. 3L, in the by-catch to halibut, the length of cod fluctuated from 27 to 87 cm, the mean length was equal to 46.5 cm (Table 21). Mature individuals with 42-49 cm length prevailed in catch.

On the Flemish Cap Bank, a negligible number of cod 42-102 cm in length was taken in the fishery for redfish.

The largest cod were registered in Div. 3N. The length distribution varied from 33 to 123 cm, the average size was 60.5 cm.

In Div. 3O, the cod length varied from 30 to 135 cm, the average length was 56.4 cm. The individuals with 51-55 cm length made up the bulk of catch.

Red hake. This fish occurred in by-catch in special fishery for halibut. The length of fish investigated in Div. 3L fluctuated from 21 to 51 cm, the average one was 36.7 cm (Table 22). Catch was, mainly, represented by individuals with 33-38 cm size.

In Div. 3M, the length of fish was from 15 to 48 cm.

White hake. The main catch of that species was taken in Div. 3O. In the area, fish length fluctuated from 18 to 108 cm, the mean one was equal to 49.9 cm (Table 23). Individuals with the length of 45-50 cm made up the bulk of the catch.

Thorny skate. They occurred in catch in every division and layer. In Div. 3L, the length of skate varied from 30 to 96 cm, the average length equaled to 50.3 cm (Table 24).

In Div. 3N, the length of taken individuals varied from 30 to 102 cm with the mean one of 57.5 cm. In the catch, the individuals 51-59 cm in length were prevailing.

In Div. 3O, the length of thorny skate fluctuated from 36 to 93 cm, the mean one equaled to 61.5 cm.

Spinytail skate. In Div. 3LMNO, the fish length fluctuated from 39 to 177 cm under the average one of 82.7 cm (Table 25).

Other fish species. In the period of fishery, the by-catch was represented by halibut, common grenadier, wolffishes, roundnose grenadier, spiny eels, longfin cods and others.

Subarea 4

A. State of fishery

Silver hake. In March-June, the one trawler fished silver hake on the commercial quota of a Canadian company. The vessel operated in Div. 4W at 100-300 m depth. Mean daily catch rate was 28.7 tons. The portion of hake in catches attained 99-100%. Herrings, spiny dogfish, alewife, red hake and butterfish occurred in by-catch. The catch of silver hake in Div. 4W was preliminarily estimated as 2499 tons (Table 1).

B. Special Investigations

No environmental research or hydrographic observations were conducted.

Biological data in Div. 4W were collected by a PINRO observer working onboard a fishing vessel.

Silver hake. The length of silver hake in Div. 4W ranged from 19 to 39 cm. Mean length was 26.5 cm (Table 26). The fishery was based on aggregations of mature fish, the percentage of which was 78 %.

TABLE 1. Preliminary data on catch taken by Russian trawlers in NAFO SA 1-4 in 2002.

Species	Division	Catch, t
Greenland halibut	1A	273
	1C	98
	1D	562
	1ACD	**933**
	3L	2912
	3M	188
	3N	369
	3O	13
	3LMNO	**3482**
Atlantic halibut	3L	1
	3N	6
	3O	6
	3LMNO	**13**
American plaice	3L	49
	3M	4
	3N	159
	3O	192
	3LMNO	**404**
Yellowtail flounder	3N	101
	3O	2
	3LNO	**103**
Witch flounder	3L	15
	3M	4
	3N	36
	3O	76
	3LMNO	**131**
Grenadier spp.	3L	146
	3M	13
	3N	68
	3O	1
	3LMNO	**228**
Redfish spp.	1F	4820
	2J	2857
	1F2J	**7677**
	3L	94
	3M	1155
	3N	25
	3O	11182
	3LMNO	**12456**
Skate	3L	105
	3M	8
	3N	2731
	3O	321
	3LMNO	**3165**
Atlantic cod	3L	3
	3M	1
	3N	112
	3O	226
	3LMNO	**342**
Haddock	3N	5
	3O	25
	3NO	**30**
Wolffish spp.	3L	7
	3MN	32
	3O	13
	3LMNO	**52**
Red hake	3L	72
	3M	9
	3N	93
	3O	46
	3LMNO	**220**
White hake	3O	1060
Silver hake	**4W**	**2499**

TABLE 2. Length composition of Greenland halibut trawl catch (no. of indivs.) in NAFO Div. 1AD in 2002.

Length, cm	Div. 1A			Div. 1D			Divs. 1AD		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
20	9	11	20				9	11	**20**
22									
24		11	11					11	**11**
26	31		31				31		**31**
28	19	28	47	7		7	26	28	**54**
30	47	9	56		20	20	47	29	**76**
32	69	52	121	39	7	46	108	59	**167**
34	170	69	239	7	14	21	177	83	**260**
36	105	86	191	171	65	236	276	151	**427**
38	244	209	453	341	115	456	585	324	**909**
40	393	196	589	871	378	1249	1264	574	**1838**
42	478	291	769	1567	563	2130	2045	854	**2899**
44	376	252	628	2469	837	3306	2845	1089	**3934**
46	300	317	617	3225	1163	4388	3525	1480	**5005**
48	204	135	339	3064	1016	4080	3268	1151	**4419**
50	101	234	335	2825	1057	3882	2926	1291	**4217**
52	136	124	260	2036	827	2863	2172	951	**3123**
54	101	128	229	1795	822	2617	1896	950	**2846**
56	41	129	170	812	387	1199	853	516	**1369**
58		72	72	517	333	850	517	405	**922**
60	28	129	157	380	449	829	408	578	**986**
62	39	93	132	234	363	597	273	456	**729**
64	77	77	154	195	360	555	272	437	**709**
66	39	9	48	129	307	436	168	316	**484**
68	42	20	62	86	230	316	128	250	**378**
70	22	86	108	66	262	328	88	348	**436**
72	30	53	83	7	268	275	37	321	**358**
74	9	33	42	28	196	224	37	229	**266**
76	19	22	41		130	130	19	152	**171**
78		33	33		217	217		250	**250**
80	11	30	41		144	144	11	174	**185**
82		51	51		141	141		192	**192**
84		18	18		96	96		114	**114**
86		33	33		147	147		180	**180**
88					54	54		54	**54**
90		19	19		109	109		128	**128**
92					75	75		75	**75**
94		9	9		84	84		93	**93**
96					34	34		34	**34**
98					45	45		45	**45**
100					21	21		21	**21**
102					22	22		22	**22**
104					6	6		6	**6**
Total	**3140**	**3068**	**6208**	**20871**	**11364**	**32235**	**24011**	**14432**	**38443**
Av. length, cm	**45.4**	**51.2**	**48.3**	**49.2**	**56.8**	**51.9**	**48.7**	**55.6**	**51.3**

TABLE 3. Age composition of Greenland halibut trawl catch (no. of indivs.) in NAFO Div. 1AD in 2002.

Length, cm	Age																		Weight, g
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	NN	
20	2																	**2**	**51.5**
22																			
24		2																**2**	**92.5**
26		5																**5**	**106.0**
28		13																**13**	**138.3**
30		10	8															**18**	**173.9**
32		9	14															**23**	**249.0**
34			45															**45**	**299.5**
36			54	32														**86**	**324.7**
38			51	111														**162**	**464.1**
40				277	18													**295**	**539.1**
42				231	231													**462**	**637.2**
44				153	458													**611**	**714.7**
46				48	624	96												**768**	**780.6**
48					333	333												**666**	**999.6**
50					33	597												**630**	**1144.5**
52					49	394	25											**468**	**1240.0**
54					29	257	143											**428**	**1349.7**
56						66	144											**210**	**1563.1**
58						22	55	66	11									**153**	**1798.9**
60							26	103	17									**146**	**2077.1**
62							9	51	60									**120**	**2287.9**
64							7	51	59									**117**	**2425.0**
66							10	5	60	10								**85**	**2820.0**
68								4	36	36								**76**	**3029.7**
70										57	7	4						**68**	**3453.7**
72									5	32	23							**59**	**3984.6**
74										29	12	3						**44**	**4132.0**

Table 3. continued.

76										10	17	3						**30**	**3903.9**
78										10	21	5						**36**	**4664.3**
80											16	16						**31**	**5775.0**
82											4	21	7					**32**	**5695.6**
84											9	14	3					**26**	**6464.4**
86												12	14					**26**	**7303.3**
88											1	1	7	3				**13**	**7967.8**
90													5	11	3			**19**	**8550.0**
92													6		6			**11**	**8655.0**
94													3	5	9			**17**	**10949.0**
96														3	1	1		**5**	**10415.0**
98														3	2	2		**6**	**10965.0**
100														1	2		1	**4**	**11720.0**
102																1	2	**3**	**12303.3**
104																1		**1**	**13125.0**
Total	**2**	**39**	**171**	**852**	**1776**	**1764**	**418**	**280**	**247**	**185**	**108**	**79**	**46**	**25**	**21**	**5**	**3**	**6022**	
%	**0.0**	**0.7**	**2.8**	**14.1**	**29.5**	**29.3**	**6.9**	**4.7**	**4.1**	**3.1**	**1.8**	**1.3**	**0.8**	**0.4**	**0.4**	**0.1**	**0.0**	**100.0**	

TABLE 4. Length composition of Redfish (indiv.) in catches by Russian travelers in the NAFO Div. 1F, 2J in 2002.

Length Cm	NAFO Div.						Total		
	1 F			2 J					
	Males	Females	Total	Males	Females	Total	Males	Females	Total
23	4	3	7	-	-	-	4	3	7
24	17	12	29	-	-	-	17	12	29
25	62	69	131	-	-	-	62	69	131
26	140	122	262	-	2	2	140	124	264
27	322	263	585	3	2	5	325	265	590
28	497	431	928	6	9	15	503	440	943
29	706	477	1183	15	12	27	721	489	1210
30	1111	818	1929	25	11	36	1136	829	1965
31	1527	1015	2542	32	25	57	1559	1040	2599
32	2332	1311	3643	35	16	51	2367	1327	3694
33	4028	1529	5557	85	18	103	4113	1547	5660
34	5828	2047	7875	100	26	126	5928	2073	8001
35	6459	3211	9670	110	23	133	6569	3234	9803
36	3924	3705	7629	78	48	126	4002	3753	7755
37	2499	3863	6362	49	52	101	2548	3915	6463
38	1387	2718	4105	27	41	68	1414	2759	4173
39	604	1265	1869	13	14	27	617	1279	1896
40	173	531	704	7	8	15	180	539	719
41	54	158	212	2	4	6	56	162	218
42	13	40	53	1	3	4	14	43	57
43	2	6	8	-	-	-	2	6	8
44	1	5	6	-	-	-	1	5	6
45	1	1	2	-	-	-	1	1	2
No	**31691**	**23600**	**55291**	**588**	**314**	**902**	**32279**	**23914**	**56193**
Average length, cm	**34,1**	**35,1**	**34,5**	**34,3**	**35,2**	**34,6**	**34,3**	**35,4**	**34,8**

TABLE 5. Redfish age composition (indiv.) in the NAFO Div. 1F, 2J in 2002.

Age, Years	NAFO Div.						Total		
	1 F			2 J					
	Males	Females	Total	Males	Females	Total	Males	Females	Total
6	8	7	15	-	-	-	8	7	15
7	231	202	433	1	2	3	232	204	436
8	469	428	897	4	7	11	473	435	908
9	591	341	932	9	7	16	600	348	948
10	1114	686	1800	24	15	39	1138	701	1839
11	2516	1719	4235	47	32	79	2563	1751	4314
12	4434	2559	6993	83	32	115	4517	2591	7108
13	8176	2317	10493	147	27	174	8323	2344	10667
14	6312	4619	10931	113	48	161	6425	4667	11092
15	6003	6517	12520	116	83	199	6119	6600	12719
16	1191	2692	3883	24	38	62	1215	2730	3945
17	569	1364	1933	15	18	33	584	1382	1966
18	72	130	202	3	5	8	75	135	210
19	4	12	16	-	-	-	4	12	16
20	1	4	5	-	-	-	1	4	5
21	1	1	2	-	-	-	1	1	2
Total	**31692**	**23598**	**55290**	**586**	**314**	**900**	**32278**	**23912**	**56190**

TABLE 6. Greenland halibut length composition (no. of individuals) of the Russian trawlers catch by months in the NAFO Div. 3L in 2002.

Length, cm	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Total 3L
20							2						**2**
22				1		2	10						**13**
24		3		1		6	20	5					**35**
26		7	3	3	6	15	41	9	2				**86**
28	14	86	38	5	6	27	57	13			7	9	**262**
30	35	228	159	30	50	42	92	28			35	17	**716**
32	72	490	358	76	170	124	195	48	19	3	28	24	**1607**
34	90	517	407	150	330	211	300	110	40	5	141	41	**2342**
36	171	776	554	153	470	310	363	192	78	7	174	110	**3358**
38	295	1286	774	361	748	446	480	258	122	24	223	169	**5186**
40	415	1757	1109	577	1115	562	663	332	205	45	324	281	**7385**
42	478	1773	1026	675	1410	675	758	330	229	66	253	245	**7918**
44	484	1554	951	696	1371	676	698	226	251	132	248	235	**7522**
46	409	1240	696	503	1310	497	446	172	200	142	155	222	**5992**
48	280	823	522	340	914	408	341	107	146	122	72	112	**4187**
50	218	532	374	261	714	349	237	68	87	95	23	62	**3020**
52	104	289	177	138	436	190	130	34	42	81	25	25	**1671**
54	63	132	92	73	273	119	96	15	27	44	5	10	**949**
56	18	54	56	32	167	78	46	8	17	19	2	4	**501**
58	10	27	27	19	83	33	21		8	28		1	**257**
60	8	24	15	12	58	25	16	3	1	10		2	**174**
62	4	11	17	6	50	16	11		3	10	1	1	**130**
64	6	9	6	10	26	10	7	1	1	6			**82**
66	3	8	1	5	22	6	3		2	3			**53**
68	2	4	5	2	23	1	2		1	1			**41**
70	2	6	6	4	14	5	3					1	**41**
72	4	3	7	2	10	2	1			2			**31**
74	1	4	1		5	2	4						**17**
76		2	2	1	7	3	1	1					**17**
78		3	4	1	8		1						**17**
80		4	2		6	5	2						**19**
82	1	2		1	4	1	2	1					**12**
84	1		1		2	3	1						**8**
86					3	4	2						**9**
88				2	2		3						**7**
90		1	1			1							**3**
92				1	1								**2**
94							3						**3**
96					1								**1**
Total	**3188**	**11655**	**7391**	**4141**	**9815**	**4854**	**5058**	**1961**	**1481**	**845**	**1716**	**1571**	**53676**
Av. length, cm.	**43.7**	**42.4**	**42.3**	**43.9**	**44.9**	**43.9**	**42.4**	**41.6**	**44.0**	**48.1**	**41.1**	**42.7**	**43.2**

TABLE 7. Greenland halibut length composition (no. of individuals) of the Russian trawlers catch by months in the NAFO Div. 3M in 2002.

Length, cm	Month								Total 3M
	II	III	IV	V	VI	VII	VIII	XII	
28	1								**1**
30	5	2		1					**8**
32	9	2		10	3	1		4	**29**
34	14	12	10	21	6	7		1	**71**
36	74	10	16	31	19	7	1	7	**165**
38	91	23	62	47	32	19	4	12	**290**
40	157	55	107	101	41	64	6	48	**579**
42	177	41	168	174	84	141	13	83	**881**
44	185	16	265	221	104	223	19	98	**1131**
46	265	27	228	259	111	368	28	134	**1420**
48	247	30	227	251	119	387	35	95	**1391**
50	221	12	212	232	121	447	40	74	**1359**
52	151	4	115	140	119	403	41	46	**1019**
54	103	1	77	94	56	210	37	11	**589**
56	70	2	44	62	68	170	32	18	**466**
58	52	1	23	32	24	100	25	9	**266**
60	25		14	15	14	54	11	4	**137**
62	17	1	12	12	14	37	5	1	**99**
64	13	1	12	5	12	18	6		**67**
66	10	1	8	2	9	7	1		**38**
68	4		3	4	6	6	1		**24**
70	3		3	5	5	5	4	1	**26**
72	5		2	1	1	3			**12**
74	3		5	1	5	1			**15**
76	1		2	3	3				**9**
78	2		2	2	4	1			**11**
80			3	3	2				**8**
82		1	1	1					**3**
84	1		3	1	1				**6**
86			1	2	1				**4**
88					1				**1**
90		1	1		1				**3**
92			1	1					**2**
94									
96	1				1				**2**
Total	**1907**	**243**	**1627**	**1734**	**987**	**2679**	**309**	**646**	**10132**
Av. length, cm.	**47.6**	**43.6**	**47.9**	**47.9**	**49.8**	**50.3**	**52.0**	**46.8**	**48.6**

TABLE 8. Greenland halibut length composition (no. of individuals) of the Russian trawlers catch by months in the NAFO Div. 3N in 2002.

Length,	Month								Total
cm	I	II	III	V	VI	VII	VIII	XI	3N
18			1						**1**
20			2						**2**
22		1							**1**
24			1	1					**2**
26			1	3					**4**
28		1	9	3	2	1		1	**17**
30		11	8	16	9			5	**49**
32	5	22	13	87	32	5	2	20	**186**
34	5	31	24	145	60	5	4	29	**303**
36	17	64	54	174	78	10	8	62	**467**
38	45	164	168	194	95	31	19	86	**802**
40	65	243	230	294	139	60	55	123	**1209**
42	75	348	331	345	162	104	56	172	**1593**
44	69	296	390	307	141	111	82	209	**1605**
46	68	257	409	213	136	149	93	289	**1614**
48	45	181	379	163	128	137	66	317	**1416**
50	20	118	262	133	74	137	58	263	**1065**
52	13	88	190	73	43	80	26	202	**715**
54	11	30	135	35	26	83	12	125	**457**
56	7	19	49	18	12	43	14	96	**258**
58	2	12	29	16	3	27	6	44	**139**
60	2	10	11	7	4	17	3	19	**73**
62	4	6	17	6	3	7	5	16	**64**
64	2		12	4	4	16	5	6	**49**
66	1	9	14			3	4	6	**37**
68		6	14	3		8	2	4	**37**
70		4	11	2	1	6	5	5	**34**
72	1	3	7	1		9	4	3	**28**
74	1	4	3	2	2	7	3		**22**
76		3	5	2		6	5	3	**24**
78			10		1	6	1	4	**22**
80		1	2	1		2	1	1	**8**
82		1	2	2		5		2	**12**
84		3	2			4		1	**10**
86		2	2			4			**8**
88			3			2			**5**
90			1			1	1		**3**
92						1	1		**2**
94			1						**1**
Total	**458**	**1938**	**2802**	**2250**	**1155**	**1087**	**541**	**2113**	**12344**
Av. length, cm.	**44.6**	**44.9**	**47.0**	**43.0**	**43.7**	**50.0**	**47.9**	**47.9**	**46.0**

TABLE 9. Greenland halibut length composition (no. of individuals) of the Russian trawlers catch by months in the NAFO Div. 3O and 3LMNO in 2002.

Length,	Month											Total	Total
Cm	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	3O	3LMNO
12				1								**1**	**1**
14								1	1	1		**3**	**3**
16									2	3		**5**	**5**
18			1	1						1		**3**	**4**
20			4	15				1	2	2		**24**	**28**
22			7	27					4	3		**41**	**55**
24	1		2	12				3	12	18	1	**49**	**86**
26	2	1	10	4				6	13	24		**60**	**150**
28	4		14	3				5	15	18	1	**60**	**340**
30	1		13	5				1	7	21		**48**	**821**
32		1	5	1	1			4	8	12		**32**	**1854**
34	4	5	4	1				3	6	23	2	**48**	**2764**
36	4		1			1	1	3	4	15	1	**30**	**4020**
38	12	1	4	1			1	5	11	5		**40**	**6318**
40	17	5	2				8	5	4	12	1	**54**	**9227**
42	25	6	6			5	18	12	17	10		**99**	**10491**
44	22	3	3			4	22	25	14	17		**110**	**10368**
46	35	4	1		1	6	45	29	20	9		**150**	**9176**
48	25	4	4		1	7	35	28	28	10		**142**	**7136**
50	13	9	1			6	40	20	23	8	1	**121**	**5565**
52	14		3			8	26	19	21	11		**102**	**3507**
54	7	2				6	49	19	19	5		**107**	**2102**
56	4	2	2			5	12	12	10	6		**53**	**1278**
58	1	1	1		1	1	9	5	10	3		**32**	**694**
60	4	1	1			1	12	2	11	2		**34**	**418**
62	1	1	2			1	4	2	3	1		**15**	**308**
64	2	1					1	3	7	2		**16**	**214**
66	1		1			1	6	4	1	2		**16**	**144**
68	1						4	4	5	1		**15**	**117**
70			1				5	3	2			**11**	**112**
72	1						2	3	3			**9**	**80**
74							1	1	1			**3**	**57**
76								2	5			**7**	**57**
78								1	2			**3**	**53**
80							3		3	1		**7**	**42**
82							2		2			**4**	**31**
84								1	3	1		**5**	**29**
86													**21**
88								1				**1**	**14**
90													**9**
92									1			**1**	**7**
94													**4**
96	1											**1**	**4**
Total	**202**	**47**	**93**	**71**	**4**	**52**	**306**	**233**	**300**	**247**	**7**	**1562**	**77714**
Av. length, cm.	**46.2**	**46.0**	**35.2**	**23.8**	**46.5**	**50.5**	**51.9**	**49.0**	**47.3**	**37.9**	**35.6**	**45.1**	**44.4**

TABLE 10. Age composition of Greenland halibut catches in NAFO Div. 3LMNO in 2002, %.

Age	Division				
	3 L	3 M	3 N	3 O	3 LMNO
2	0.02	-	0.02	3.15	**0.08**
3	0.92	0.03	0.25	12.14	**0.92**
4	7.28	1.05	3.73	7.06	**5.90**
5	23.41	7.79	15.76	7.84	**19.85**
6	34.94	24.98	31.42	16.83	**32.72**
7	27.05	44.25	35.47	29.61	**30.68**
8	4.56	14.53	8.47	11.75	**6.62**
9	0.79	3.58	1.74	3.66	**1.37**
10	0.42	1.78	0.95	2.50	**0.72**
11	0.26	1.01	0.77	2.12	**0.48**
12	0.17	0.55	0.70	1.73	**0.33**
13	0.08	0.22	0.34	0.77	**0.15**
14	0.04	0.09	0.16	0.39	**0.07**
15	0.03	0.07	0.11	0.26	**0.05**
16	0.02	0.06	0.06	0.06	**0.03**
17	0.01	0.02	0.02	0.06	**0.01**
18	-	-	-	-	**-**
19	0.004	-	0.01	-	**0.004**
20	-	-	-	-	**-**
21	0.002	0.02	-	0.06	**0.01**
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

TABLE 11. Length composition (no. of individuals) of Roughhead grenadier in Russian trawlers catches by NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
24	5				**5**
27	8	1	3	1	**13**
30	37	8	12	3	**60**
33	127	21	21	7	**176**
36	281	33	57	47	**418**
39	576	61	72	78	**787**
42	675	83	130	113	**1001**
45	544	84	146	58	**832**
48	373	78	197	44	**692**
51	191	86	148	20	**445**
54	140	74	169	8	**391**
57	77	40	121	8	**246**
60	68	40	77	8	**193**
63	50	27	40	2	**119**
66	33	14	29	5	**81**
69	32	7	17	1	**57**
72	32	11	7	2	**52**
75	30	6	8		**44**
78	21	5	5	1	**32**
81	12		4		**16**
84	2	2	1		**5**
87	2				**2**
90	1	1			**2**
Total	**3317**	**682**	**1270**	**406**	**5675**
Av. length, cm.	**46,2**	**50,3**	**51,0**	**44,6**	**47,6**

TABLE 12. Length composition of Redfish (indiv.) in catches by Russian trawlers by months. Div. 3L, 2002.

Length, cm	Month								Total
	I	II	IV	V	VI	VII	VIII	IX	
19						1			**1**
20							3		**3**
21					1	1			**2**
22				2	1	6	3	1	**13**
23	1	2	8	7	5	13	3		**39**
24	1	4	38	23	8	18	7		**99**
25	2	6	55	63	3	19	12		**160**
26	5	8	59	56	13	38	17	2	**198**
27	5	35	66	84	19	33	30	4	**276**
28	8	36	69	126	13	46	50	8	**356**
29	6	49	58	128	23	54	52	7	**377**
30	15	57	66	173	40	63	58	5	**477**
31	22	56	51	156	31	86	109	2	**513**
32	18	56	40	120	47	104	125	8	**518**
33	12	52	43	160	38	113	141	5	**564**
34	10	47	29	148	37	87	117	10	**485**
35	4	47	22	139	31	80	117	6	**446**
36	2	23	6	56	16	37	60	3	**203**
37	3	22	6	36	7	29	36	3	**142**
38	2	13	3	11	5	15	19	1	**69**
39	1	3	2	2	1	6	6	1	**22**
40		5	2	2	1	2	3		**15**
41		2	1			3	1		**7**
42					1	3	2		**6**
43		1		1		2	2		**6**
44		1				1		1	**3**
45						1	2		**4**
Total	**117**	**525**	**624**	**1493**	**341**	**861**	**975**	**67**	**5004**
Length, av., cm.	**31.1**	**31.8**	**29.1**	**31.0**	**31.4**	**31.6**	**32.3**	**31.8**	**31.1**

TABLE 13. Length composition of Redfish (indiv.) in catches by Russian trawlers by months. Div. 3M, 2002.

Length, cm	Month						Total
	II	III	V	VI	VII	VIII	
8					1		**1**
9							
10					1		**1**
11			1				**1**
12			3				**3**
13			5				**5**
14			8				**8**
15			11	2	2		**15**
16			24	3	9		**36**
17			28	30	28		**86**
18			36	64	72	1	**173**
19			75	137	124	5	**341**
20			85	201	257	18	**561**
21			60	151	340	31	**582**
22			52	121	294	53	**520**
23	1		53	213	311	39	**617**
24	3	1	52	224	483	49	**812**
25	4		51	293	564	65	**977**
26	6		51	238	676	92	**1063**
27	8		53	232	793	123	**1209**
28	18		60	297	890	165	**1430**
29	39	1	72	195	858	159	**1324**
30	42	1	83	175	843	166	**1310**
31	40		50	104	511	120	**825**
32	28	1	53	36	303	83	**504**
33	19		37	12	134	43	**245**
34	15		25	4	63	13	**120**
35	14		17	2	26	11	**70**
36	11		6		22		**39**
37	10		6		19	2	**37**
38	6		1		6	1	**14**
39	8				9		**17**
40	3				10		**13**
41	1				1		**2**
Total	**276**	**4**	**1058**	**2734**	**7650**	**1239**	**12961**
Length, av., cm.	**31.5**	**28.8**	**25.1**	**25.0**	**26.9**	**28.0**	**26.5**

TABLE 14. Redfish age composition in the NAFO Div. 3M in 2002.

Age, Years	Juveniles		Males		Females		Total	
	n	%	n	%	n	%	n	%
2	3	27.3					**3**	**0.02**
3	6	54.5	4	0.1	17	0.3	**27**	**0.2**
4	2	18.2	142	2.3	149	2.2	**293**	**2.3**
5			477	7.6	471	7.1	**948**	**7.3**
6			616	9.8	837	12.6	**1453**	**11.2**
7			1128	18.0	841	12.6	**1969**	**15.2**
8			1256	20.0	1031	15.5	**2287**	**17.7**
9			1377	22.0	864	13.0	**2241**	**17.3**
10			778	12.4	798	12.0	**1576**	**12.2**
11			285	4.5	860	12.9	**1145**	**8.9**
12			92	1.5	508	7.6	**600**	**4.6**
13			39	0.6	137	2.1	**176**	**1.4**
14			62	1.0	33	0.5	**95**	**0.7**
15			13	0.2	71	1.1	**84**	**0.6**
16			5	0.1	36	0.5	**41**	**0.3**
Total	**11**	**100.0**	**6274**	**100.0**	**6653**	**100.0**	**12938**	**100.0**

TABLE 15. Length composition of redfish (indiv.) in catches by Russian trawlers by months. Div. 3N, 2002.

Length, Cm	Month									Total
	I	II	III	V	VII	VIII	IX	X	XI	
17									1	**1**
18							2		7	**9**
19							3	2	17	**22**
20							11	7	11	**29**
21							23	13	14	**50**
22							21	44	25	**90**
23		2		1			44	53	26	**126**
24		3					51	56	28	**138**
25		5		1			30	36	26	**98**
26	1	5		3			41	29	40	**119**
27	3	6	1	5			23	23	32	**93**
28	2	3	1	10	1		27	29	36	**109**
29	3	11	1	19	9		17	21	26	**107**
30	4	11	1	19	8	2	9	20	24	**98**
31	7	7	6	27	25	3	5	14	36	**130**
32	20	10	6	43	44	25	1	18	42	**209**
33	19	6	9	46	76	21	3	9	36	**225**
34	20	15	8	48	48	39	1	2	49	**230**
35	13	4	4	43	60	66	1	3	48	**242**
36	7	6	4	36	21	44			39	**157**
37	13	5	3	10	22	25	1		27	**106**
38	12	3	4	4		15			15	**53**
39	7	4	1			2			6	**20**
40	2	1		1		2			7	**13**
41	1								4	**5**
42									2	**2**
43									1	**1**
44	1									**1**
Total	**135**	**107**	**49**	**316**	**314**	**244**	**314**	**379**	**625**	**2483**
Length, av., cm.	**34.2**	**31.4**	**33.6**	**32.9**	**33.5**	**34.9**	**25.0**	**25.7**	**29.8**	**30.3**

TABLE 16. Length composition of redfish (indiv.) in catches by Russian trawlers by months. Div. 3O, 2002.

Length, cm	Month										Total
	I	II	III	IV	V	VI	VIII	IX	X	XI	
11			2								**2**
12			2								**2**
13			2	1							**3**
14			6	2							**8**
15	8	3	14	15							**40**
16	16	24	60	16		2					**118**
17	54	54	80	18	2	2					**210**
18	124	141	274	89	16	6					**650**
19	237	225	421	145	40	28					**1096**
20	458	494	915	364	103	50					**2384**
21	848	760	1214	432	189	99	2		5		**3549**
22	1434	1240	1627	733	369	206	12	5	4	1	**5631**
23	1509	947	1807	587	592	541	24	6	6	2	**6021**
24	1696	947	1726	669	532	775	36	10	6		**6397**
25	1739	898	1330	390	330	521	24	6	7		**5245**
26	1301	632	814	282	272	571	17	8	6		**3903**
27	1270	623	575	212	270	550	22	5	1		**3528**
28	700	324	311	124	156	275	17	4	4		**1915**
29	450	161	166	51	73	131	10	7	2	1	**1052**
30	301	138	101	27	63	97	11	5			**743**
31	147	94	66	10	33	32	4	2	1		**389**
32	153	75	47	9	32	15	8	1			**340**
33	109	28	31	6	16	6	12	1			**209**
34	84	36	14	1	7	2	12	2			**158**
35	75	26	14	1	3	4	11	1			**135**
36	29	15	10		1		12				**67**
37	21	11	6		3		13	1	1		**56**
38	11	7		1			9		1		**29**
39	8	7	1		1		3	1			**21**
40	4	3	2				5				**14**
41		3	1				3	1			**8**
42	1	1					2				**4**
43	1	1					3				**5**
44		1					4				**5**
45							1				**1**
46	1										**1**
52								1			**1**
Total	**12789**	**7919**	**11639**	**4185**	**3103**	**3913**	**277**	**67**	**44**	**4**	**43940**
Length, av., cm.	**24.8**	**23.9**	**23.3**	**23.1**	**24.4**	**25.1**	**29.4**	**27.5**	**25.2**	**24.3**	**24.1**

TABLE 17. Redfish age composition in the NAFO Div. 3O in 2002.

Age, Years	Males n	Males %	Females n	Females %	Total n	Total %
4	27	0.1			**27**	**0.06**
5	880	4.2	624	2.8	**1504**	**3.4**
6	4879	23.0	2348	10.4	**7227**	**16.5**
7	11124	52.5	8145	36.1	**19269**	**44.0**
8	3282	15.5	5365	23.8	**8647**	**19.7**
9	660	3.1	2503	11.1	**3163**	**7.2**
10	189	0.9	1907	8.4	**2096**	**4.8**
11	60	0.3	660	2.9	**720**	**1.6**
12	26	0.1	346	1.5	**372**	**0.8**
13	13	0.1	396	1.8	**409**	**0.9**
14	12	0.1	122	0.5	**134**	**0.3**
15	14	0.1	120	0.5	**134**	**0.3**
16	13	0.1	10	0.04	**23**	**0.05**
17	16	0.1	28	0.1	**44**	**0.1**
18	6	0.03	5	0.02	**11**	**0.02**
19			6	0.03	**6**	**0.01**
20			2	0.01	**2**	+
21			1	+	**1**	+
22						
23						
24						
25						
26						
27				+	**1**	+
Total	**21201**	**100.0**	**22589**	**100.0**	**43790**	**100.0**

TABLE 18. Length composition (no. of individuals) of American plaice in Russian trawlers catches in NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
22			9	176	**185**
24	5		27	348	**380**
26	9		49	354	**412**
28	21		100	196	**317**
30	56		173	196	**425**
32	120		306	315	**741**
34	158		390	390	**938**
36	286		500	460	**1246**
38	336	2	566	504	**1408**
40	209		461	618	**1288**
42	173	2	398	708	**1281**
44	97	3	360	632	**1092**
46	76	1	360	464	**901**
48	39	1	311	375	**726**
50	24	3	239	316	**582**
52	7	5	210	230	**452**
54	2	2	148	227	**379**
56			128	124	**252**
58			68	86	**154**
60			56	45	**101**
62			22	14	**36**
64			12	12	**24**
66			9	9	**18**
68			4	3	**7**
70			1	1	**2**
72				1	**1**
Total	**1618**	**19**	**4907**	**6804**	**13348**
Av. length, cm.	**38,7**	**48,1**	**42,0**	**40,3**	**40,7**

TABLE 19. Length composition (no. of individuals) of Witch flounder in Russian trawlers catches in NAFO Divs. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
22				1	**1**
24			1	5	**6**
26		1	1	19	**21**
28	1		7	16	**24**
30	4		18	38	**60**
32	11	2	32	91	**136**
34	13	1	87	115	**216**
36	21	5	126	156	**308**
38	29	3	115	246	**393**
40	17	8	44	245	**314**
42	15	9	54	220	**298**
44	10	8	26	132	**176**
46	3	7	23	87	**120**
48	1	7	13	87	**108**
50		3	6	29	**38**
52		2	7	10	**19**
54	2	1	1	6	**10**
56				4	**4**
58		1	1	1	**3**
Total	**127**	**58**	**562**	**1508**	**2255**
Av. length,cm.	**38,6**	**43,5**	**38,4**	**40,0**	**39,6**

TABLE 20. Length composition (no. of individuals) of Yellowtail flounder in Russian trawlers catches in NAFO Div. 3MN in 2002.

Length, cm	3M	3N	3MN
24		15	**15**
26		59	**59**
28		122	**122**
30		175	**175**
32		286	**286**
34		400	**400**
36		464	**464**
38		502	**502**
40		291	**291**
42		202	**202**
44	1	108	**109**
46		48	**48**
48		33	**33**
50		13	**13**
52		4	**4**
54		5	**5**
Total	**1**	**2727**	**2728**
Av. length, cm.	**44,5**	**36,8**	**36,8**

TABLE 21. Length composition (no. of individuals) of Atlantic cod in Russian trawlers catches in NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
27	1				**1**
30	19			13	**32**
33	70		6	36	**112**
36	113		24	82	**219**
39	145		42	213	**400**
42	159	1	100	386	**646**
45	163	2	141	613	**919**
48	150	9	214	828	**1201**
51	98	11	281	879	**1269**
54	89	2	352	940	**1383**
57	50		311	783	**1144**
60	33	1	238	631	**903**
63	17	6	198	531	**752**
66	9	5	139	344	**497**
69	5	6	94	220	**325**
72	5	9	58	153	**225**
75	4	10	46	97	**157**
78	1	6	44	69	**120**
81	1	15	34	53	**103**
84	2	13	28	46	**89**
87	2	11	26	35	**74**
90		7	20	38	**65**
93		3	23	27	**53**
96		5	19	10	**34**
99		1	17	13	**31**
102		2	24	9	**35**
105			13	6	**19**
108			10		**10**
111			3		**3**
114			4	1	**5**
117			5		**5**
120			4		**4**
123			2		**2**
135				1	**1**
Total	**1136**	**125**	**2520**	**7058**	**10839**
Av. length, cm.	**46,5**	**74,9**	**60,5**	**56,4**	**56,5**

TABLE 22. Length composition (no. of individuals) of Red hake in Russian trawlers catches in NAFO Div. 3LMN in 2002.

Length, cm	3L	3M	3N	3LMN
15		1		**1**
18				**0**
21	2	1		**3**
24	5	1		**6**
27	69	6		**75**
30	400	33	1	**434**
33	704	81	3	**788**
36	758	104	17	**879**
39	561	91	27	**679**
42	288	27	15	**330**
45	90	9	6	**105**
48	15	2	3	**20**
51	3			**3**
Total	**2895**	**356**	**72**	**3323**
Av. length, cm.	**36,7**	**37,0**	**40,4**	**36,8**

TABLE 23. Length composition (no. of individuals) of White hake in Russian trawlers catches in NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
9		2			**2**
12		8			**8**
15		8			**8**
18		20		2	**22**
21		7		5	**12**
24		11	1	23	**35**
27		2		34	**36**
30		2		75	**77**
33		1	1	88	**90**
36			1	131	**132**
39			5	551	**556**
42			34	1667	**1701**
45			56	2706	**2762**
48			35	2747	**2782**
51			36	1552	**1588**
54			36	1007	**1043**
57	1		34	661	**696**
60			19	413	**432**
63	1		9	315	**325**
66			4	188	**192**
69			5	133	**138**
72			4	99	**103**
75	1		2	68	**71**
78			4	48	**52**
81			1	15	**16**
84				12	**12**
87				9	**9**
90				4	**4**
93			2	1	**3**
96			2	4	**6**
99				3	**3**
102					
105				1	**1**
108				1	**1**
Total	**3**	**61**	**291**	**12563**	**12918**
Av. length, cm	**66,0**	**18,9**	**53,1**	**49,9**	**49,8**

TABLE 24. Length composition (no. of individuals) of Thorny skate in Russian trawlers catches in NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
30	1		5		**6**
33	9	1	36		**46**
36	34	3	79	6	**122**
39	160	4	188	8	**360**
42	202	19	360	40	**621**
45	243	22	713	58	**1036**
48	237	20	1112	80	**1449**
51	180	19	1322	117	**1638**
54	112	16	1218	136	**1482**
57	86	15	1240	136	**1477**
60	56	17	1096	140	**1309**
63	41	9	930	121	**1101**
66	34	7	754	114	**909**
69	30	6	530	93	**659**
72	24	6	344	73	**447**
75	9	2	219	63	**293**
78	7		107	62	**176**
81	4		62	18	**84**
84	2		32	15	**49**
87			16	6	**22**
90			7	3	**10**
93	1			1	**2**
96	1				**1**
99					
102			1		**1**
105					
108					
111					
114		1			**1**
Total	**1473**	**168**	**10371**	**1290**	**13302**
Av. length, cm.	**50,3**	**54,4**	**57,5**	**61,5**	**57,0**

TABLE 25. Length composition (no. of individuals) of Spinytail skate in Russian trawlers catches in NAFO Div. 3LMNO in 2002.

Length, cm	3L	3M	3N	3O	3LMNO
39	1		1		**2**
42	3	2			**5**
45					
48		3	1		**4**
51	3		3		**6**
54	3	1		1	**5**
57	1	1	1	1	**4**
60	2	2	2	4	**10**
63	2	2	1		**5**
66	4	2			**6**
69				1	**1**
72	4	5		1	**10**
75		4	3	1	**8**
78	3	2	1	1	**7**
81	1	3	2	2	**8**
84	2	2	2		**6**
87	1	2	3		**6**
90	2	3	3	1	**9**
93	1	3	1		**5**
96		1	3	1	**5**
99		7	1		**8**
102		3			**3**
105		6	1		**7**
108	1	4			**5**
111		1	2		**3**
114		1	1		**2**
117		1			**1**
120	1		1		**2**
123		2			**2**
126		2			**2**
129		2			**2**
132		1			**1**
135					
138		1			**1**
141		2			**2**
144					
146		1			**1**
156				1	**1**
177			1		**1**
Total	**35**	**72**	**35**	**8**	**150**
Av. length, cm.	**67,1**	**90,0**	**83,6**	**81,6**	**82,7**

TABLE 26. Silver hake length composition of the Russian trawlers catch in the NAFO Div. 4W (200-mile zone of Canada) in 2002.

Length, cm	Number of individuals
19	1
20	2
21	13
22	35
23	102
24	346
25	837
26	1269
27	1012
28	579
29	378
30	154
31	67
32	35
33	20
34	9
35	2
36	1
37	
38	1
39	1
Total	4864
Av. length, cm	26.5

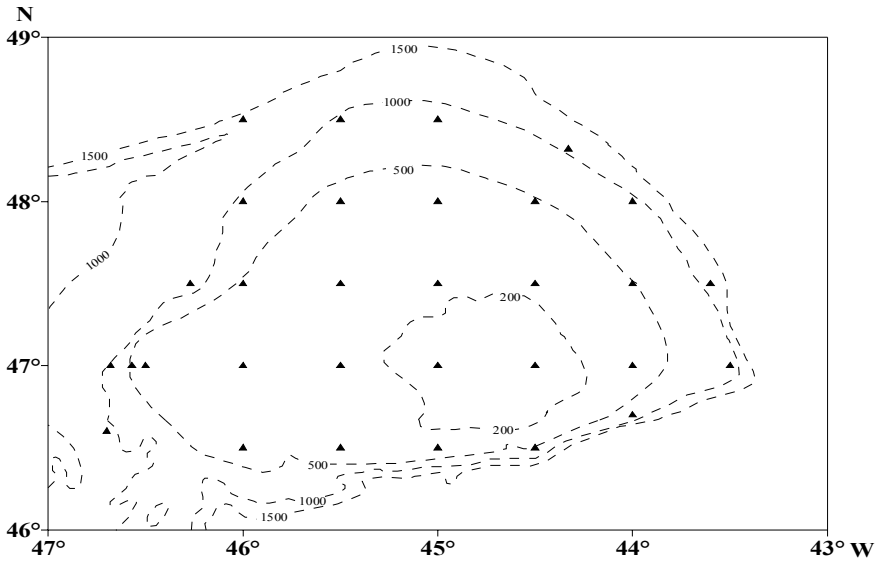

Fig. 1 Location of oceanographic stations, 31.05 -10.06.2002

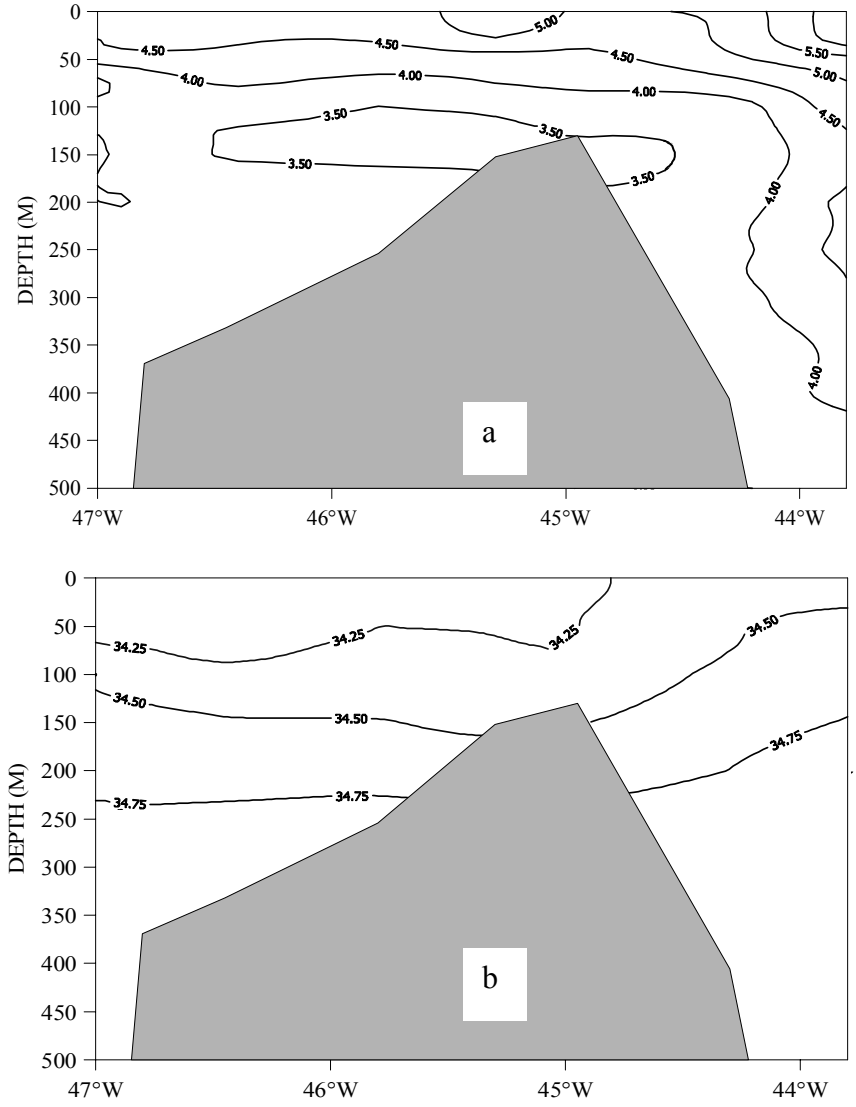

Fig. 2. Vertical distribution of temperature (°C) (a) and salinity (b) over the Flemish Cap Bank (along 47°N) in June 2002.

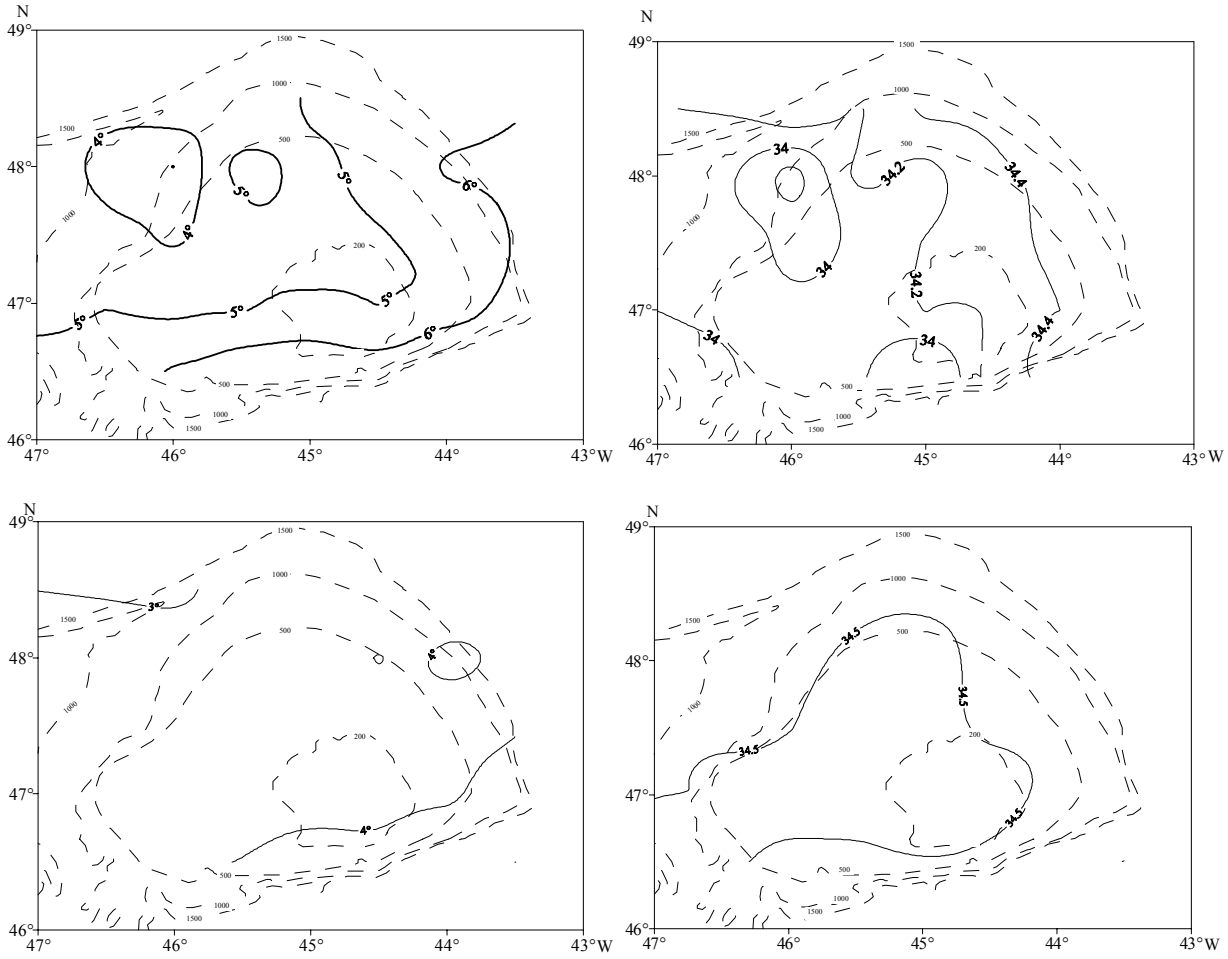

Fig. 3. Temperature (°C) and salinity distribution on the surface (a, b) and in 100 m layer (c, d) in the Flemish Cap area in June 2002