



Serial No. N1476

NAFO SCS Doc. 88/15

SCIENTIFIC COUNCIL MEETING - JUNE 1988

USSR Research Report for 1987

SECTION I (Subarea 4) - A. S. Noskov

SECTION II (Subareas 2 and 3) - V. A. Borovkov, A. K. Chumakov and S. M. Kovalev
(Tables only, text not available)

SECTION I - Subarea 4

by

A. S. Noskov

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

A. State of fishery

The 1987 Soviet silver hake catches off the Nova Scotia constituted 39.6 thous. tons against the allotted quota of 45 thous. tons. Falling short of the silver hake allocation can be attributed to the fact that the area was closed for the fishery until the end of May, and the fish aggregations were missing in the fishing ground in the beginning of August. So, according to the data from the ships of the BMRT class, the catches per day of fishing were 37.0 tons in June, 34.6 tons in July and reduced to 12.6 tons during the first ten-day period in August. Over the entire fishing period the catch per day of fishing by the ships of the BMRT class averaged to 30.2 tons. Judging by large catches taken in May by individual ships the quota would have been taken provided the earlier fishery was permitted.

In the catches the bulk of the silver hake was represented by specimens with the 24-34 cm body length. The mean length constituted 28.4 cm and mean weight - 0.161 kg, which is considerably below the same indices for the previous years. So, in 1986, the mean length was 29.8 cm, and mean weight - 0.186 kg; in 1985 these values were 30.1 cm and 0.198 kg, respectively. A reduction of the mean length of the silver hake in 1987 can be explained by predominance of the strong 1985 year class which constituted 59.3% of the catches on average (table 1).

In 1988-1989 the bulk of the silver hake commercial stocks will be represented by the strong 1985 and medium size 1984, 1986 and 1987 year classes, so their abundance will remain high.

Table 1. Age composition (%) of commercial silver hake catches taken on the Scotian Shelf in 1980-1987.

Age	Years	1980	1981	1982	1983	1984	1985	1986	1987
1		1.4	0.7	4.9	1.4	5.0	5.4	7.4	1.6
2		16.8	9.9	14.9	42.6	10.1	33.7	12.9	59.3
3		36.2	42.6	24.1	27.0	38.6	29.9	45.1	21.0
4		32.4	33.0	37.6	20.6	33.1	21.8	28.8	14.5
5		9.6	10.3	12.8	5.8	10.5	7.7	5.3	2.8
6		2.2	2.6	4.1	1.9	2.0	1.2	0.4	0.6
7		0.6	0.7	1.1	0.5	0.6	0.3	0.1	0.2
8		0.5	0.1	0.4	0.1	0.1	+	+	-
9		0.2	0.1	0.1	0.1	+	+	+	-
10		0.1	+	+	-	-	-	+	-
Mean age, years		3.4	3.5	3.6	3.0	3.4	3.0	3.1	2.6
Fishing gear		Trawl Hake-815							

B. Special studies

According to the joint program, a trawling inventory survey of 0+ group silver hake was carried out by the Soviet and Canadian scientists from 18 October to 13 November 1987 on the SRTM-K "Maltsevo". The hauls were made at 109 stations with the standard IYGPT trawl; simultaneously the water temperature measurements were taken. In most cases the catch per hauling did not exceed 50 sp. As in the previous years, the largest catches (over 500 sp.) were taken south-westward of the Sable Island shoals. Compared with the abundance of the 0+ group in the other years the total abundance of the 1987 year class can be estimated as average (table 2).

Table 2. Indices of abundance of 0+ group of silver hake in 1978-1987.

Years	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Abundance, 10 ⁷ sp.	48	12	5	110	2	34	11	62	32	20

In 1987 the body length of the 0-group silver hake ranged from 2 to 7 cm, 3.3 cm on average. The mean length was 2-3 cm below that recorded in the previous years, which can be most likely attributed to a delayed spawning. Compared with 1984-1986, the hydrographic conditions in 1987 were characterized by the intensification of the influx of cold Labrador waters and reduced influx of warm slope waters, which has resulted in a total decrease of the water temperatures on the Scotian Shelf in summer and in the fall.

SECTION II - Subareas 2 and 3

by

V. A. Borovkov, A. K. Chumakov and S. M. Kovalev

Polar Research Institute of Marine Fisheries and Oceanography (PINRO)
6 Knipovich Street, Murmansk, 183763, USSR

Table 1. Abundance (mill. ind.) and biomass (thous. t) groundfish near the bottom (trawl survey) and in the pelagial (echo survey) in SA 3, 1987.

Species	Div.	Bottom		Pelagial		Total	
		Abundance	Biomass	Abundance	Biomass	Abundance	Biomass
Cod	SE	132.9	130.5	136.0	134.8	268.9	265.3
	SE	73.4	131.9	29.4	45.5	102.8	177.4
	SENO	54.2	289.8	9.7	40.0	63.9	329.8
	SEI	36.8	12.3	40.2	9.3	77.0	21.6
Redfish	SE	154.6	69.5	190.0	85.0	344.6	154.5
	SENO	281.5	80.0	700.0	189.0	1021.5	269.0
	SEI	463.2	106.4	> 2580.0	> 350.0	> 14263.2	> 456.4
Haddock	SENO	39.7	27.1	30.3	19.7	70.0	46.8

Table 2. Abundance (mill. ind.) and biomass (thous. t) groundfish in SA 3 based on reasearch catches, 1983-1987.

Species	Div.	Abundance					Biomass				
		1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
Cod	3K	35.3	295.0	266.4	276.4	132.9	56.0	355.3	293.6	271.3	132.5
	3L	121.5	311.0	180.7	297.0	73.4	402.3	383.3	177.1	437.2	132.9
	3M	137.3	259.3	520.7	263.8	54.2	182.8	206.8	457.7	425.4	237.8
	3N	65.4	60.5	37.1	37.2	36.8	23.0	31.1	28.1	26.1	12.3
Redfish	3K	964.3	740.1	810.3	816.1	154.6	376.6	319.8	356.9	372.8	69.5
	3L	428.0	720.3	245.1	133.4	182.1	125.0	199.4	85.9	46.8	64.8
	3M	1187.8	763.8	1232.4	750.7	99.4	127.4	108.7	129.0	109.4	19.2
	3N	644.0	376.7	177.3	1200.2	463.2	154.9	132.3	51.9	309.5	106.4
American plaice	3K	144.7	93.3	48.8	48.3	44.4	64.5	52.7	17.9	18.9	18.4
	3L	1440.2	1295.6	693.0	826.8	604.3	533.8	642.1	325.6	300.6	255.8
	3M	20.4	26.5	15.8	33.4	16.5	8.9	7.5	7.8	40.2	9.3
Yellowtail flounder	3M	257.4	261.0	194.0	89.6	64.8	115.3	96.9	84.5	59.5	26.5
	3N	77.9	444.8	152.5	49.3	39.7	19.3	229.8	85.2	37.1	27.1
Haddock											

Table 3. Length composition of roundnose grenadier in research catch from NAFO Subareas 0, 1, 3 and Div. 3K in 1987, ‰.

Length, sm	Subarea 0		Subarea 1		Subarea 2		Div. 3K	
	males	females	males	females	males	females	males	females
18-20	-	-	-	-	1	-	-	-
21-23	-	-	1	-	3	-	-	-
24-26	-	1	2	1	2	1	1	-
27-29	3	3	11	3	4	1	3	3
30-32	21	1	23	10	13	7	5	8
33-35	36	15	30	21	19	8	39	23
36-38	69	19	42	21	27	14	59	20
39-41	44	21	33	27	34	19	93	35
42-44	67	21	47	23	41	28	107	53
45-47	50	22	52	32	43	30	90	37
48-50	63	37	56	46	57	37	104	53
51-53	60	16	50	31	57	39	58	28
54-56	56	29	54	45	63	45	36	26
57-59	37	19	52	45	71	52	33	13
60-62	30	13	41	33	45	37	22	8
63-65	44	28	38	29	54	38	15	8
66-68	34	20	19	15	25	24	6	5
69-71	19	19	15	12	16	11	2	2
72-74	15	8	7	9	8	12	-	1
75-77	12	10	5	7	3	5	2	-
78-80	8	13	4	4	2	1	1	-
81-83	1	7	1	1	-	2	-	-
84-86	4	1	1	1	-	1	-	-
87-89	-	1	-	-	-	-	-	-
90-92	-	3	-	-	-	-	-	1
Relative number, ‰	673	327	584	416	588	412	676	324
Mean length, sm	50.8 ±0.5	55.4 ±0.9	50.3 ±0.3	52.2 ±0.3	52.3 ±0.2	54.3 ±0.3	46.3 ±0.3	46.6 ±0.4
Number ind.	508	247	2082	1481	2551	1787	899	429

Table 4. Age composition of roundnose grenadier in research catches from NAFO Subareas 0, 2 and Div. 3K in 1987, %_{op}.

Year-class	Age years	0		2		3K	
		males	females	males	females	males	females
1985	2	1	3	7	2	1	1
1984	3	28	8	15	8	18	12
1983	4	46	13	23	21	44	21
1982	5	66	24	37	20	50	37
1981	6	61	26	44	28	103	47
1980	7	77	34	64	43	119	56
1979	8	85	38	81	54	103	49
1978	9	74	32	81	57	78	39
1977	10	69	32	78	56	56	29
1976	11	49	25	59	45	33	15
1975	12	45	29	48	38	16	9
1974	13	33	24	29	24	11	6
1973	14	19	19	13	12	4	1
1972	15	12	9	6	8	1	-
1971	16	5	7	2	4	-	-
1970	17	3	3	1	2	-	-
1969	18	-	1	-	-	-	1
Mean age, years		8.4 _{0.1}	9.2 _{0.2}	8.7 _{0.1}	9.2 _{0.1}	7.4 _{0.1}	7.4 _{0.1}
Number of ind.		508	247	2551	1737	899	429

Table 5. Age composition of beaked redfish (by length-age keys) from research catches in Div. 3KLNOM in 1987, %.

Age, years	34	35	36	38	40
1	-	-	-	-	24
2	-	-	-	-	32
3	2	-	-	-	1
4	3	1	-	2	6
5	36	2	35	16	38
6	26	8	75	95	74
7	81	21	219	306	284
8	242	79	232	297	250
9	181	267	118	105	90
10	108	280	88	76	35
11	54	146	45	32	44
12	78	85	42	22	29
13	75	51	41	19	33
14	32	23	35	9	22
15	47	16	24	6	12
16	21	11	22	5	14
17	5	7	20	4	5
18	2	2	14	3	2
19	2	1	4	1	2
20	3	-	3	1	1
21	1	-	2	1	1
22	1	-	1	-	-
Mean age	9.8	10.5	9.4	8.2	8.1
Number of ind.	11175	15156	40155	19235	78545

Table 7. Length composition of cod in SA 3 in 1986-1987, %.

Length sm	3K		3L		3N		3O		3M	
	1986	1987	1986	1987	1986	1987	1986	1987	1986	1987
9-10										
11-11										
12-14										
15-17										
18-21										
22-23										
24-26										
27-29										
30-32										
33-35										
36-38										
39-41										
42-44										
45-47										
48-51										
52-53										
54-56										
57-59										
60-62										
63-65										
66-68										
69-71										
72-74										
75-78										
79-81										
82-83										
84-86										
87-89										
90-92										
93-95										
96-98										
99-101										
102-104										
105-109										
108-110										
111-113										
114-116										
117-119										
120-122										
123-125										
126-128										
129-131										
132-134										
135-137										
138-140										
Total %	1000	1000	1000	997	1000	1000	998	1000	999	1000
Fishes measured	11449	6553	8990	3812	3789	3545	3824	1838	4954	6076
Mean length	44.86	47.18	48.45	53.82	43.58	47.18	52.76	67.84	37.76	43.54

Table 8. Length composition of Yellowtail flounder in Div. 3LNO in March-May 1987, %.

Length sm	Div. 3N		Div. 3O		Div. 3L	
	Males	Females	Males	Females	Males	Females
8		1				
9		1				
10		1				
11		1				
12		1				
13		1				
14		1				
15		1				
16		1				
17		1				
18		1				
19		1				
20		1				
21		1				
22		1				
23		1				
24		1				
25		1				
26		1				
27		1				
28		1				
29		1				
30		1				
31		1				
32		1				
33		1				
34		1				
35		1				
36		1				
37		1				
38		1				
39		1				
40		1				
41		1				
42		1				
43		1				
44		1				
45		1				
46		1				
47		1				
48		1				
49		1				
50		1				
51		1				
52		1				
53		1				
54		1				
55		1				
56		1				
57		1				
58		1				
59		1				
60		1				
61		1				
62		1				
63		1				
64		1				
65		1				
66		1				
67		1				
68		1				
69		1				
70		1				
71		1				
72		1				
73		1				
74		1				
75		1				
76		1				
77		1				
78		1				
79		1				
80		1				
81		1				
82		1				
83		1				
84		1				
85		1				
86		1				
87		1				
88		1				
89		1				
90		1				
91		1				
92		1				
93		1				
94		1				
95		1				
96		1				
97		1				
98		1				
99		1				
100		1				
Total, %	512	486	548	448	525	473
Fishes measured	713	679	719	777	764	712
Mean length	33.28	35.47	35.63	37.26	35.61	37.24

Table 9. Length composition of American plaice based on reasearch catches in 1987, %.

Length, sm	Div. 30		Div. 3M		Div. 3L		Div. 3K		Div. 3M	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
12-13	-	-	4	5	-	-	-	-	-	-
14-15	6	15	22	24	5	5	1	2	-	-
16-17	13	25	30	36	11	8	2	5	-	-
18-19	26	40	37	39	22	17	4	13	-	1
20-21	15	25	31	35	27	23	9	23	2	1
22-23	23	28	50	56	31	22	12	29	6	3
24-25	25	40	57	57	39	26	13	24	8	17
26-27	37	47	44	39	45	32	25	54	11	29
28-29	32	46	39	44	52	37	30	65	8	31
30-31	18	48	42	37	44	30	39	52	16	19
32-33	24	54	26	22	51	37	35	60	54	17
34-35	21	46	18	23	51	44	35	83	99	34
36-37	19	42	13	19	45	42	19	80	114	52
38-39	16	39	11	12	29	45	11	66	44	57
40-41	13	32	13	12	18	28	1	57	14	82
42-43	10	25	10	11	10	29	2	42	7	81
44-45	10	26	6	9	6	20	3	37	4	92
46-47	6	19	5	8	3	14	-	26	1	50
48-49	3	20	1	10	1	16	1	15	-	18
50-51	1	13	1	7	-	9	-	11	-	10
52-53	2	12	-	5	-	6	-	6	-	5
54-55	-	7	-	6	-	5	-	3	-	8
56-57	-	5	-	5	-	2	-	2	-	4
58-59	-	5	-	3	-	2	-	1	-	1
60-61	-	2	-	2	-	1	-	-	-	-
62-63	-	3	-	3	-	-	-	1	-	-
64-65	-	1	-	1	-	-	-	-	-	-
66-67	-	-	-	1	-	-	-	-	-	-
68-69	-	-	-	-	-	-	-	-	-	-
70-71	-	1	-	-	-	-	-	-	-	-
76-77	-	1	-	-	-	-	-	-	-	-
Total	320	667	460	531	490	500	242	757	388	612
Fishes measured	995	2050	2197	2503	5326	5400	485	1510	1024	1609
Mean length	29.59	33.08	28.60	32.40	29.94	33.83	30.57	34.62	34.87	37.43

Table 10. Abundance and biomass of Greenland halibut in Div. 3K in 1981-1987 (based on research catches).

Year	Month	Surveyed area, sq. miles	Number of hauls	Abundance mill. ind.	Biomass thou. t
1981	January	9479	34	57.1	62.3
1981	July	20755	48	110.2	62.5
1982	July	23030	53	154.9	98.4
1983	January	19954	67	120.2	96.7
1983	July	27926	94	587.8	122.6
1984	July	31185	113	288.6	216.7
1985	June	19012	53	127.1	72.9
1986	May-June	31185	122	266.4	174.8
1987	May-June	28470	108	129.7	66.9

Table 11. Age composition of Greenland halibut in Div. 3K in 1983-1987 (based on research catches), ‰.

Age years	Males					Females				
	1983	1984	1985	1986	1987	1983	1984	1985	1986	1987
1	-	-	-	2	4	-	-	-	3	-
2	43	2	17	38	85	82	5	53	61	102
3	218	55	74	97	177	220	62	101	114	158
4	257	139	220	150	169	197	119	184	138	116
5	183	214	289	236	147	159	196	230	213	121
6	130	239	221	258	245	126	227	195	237	199
7	93	220	118	156	186	99	200	128	141	202
8	41	107	44	45	26	55	100	60	50	47
9	30	23	14	15	17	26	44	30	21	25
10	4	1	2	3	3	13	21	13	10	9
11	1	-	1	-	2	5	7	3	3	8
12	+	-	-	-	+	5	7	2	3	5
13	-	-	-	-	-	6	5	1	3	4
14	-	-	-	-	-	3	3	-	1	1
15	-	-	-	-	-	2	2	+	1	-
16	-	-	-	-	-	1	2	-	1	1
17	-	-	-	-	-	+	+	-	+	2
18	-	-	-	-	-	1	+	-	+	-
19	-	-	-	-	-	+	-	-	-	-
20	-	-	-	-	-	-	-	-	-	-
Number of ind.	5083	2436	1334	7006	3311	4587	5609	2626	3165	4030
Mean age, years	4.76	5.84	5.24	5.32	5.05	4.26	6.10	5.32	5.34	5.31

Table 12. Results of Greenland halibut trawl survey in IBCD, 1987.

Strata	Depth (m)	Sets	Average catch per hour		Abundance ind. 10 ³	Biomass t
			spp.	kg		
11	501-750	3	55.3	62.1	4086	4585
12	751-1000	5	80.8	98.6	4740	5784
13	1001-1250	5	125.2	176.8	5664	7859
16	1001-1250	5	93.6	134.6	7315	10519
17	751-1000	4	234.0	206.2	14681	17954
18	501-750	3	3.7	3.3	89	80
19	401-500	4	0.3	0.3	1	2
21	201-300	3	0.3	0.3	15	11
26	501-750	5	66.6	66.3	8749	8717
27	401-500	3	25.3	14.3	254	143
Total	201-1250	40	75.6	94.2	45495	56644

Table 13. Results of Greenland halibut trawl survey in Divisions 2GH, October-November 1987.

Strata	Depth m.	Sets	Mean catch per hour		Abundance, ind. 10 ³	Biomass t
			spp.	kg.		
909	< 200	4	27.5	10.8	2824	1076
910	< 200	3	12.7	4.1	1097	397
925	< 200	3	5.6	1.5	534	104
901	201-300	3	62.7	14.5	2815	650
908	201-300	3	25.0	5.3	480	116
911	201-300	3	67.6	3.1	1717	80
924	201-300	3	36.7	12.6	1027	354
902	301-400	3	3.0	1.7	15	7
912	301-400	3	25.7	3.6	69	10
923	301-400	3	10.3	9.4	67	62
903	401-500	3	49.3	31.1	146	32
913	401-500	3	30.7	22.0	70	51
922	401-500	3	18.0	22.2	124	153
928	401-500	3	13.3	13.7	387	397
904	501-750	3	86.0	86.1	487	488
914	501-750	3	47.3	36.9	198	154
921	501-750	3	66.3	79.2	349	436
929	501-750	4	51.0	63.8	2383	2980
905	751-1000	3	366.7	520.3	2227	3160
915	751-1000	3	103.0	124.4	366	442
920	751-1000	3	151.7	178.1	966	1134
906	1001-1250	3	64.7	151.8	548	1288
916	1001-1250	3	174.0	268.1	941	1450
919	1001-1250	4	165.5	283.8	1937	3322
935	751-1000	3	73.0	104.2	259	371
940	751-1000	3	132.0	220.3	474	722
962	751-1000	3	104.3	172.0	935	1542
936	1001-1250	3	24.7	44.7	71	129
939	1001-1250	3	40.0	122.1	153	588
963	1001-1250	3	27.0	60.7	285	596
TOTAL	< 200-1250	93	69.1	90.1	25812	22361

Table 14. Results of Greenland halibut trawl survey in NAFO Subarea OB, 1987.

Strata	Depth m.	Sets	Average catch per hour		Abundance, ind. 10 ³	Biomass, t.
			sp.	kg.		
1	201-300	3	0.7	0.2	58	20
2	301-400	3	163.0	12.1	11132	627
3	401-500	3	6.3	5.7	614	552
4	501-750	5	26.2	45.2	4533	7818
5	751-1000	6	65.2	100.2	4956	9682
6	1001-1250	5	65.8	95.9	4814	7015
8	201-300	3	2.0	0.2	263	21
9	301-400	4	34.0	8.0	5060	1184
10	401-500	3	11.5	10.6	657	614
11	501-750	4	26.5	28.2	2268	2410
12	751-1000	4	88.5	139.5	3001	4872
13	1001-1250	3	64.0	105.6	813	1342
22	201-300	3	6.0	1.5	494	123
23	301-400	3	170.0	14.8	5887	511
24	401-500	3	59.3	12.1	3184	650
25	501-750	4	34.0	27.6	2682	2179
TOTAL	201-1250	59	51.4	44.2	50546	97819

Table 15. Results of Greenland halibut trawl survey in OB, 1979-1987.

	1979 Sep.	1980 Nov.-Dec.	1981 Dec.	1982 Nov.	1983 Nov.	1984 Sep.	1985 Nov.-Dec.	1986 Oct.-Nov.	1987 Oct.
Abundance, mill. ind.	109.1	161.3	64.5	191.0	179.0	72.6	122.7	138.5	50.6
± error, mill. ind.	±14.7	±26.5	±19.6	±49.5	±43.0	±16.9	±37.8	±32.9	±15.4
Biomass, thous. t.	200.9	240.0	105.1	355.3	304.1	119.1	110.2	158.6	37.8
± error, thous. t.	±27.9	±48.9	±38.7	±102.4	±80.5	±23.0	±27.0	±33.8	±7.0
No. of hauls	98	39	13	53	71	33	77	66	59
Depth range	401-1250	301-1250	501-1250	401-1500	401-1500	501-1250	201-1500	200-1250	200-1250
% of surveyed area	44.1	56.7	23.8	40.7	48.2	35.4	77.5	95.5	95.5