

JOINT



REPORT

**REPORT OF THE INTERNATIONAL
0-GROUP FISH SURVEY IN THE BARENTS SEA
AND ADJACENT WATERS
IN AUGUST-SEPTEMBER 2002**



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Joint IMR-PINRO report

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IN THE BARENTS SEA AND ADJACENT WATERS
IN AUGUST-SEPTEMBER 2002**

Institute of Marine Research
P.O. Box 1870 Nordnes
N-5024 Bergen
NORWAY

PINRO
6 Knipovich Street
183763 Murmansk
RUSSIA

Murmansk
PINRO Press

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**REPORT OF THE INTERNATIONAL 0-GROUP FISH SURVEY IN
THE BARENTS SEA AND ADJACENT WATERS IN AUGUST-SEPTEMBER 2002**

The 38 th annual international 0-group fish survey was carried out during the period 10 August-8 September 2002 in the Barents Sea and adjacent waters. The following research vessels participated in the survey:

State	Vessel	Period	Research Institute
Norway	“G. O. Sars”	16.08 - 08.09	Institute of Marine Research, Bergen
Norway	“Johan Hjort”	24.08 - 08.09	Institute of Marine Research, Bergen
Russia	“AtlantNIRO”	10.08 - 08.09	The Polar Research Institute of Marine
Russia	“Fridtjof Nansen”	29.08 – 08.09	Fisheries and Oceanography, Murmansk

Names of scientists and technicians who worked onboard different vessels are given in the Appendix.

Preliminary analysis of the survey data was made onboard “G.O.Sars” and “AtlantNIRO” and the final report was finished by correspondence. Observations of the geographical distribution of 0-group fish and their abundance are given in this report together with a brief description of the hydrographical conditions in the sea.

MATERIAL AND METHODS

The geographical distribution of 0-group fish was estimated with a small mesh mid-water trawl. All vessels which participated in the survey in 2002 used the type of mid-water trawl recommended in 1980 (Anon. 1983). The standard procedure consisted of tows at 3 depths, each of 0.5 nautical miles, with the headline of the trawl located at 0, 20 and 40 m. Additional tows at 60 and 80 m, also of 0.5 nm length, were made when the 0-group fish layer was recorded deeper than 60 m or 80 m on the echo-sounder. Trawling procedure was standardised in accordance with the recommendations made in 1980. A smaller sized pelagic trawl was used during the first 20 years of the 0-group investigations. After 1985, the present gear has been used regularly. In the mid-90s, Nakken and Raknes (1996) recalculated the indices from the first 20 years. Their new indices are based upon the number of 0-group cod and haddock that would have been caught if the new equipment had been used during the whole period from 1965. The indices of cod and haddock abundance recalculated by Nakken and Raknes (1996) have been incorporated in the 0-group report since 2001.

The distance between most stations was 35 nautical miles (Fig.1). Hydrographical observations were made at each trawl station and at several permanent hydrographical sections. Figs 2-4 show temperature and salinity along the hydrographical sections: Kola, Bear Island - W and Cape Kanin – N. Mean temperatures in the main parts of these sections are presented in Table 1. During the survey the standard Bear Island – North Cape section was not occupied due to the late start of the research vessel “Fridtjof Nansen”. Horizontal distributions of temperature and salinity are shown for 0, 50, 100, 200 m and bottom in Figs 5-14.

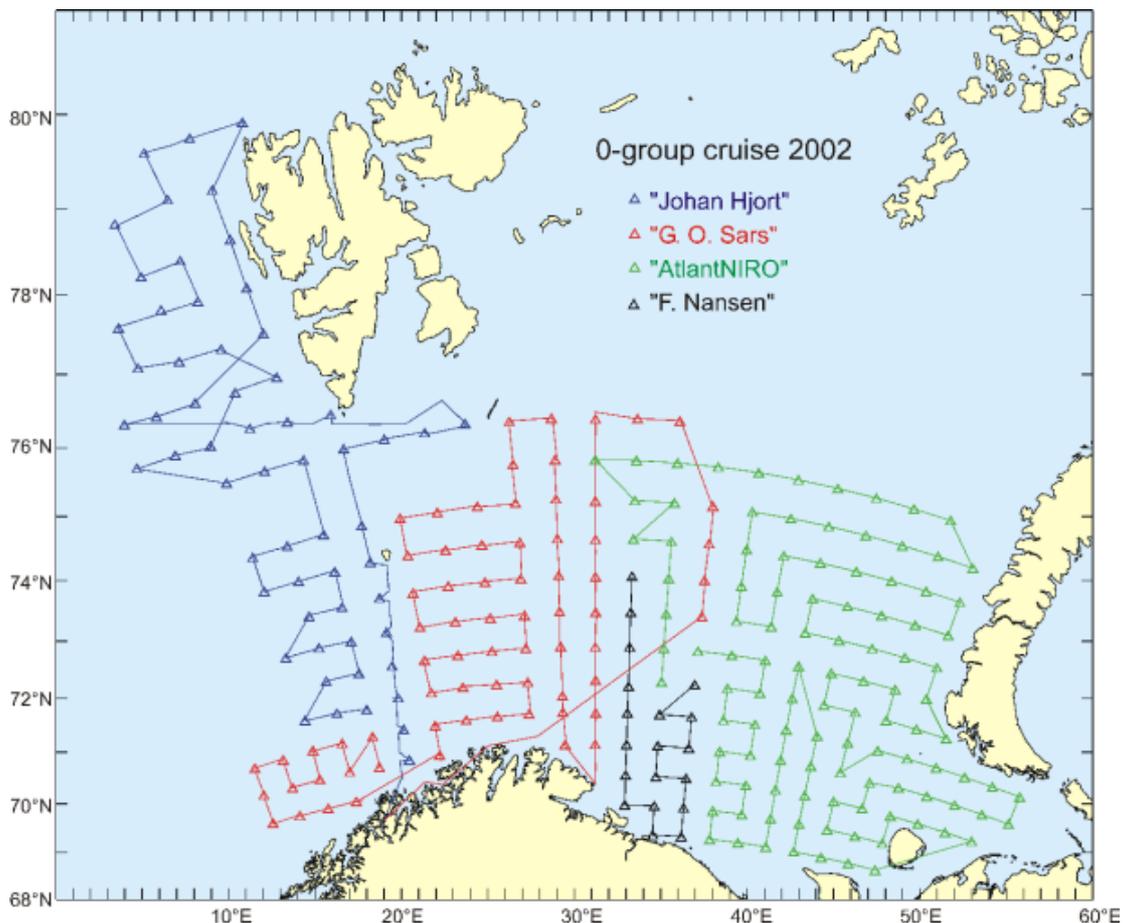


Fig.1. Trawl stations occupied under the 0-group investigations in 2002

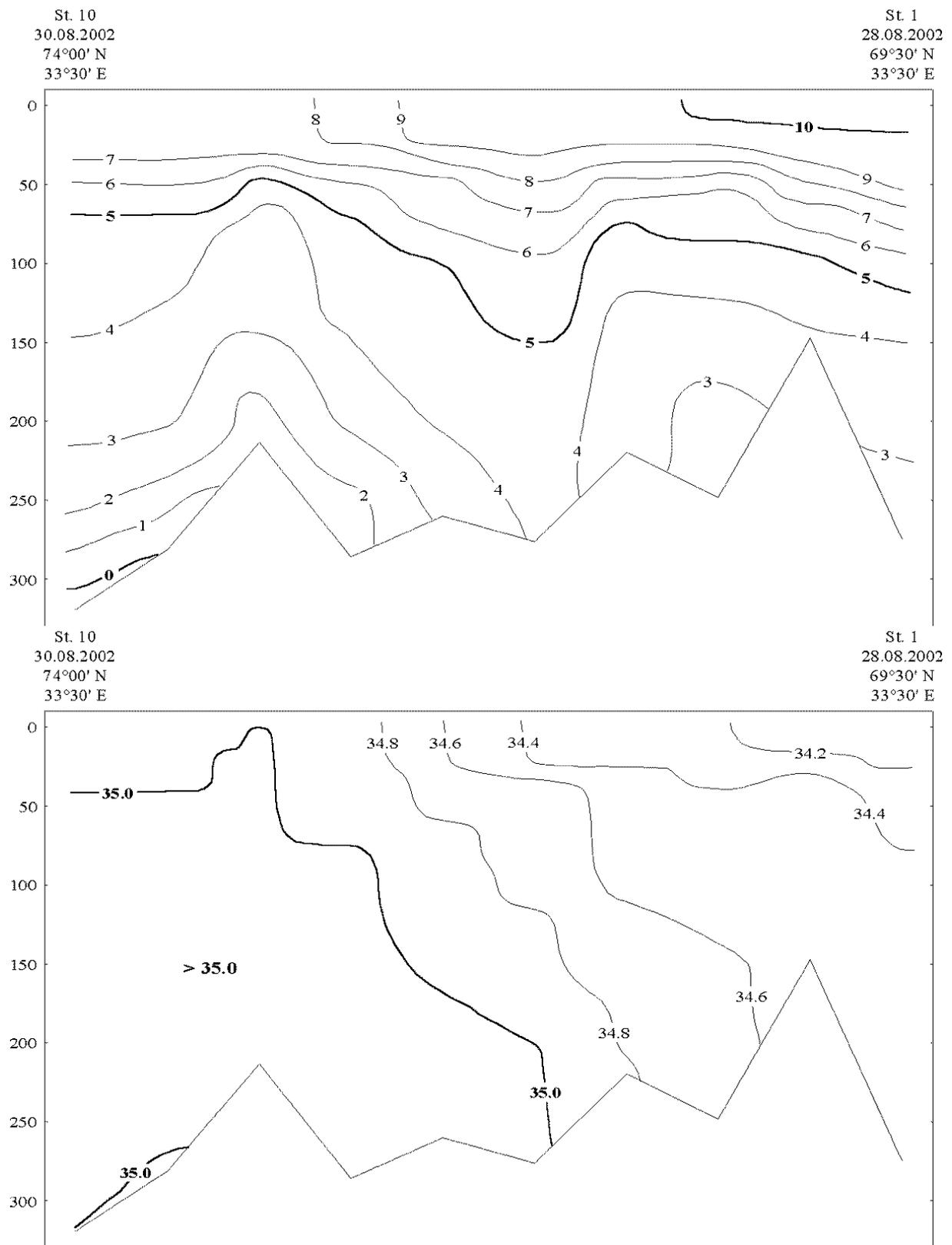


Fig.2. Temperature and salinity in the Kola section

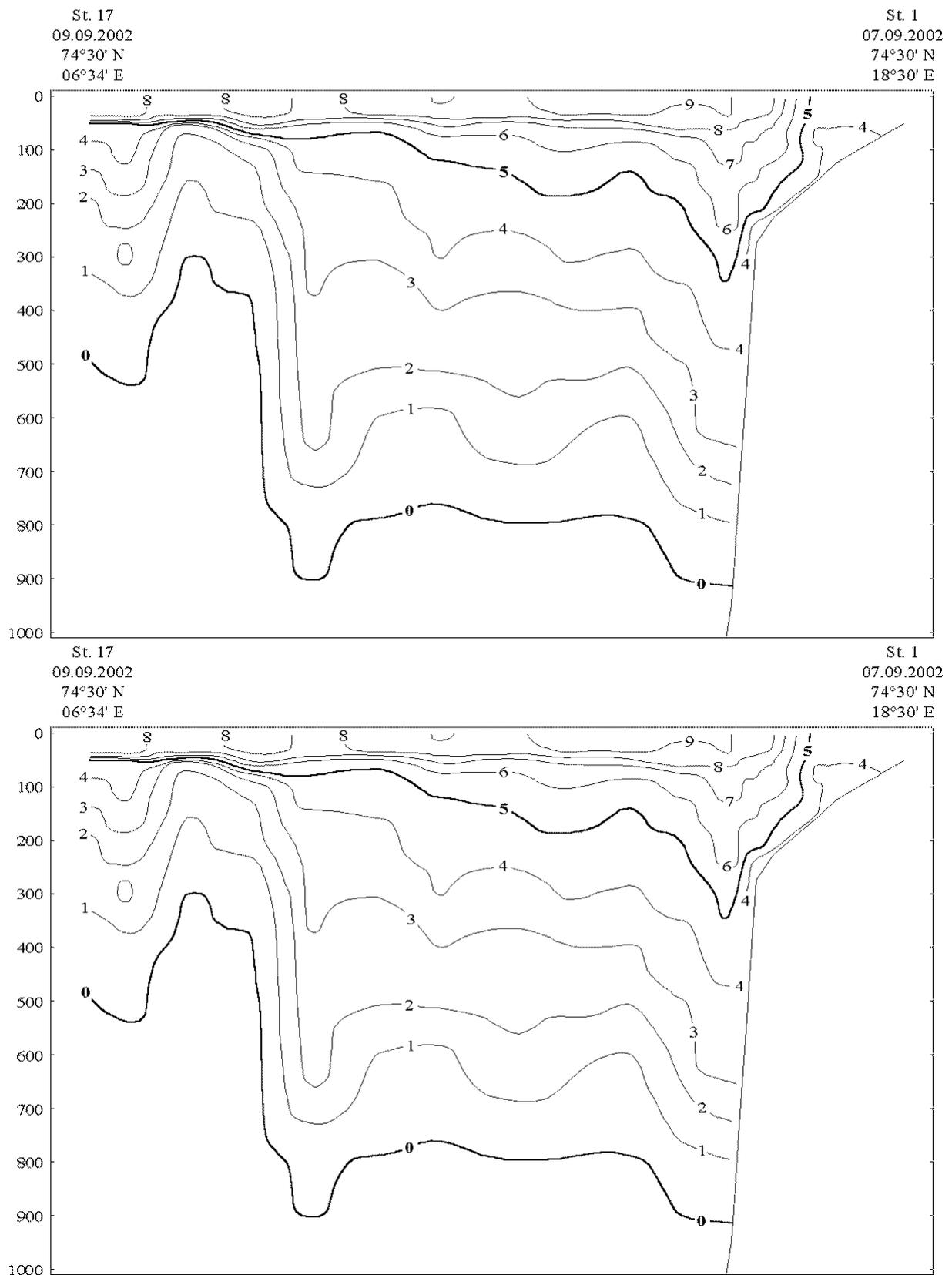


Fig.3. Temperature and salinity in the Bear Island-W section

St. 20
15.08.2002
72°30' N
43°15' E

St. 1
17.08.2002
68°45' N
43°15' E



St. 20
15.08.2002
72°30' N
43°15' E

St. 1
17.08.2002
68°45' N
43°15' E

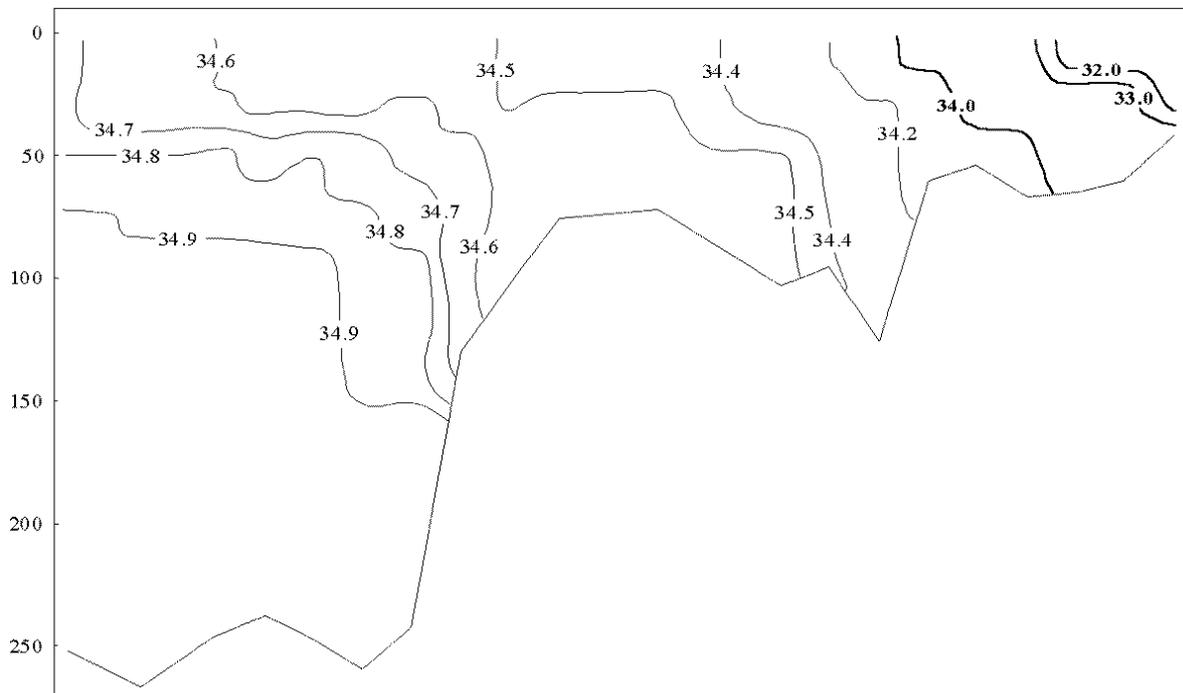


Fig.4. Temperature and salinity in the Kanin section

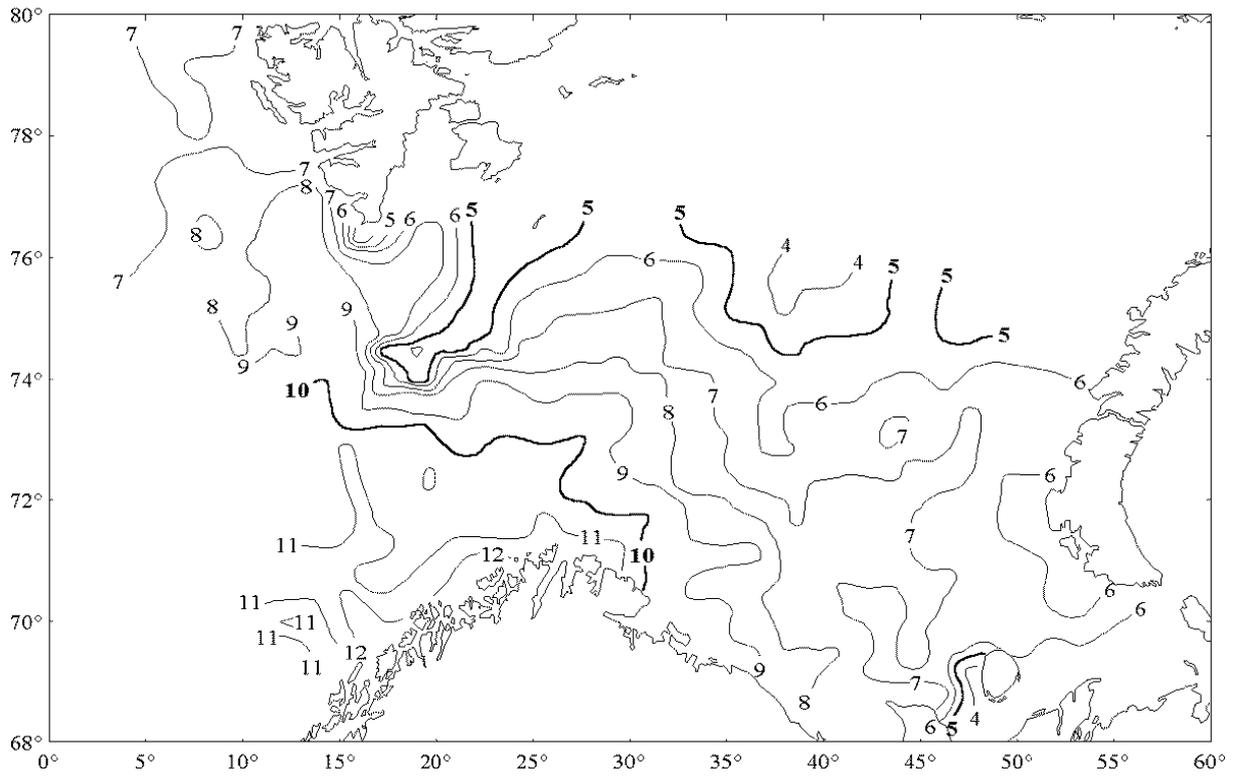


Fig.5. Distribution of surface temperature (°C)

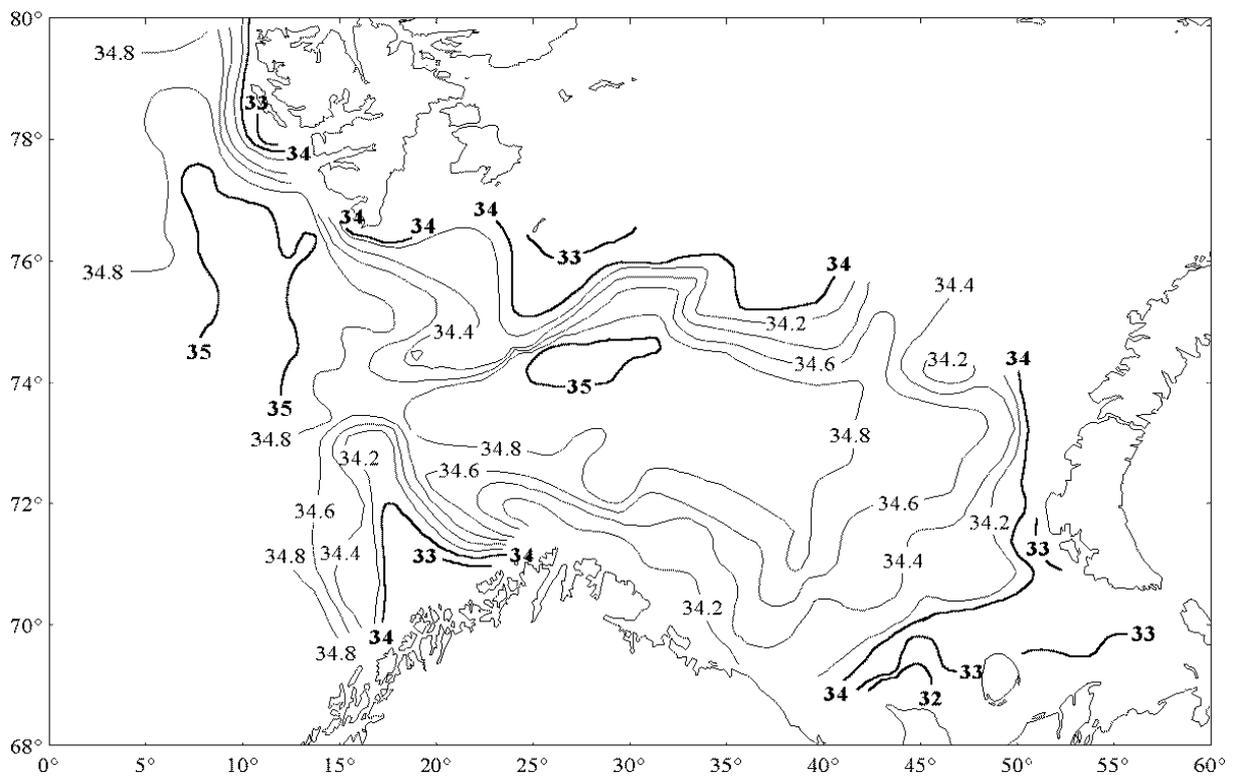


Fig.6. Distribution of surface salinity

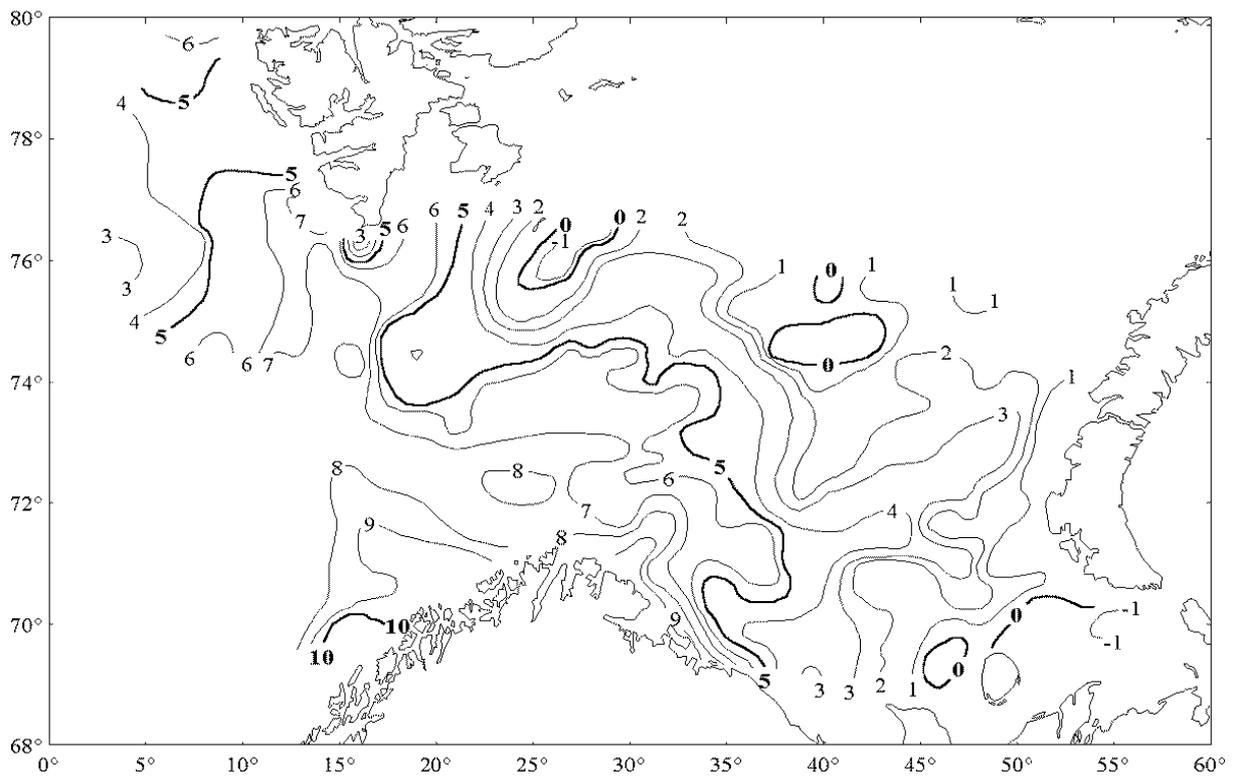


Fig.7. Distribution of temperature (°C) in 50 m depth

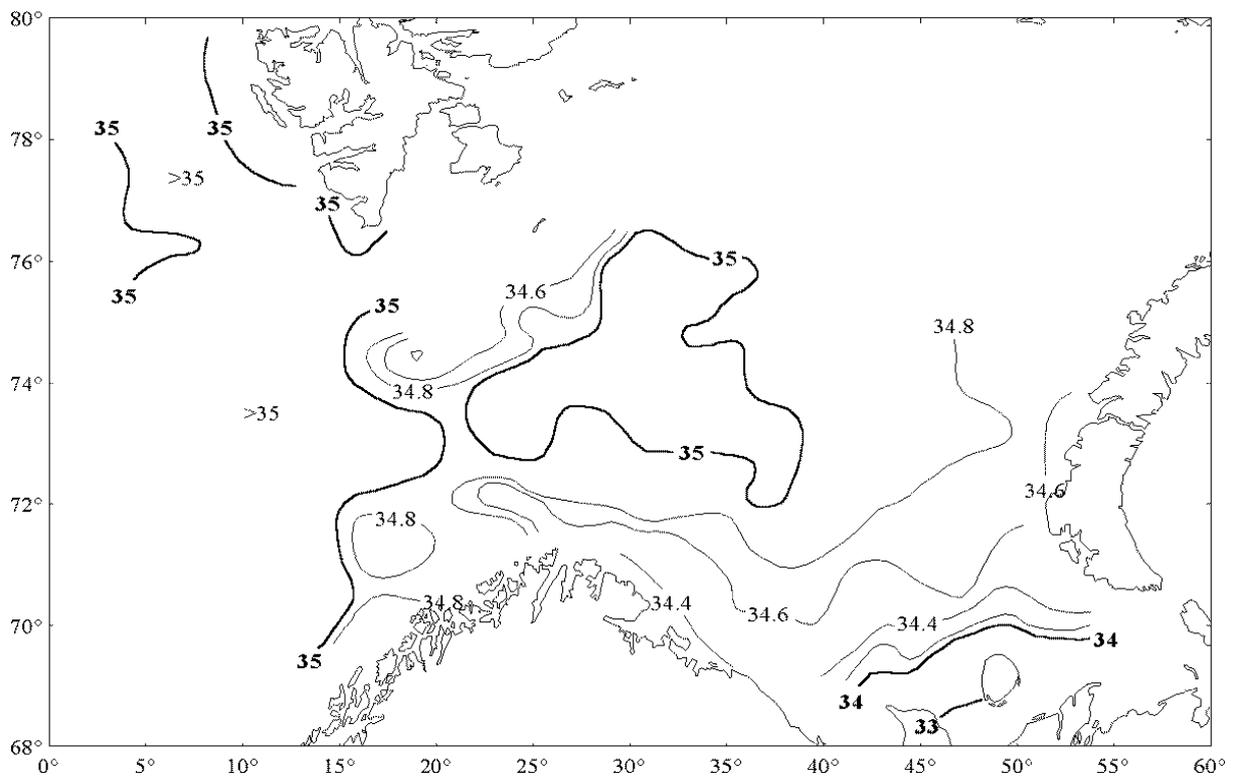


Fig.8. Distribution of salinity in 50 m depth

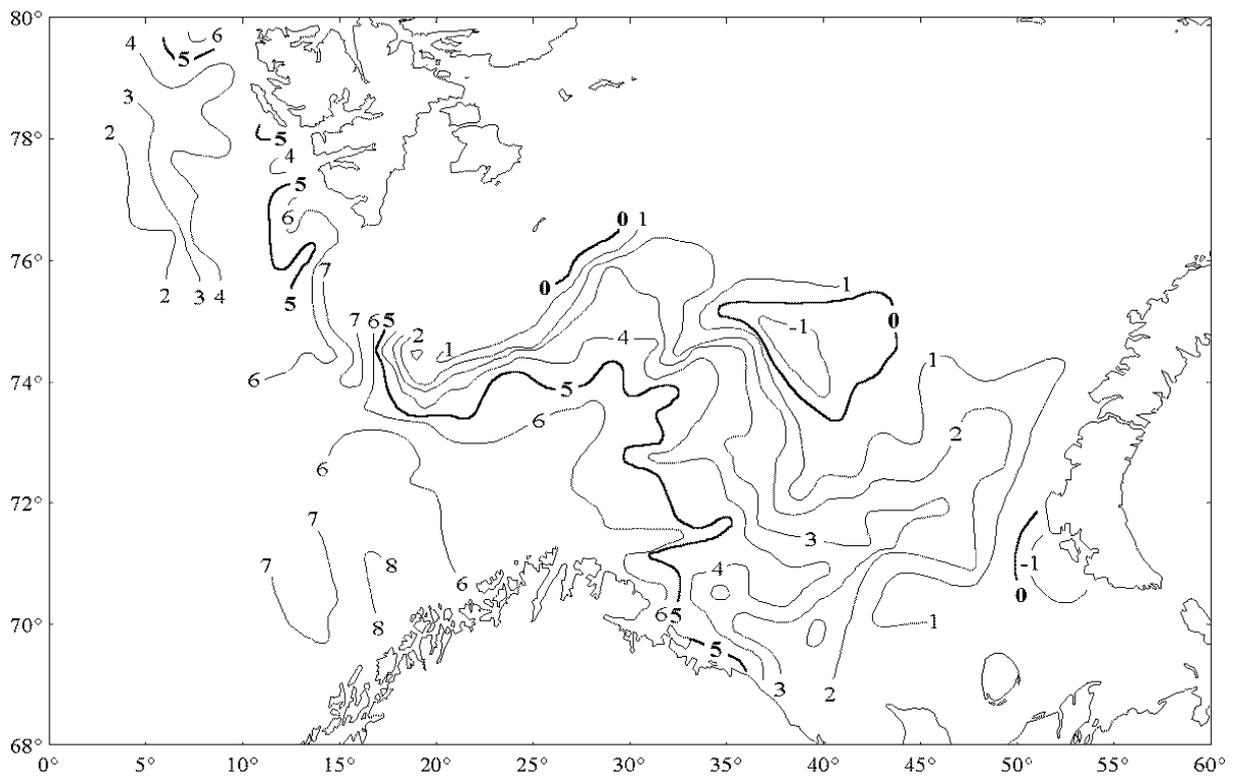


Fig.9. Distribution of temperature (°C) in 100 m depth

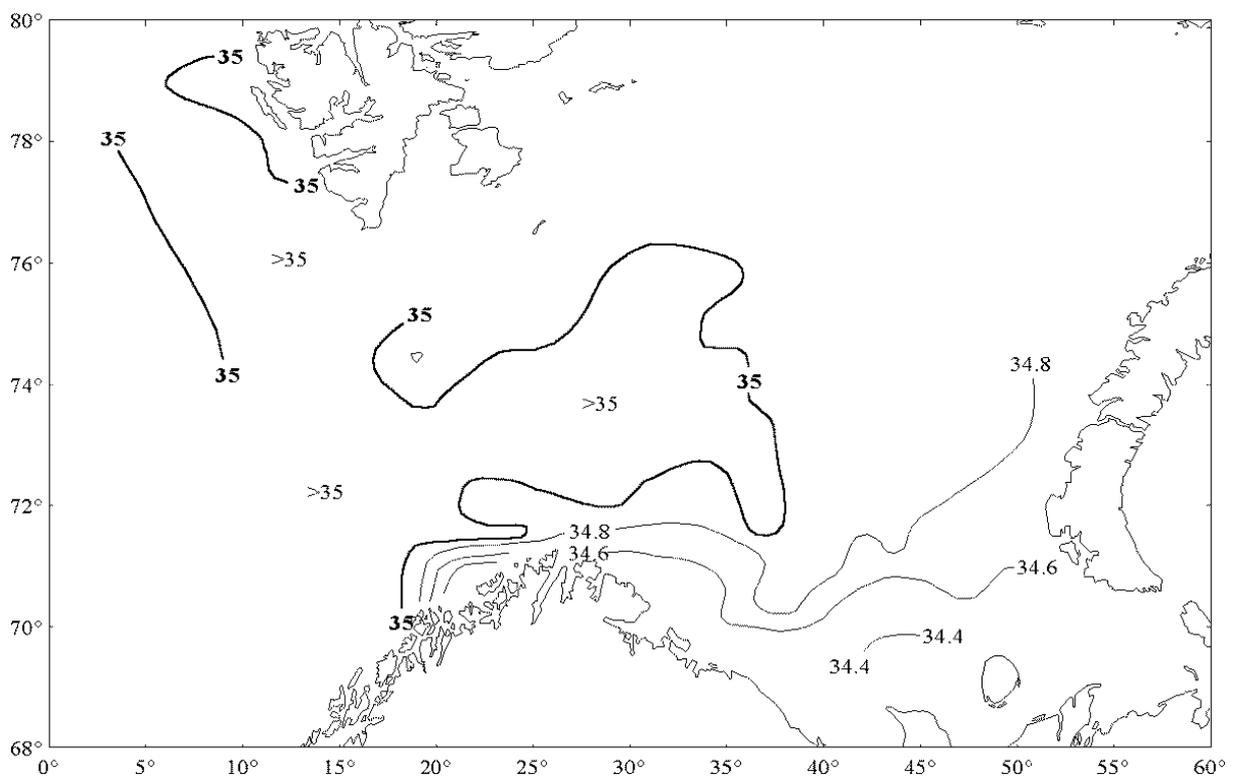


Fig.10. Distribution of salinity in 100 m depth

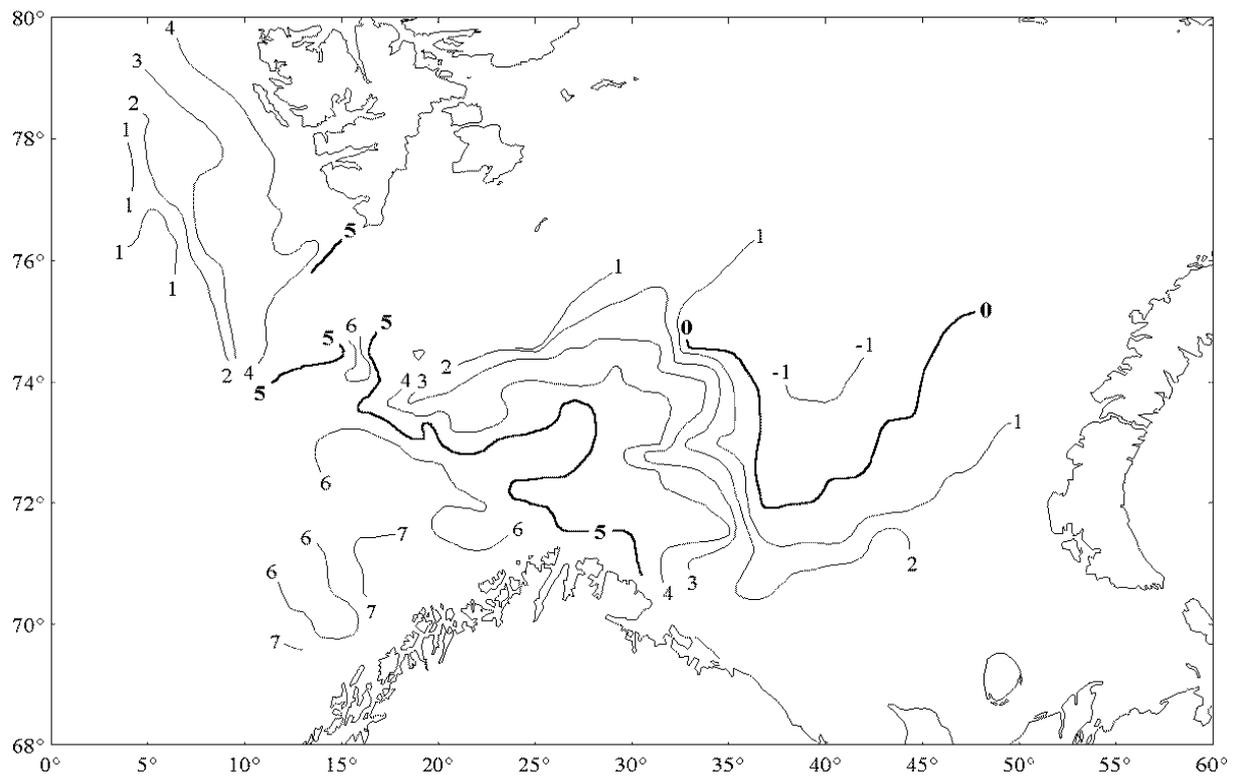


Fig.11. Distribution of temperature (°C) in 200 m depth

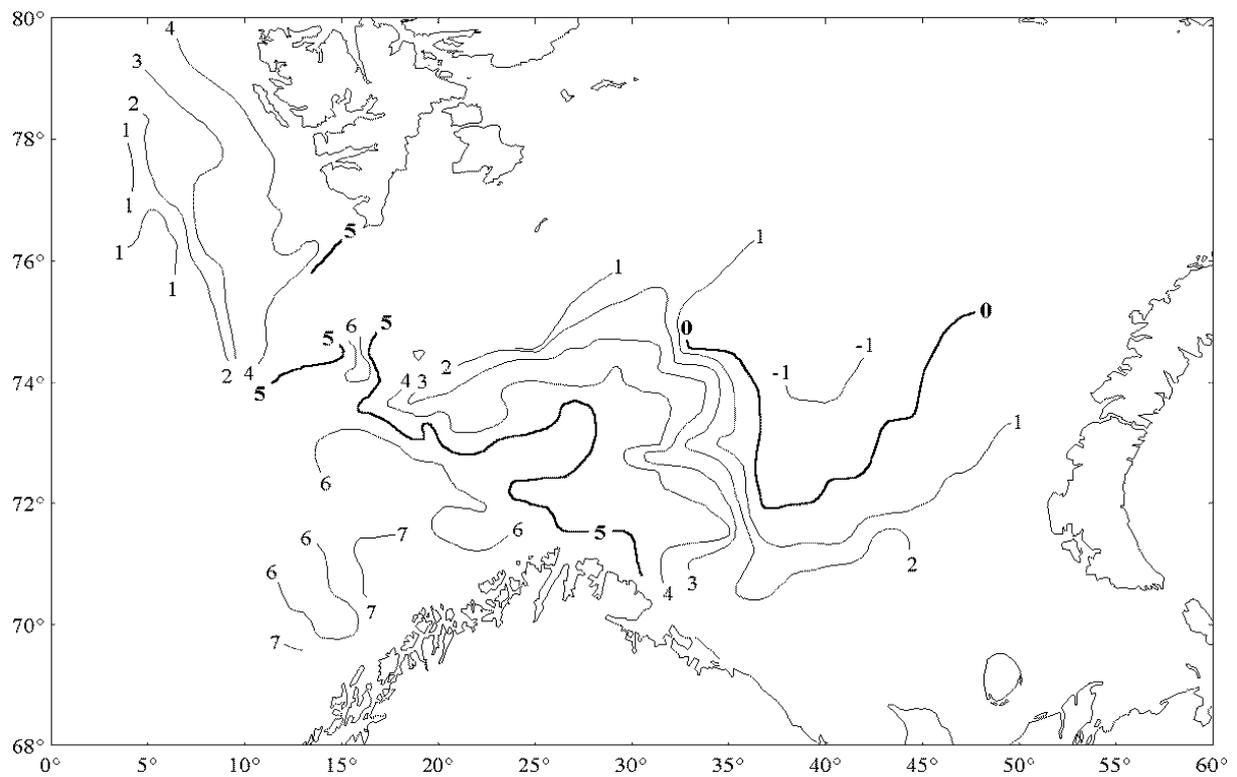


Fig.12. Distribution of salinity in 200 m depth

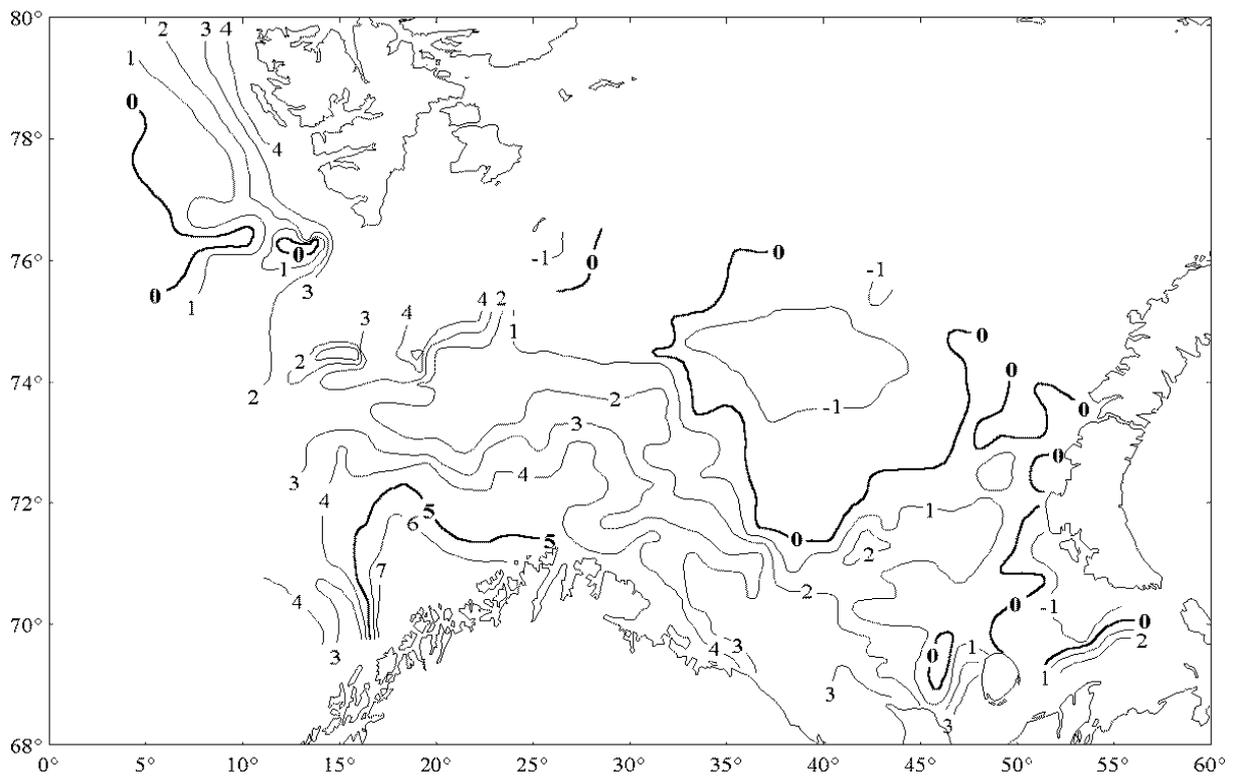


Fig.13. Distribution of bottom temperature (°C)

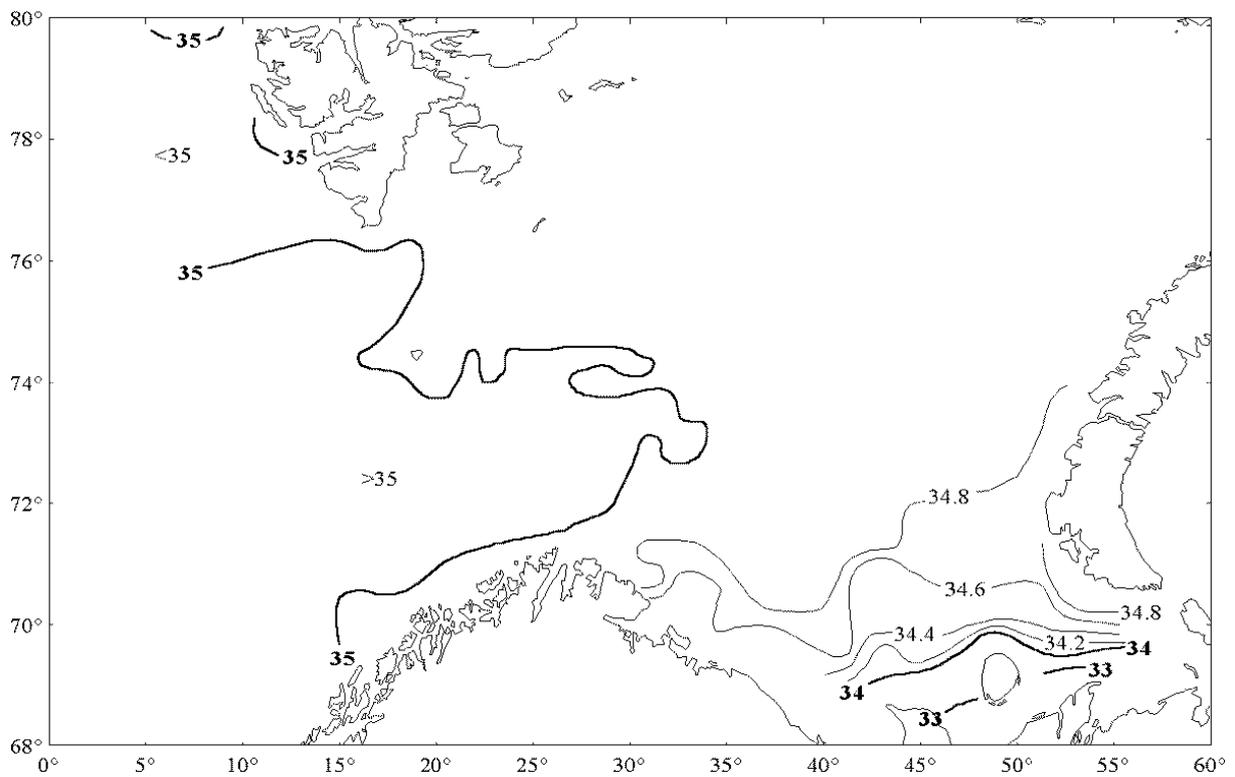


Fig.14. Distribution of bottom salinity

Table 1. Mean water temperature¹ in main parts of standard sections in the Barents Sea and adjacent waters in August-September 1965-2002

Year	Section ² and layer (depth in meters)						
	1	2	3	4	5	6	7
	0-50	50-200	0-200	0-bot.	0-bot.	0-200	0-200
1965	6.7	3.9	4.6	4.6	3.7	5.1	-
1966	6.7	2.6	3.6	1.9	2.2	5.5	3.6
1967	7.5	4.0	4.9	6.1	3.4	5.6	4.2
1968	6.4	3.7	4.4	4.7	2.8	5.4	4.0
1969	6.7	3.1	4.0	2.6	2.0	6.0	4.2
1970	7.8	3.7	4.7	4.0	3.3	6.1	-
1971	7.1	3.2	4.2	4.0	3.2	5.7	4.2
1972	8.7	4.0	5.2	5.1	4.1	6.3	3.9
1973	7.7	4.5	5.3	5.7	4.2	5.9	5.0
1974	8.1	3.9	4.9	4.6	3.5	6.1	4.9
1975	7.0	4.6	5.2	5.6	3.6	5.7	4.9
1976	8.1	4.0	5.0	4.9	4.4	5.6	4.8
1977	6.9	3.4	4.3	4.1	2.9	4.9	4.0
1978	6.6	2.5	3.6	2.4	1.7	5.0	4.1
1979	6.5	2.9	3.8	2.0	1.4	5.3	4.4
1980	7.4	3.5	4.5	3.3	3.0	5.7	4.9
1981	6.6	2.7	3.7	2.7	2.2	5.3	4.4
1982	7.1	4.0	4.8	4.5	2.8	5.8	4.9
1983	8.1	4.8	5.6	5.1	4.2	6.3	5.1
1984	7.7	4.1	5.0	4.5	3.6	5.9	5.0
1985	7.1	3.5	4.4	3.4	3.4	5.3	4.6
1986	7.5	3.5	4.5	3.9	3.2	5.8	4.4
1987	6.2	3.3	4.0	2.7	2.5	5.2	3.9
1988	7.0	3.7	4.5	3.8	2.9	5.5	4.2
1989	8.6	4.8	5.8	6.5	4.3	6.9	4.9
1990	8.1	4.4	5.3	5.0	3.9	6.3	5.7
1991	7.7	4.5	5.3	4.8	4.2	6.0	5.4
1992	7.5	4.6	5.3	5.0	4.0	6.1	5.0
1993	7.5	4.0	4.9	4.4	3.4	5.8	5.4
1994	7.7	3.9	4.8	4.6	3.4	6.4	5.3
1995	7.6	4.9	5.6	5.9	4.3	6.1	5.2
1996	7.6	3.7	4.7	5.2	2.9	5.8	4.7
1997	7.3	3.4	4.4	4.2	2.8	5.6	4.1
1998	8.4	3.4	4.7	2.1	1.9	6.0	³⁾
1999	7.4	3.8	4.7	3.8	3.1	6.2	5.3
2000	7.6	4.5	5.3	5.8	4.1	5.7	5.1
2001	6.9	4.0	4.7	5.6	4.0	5.7	4.9
2002	8.6	4.8	5.8	4.0	3.7	-	5.4
Average 1965-2002	7.4	3.8	4.7	4.3	3.3	5.8	4.7

¹⁾ Earlier presented temperatures have been slightly adjusted (Tereshchenko, 1992).

²⁾ 1-3: Murmansk Current; Kola section (70°30'N-72°30'N, 33°30'E)

4: Cape Kanin section (68°45'N-70°05'N, 43°15'E)

5: Cape Kanin section (71°00'N-72°00'N, 43°15'E)

6: North Cape Current; North Cape-Bear Island section (71°33'N, 25°02'E – 73°35'N, 20°46'E)

7: West Spitsbergen Current; Bear Island – West section (74°30'N 06°34'E – 15°55'E).

³⁾ In 1998 only the central branch and the eastern branch of the West Spitsbergen Current were covered, and the temperatures were 5.4 and 4.5°C respectively.

Trawl stations with and without catch are indicated in the distribution charts in Figs 15-26, as filled and open symbols respectively. The density grading is based on catches, measured in number of fish per 1.0 nautical mile trawling. Double shading indicates dense concentrations. The criteria for discriminating between dense and scattered concentrations are the same as in earlier reports (Anon. 1980). Abundance indices are given in Table 2. All area-based abundance indices were estimated using standard software (Fotland et al. 1995). Another set of logarithmically transformed abundance indices is given for 0-group herring, cod and haddock (Table 3), calculated according to Randa (1984). These are based on the number of fish caught during a standard trawl haul of one nautical mile. Length frequency distributions of the main species are given in Table 4.

HYDROGRAPHY

2002 seems to be the year with a strong influx of warm water into the Barents Sea. The surface water temperatures were above the long term mean in the western and central parts of the sea, while in the eastern part the surface temperature was typically 0.5-1.0°C below the long term mean. Temperature anomalies in depths more than 50 m were positive over the entire area except for some small: near Kolguev Island, Bear Island and in the north of the survey area. The bottom temperature showed little variations compared to previous years, with a small increase in the northwest and a small decrease in the southeast.

Of all the sections, the waters of the Bear Island-West Section showed the highest positive temperature anomalies (up to +3.8°C) in the 0-50 m layer. The water temperature of the Middle and Eastern (marine and coastal parts) Branches of the Norwegian Current were 1.9, 2.0, 1.4°C above the long-term mean in the 0-50 m layer and 1.3, 1.5, 1.4°C above the long term mean in the 0-200 m layer. Some negative anomalies were observed between the Western and Middle branches of the Norwegian Current in the 50-1000 m layer (up to – 2.3°C) and in the deep waters (deeper than 600 m) of the Middle Branch of the Norwegian Current (up to –0.8°C).

Water temperatures in the Kola Section in the 0-50 m and 0-200 m layers exceeded the long-term mean by 1.4, 0.7°C in the Murman Coastal Current, by 1.5, 1.0°C in the Murman Current and by 0.6, 0.5°C in the Central Branch of the North Cape Current. The Northern Branch of the North Cape Current was by 1.4, 0.9°C warmer than normal in the same layers.

The Kanin Current in the Kanin Section was colder than normal (up to –2.4°C) in the 0-50 m layer except for the 20-30 m depths where positive anomalies (1.8-2.3°C) were observed. Temperature of the Novaya Zemlya Current in the 0-20 m layer was insignificantly lower than the long-term mean, however, deeper than 30 m positive temperature anomalies (on the average 0.5-1.0°C) were observed. As a result, temperatures in the whole water column of the Kanin and Novaya Zemlya currents were respectively by 0.3°C lower and by 0.4°C higher than the long-term mean.

Water salinity in the survey area was close to the long-term mean. However, some exceptions were observed: the surface waters of the southeastern Barents Sea were saltier than normal (the anomaly reached +3.3). Conversely, surface waters off Kanin Peninsula, southeast of Hopen Island and along the Norwegian coast were fresher than normal (the anomaly reached –1.5).

Table 2. Abundance indices of 0-group fish in the Barents Sea and adjacent waters in 1965-2002

Year	Capelin ¹	Cod ²	Haddock ²	Polar cod		Redfish	Greenland halibut	Long rough dab
				West	East			
1965	37	11	13	0		159		66
1966	119	2	2	129		236		97
1967	89	62	76	165		44		73
1968	99	45	14	60		21		17
1969	109	211	186	208		295		26
1970	51	1097	208	197		247	1	12
1971	151	356	166	181		172	1	81
1972	275	225	74	140		177	8	65
1973	125	1101	87	26		385	3	67
1974	359	82	237	227		468	13	93
1975	320	453	224	75		315	21	113
1976	281	57	148	131		447	16	96
1977	194	279	187	157	70	472	9	72
1978	40	192	110	107	144	460	35	76
1979	660	129	95	23	302	980	22	69
1980	502	61	68	79	247	651	12	108
1981	570	65	30	149	93	861	38	95
1982	393	136	107	14	50	694	17	150
1983	589	459	219	48	39	851	16	80
1984	320	559	293	115	16	732	40	70
1985	110	742	156	60	334	795	36	86
1986	125	434	160	111	366	702	55	755
1987	55	102	72	17	155	631	41	174
1988	187	133	86	144	120	949	8	72
1989	1300	202	112	206	41	698	5	92
1990	324	465	227	144	48	670	2	35
1991	241	766	472	90	239	200	1	28
1992	26	1159	313	195	118	150	3	32
1993	43	910	240	171	156	162	11	55
1994	58	899	282	50	448	414	20	272
1995	43	1069	148	6	0	220	15	66
1996	291	1142	196	59	484	19	5	10
1997	522	1077	150	129	453	50	13	42
1998	428	576	593	144	457	78	11	28
1999	722	194	184	116	696	27	13	66
2000	303	870	417	76	387	195	28	81
2001	221	212	394	148	146	11	32	86
2002	327	1055	412	179	588	28	34	173
1985-2002	296	667	256	114	291	333	19	120
1965-2002	279	463	188			386	18	97

¹) Assessment for 1965-1978 in Anon. 1980 and for 1979-1993 in Ushakov and Shamray 1995.

²) Indices for 1965-1985 adjusted according to Nakken and Raknes (1996).

Table 3. Estimated logarithmic indices of year-class abundance with 90% confidence limits for 0-group herring, cod and haddock in the Barents Sea and adjacent waters, 1966-2002

Year	Herring			Cod			Haddock		
	Index	Confidence limits		Index	Confidence limits		Index	Confidence limits	
1966	0.14	0.04	0.31	0.02	0.01	0.04	0.01	0.00	0.03
1967	0.00	-	-	0.04	0.02	0.08	0.08	0.03	0.13
1968	0.00	-	-	0.02	0.01	0.04	0.00	0.00	0.02
1969	0.01	0.00	0.04	0.25	0.17	0.34	0.29	0.20	0.41
1970	0.00	-	-	2.51	2.02	3.05	0.64	0.42	0.91
1971	0.00	-	-	0.77	0.48	1.01	0.26	0.18	0.36
1972	0.00	-	-	0.52	0.35	0.72	0.16	0.09	0.27
1973	0.05	0.03	0.08	1.48	1.18	1.82	0.26	0.15	0.40
1974	0.01	0.01	0.01	0.29	0.18	0.42	0.51	0.39	0.68
1975	0.00	-	-	0.90	0.66	1.17	0.60	0.40	0.85
1976	0.00	-	-	0.13	0.06	0.22	0.38	0.24	0.51
1977	0.01	0.00	0.03	0.49	0.36	0.65	0.33	0.21	0.48
1978	0.02	0.01	0.05	0.22	0.14	0.32	0.12	0.07	0.19
1979	0.09	0.01	0.20	0.40	0.25	0.59	0.20	0.12	0.28
1980	-	-	-	0.13	0.08	0.18	0.15	0.10	0.20
1981	0.00	-	-	0.10	0.06	0.18	0.03	0.00	0.05
1982	0.00	-	-	0.59	0.61	0.77	0.38	0.30	0.52
1983	1.77	1.29	2.33	1.69	1.34	2.08	0.62	0.48	0.77
1984	0.34	0.20	0.52	1.55	1.18	1.98	0.78	0.60	0.99
1985	0.23	0.18	0.28	2.46	2.22	2.71	0.27	0.23	0.31
1986	0.00	-	-	1.37	1.06	1.70	0.39	0.28	0.52
1987	0.00	0.00	0.03	0.17	0.01	0.40	0.10	0.00	0.25
1988	0.32	0.16	0.53	0.33	0.22	0.47	0.13	0.05	0.34
1989	0.59	0.49	0.76	0.38	0.30	0.48	0.14	0.10	0.20
1990	0.31	0.16	0.50	1.23	1.04	1.34	0.61	0.48	0.75
1991	1.19	0.90	1.52	2.30	1.97	2.37	1.17	0.98	1.37
1992	1.06	0.69	1.50	2.94	2.53	3.39	0.87	0.71	1.06
1993	0.75	0.45	1.14	2.09	1.70	2.51	0.64	0.48	0.82
1994	0.28	0.17	0.42	2.27	1.83	2.76	0.64	0.49	0.81
1995	0.16	0.07	0.29	2.40	1.97	2.88	0.25	0.13	0.41
1996	0.65	0.47	0.85	2.87	2.53	3.24	0.39	0.25	0.56
1997	0.39	0.25	0.54	1.60	1.35	1.86	0.21	0.12	0.31
1998	0.59	0.40	0.82	0.68	0.48	0.91	0.59	0.44	0.76
1999	0.41	0.25	0.59	0.21	0.11	0.34	0.25	0.11	0.44
2000	0.30	0.17	0.46	1.49	1.21	1.78	0.64	0.46	0.84
2001	0.13	0.04	0.25	0.23	0.12	0.36	0.67	0.52	0.84
2002	0.53	0.36	0.73	1.22	0.97	1.50	0.99	0.75	1.25
Mean 1985- 2002	0.44			1.46			0.50		

Table 4. Length distribution of 0-group fish in the Barents Sea and adjacent waters in August-September 2002, %

Length, cm	Herring	Capelin	Cod	Haddock	Polar Cod	Red fish	Sandeel	Green land halibut	Long rough dab
1.0-1.4									
1.5-1.9							0.14		0.42
2.0-2.4		0.09			0.63	11.84	1.23	0.35	5.86
2.5-2.9		1.28			5.99	1.94	26.34	1.4	22.01
3.0-3.4		13.68			20.11	15.67	55.80	2.45	34.14
3.5-3.9		15.65	0.02	0.08	28.60	41.08	13.74	3.5	31.64
4.0-4.4	0.12	21.04	0.16	0.04	25.45	27.31	2.62	0.7	5.43
4.5-4.9	0.94	12.90	0.22	0.13	13.23	2.16	0.04	2.62	0.43
5.0-5.4	8.08	9.65	0.93	0.91	4.80		0.01	2.27	0.04
5.5-5.9	20.15	4.25	2.58	1.11	0.96			1.57	0.03
6.0-6.4	15.92	5.78	6.41	3.49	0.25		0.01	22.98	
6.5-6.9	10.31	6.98	10.86	2.52			0.01	34.12	
7.0-7.4	5.55	6.92	17.45	4.48			0.01	22.63	
7.5-7.9	3.91	1.28	18.58	4.49			0.02	2.8	
8.0-8.4	5.49	0.40	16.56	5.20			0.01	1.57	
8.5-8.9	5.40	0.09	11.55	3.67				1.05	
9.0-9.4	5.06		7.72	4.27			0.02		
9.5-9.9	4.40		3.41	8.61			0.01		
10.0-10.4	4.32		1.86	7.91					
10.5-10.9	3.51		1.40	11.24					
11.0-11.4	3.61		0.16	11.11					
11.5-11.9	2.04		0.02	8.42					
12.0-12.4	1.02		0.08	7.87					
12.5-12.9	0.17			6.83					
13.0-13.4			0.01	3.90					
13.5-13.9				2.34					
14.0-14.4				1.38					
Tot catch	87184	89450	86354	8315	576942	163	13810	280	3282
Mean L (mm)	74.6	48.0	78.5	103.6	39.4	35.8	32.0	63.9	33.0

The comparison of the results from 2002 and 2001 (another warm year) shows that the surface waters were colder in the eastern part of the survey area in 2002 than in the same period of 2001 (the average of 2.0°C). On the contrary, surface waters in the western and central parts were warmer (the average of 1.0°C). The temperature difference between 2002 and 2001 was insignificant in the waters deeper than 50 m. The surface waters along the Norwegian coast and in the northern part of the survey area were fresher than in the previous year, but in the central and southeastern parts they were saltier. The meteorological situation during this year can be characterized by prevailing northeastern winds which promoted the penetration of the cold air from the Arctic and, as result, the cooling of the surface waters in the eastern part of the survey area.

DISTRIBUTION AND ABUNDANCE OF 0-GROUP FISH AND *GONATUS FABRICII*

Compared to previous year, 0-group cod, herring, capelin, saithe, polar cod, long rough dab and sandeel were observed in a wider area and further eastward than usual. The abundance of haddock, saithe and polar cod was significantly higher than the long term mean. The abundance of cod, herring and capelin was close to the normal. The reason for the wide and more easterly distribution of several species might be an intensive advection of warm Atlantic water into the Barents Sea as mentioned in the hydrography chapter. The abundance of polar cod is underestimated due to an incomplete coverage of their northeastern and northwestern distribution areas.

Herring (Fig. 15)

0-group herring were found in a wider area than last year. Dense concentrations of 0-group herring were found in small local areas west of Spitsbergen. In addition, a continuous distribution of 0-group herring was observed from the central to the south-eastern Barents Sea (to 45° E). The abundance index (0.53) increased since the last year, being close to the long-term mean (Table 3). The year class can be characterised as average. The mean length of 0-group herring was 74.6 mm (Table 4), which is more than 10 mm larger than in 2000 and 2001. Schools of large 0-group herring with a mean total length of more than 110 mm were observed in the western part of the area, while the length of herring in the eastern parts was close to 70 mm.

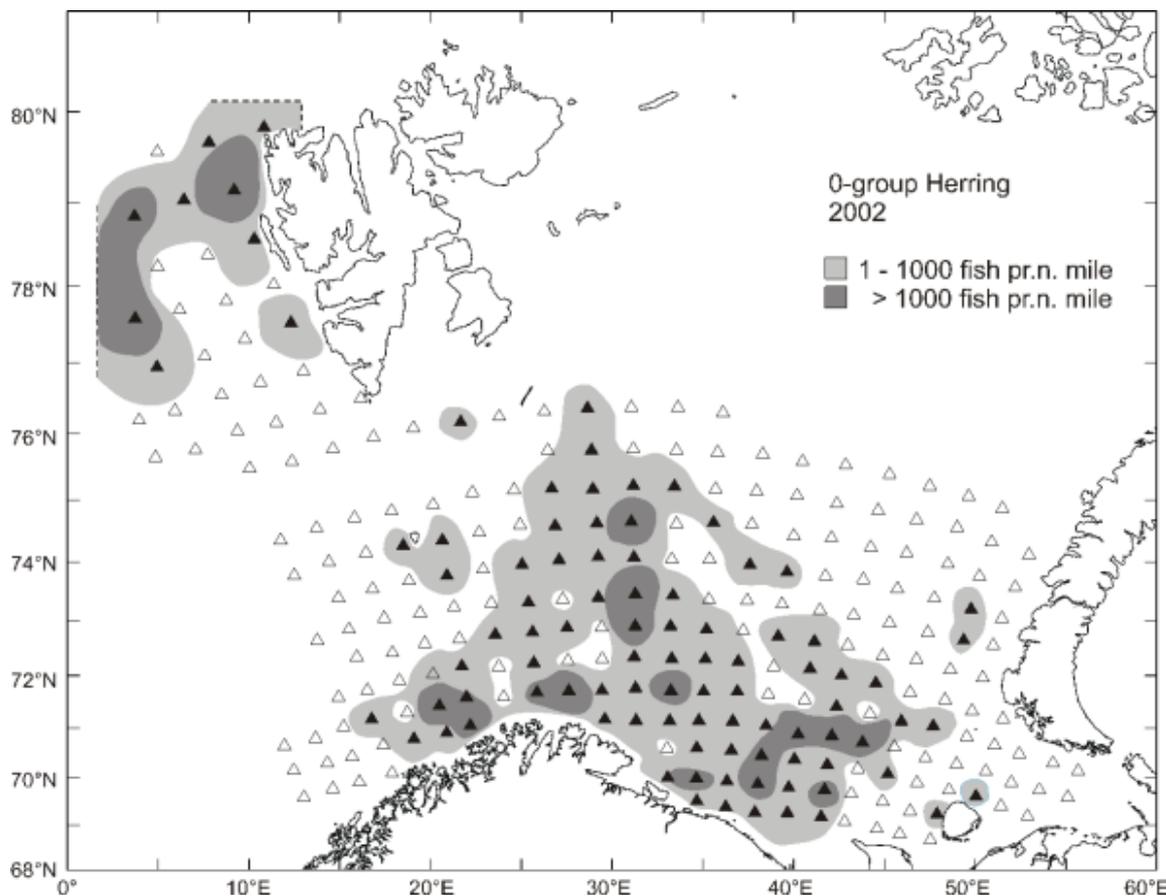


Fig.15. Distribution of 0-group herring

Capelin (Fig. 16)

0-group capelin were distributed in the central and eastern parts of the sea, from the coast to 76°30' N and from Bear Island to the coast of Novaya Zemlya. Small scattered patches were found west of Spitsbergen. More dense concentrations were mostly located in the eastern part of the sea. The abundance index was estimated as 327, i.e. somewhat above the long term mean (Table 2). The year class can be characterised as average. The mean length was 48 mm (Table 4), which is a few mm larger than in the last year.

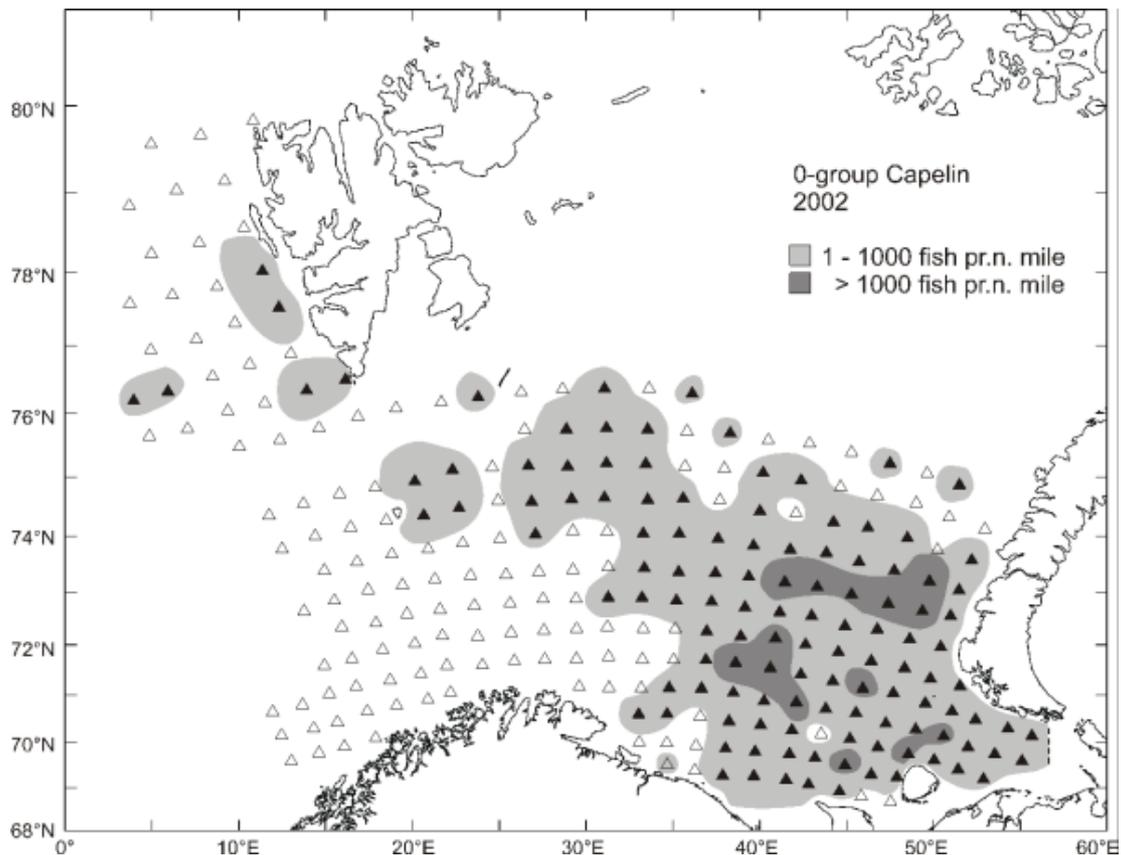


Fig.16. Distribution of 0-group capelin

Cod (Fig. 17)

Compared to the last year, 0-group cod were found in a much wider area in much higher densities. Larger part of the year class was distributed in the east than in the previous years. Scattered concentrations were observed from the north-west of Spitsbergen to 53° E. Dense concentrations were observed from coast to 76° N and between 23°-48° E. The logarithmic index was 1.22 which is close to the long term mean (Table 3), while the abundance index 1055 is one of the highest ever measured (Table 2). The implication of this is that the 2002 year-class is widely distributed with medium abundance. The year class can be characterised as medium. The mean length of the 0-group cod is 78,5mm (Table 4) and is about 3 mm longer than was found in 2001 and close to the long term average of 0-group cod in the Barents Sea.

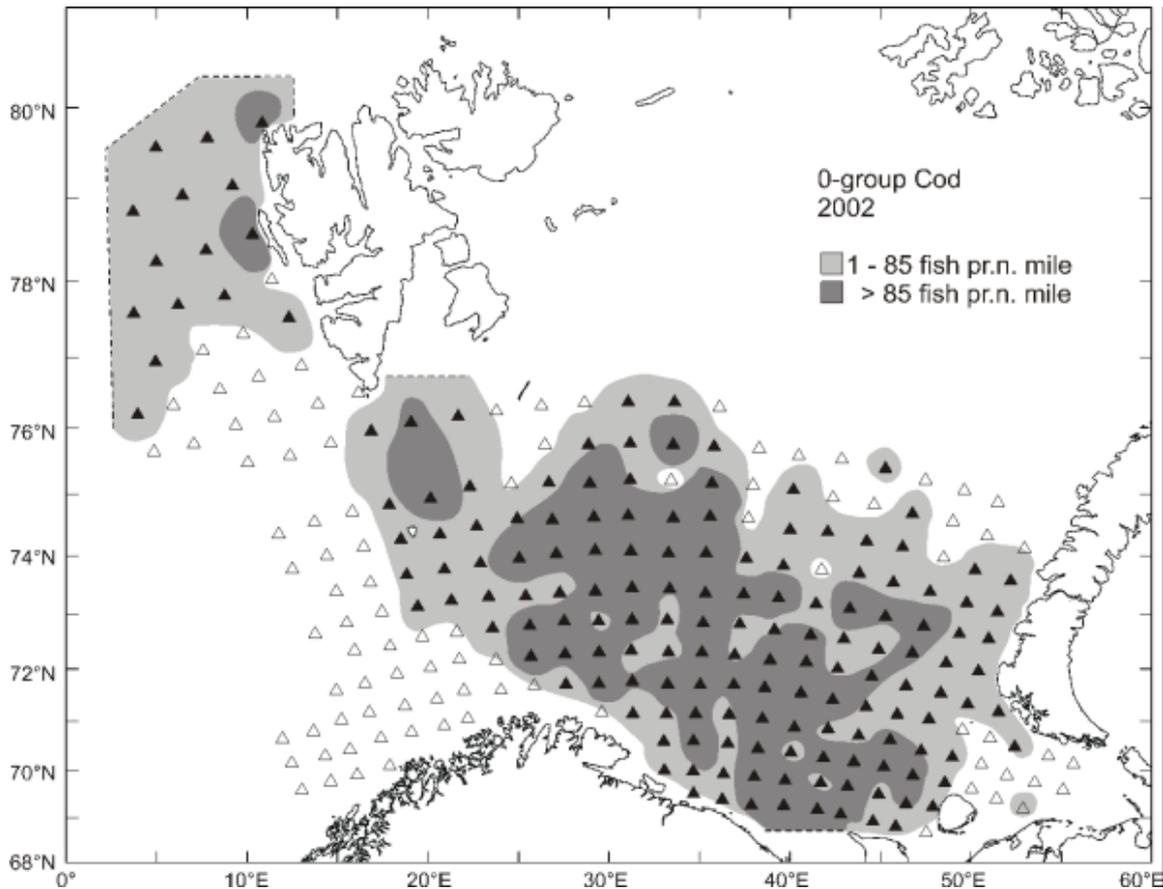


Fig.17. Distribution of 0-group cod

Haddock (Fig. 18)

Haddock goes through the period of a steadily high and stable recruitment. The total distribution area of 0-group haddock was slightly greater than last year, with dense concentrations in the large areas of the central Barents Sea. The abundance index 412 is the fourth highest observed. Only the indices for 1991, 1998 and 2000 were higher (Table 2). The logarithmic index 0.99 is the second highest ever recorded. Only the 1991 the index was higher (Table 3). Length distribution and mean length of 0-group haddock are shown in Table 4. The mean length of 0-group haddock was 103.6 mm, i.e. 3.7 mm longer than in the previous year. The year class of haddock can be characterised as strong.

Polar cod (Fig. 19)

As in the previous years, two separate areas (components) of 0-group polar cod were observed. Dense concentrations were found west and south of Spitsbergen and along the coast of Novaya Zemlya. The eastern component was the largest, and has increased compared to the last year (Table 2). The 0-group polar cod had similar distribution as in 1999 and 2000. The abundance of both polar cod components is underestimated due to an incomplete coverage of the northern distribution areas. Nevertheless, the abundance index of both components seems

to be much higher than the long-term mean. The mean length of polar cod was 39.4 mm (Table 4), which is somewhat longer than in the last year.

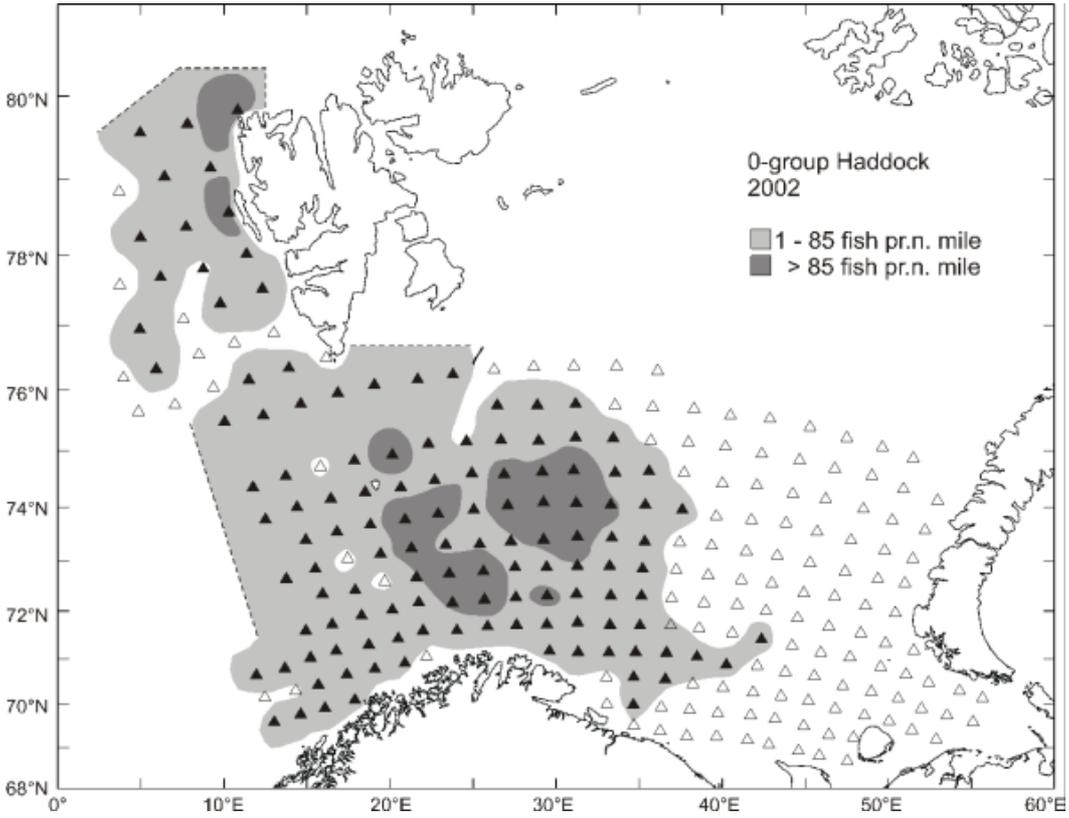


Fig.18. Distribution of 0-group haddock

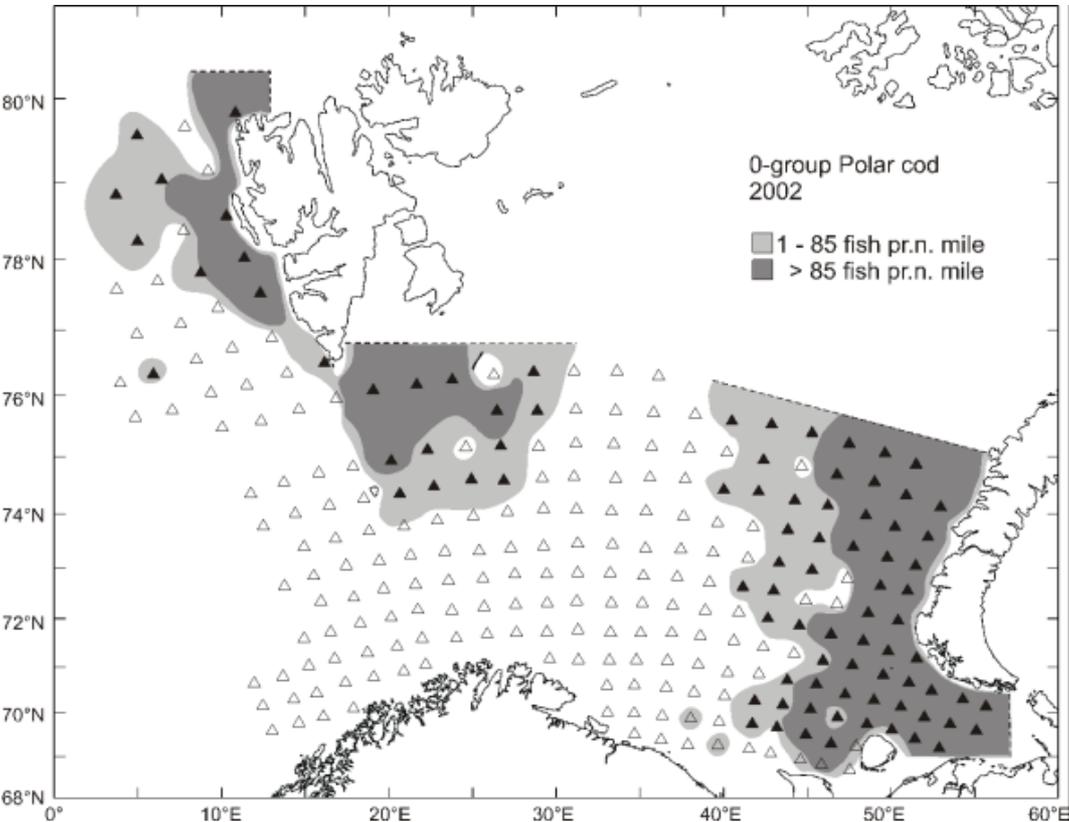


Fig.19. Distribution of Polar cod

Saithe (Fig. 20)

The distribution of 0-group saithe has gradually increased during the last years. Compared to the last years observations, 0-group saithe were distributed over the 2-3 times greater area. Saithe were found from 79° N west of Spitsbergen to 52° E near the coast of Novaya Zemlya. In most of the distribution areas 0-group saithe were found in scattered aggregations. An abundance index for this year is calculated as 175. It seems that the proportion of the 2002 year-class in the Barents Sea is higher than in the previous years and the year-class can be characterised as strong. The mean length was 81.2 mm.

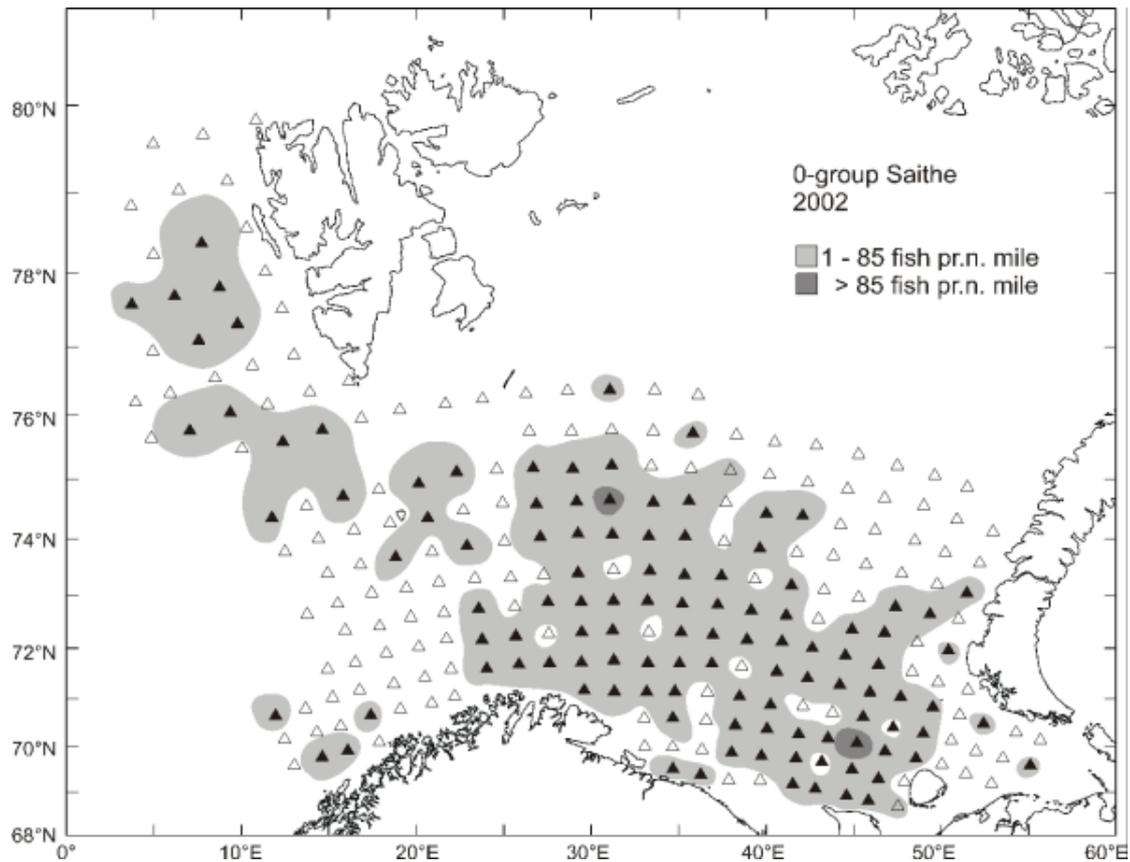


Fig.20. Distribution of 0-group Saithe

Redfish (Fig. 21)

During the last years the recruitment of redfish has declined. 0-group redfish were mainly distributed west of Spitsbergen. The abundance index was 28, which is a slight increase compared to last year, still remaining very low (Table 2). The mean length of 0-group redfish was 35.8 mm (Table 4), somewhat longer than in the last year.

Greenland halibut (Fig. 22)

There is a slight increase in the abundance of 0-group Greenland halibut, which were found in two areas – south and west of Spitsbergen. The abundance index (34) is significantly higher than the average and is the highest since 1987 (Table 2). The mean length of 0-group Greenland halibut was 63.9 mm (Table 4), which is almost equal to that observed last year.

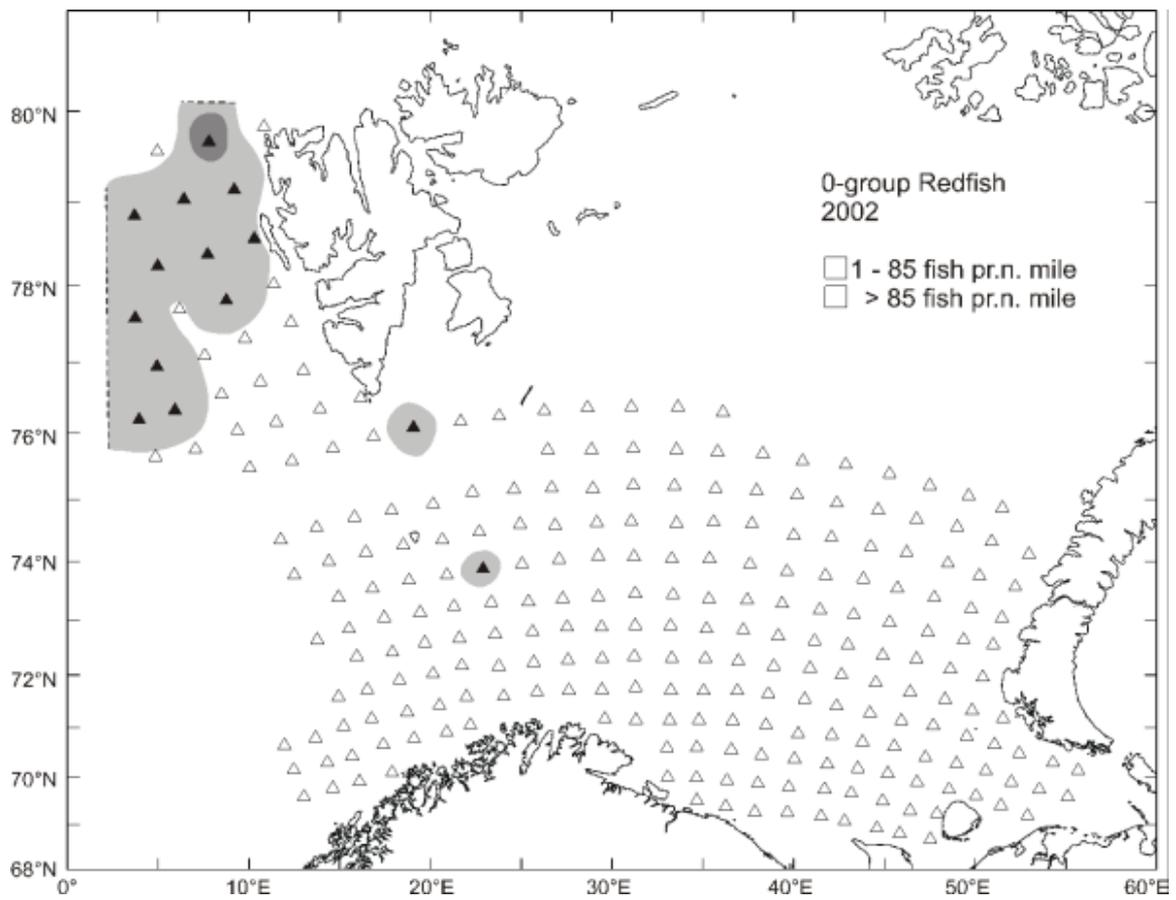


Fig.21. Distribution of 0-group Redfish

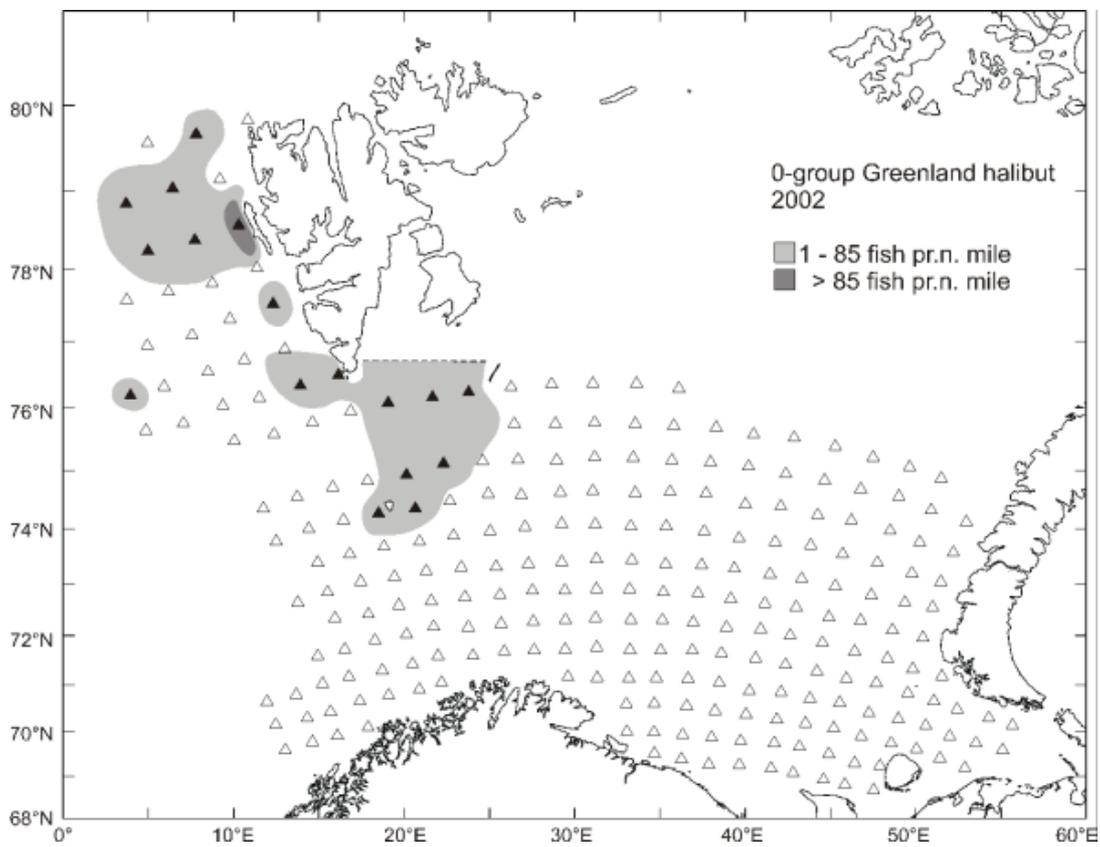


Fig.22. Distribution of 0-group Greenland halibut

Long rough dab (Fig. 23)

0-group long rough dab were registered in three different areas. Two areas are located west and south of Spitsbergen and a larger one, in the eastern Barents Sea from 39° E to the coast of Novaya Zemlya. Distribution increased significantly compared to last years, with the 0-group abundance index of 173, the highest since 1994 (Table 2). The length of 0-group long rough dab was 33.0 mm, close to that observed in 2001 (32.5 mm).

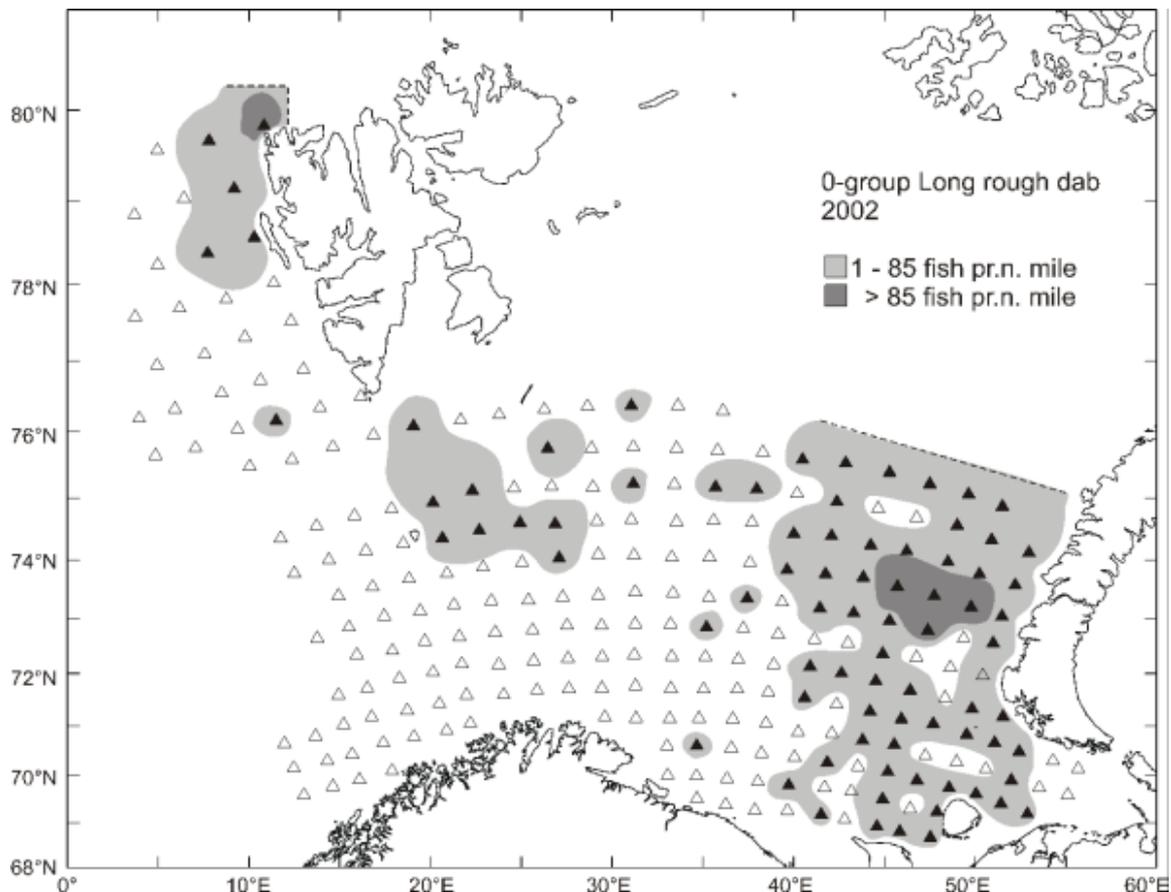


Fig.23. Distribution of 0-group Long rough dab

Sandeel (Fig. 24)

0-group sandeel were much more abundant than in the previous year. The area of distribution was approximately three times that of 2001. Sandeel was distributed in the eastern part of the area between Cape Kanin and the southern coast of Novaya Zemlya. In the central part of the Barents Sea the sandeel was found only in some small areas. Mean length of 32.0 mm (Table 4) is much lower than in 2001 (40.6 mm). Abundance index was not calculated for this species.

Catfish (Fig. 25)

Scattered concentrations were found in different parts of the sea. One dense patch was observed west of Spitsbergen. Mean length of 0-group catfish was 67.7 mm. Abundance index was not calculated for this species.

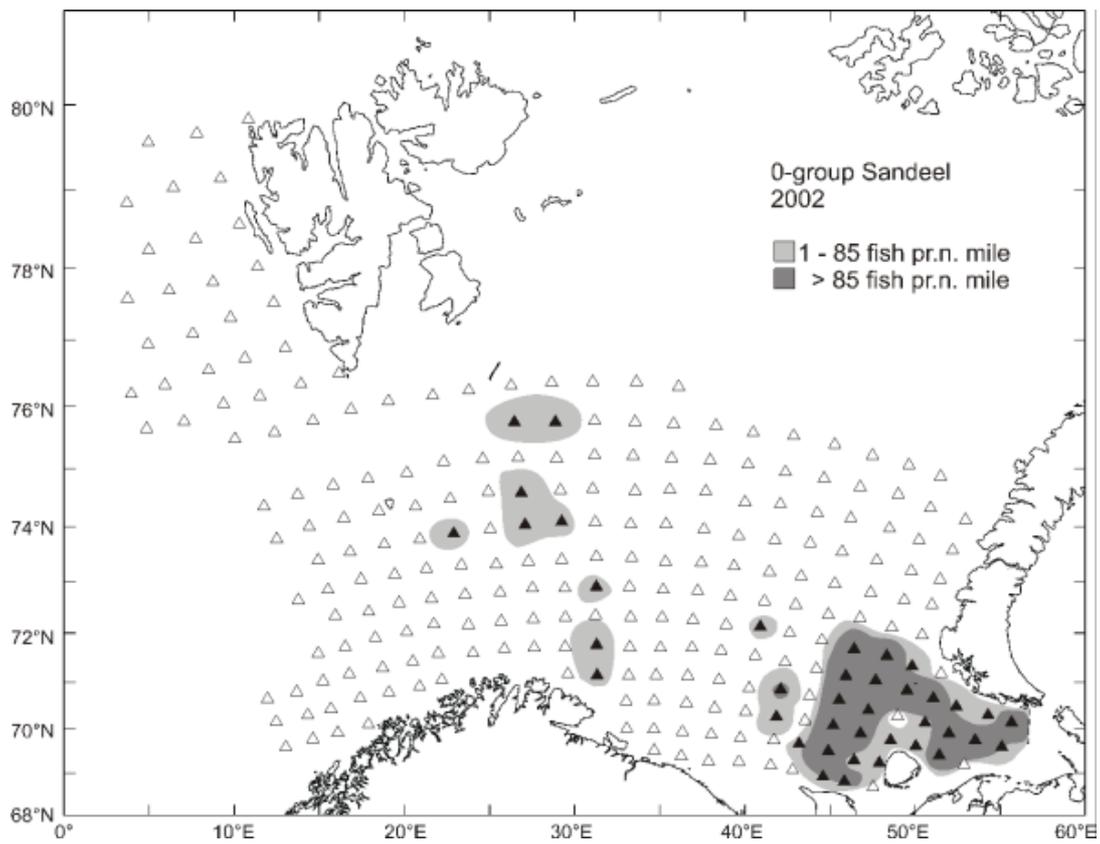


Fig.24. Distribution of 0-group Sandeel

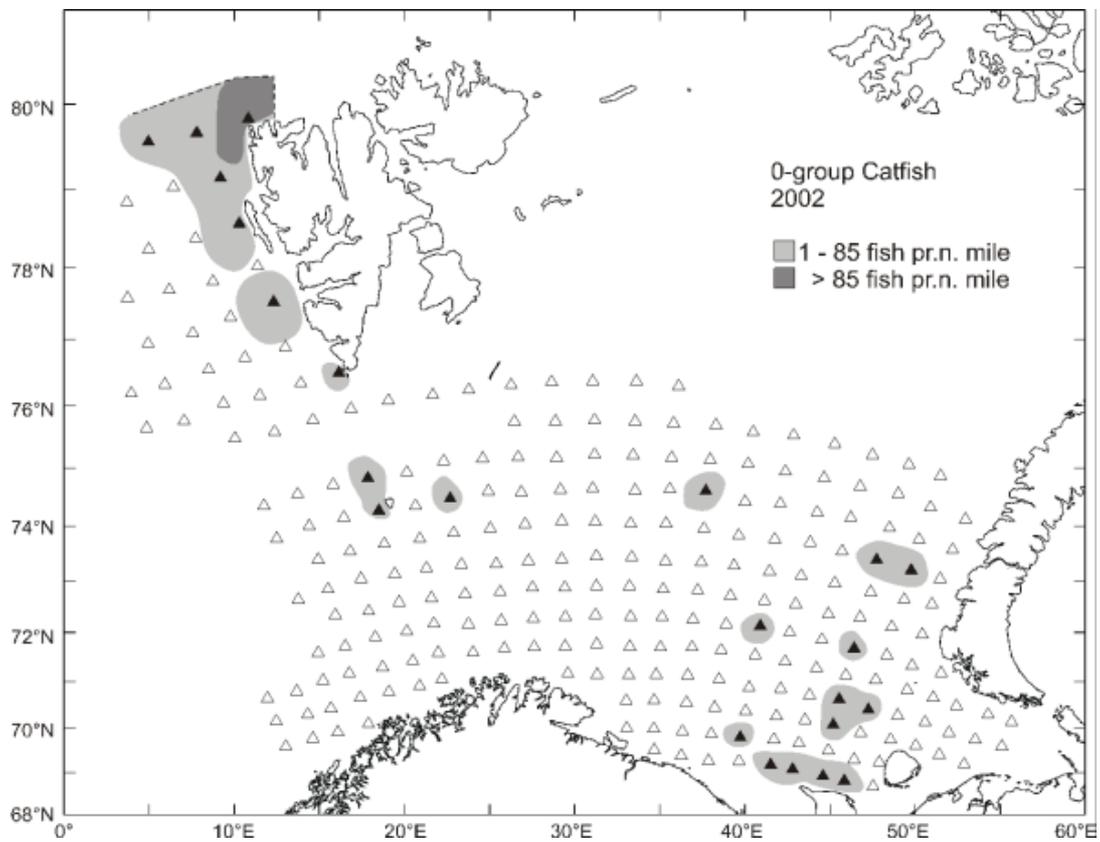


Fig.25. Distribution of 0-group Catfish

Gonatus (Fig. 26)

In the western part of the study area, 0-group *Gonatus fabricii* was found in two large areas west and south of Spitsbergen. Some scattered concentrations were observed in the central Barents Sea as far east as 40° E. Abundance index was not calculated for this species.

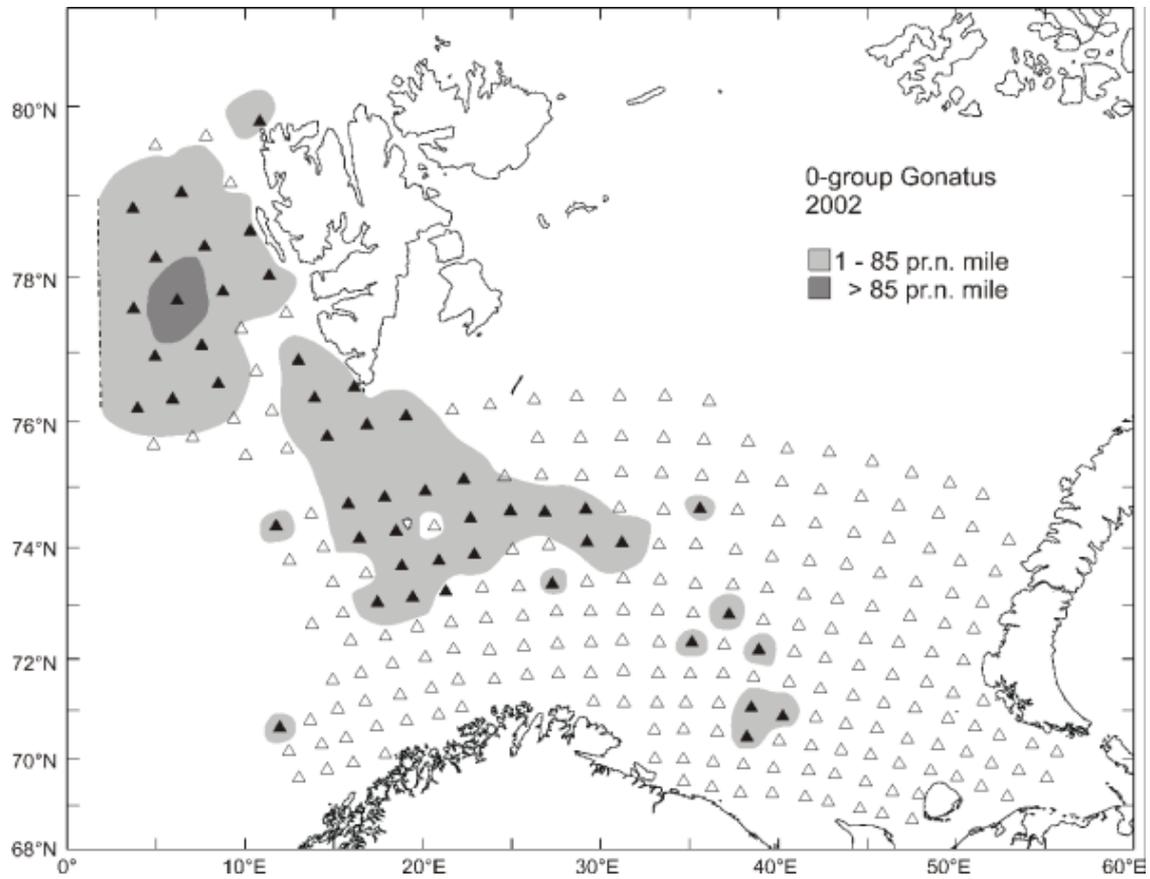


Fig.26. Distribution of 0-group *Gonatus fabricii*

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APPENDIX

Research vessel	Participants
“AtlantNIRO”	O. Dolgaya, M. Kalashnikova, V. Mamylov, R. Maslova, T. Prokhorova, D. Prozorkevich (cruise leader), S. Ratushniy, E. Timokhin, A. Trofimov, O. Vavilina, N.Zuykova
“Fridtjof Nansen”	I. Dolgolenko (cruise leader), Yu. Garbut, V. Kapralov, S. Kharlin, V. Kiselev, A. Lukmanov, S. Nemchinov, A. Nikiforov, S. Rusyaev, V. Sergeev, F. Shevchenko, T. Yusupov
“G.O.Sars”	B. Endresen, J. Erices, P. Fossum (cruise leader), O. Gullaksen, T. Haugland, T. Kolstad, H. Skogstrand, J. Træland, J. Wangensten, N. Ushakov
“J.Hjort”	P. Alvestad, J.R. Andersen, K. Gjertsen, R. Ingvaldsen (cruise leader), J. Johannessen, E.S. Meland, M. Mjanger, A. Røstgård, Ø. Østensen

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No. 2

Anon. 2001. Report of the international 0-group fish survey in the Barents Sea and adjacent waters in August – September 1998. IMR/PINRO Joint Report Series, No. 2/2001. ISSN 1502-8828. 26 pp.

No. 3

Anon. 2001. Report of the international 0-group fish survey in the Barents Sea and adjacent waters in August – September 1999. IMR/PINRO Joint Report Series, No. 3/2001. ISSN 1502-8828. 26 pp.

No. 4

Anon. 2001. Report of the international 0-group fish survey in the Barents Sea and adjacent waters in August – September 2000. IMR/PINRO Joint Report Series, No. 4/2001. ISSN 1502-8828. 26 pp.

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Aglen, A., Drevetnyak, K., Jakobsen, T., Korsbrekke, K., Lepesevich, Y., Mehl, S., Nakken, O., and Nedreaas, K. H. 2001. Investigations on demersal fish in the Barents Sea winter 2000. Detailed report. Botnfiskundersøkingar i Barentshavet vinteren 2000. Detaljert rapport. IMR/PINRO Joint Report Series, No. 5/2001. ISSN 1502-8828. 74 pp.

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2002

No.1

Anon. 2002. Report of joint Russian/Norwegian aerial surveys in the Barents sea in September 2001. IMR/PINRO Joint Report Series, No. 1/2002. ISSN 1502-8828. 11pp.

No.2

Anon. 2002. Investigations on demersal fish in the Barents Sea winter 2001. Detailed report. IMR/PINRO Joint Report Series, No.1 /2002. ISSN 1502-8828. 66 pp.

JOINT



**Institute of
Marine Research**
Nordnesgaten 50,
5817 Bergen
Norway



**Polar Research
Institute of Marine
Fisheries and Ocean-
ography (PINRO),**
6 Knipovich Street,
183763 Murmansk
Russia

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