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Russian Research Report, 1996

by

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PART I - Researches Carried Out by AtlantNIRO in NAFO Division 4 in 1996

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A. FISHERY CONDITIONS

In the period from mid-April to the third ten-day period of May the fishery of silver hake in the area southwards of SMGL was carried out by two Russian large-tonnage vessels. Total catch for that period amounted to about 0.7 thousand while average catch per hour was 0.66 t. No scientific observers were aboard the vessels, since the latter operation in the Scotian Shelf area had not been planned in advance.

As to the prospects for 1998, taking into consideration the results of 0-group hake trawling surveys in 1995-1996 and significant decrease of fishery from 1994, considerable increase of the latter species biomass may be expected. Therefore, in spite of more strict measures implemented to the foreign fishery regulation, it may be assumed that at least in March-April 1998 hake catches per unit effort will be rather high.

B. SPECIAL RESEARCHES

Environmental researches

In 1996 researches of interannual and seasonal variability of boundaries between water masses of various origin at the surface of North-Western Atlantic were continued (Sigaev, 1992, 1993). Latitudinal variations of cold shelf water boundary at slope water and left edge of Gulf Stream front boundaries 1985-1995 in North-Western Atlantic between 55° and 70° W (Divisions 5Zc, 4Xw, 4Vs) were considered. Analysis of those boundaries localization indices reveals predominance of 3-4 year cycles in their variability with significant biases latitudinally. It is noted that seasons contributes

interannual variability in various ways. The following peculiarities were observed:

- slope water boundaries mostly vary similar to variations of Gulf Stream front left edge as affected by the processes of its meandering and warm rings formation;
- cold shelf water boundaries not always correspond to Gulf Stream front and slope water boundaries variations, since they depend mostly on Labrador current and branches water southward transport;
- the trend of southward shift was common for all boundaries from 1985 to 1988 while after 1988 the northward shift predominated.

The years of increase and reduce of warm and cold waters advection into the shelf are specified. For example, in Subdivision 4Xw 1996, 1989 and 1993 were relatively warm years while 1988, 1991 and 1994 were cold ones. Interannual variability of average annual and seasonal indices of boundaries localization were compared to some fish species abundance variations in the age of 1-2 years. Quality relations revealed between the latter evidence considerable impact of water advection upon year-classes abundance. Thus, increase of cold water advection in Subdivision 4Xw in spring (southward shift of water mass boundaries) results in decrease of silver hake year-classes abundance. One-year old cod abundance in the same area was directly related to average annual variations of Gulf Stream front and cold water boundaries. Adverse relation is observed between pollock and herring year-classes abundance and variability of slope and cold shelf water masses. The research results are presented by Sigaev (1996).

In October 1996 oceanographic data were collected during Canadian-Russian surveys of 0-group silver hake in the Scotian Shelf area from R/V "Alfred Needler" (totally 70 stations). Preliminary analysis of water temperature and salinity distribution shows that during the survey period the warm water inflow into deep-water shelf area (temperature 9.5-9.9°C, salinity 34.80-35.08‰ at bottom) was observed which approach the level of Lahave and Emerald Deeps. It allows to assume that favourable oceanographic conditions occurred for young silver hake overwintering.

Biological researches

In October-November 1996 the trawling survey of 0-group silver hake was carried out by Canadian research vessel with participation of two scientists from AtlantNIRO. According to preliminary assessment the year-class of 1996 is one of the most abundant during entire period of observation and the second large after the year-class 1981.

Other researches

The reliability of the silver hake stock retrospective assessments, obtained by Canadian scientists in 1985 and 1996 was analysed. Though the problem had not been settled definitely, the data presented allows to assume that the recent values for the period following 200-mile zone enforcement are underestimated.

Detailed researches concerning the above problem are presented in appropriate scientific document.

REFERENCES

Sigaev I.K. 1992. Anomalies of water temperature and water-mass border indices in the Northwest Atlantic area in 1990. NAFO SCR Doc.92/36, Serial No.2084, 5p.

Sigaev I.K. 1993. Oceanographic conditions in some areas of the Northwest Atlantic in 1992. NAFO SCR Doc.93/1, Serial No.2176, 5p.

Sigaev I.K. 1996. On water masses boundaries interannual and seasonal variability in the Northwest Atlantic Ocean and its impact upon some commercial species fishery. Fishery and biological researches carried out by AtlantNIRO in 1994-1995. Collected volume of scientific papers. Vol.1, Kaliningrad, p.64-73.

PART II - Report on PINRO Research In the NAFO Area in 1996 by A. A. Vaskov

1. SUBAREAS 0 AND I

A. Status of the fisheries

In 1996 fishery on Greenland halibut was carried out by 1-2 BMRT-type vessels at 800-1580m depths off West Greenland from 63°29' to 63°49'N between 56°40' and 57°50'W from 18 September to December, with daily catch being 4.2-5.0 t/day. Halibut catch constituted 229 t. Roundnose grenadier by-catch varied from 1.6 to 7.3%.

No fishery on halibut was conducted off the Baffin Land.

B. Special Research Studies

No special environmental studies, including hydrographic, and biological studies were performed.

SUBAREAS 2 AND 3

A. Status of Fisheries

Greenland halibut. Directed fishery on halibut by 2 BMRT-type

vessels was carried out in Flemish Pass (Divs. 3L and 3M) in March and during the first decade of April and covered the depth from 870 to 1400m. Daily catch varied from 2.9 to 5.3 t. Roughhead grenadier, wolffish, flounder and scate were registered in by-catch (12-60%).

According to preliminary data the Greenland halibut catch from these subareas constituted 306 t in 1996. National quota (2550t) remained unfished.

Redfish. During the first decade of September the redfish fishery was conducted by BMRT-type vessel on the southeastern slope of the Grand Newfoundland Bank (Div.3N). Daily catch varied from 4-9 to 30 t.

During the second decade several hauls were done by the same vessel on the Flemish Cap Bank. Daily catch amounted to 8-12 t.

According to preliminary data in 1996 the redfish catch in Div.3N made up 65 t and 43 t on the Flemish Cap Bank.

Cod. In 1996, as in previous years, there was no directed fishery for cod by Russian vessels in the Northwest Atlantic. The cod quota (1078 t) remained unfished.

Other species. No directed fishery for other species was conducted. Flounders, wolffish, sharks occurred only as by-catch in Greenland halibut and redfish fisheries.

Northern shrimp. In 1996, the fishery on northern shrimp was conducted by Russian vessels on the Flemish Cap Bank from January to October. The Bank western and northern slopes with 250-350m depths were the main fishing areas. Maximum catches were obtained in June. Catch per effort was 169 kg/hr during that period.

By preliminary data for 1996 the shrimp catch taken by Russian vessels amounted to 4421 t.

B. Special Research Studies

1. No environmental and oceanographic studies were carried out.
2. Biological studies.

From 13 January to 17 February 1996 a research vessel MI-0707 "Ozernitsa" performed works in the depth range between 800 and 1150m in Flemish Pass (Divs.3LM). This was done with the aim to outline the distribution and to study biological characteristics of Greenland halibut from commercial catch.

From 18 to 24 February an assessment trawl survey to study abundance and biomass of Greenland halibut in Divs.3LM was conducted by the same vessel (Table 1).

Investigations on selectivity of sorting systems regarding halibut were carried out by RV "Ozernitsa" (MI-0707) in Flemish Pass from 25 February to 7 March.

From 30 April to 12 May a trawl survey for stock assessment of cod, redfish and Greenland halibut was carried out by RV "Olaïne" (MI-8339) on the Flemish Cap Bank (Div.3M).

Studies on distribution and biological characteristics of Greenland halibut were performed by the same vessel from 13 to 27 May.

Table 1. Inventory of biological surveys, 1996.

SA	Div.	Month	Survey type ¹	Object	No. of tows
3	3LM	2	S	Greenland halibut	33
	3LM	1-3	O	Greenland halibut	130
	3M	5	S	Groundfish	76
	3LM	5	O	Greenland halibut	72

¹ Use number from 1 to 12 for months

² Insert S for stratified-random and O for other surveys

Greenland halibut. During experimental works on studying sorting systems the grids of 1.2m long, 1m width, (35-40mm bar distance) were tested. For the system with 35mm distance between grid's bars the fish length, corresponding to 50% retention, constituted 33.1-33.3cm, with a range of selectivity being 3.6-4.2cm. For the system with 40mm bar distance these parameters were 33.8 and 12.9cm, respectively. Specimens below 30cm long escaped completely. Thus, the sorting system with 35mm distance between grid's bars allows to prosecute fishing regulations in regard to halibut minimum length allowable for catch. Detailed description of experiments on sorting grid systems is given in the paper by S.F.Lisovsky, V.A.Sakhno and K.V.Gorchinsky (NAFO SCR Doc.96/37).

Greenland halibut were registered in all catches taken at 800-1150m depth in Flemish Pass. Length of fish from the catches varied from 22 to 106cm (Table 2). Specimens 42-44cm long at age 5-6 made up the bulk of catches. The abundance of halibut in these areas amounted to 41 mill.spec. and biomass - 31.8 thou.t by the results from trawl assessment survey in February 1996. A description of Russian survey conducted during winter period is given in detail in the paper by K.V.Gorchinsky (NAFO SCR Doc. 96/72).

During the assessment survey in May 1996 on the Flemish Cap Bank the length of Greenland halibut varied from 12 to 64cm. The abundance of halibut amounted to 2.8 mill.spec. and biomass - 1.2 thou.t. Data on distribution and biology of halibut are presented in detail in the paper by P.I.Savvatimsky and A.A.Vaskov (NAFO SCR Doc. 97/).

Redfish. During the assessment trawl survey on the Flemish Cap Bank the redfish, S.mentella and S.fasciatus, were from 7 to 50cm long at age 2-23. The main portion consisted of fish 20-23cm long at age 6-7 from 1990-1989 high abundant yearclasses. Length of S.marinus varied from 16 to 55cm. Summarized stock of redfish from Sebastes genus constituted 71.9 mill.spec. and 15.9 thou.t. Detailed information is given in the papers by A.A.Vaskov and T.M.Igashov; A.A.Vaskov (NAFO SCR Doc. 97/).

Cod. No dense aggregations of cod were found during trawl survey on the Flemish Cap Bank. Single specimens of cod 21-100cm long occurred in catches taken to 600m depth. Fish 33-51cm long at age 3-5 from 1993-1991 yearclasses made up the bulk of catches.

The estimates for stock assessment of cod, obtained in 1996, are the lowest for the period of investigations; the abundance and biomass were set at 1.1 mill.spec. and 0.7 thou.t, respectively.

Data in detail are given in the paper by V.M.Kiseleva (NAFO SCR Doc. 97/).

Northern shrimp. Studies on biological characteristics of the northern shrimp population on the Flemish Cap Bank were done onboard the vessel "Kapitan Rogosin" in February-April 1996.

By the data obtained the differences in length and sex composition of shrimp from different areas were revealed. In April, on the northern slope of the bank 96% of catch consisted of males. During the same period the males from catches taken on the western slope constituted 74%.

In February-April 1996, shrimp with 10-32mm carapace occurred in catches. Length frequency of males in February-March was mainly characterized by a modal length 18-22mm. In April an increase of small-size males with 12-14mm carapace were registered in catches.

Detailed information on studying the northern shrimp is given in the paper by B.I.Berenboim (NAFO SCR Doc. 96/90).

Table 2. Length frequency of Greenland halibut on the data of commercial fishery in Div. 3LM, 1996.

Length, cm	Males	Females	Total
22-23	1	-	1
24	-	-	-
26	2	1	3
28	4	4	8
30	13	15	28
32	46	53	99
34	124	122	246
36	164	205	369
38	272	323	595
40	325	413	738
42	436	564	1000
44	476	542	1018
46	415	461	876
48	358	403	761
50	219	271	490
52	142	220	362
54	72	137	209
56	57	96	153
58	37	104	141
60	18	43	61
62	12	21	33
64	11	16	27
66	5	16	21
68	7	19	26
70	1	16	17
72	-	13	13
74	-	16	16
76	-	13	13
78	-	28	28
80	-	22	22
82	-	26	26
84	-	15	15
86	-	21	21
88	-	12	12
90	-	4	4
92	-	6	6
94	-	1	1
96	-	1	1
98	-	-	-
100	-	1	1
102	-	1	1
104	-	-	-
106	-	1	1
No.fish mess.	3217	4246	7463
Mean length,cm	44.6	47.0	46.0