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COASTAL AND FJORD RESOURCES OFF FINNMARK AND TROMS COUNTIES, NORWAY, BASED ON THE 1992 SURVEY.

by

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1. ABSTRACT

In 1992 an acoustic survey in fjords and shelf areas off Finnmark and Troms, two counties in northern Norway, was made to estimate the total biomass of cod, haddock, saithe, redfish species and herring to be 876.000 tonnes. The total biomass of cod was calculated to 112.000 tonnes. Based on otolith structures about 1/3 of the cod (34.000 tonnes) was identified as North East Arctic cod. The remaining, dominant fraction of 78.000 tonnes was coastal cod which form local stocks, according to tagging experiments performed in 1986 - 92. The biomass of other fish species were; haddock: 78.000 tonnes; herring: 470.000 tonnes; capelin: 10.000 tonnes; saithe: 181.000 tonnes and redfish: 25.000 tonnes.

2. INTRODUCTION

2.1 Background

From 1973 40.000 tonnes of coastal cod has been added to the Norwegian quota of North-Eastern Artic cod. This quota, which is still an agreement and used by The International Council for the Exploration of the Sea (ICES), is set on the basis of the annual Norwegian landings of cod in the ICES statistical areas 06 and 07 (Nordland, Trøndelag, Møre and Romsdal counties) during the whole year, pluss the landings in area 00 (Lofoten) in the fourth and fifth quarters (Figure 1). Based upon these area settings, there are no coastal cod landings North of Lofoten. However, the coastal areas in Finnmark, the northernmost county in Norway, seem to contain local populations of cod, according to JAKOBSEN (1987) who tagged about 10.000 cod caught on local spawning grounds in the fjords.

To evaluate the abundance of the fish resources in north Norwegian fjords and shelf areas, in 1991 Fiskeriforskning initiated a program on the coastal resources of north Norway, with funding from The Royal Norwegian Ministry of Fisheries. The planning was based on investigations made since 1985 by the Norwegian College for Fisheries Science at the University of Tromsø. The college has used the R/V "Johan Ruud" (33 m) to investigate the distribution and sizes of wild fish populations in some fjords in the county of Troms. The investigations were made before and during the release of tagged codlings reared from sexual products stripped from parent cod from the same fjords, to study enhancement effects on local cod stocks. The methods included genetical separation of sub-populations of cod, haddock, whiting and blue whiting.

In 1992 Fiskeriforskning started the work at sea in the coastal areas of Finnmark and Troms. The main objective was to evaluate the distribution and stock biomass of the most common commercial fish species and deep sea prawn. Most of the effort was allocated to cod and haddock, but saithe, redfish, herring and capelin were also of important targets.

2.2 Terms of reference

The following terms of reference were given to the participants:

1) Assess the abundance and stock composition of cod, haddock, saithe, redfish, herring and capelin in coastal areas of Troms and Finnmark in 1992.

2) Give priority to an assessment of cod, with an emphasis on coastal cod. Separation of parameters versus age is essential.

3) Estimate the stock biomass for the five other species listed above.

4) Estimate maturity ogive, length and weight by age, and spawning stock biomasses of cod.

5) Establish isopleth diagrams for temperature for some main trancects.

3. MATERIALS AND METHODS

All material given in this report was sampled during a cruise using the R/V "Johan Ruud", a 33 m stern trawl-rigged research vessel. All fjords and proximal shelf areas within the 12 n. mile fishing border from the Russian border, Finnmark County, to Senja, Troms County were investigated during the period from 24 August to 3 October 1992 (Figure 2 and 3). The authors were gathered in two periods, in Hammerfest 24 - 31 January and in Bodø 24 -29 May 1993.

3.1 Survey areas and routes

The investigation occurred in the ICES statistical areas 03, 04 and the northernmost part if 05 (Figure 1). These areas have been subdivided by the the Norwegian Directorate of Fisheries (NDF). It was attempted to visit all sub-areas comprising fjords and shelf areas inside the 12 n. mile border. About 5200 nautical miles were sailed and the coverage is presented in Figure 2 and 3.

In order to focus on differences between fjords and shelf areas, and study possible gradients from west to east along the coast, we have grouped some of the ICES/NDF sub-areas into larger units. These units will be referred to by names given in Figure 6.

The 1992 survey had a maximum limit of 40 days with the R/V "Johan Ruud". During the cruise we tried to survey all the major fjords, fjord branches and sounds using overlapping triangular transects when going in and out of the fjord, to get the best possible coverage of the areas (MACLENNAN & SIMMONDS 1992). Parts of the major areas to be visited were planned before the cruise, while some of the cruise tracks were planned in detail during the actual cruise to get the best possible coverage.

3.2 Acoustic methods

The acoustic integration method onboard R/V "Johan Ruud" was based upon the Bergen Echo Integration (BEI) system using a Sun Sparc 2 work station receiving information from an EK 500 Simrad echosounder with a hull mounted 38 kHz split beam transducer. The instrument settings made integrations for each 1.0 n. mile. The method of FOOTE et al. (1983) combined with a Simrad Lobe program was used for the calibration of the acoustic system. Cruising speed during integration was 9.0 knots. The TS-values used were:

- cod, haddock, saithe and redfish: $TS = 20.0 \log l - 68$
- herring: $TS = 20.0 \log l - 71.9$
- capelin: $TS = 19.1 \log l - 74$

3.3 Identification

To identify acoustic targets, fishing was performed when possible. Trawl sampling was standard procedure, but the large variations in the bottom topography required alternative procedures. Pelagic trawling presented few problems, while demersal trawling in some places was impossible due to the bottom. In some cases jigging was performed to identify targets. In total of 293 fishing stations, comprising 133 demersal trawl tows, 143 pelagic trawl tows and 17 jigging stations, each lasting for approximately half an hour, were taken during the 1992 survey (Figure 4 and 5).

Demersal trawling was done on bottom ranging from about 25 to about 450 m depth. Pelagic trawling was made according to echo signals, in discrete depths ranging from the surface to 10 m above the bottom.

The demersal trawl was a 1300 mesh REFA Finnsnes prawn trawl with 35 mm mesh size and equipped with rubber bobbins. The pelagic trawl was a 10 fathoms Harstad-trawl, with a cod-end having 10 mm meshes (knot to knot). The trawling speed was 2.0 knots.

For the jigging we used three hand-operated jiggs, each equipped with six hooks.

Length, weight, sex and stage of maturity were recorded for each individual fish specimen, and age determined from otoliths stored in a freezer before being broken and read in laboratory.

3.4 Judging and biomass estimations

Biomass figures were calculated by combining:

i) CPUE-data from the survey trawl catches,
ii) the fish length measurements,
iii) the aged fish material,
iv) the acoustic integrated data,
v) the judging.

The judging was done at sea and the age read in laboratory. During the judging we tried to include the listed factors, in addition to coloured screen prints. All integrated and judged data were stored on magnetic tapes.

3.5 Age determination, growth and types of otoliths

3.5.1 Cod

4.037 otoliths of cod were taken for determination of type and age. The agening was made by identification of annual growth rings (1 hyaline pluss 1 opaque zone equals a year) in the otoliths, in accordance with procedures used by the Institute of Marine Research, Bergen. We discriminated between North-East Arctic and coastal cod by the method developed by ROLLEFSEN (1933, 1934).

3.5.2 Haddock

A total of 3.509 otolihs of haddock were sampled. During the age determinations we attempted to distinguish between coastal and Nort-East Arctic haddock, as for cod, with no sucess. The technique for reading age from haddock otoliths was calibrated against procedures established by the Institute for Marine Research, Bergen (Ågotnes, pers.comm.).

4. RESULTS

4.1 Biomass assessments

The total standing biomass in Troms and Finnmark was in 1992 calculated to be 876.000 tonnes (Table 1). More than half of this was herring (470.000 tonnes) and about on fifth was saithe (181.000 tonnes). Cod and haddock were found to be about 112.000 and 78.000 tonnes respectively, and redfish about 25.000 tonnes. As expected wery little capelin (10.000 tonnes) was registered at this time of the year.

There were rather large variations between areas in the species distribution between areas and the composition of species within areas (Table 1). For all species the largest biomass was found in Finnmark, and except for herring and redfish, the largest fractions were found in eastern Finnmark, area 03.

4.2 Cod

4.2.1 Classification of stocks by otholiths

Coastal cod dominated over NE Arctic cod in all fjords and shelf areas from Malangen to Tana. In the fjords coastal cod constituted 86 to 98 % (Tables 3-8). In shelf areas the proportions were lower, 79 % at Western Troms, 46 % at Sleppen and 73 % at Varanger (Tables 9 - 11).

4.2.2 Age, length and weight relationships in coastal cod

In some fjords and shelf areas coastal cod 3 years and younger, and 6 years and older, were represented by numbers lower than 10 specimens. The numbers of 4 and 5 year old coastal cod was higher than 10 in all areas (Tables 3-11) and provide the best material for comparisons between areas.

The age distributions of coastal cod were not uniform. For instance, in Malangen, Ullsfjord and Lyngen 5 year old cod expressed the strongest mode, while 4 year old cod expressed the strongest mode in Balsfjord (Tables 3 and 4).

4 year old cod in Malangen, Balsfjord, Ullsjord, Lyngen and Kvænangen was on an average smaller than 45 cm, and between 45 and 50 cm in fjord farther east (Table 11). In the shelf areas Vest-Troms, Loppa-Sørøya, Råsa, Hjelmsøy, Sleppen, Østhavet and Varangerfjord, the average lengths of 4 year old coastal cod was larger than 50 cm. Thus, there was a gradient in length increase from the fjords to the shelf (Figure 7). In 5 year old coastal cod, average lengths larger than 60 cm were recorded in Sleppen, Østhavet and Varanger in eastern Finnmark, while they were smaller in shelf areas in the western part (Table 11). In general, the average length at age increased from west to east along the coast (Figures 7 and 8).

The average weight of 4 year old coastal cod was larger than 1.2 kg in all shelf areas, and was lower than 1.0 kg in all fjords from Malangen to Revsbotn (Table 12). 5 year old cod were on an average larger than 2.0 kg in Sleppen, Østhavet and Varanger (Table 12), i.e. the three easternmost shelf areas. Thus, as for lengths, there were gradients with increasing weight seawards and eastwards.

In the western part of the investigated region, the length increments of coastal cod in Malangen and Ullsfjord decreased after reaching 4 years, in contrast to cod from Balsfjord and Lyngenfjord where the growth rate was sustained after that age (Figure 9). In the eastern-most fjords the length increments also decreased after an age of 4 years, but the cod was then larger than in the western fjords. The highest growth rate was recorded in Varanger (Figure 9), and the coastal cod in this fjord grew at the same rateas cod from coastal and shelf areas (Figure 10), or NE Arctic cod in the Østhavet area and the Barents Sea (Figure 11). Length increments of coastal cod on the shelf was equal to NE Arctic cod in the same areas and in the Barents Sea, while the length increase for coastal cod in fjords were smaller (Figures 11 and 12).

4.2.3 Maturity at age

Some of the coastal cod started to mature sexually at an age of 3 years, both in fjords and in shelf areas (table 13). 50% maturity was reached between ages of 4 and 6 years and 100% maturity between 6 and 9 years. The differences between areas in the investigated region was unsystematic, with no seaward or eastward gradients.

The percent maturity was not positively related to growth in coastal cod, as demonstrated in Malangen and Ullsfjord where length increments decreased after an age of 4 years (Figure 9). At that age few cod had matured in Malangen, while more than 50% had matured in Ullsfjord (Table 13). In Lyngen where a high growth rate was maintained between 4 and 6 years (Figure 9), larger proportions of each age group had matured than in Ullsfjord where the growth was slower.

NE Arctic cod seem to mature at a later age than coastal cod, starting at an age of 4 years in most areas (table 14). However, the significance of this feature may be doubted, because the number of observations are very few, especially for young fish.

4.2.4 Stock assessment

In 1992, on the coast from western Troms to eastern Finnmark, we recorded a total of 88 million coastal and North-East Arctic cod which amounted to a biomass of 112.000 tonnes (Tables 1, 15 and 16). A little more than the half (60.000 tonnes) of this biomass was found in eastern Finnmark (area 03), and approximately 25 % each (25.000 and 27.000 tonnes) in western Finnmark and Troms, respectively. Some of the fjords, *i.e.* Varanger, Porsanger, Revsbotn and Lyngen, had significantly more cod than other fjords. However, there were in general larger amounts of cod in the shelf areas than in the fjords (Table 15).

4.2.4.1 Abundance and biomass of coastal cod

The proportion of coastal cod was 63 mill fish amounting to totally 78.000 tonnes (Tables 17 and 18). The spawning stock of coastal cod was 26 mill fish amounting to 52.000 tonnes. Most of the coastal cod were found in the fjords.

4.2.4.2 Abundance and biomass of North-East Arctic cod

A total of 25 mill North-East Arctic cod were recorded and amounted to about 35.000 tonnes (Tables 21 and 22). Contrary to the coastal cod the larger proportion was found in the shelf areas, but they were also abundant in Porsanger and Varanger.

4.3 Haddock

4.3.1 Age, length and weight relationships in haddock

The haddock caught during the investigation were mainly young fish aged 1-4 years (Tables 23 - 27). 2 year old haddock dominated in a majority of the areas, especially in the eastern fjords (Table 25). This age group was the only one represented by more than 10 specimens in all areas.

The average length of 2 year old haddock was larger than 35 cm in fjords from Malangen to Revsbotn, i.e. in the western part of the investigated region (Table 28). The age-group had lower average lengths in fjords farther to the east and in the shelf areas. 3 year old haddock were on an average longer than 42 cm to the west of Sleppen and smaller to the east.

The length frequency distributions of 2 year old haddock were unimodal and were rather uniform in shelf areas, displaying a modal maximum in the 30-35 cm class interval. The Tanafjord had very small 2 year old haddock compared to other fjords (Figure 14 and Table 28).

In shelf areas haddock 4 years and older differed in lengths but were smaller than haddock from the Barents Sea , but those were caught 4-6 months later (Figure 15). The average lengths of haddock from fjords in the western part of the investigated region were not markedly different from Barents Sea haddock, but this was not the case for haddock in the fjords farther to the east (Figure 16).

Except for the area named Vest Troms, the average weights of 2 year old haddock were higher than 0.4 kg in areas to the west of Hjelmsøy. The 3 year old haddock were heavier than 0.75 kg (Table 29) and they weighed less in Hjelmsøy and areas farther to the east, compared to the western areas.

4.3.2 Maturity at age

Except for in the Altafjord, the haddock started to mature as two year old fish in Revsbotn and areas farther west (Table 30). Farther east the maturation started in 3 or 4 year old fish. 100% maturity was recorded in 4-6 year old fish, but this observation is based on fewer specimens.

4.3.3 Stock assessment

We recorded about 174 million haddock which amounted to about 78.000 tonnes (Tables 31 and 32). This is equal to the biomass of coastal cod. The ratio between NE Arctic haddock and NE Arctic cod was much higher than what is found in the Barents Sea. Most of the haddock (42.000 tonnes) was found in Eastern Finnmark (Table 1), which is slightly more than what was found in western Finnmark (19.000) and Troms (17.000 tonnes).

4.4 Saithe, redfish, herring and capelin

4.4.1 Length distributions in saithe

Saithe caught in the fjords were mainly smaller than 50 cm (Figures 17 - 20). Larger saithe were mainly present in shelf areas from Sleppen and west-wards.

4.4.2 Stock assessments of saithe

The total biomass for saithe (181.000 tonnes) was rather evenly distributed between Troms, western Finnmark and eastern Finnmark (Table 1). Most of the biomass was found in shelf areas.

4.4.3 Length distributions in redfish

Length measurements of 4076 redfish (*Sebastes* sp.) clearly show that the strongest length mode in the fjord catches decreased from about 40 cm in Malangen to less than 10 cm in Revsbotn (Figures 21-22). The redfish were also smaller than 40 cm in fjords from Porsanger to Varanger (Figures 22-23). The length range was larger in the shelf areas (Figures 24-25).

4.4.4 Stock assessments of redfish

The total biomass of redfish was 25.000 tonnes, with about 15.500 tonnes (60 %) in western Finnmark 6.000 tonnes in eastern Finnmark and 3.500 tonnes in Troms.

4.4.5 Length distributions in herring

The length of herring varied between 5 and 35 cm, with a rather specific length distribution in each of the areas, and with no systematic geographical trend (Figures 26-30).

4.4.6 Stock assessments of herring

There was a rather large standing stock of herring - 470.000 tonnes - in the Finnmark and Troms areas (Table 1). Western Finnmark had about 75 % of this biomass (about 355.000 tonnes), while eastern Finnmark had a biomass close to 90.000 tonnes. A rather small biomass was found in Troms. The highest concentrations were found off north-eastern Varanger, Magerøy, at Revsbotn, Loppa and Silda.

4.4.7 Length distributions in capelin

The length distributions of capelin in Porsanger and Varanger were bimodal, with modes around 9 and 14 cm (Figure 31).

4.4.8 Stock assessments of capelin

Approximately 9.800 tonnes of capelin were recorded, mainly restricted to eastern Finnmark. *i.e.* Varanger, Porsanger and off Nordkapp. Only small amounts were found in other areas (Table 1).

5. DISCUSSION

The 1992 survey show that the fjords and shelf areas had considerable fisheries resources. There were large standing biomasses of cod, haddock, saithe, redfish, herring and capelin, amounting to a total of 876.000 tonnes from the Russian border to Senja in the Troms county. However, there were large regional differences.

5.1 Cod and haddock

The otolith material clearly indicates the existence of coastal cod in coastal waters outside the counties of Troms and Finnmark, living together with North-East Arctic cod. The fjords and sheltered shelf waters have larger proportions of coastal cod than open shelf waters. Some of the fjords may have distinct stocks of cod, like in Malangen where the stationarity of coastal cod has been demonstrated by a tagging experiments (ELIASSEN unpubl.).

This investigation clearly indicates regional differences in growth of cod and haddock caught in different areas. These differences may be due to genotypical differences due to self-recruitment within each area, or to phenotypical modification of imported genotypes, due to particular ecological conditions working on the level of individuals. The available material does not permit any discussion of such problems, which must be solved by appropriate methods in the future.

Most of the cod recorded in 1992 were located in the near-shore areas of the Barents Sea shelf, being more abundant there than in the fjords. A large proportion of the shelf cod was identified as coastal cod with a growth that did not differ markedly from that of NE Arctic cod found in the same areas. In fjord areas the coastal cod was an order of magnitude more abundant than NE Arctic cod.

The growth in coastal cod was slower in the fjords than in the shelf areas. This does not seem to be related to the lower environmental temperatures in fjords, compared with shelf areas near by, because the growth rates were higher in the cold fjords of Finnmark than in the warmer fjords of Troms.

This may indicate that the feeding conditions were possibly less favourable for cod in the fjords, compared to shelf areas, and better in the east than in the west.
This is contrary to haddock which grew faster in the western fjords and shelf areas, than in eastern areas. It is difficult to suggest explanations for these differences. However, both capelin and herring were more abundant inn Finnmark than in Troms, and might somehow be more available to cod than to haddock, for instance when these prey species seek cold water.

There was no systematic dominance of any yearclass of cod, indicating that the recruitment to the fjord stocks has not varied much in the period 1986-91.
However, there was a marked decline of cod aged 7 years and older, in all fjords and shelf areas, except in Porsanger where the decline was less pronounced. We have considered that the decline could be due to fishing and natural mortality, but have no information which supports such an explanation. On the other hand the fishing pressure in the fjords may be regarded as rather moderate, due to the low quotas which has been set for the cod during the last years, and this also applies for the fjords and near coastal area quotas. It seems more likely that the decline was related to sexual maturation, because 100% maturity was recorded in yearclasses 6-8 years old. If this is a valid assumption, it remains to explain where the sexually mature cod go.

During this investigation, the haddock in the fjords and the shelf areas consisted mostly of immature fish. At the age of 100% sexual maturity, i.e. 4-6 years, the abundance of older fish declined markedly. In the exploited stock of NE Arctic haddock, 4 and 8 year old fish display modes in the age frequency distribution (ANON. 1992), but these yearclasses were absent in most of the samples from the investigated areas. This is an important observation of no covariation of the yearclasses between the Barents Sea and the near-shore shelf and fjord areas. The sexually mature fish may have stayed elsewhere in September when the investigation was made. However, they may as well have been present and integrated in our acoustic methods, but escaped from our sampling gear.

Identification and acoustic integration of fish in fjords and near-shore shelf areas have some major limitations:

i) Sampling by pelagic and demersal trawling may be difficult close to or at the bottom along steep slopes frequently met with in fjords and sheltered shelf areas. Fishing with trawls was mostly done over level bottom in the median parts of fjord basins and troughs on the shelf.

ii) The acoutic method has some weaknesses regarding presize registrations along the slopes due to the side-lobes and the blind zones.

NE Arctic cod aged 1-3 years was in general weakly represented in the investigated area, in relation to 4 and 5 year old fish which were sexually maturing yearclasses, probably terminating with 100% maturity at an age of 6-7 years. ANON (1992) reports that 1-3 year old NE Arctic cod recorded in the Norwegian acoustic surveys and the Russian acoustic trawl surveys are not less numerous than 4 and 5 year old fish. Thus, the investigated areas were probably not nursery habitats for the youngest NE Arctic cod when the investigation was made. On the other hand, the coastal cod mingled with NE Arctic in coastal areas, to a larger extent in near-shore shelf ares than in the fjords.

5.2 Saithe, redfish, herring and capelin

Herring constituted the dominant biomass in Troms and Finnmark, amounting to more than 50 % of the total biomass. The populations found in different areas were not uniform, as the size differences indicate age frequency differences. However, it may be possible that schools selecting different size compositions have been present in most fjords and that the sampling has been rather random, selecting different size groups in different areas. All the herring probably belong to the stock of Norwegian spring spawners which has it northern limit of distribution in the southern Barents Sea. The presence and distribution of herring in this area may have influenced the distribution of predators like cod, saithe and haddock. Thus, absence of a different distribution pattern of herring in other years, may also cause a different distribution of predators.

Saithe constituted the second largest biomass, larger than that of cod, both in Troms, western and eastern Finnmark. Most of it was was fish smaller than 50 cm, *i.e.* probably adolescent fish.

The redfish presented in this investigation is a mixture of three *Sebastes* species, *S. marinus, S. mentella* and *S. viviparus*. Thus, it is difficult to make any comments on the stock structures.

Capelin occurred mostly in the eastern areas and consisted of both a fraction of small immature fish and larger fish which probably would enter the spawning stock in 1993.

In conclusion, it may be stated that the two counties of Troms and Finnmark in 1992 had considerable resources bound to their coastal waters.

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13. TABLES AND FIGURES

33 tables and 31 figures are presented.

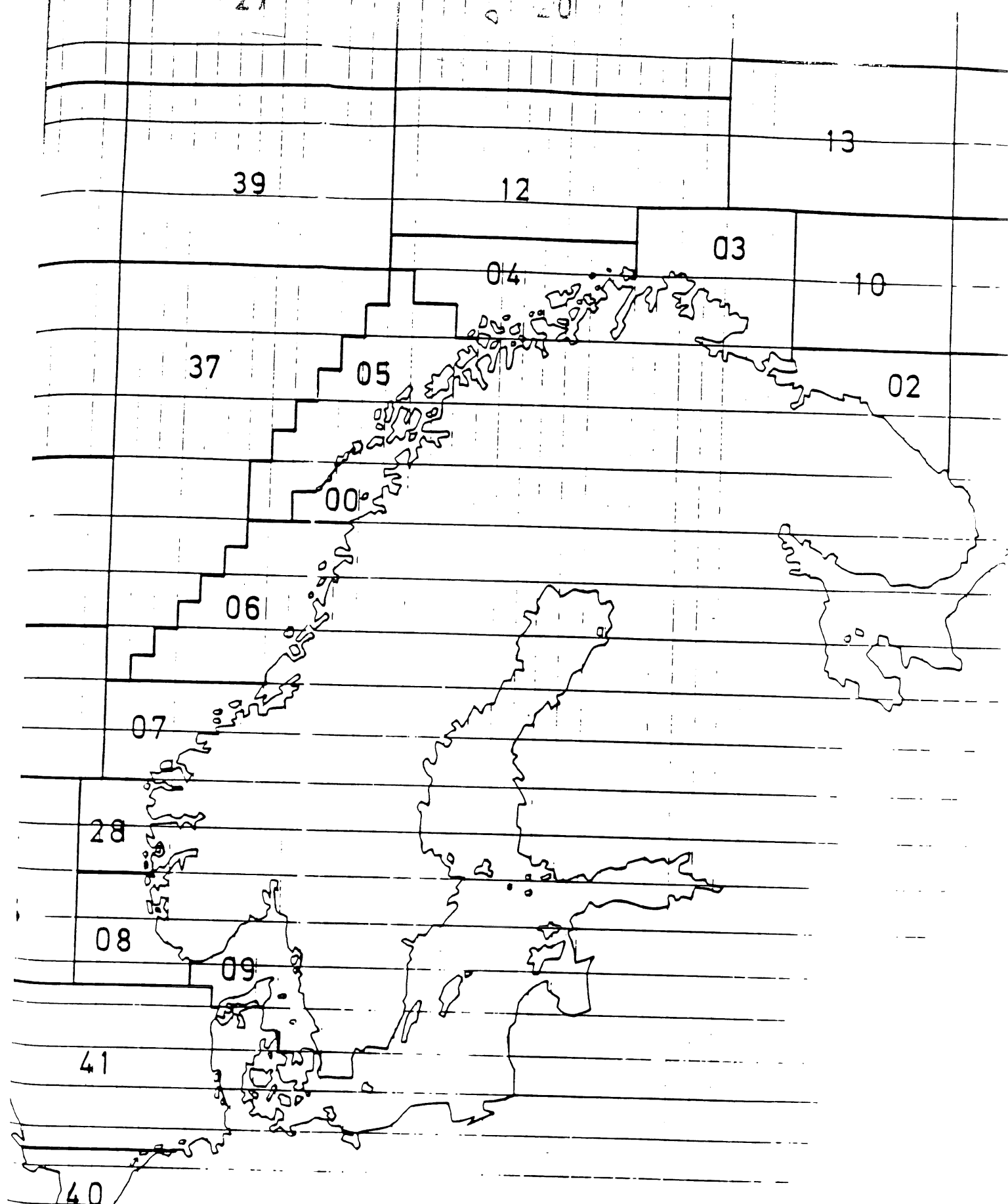

Figure 1. Geographical distribution of sea areas for use in the fisheries statistics. After: The International Council for the Exploration of the Sea (ICES) and The Norwegian Directorate of Fisheries (NDF).

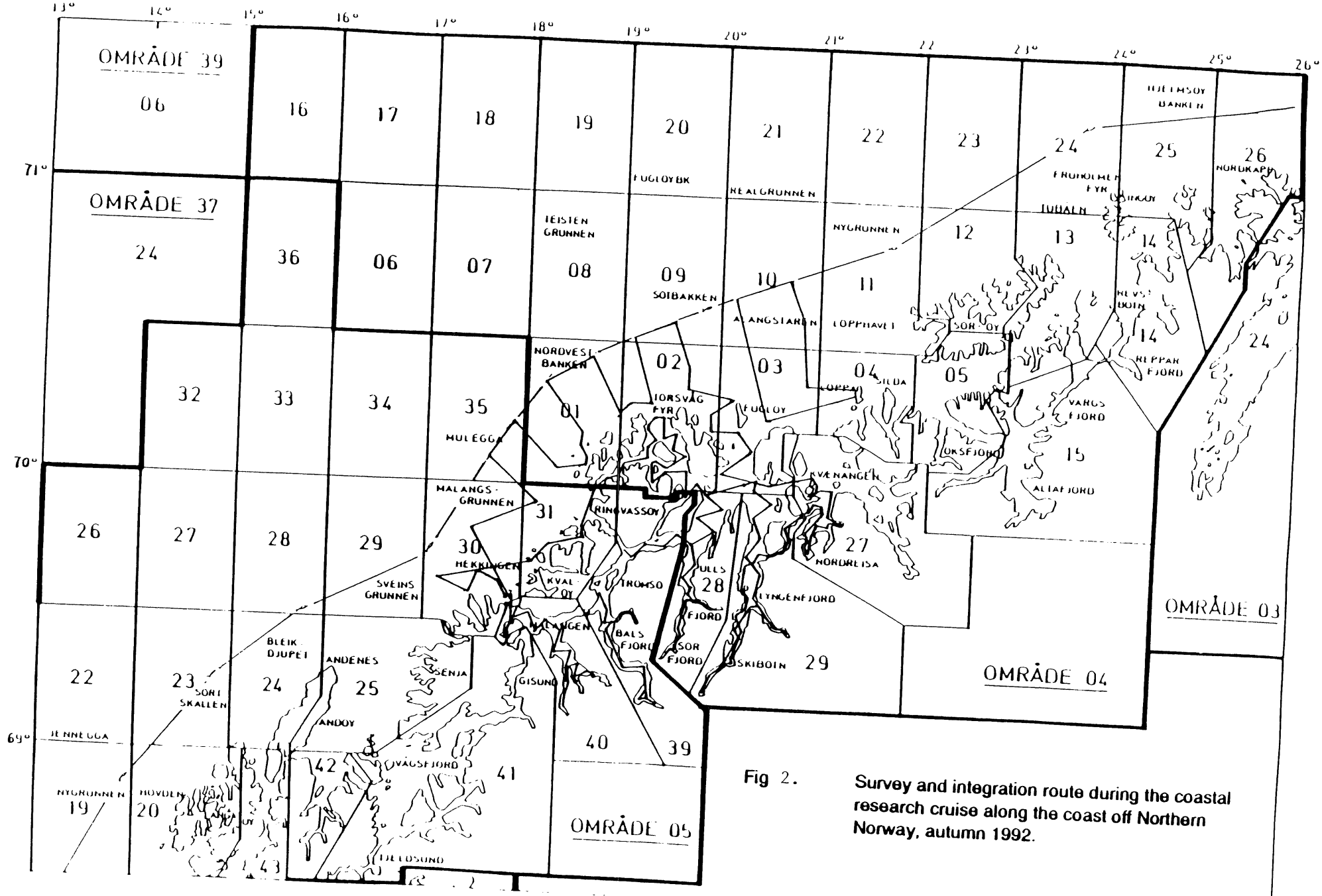

Fig 2. **Survey and integration route during the coastal research cruise along the coast off Northern Norway, autumn 1992.**

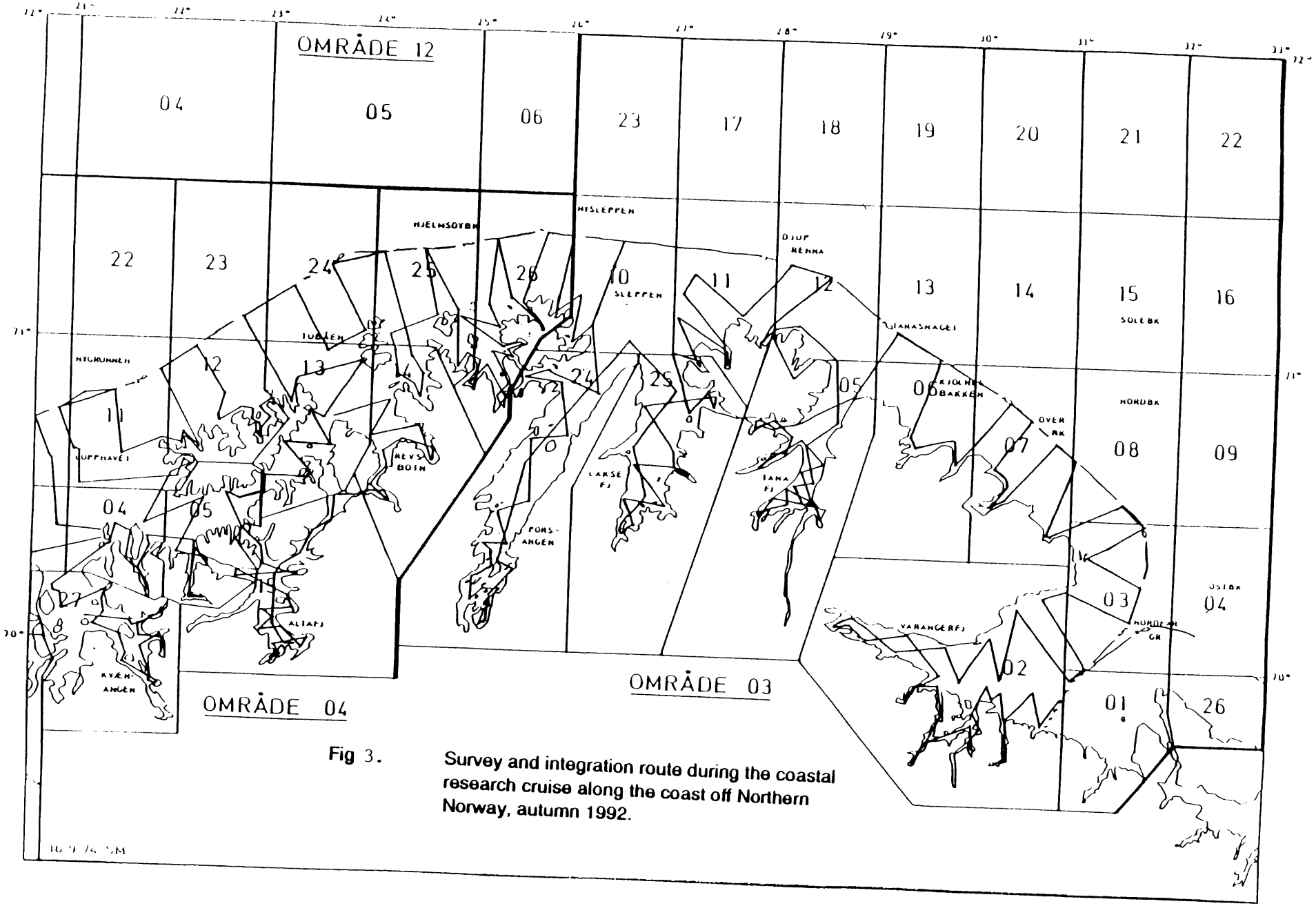

Fig 3. Survey and integration route during the coastal research cruise along the coast off Northern Norway, autumn 1992.

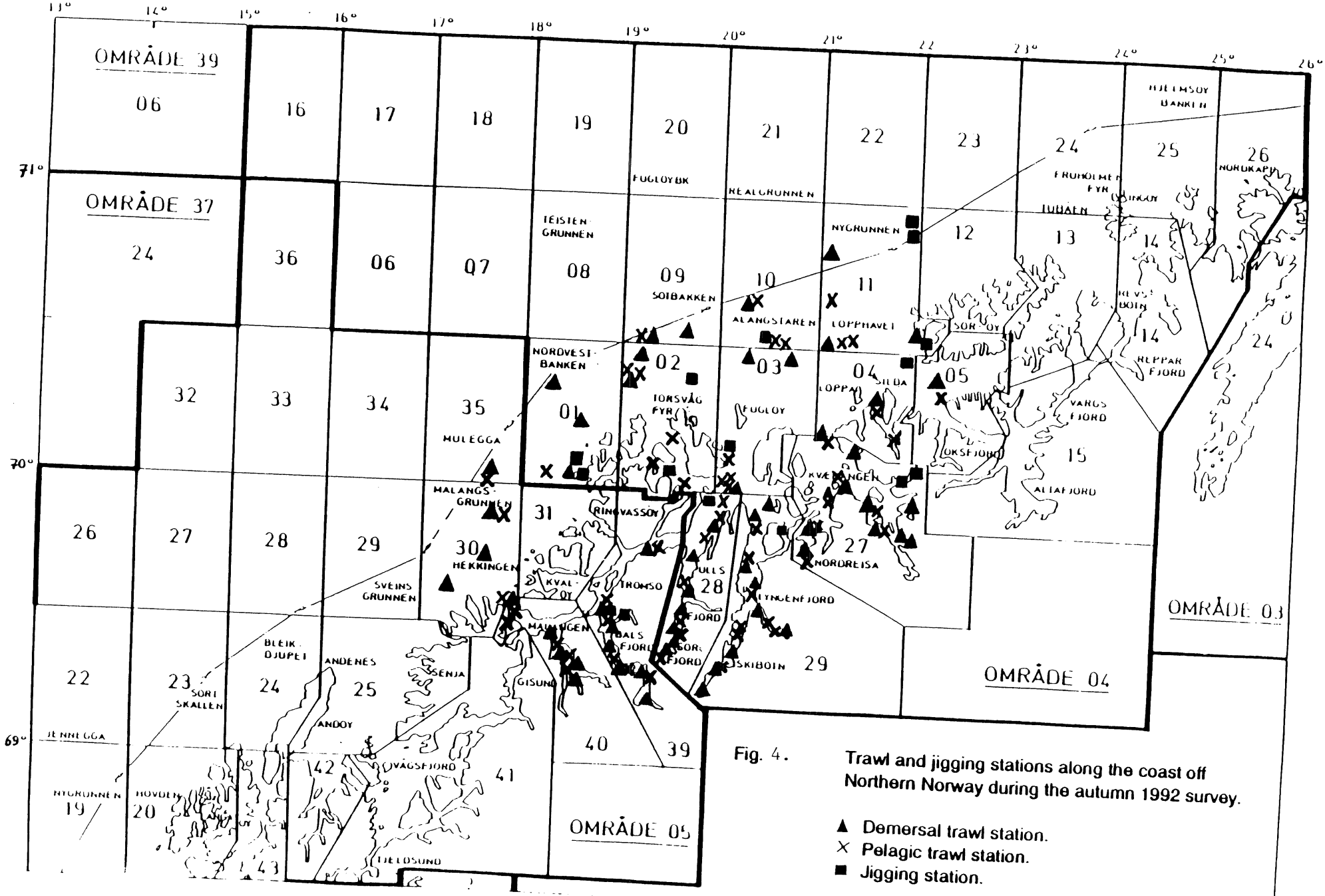

Fig. 4. Trawl and jigging stations along the coast off Northern Norway during the autumn 1992 survey.

▲ Demersal trawl station.
× Pelagic trawl station.
■ Jigging station.

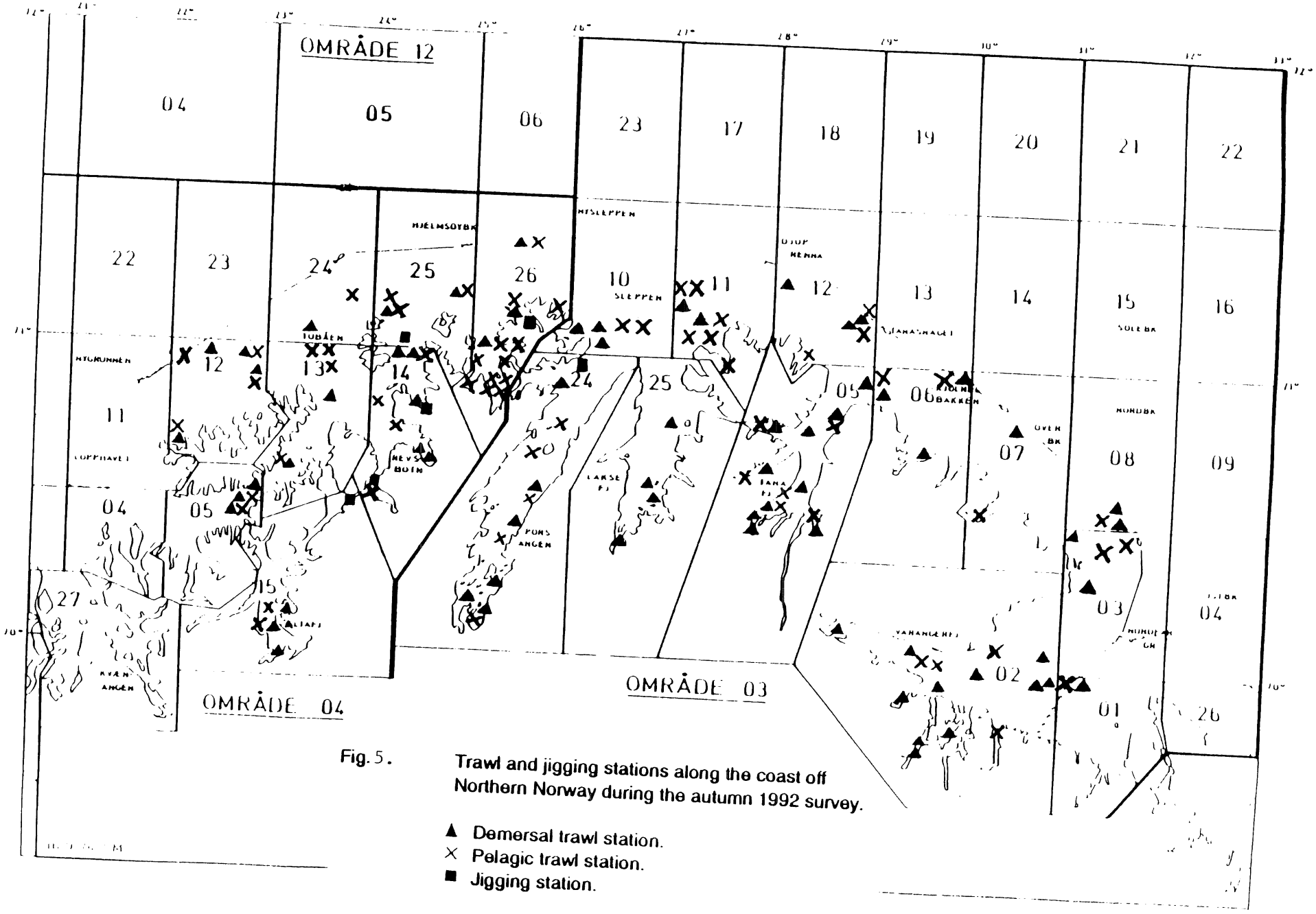

Fig. 5. Trawl and jigging stations along the coast off Northern Norway during the autumn 1992 survey.

▲ Demersal trawl station.
× Pelagic trawl station.
■ Jigging station.

Table 1.

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COASTAL RESOURCES: FINNMARK AND TROMS 1992 (TONNES)

AREA	AREA NO.	COD	HADDOCK	HERRING	CAPELIN	SAITHE	REDFISH
MAIN AREA 03							
VARANGER(VA)	03VA02	12751	3056	2253	3859	1749	530
VARANGER(VA)	03VA0301	9354	6555	3188	81	1316	1006
VARANGER(VA)	03VA08	2534	361	38352	0	172	284
VARANGER(VA)	03VA07	5557	4382	1088	0	5280	236
VARANGER(VA)	03VA0613	4037	7689	10186	0	18069	315
TANA(TA)	03TA05	2520	2897	3692	0	2335	986
NORKYN ØST(NY)	03NY12	3236	5827	10000	0	22861	1102
NORKYN VEST(NY)	03NY11	4063	4257	0	0	8185	1018
LAKSEFJORD(LA)	03LA25	2056	861	2466	0	9	298
NORKAPP(NK)	03NK10	5894	2026	10008	938	6419	77
PORSANGER(PO)	03PO24	7979	3891	8667	4820	881	128
EASTERN FINNMARK							
AREA 03 SUM		59981	41802	89900	9698	67276	5980
MAIN AREA 04		COD	HADDOCK	HERRING	CAPELIN	SAITHE	REDFISH
MAGERØY(MA)	04MA26	3910	4735	48969	39	2950	2813
HJELMSØY-INGØY (HI)	04HI2425	4401	3211	3562	0	20808	951
ROLVSØY-SØRØY(RS)	04RS13	2466	1987	26516	0	6346	409
REVSBOTN(RE)	04RE14	2427	3064	62020	0	11332	105
SØRØY(SØ) OMR. 12 + 23	04SØ1223	3043	2166	5758	0	8582	133
LOPPHAVET(LO)	04LO11	4024	1962	104112	0	6091	7053
SILDA(SI)	04SI04	1739	1523	101034	16	1296	666
STJERNØY(ST)	04ST05	2006	240	1066	0	660	3395
ALTA(AL)	04AL15	1136	472	2412	0	186	50
SUM WEST-FINNMARK		25152	19360	355449	55	58251	15575
SUM FINNMARK		85133	61162	445349	9753	125527	21555
AREA TROMS		COD	HADDOCK	HERRING	CAPELIN	SAITHE	REDFISH
ARNØY(AR) OMR. 03 + 10	04AR03	6890	3689	12447	9	21919	734
VANNØY(VN) OMR. 02 + 09	04VN02	4551	3733	0	17	9824	1518
NORDVESTBK (NB)	04NB01	1009	1456	0	0	4298	167
KVÆNANGEN-NORDR.(KN)	04KN27	1700	691	742	2	1185	95
LYNGEN(LY)	04LY29	2945	558	1715	0	2233	21
ULLSFJORD(UL)	04UL28	1266	160	1093	0	5647	160
BALSFJORD(BA)	05BA39	1052	87	8365	26	39	271
MALANGEN(ML)	05MA40	651	562	140	0	818	145
MALANGSGR.(MG)30+31+35	05MG30	7272	5794	0	0	9284	358
SUM TROMS		27336	16730	24502	54	55247	3469
SUM 04 TROMS		18361	10287	15997	28	45106	2695
AREA 04 SUM		43513	29647	371446	83	103357	18270
AREA 05 SUM		8975	6443	8505	26	10141	774
AREA 03 + 04 + 05 SUM		112469	77892	469851	9807	180774	25024
SUM ALL SPECIES+AREAS							875817

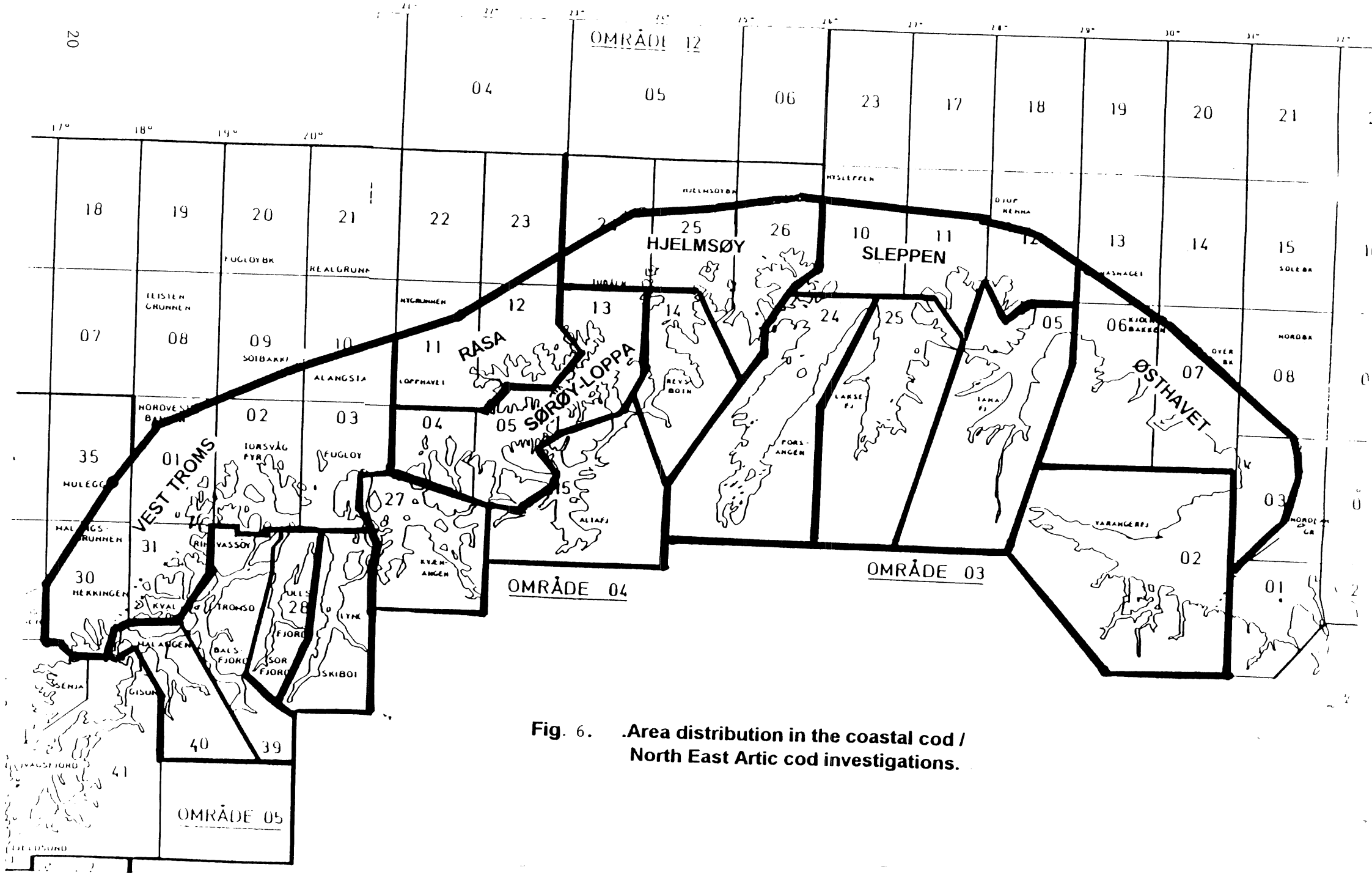


Fig. 6. .Area distribution in the coastal cod / North East Artic cod investigations.

Table 2. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0540 - Malangen

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	12	20,8	81	1,0				
2	45	28,2	212	9,6				
3	19	36,1	455	8,6				
4	12	43,4	833	10,0	2	40,5	620	1,2
5	90	46,9	1061	95,5	4	47,5	1116	4,5
6	19	52,1	1523	28,9				
7	6	51,0	1393	8,4				
8	1	55,0	1640	1,6				
9								
10	2	102,5	12100	24,2				
11	1	98,0	9950	10,0				
12								
Total	244			227	6			6
%	98			98	2			2

Areacode 0539 - Balsfjord

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	18	20,8	72	1,3				
2	90	25,8	152	13,6				
3	71	34,4	378	26,8	5	38,0	450	2,3
4	124	41,8	710	88,0	17	43,1	769	13,1
5	64	47,3	1063	68,1	10	53,4	1528	15,3
6	5	58,0	1828	9,1	5	60,3	2058	10,3
7	1	55,0	1350	1,4	2	58,5	1660	3,3
8	2	80,5	4465	8,9				
9	2	73,5	4100	8,2				
10					1	120,0	17240	17,2
11								
12								
Total	377			225	40			62
%	90			79	10			21

Table 3. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0428 - Ullsfjord

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	34	18,9	65	2,2				
2	54	26,6	177	9,6				
3	39	33,0	345	13,4	1	36,0	460	0,5
4	53	39,7	670	35,5	15	50,4	1216	18,2
5	164	42,5	803	131,8	16	53,3	1532	24,5
6	12	50,4	1317	15,8				
7	3	60,3	2153	6,5				
8	2	55,5	1710	3,4				
9	1	60,0	2380	2,4				
10	2	92,0	7885	15,8				
11								
12								
Total	364			236	32			43
%	92			85	8			16

Areacode 0429 - Lyngenfjord

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	26	19,2	57	1,5	1	23,0	100	0,1
2	64	27,6	189	12,1				
3	64	36,1	455	29,1				
4	41	42,4	766	31,4	1	42,0	550	0,6
5	91	51,4	1385	126,1	2	54,0	1576	3,2
6	26	61,8	2343	60,9				
7	2	65,5	2763	5,5				
8					2	63,5	2732	5,5
9	2	74,5	3810	7,6	1	58,0	1880	1,9
10	4	67,8	5101	20,4				
11								
12					2	73,0	3704	7,4
Total	320			295	9			19
%	97			94	3			6

Table 4. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0427 - Kvænangen

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	15	19,2	62	0,9	2	21,0	83	0,2
2	74	27,5	183	13,5	4	29,8	219	0,9
3	60	34,7	392	23,5	2	37,5	480	1,0
4	39	44,3	812	31,7	4	51,0	1250	5,0
5	51	56,1	1709	87,2	3	62,3	2092	6,3
6	41	63,1	2431	99,7	1	74,0	3623	3,6
7	11	62,4	2296	25,3	1	71,0	2940	2,9
8	7	63,9	2703	18,9				
9	8	69,5	2941	23,5				
10	2	79,0	4080	8,2	1	82,0	4510	4,5
11								
15	1	111,0	15500	15,5				
Total	309			348	18			24
%	95			94	5			7

Areacode 0404, 0405, 0413 - Loppa/Sørøya

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	10	19,5	60	0,6	2	23,3	100	0,2
2	13	29,0	228	3,0				
3	29	42,2	695	20,2	1	36,0	370	0,4
4	13	50,7	1221	15,9	4	45,4	908	3,6
5	27	57,3	1784	48,2	4	60,9	2098	8,4
6	12	64,1	2414	29,0	3	61,5	2280	6,8
7	2	73,8	3635	7,3	2	76,5	4345	8,7
8	2	69,0	3445	6,7	2	74,0	3585	7,2
9	3	63,0	2346	7,0				
10								
11	1	58,5	1620	1,6				
12								
Total	112			139	18			35
%	86			80	14			20

Table 5. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0415 - Altafjord

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	15	18,7	58	0,9				
2	58	29,2	225	13,0	3	21,7	85	0,3
3	21	37,8	465	9,8	4	35,9	375	1,5
4	13	45,4	817	10,6	5	38,8	508	2,5
5	18	51,8	1404	25,3	2	48,3	1024	2,0
6	12	56,8	1786	21,4	2	58,5	1965	3,9
7	3	60,0	2163	6,5	2	58,0	1725	3,5
8								
9	1	58,0	2195	2,2				
10								
11								
12								
Total	141			90	18			14
%	89			87	11			13

Areacode 0414 - Revsbotn

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	9	20,4	44	0,4				
2	19	27,8	147	2,8				
3	39	34,9	340	13,3				
4	16	45,0	840	13,4				
5	15	57,8	1867	28,0				
6	11	65,4	2638	29,0				
7	1	74,0	4000	4,0				
8					4	60,5	1928	7,7
9	1	85,0	5370	5,4	3	58,7	1717	5,2
10					2	52,0	1670	3,3
11								
12								
Total	111			96	9			16
%	93			86	7			14

Table 6. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0324 - Porsanger

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	3	19,3	65	0,2				
2	15	28,0	205	3,1				
3	67	34,4	376	25,2	16	39,1	556	8,9
4	23	46,3	1014	23,3	8	49,6	1101	8,8
5	36	49,2	1236	44,5	4	53,5	1348	5,4
6	47	54,7	1683	79,1	6	60,2	1925	11,6
7	12	55,7	1626	19,5	1	55,0	1450	1,5
8	8	58,6	2068	16,5	1	54,0	1660	1,7
9	10	58,6	2025	20,3				
10	14	57,9	1941	27,2				
11	9	56,3	1846	16,6				
13	1	60,0	1860	1,9				
Total	245			277	36			38
%	87			88	13			12

Areacode 0325 - Laksefjord

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	1	18,0	40	0,0				
2	18	30,3	239	4,3				
3	60	37,4	489	29,3				
4	34	47,0	961	32,7	3	39,7	623	1,9
5	41	53,4	1430	58,6	4	54,8	1653	6,6
6	47	54,8	1566	73,6	3	56,0	1750	5,3
7	8	60,4	2044	16,4	1	51,0	1250	1,3
8					4	63,0	2913	11,7
9					3	61,3	2097	6,3
10								
11								
12								
Total	209			215	18			33
%	92			87	8			13

Table 7. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0305 - Tana

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	6	18,0	50	0,3				
2	30	27,6	218	6,5	2	35,0	370	0,7
3	55	36,0	442	24,3	3	41,7	700	2,1
4	32	49,2	1176	37,6	10	49,8	1184	11,8
5	35	54,3	1611	56,4	8	66,6	2824	22,6
6	53	59,1	2082	110,3				
7	10	61,0	2471	24,7	1	72,0	3230	3,2
8	2	58,5	1775	3,6	2	61,0	2290	4,6
9	4	59,3	2105	8,4				
10					1	65,0	2440	2,4
11								
12								
Total	227			272	27			48
%	89			85	11			15

Areacode 0302 - Varanger

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	14	17,0	44	0,6				
2	39	26,4	170	6,6	2	28,5	200	0,4
3	171	40,9	657	112,4	25	35,1	396	9,9
4	54	53,7	1432	77,4	47	45,6	907	42,6
5	29	61,0	2180	63,2	34	55,5	1665	56,6
6	8	64,4	2479	19,8	6	60,2	1953	11,7
7	4	70,5	3508	14,0	3	64,0	2330	7,6
8	1	69,0	3200	3,2	1	73,0	3540	3,5
9	3	63,2	2473	7,4	3	79,5	4453	13,4
10	1	82,0	6660	6,7				
11								
12								
Total	324			311	121			146
%	73			68	27			32

Table 8. . Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0401, 0402, 0403, 0409, 0410, 0530, 0531, 0535 - Western Troms

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	1	17,0	35	0,0				
2	3	27,7	230	0,7				
3	6	41,0	693	4,2	3	48,8	1123	3,4
4	21	52,3	1286	27,0	10	52,3	1339	13,4
5	54	49,5	1504	81,2	7	58,4	1891	13,2
6	20	63,0	2727	54,5	9	64,8	2601	23,4
7	2	65,0	2675	5,4	1	71,0	2710	2,7
8	2	60,0	1960	3,9				
9	3	89,0	7343	22,0				
10								
11	1	86,0	5140	5,1	1	99,0	9380	9,4
12								
Total	113			204	31			66
%	79			76	21			24

Areacode 0411, 0412 - Råsa

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1								
2	13	31,5	296	3,9				
3	35	45,4	875	30,6	8	46,3	975	7,8
4	39	54,4	1507	58,8	35	53,8	1459	51,1
5	59	58,8	1909	112,7	38	58,8	1917	72,9
6	22	63,2	2499	55,0	10	59,8	2036	20,4
7	2	66,5	2895	8,8	2	78,5	5845	11,7
8					1	96,0	8670	8,7
9	3	87,0	7643	22,9				
10	1	66,0	2760	2,8				
11								
12								
Total	174			292	94			172
%	65			63	35			37

Table 9. Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0425, 0425, 0426 - Hjelmsøy

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	11	18,2	48	0,5				
2	16	28,2	193	3,1	9	28,4	189	1,7
3	42	39,3	549	23,0	11	37,1	464	5,1
4	33	52,5	1301	43,0	6	53,0	1377	8,3
5	34	57,5	1780	60,5	23	55,7	1468	33,8
6	18	65,7	2710	48,8	7	67,0	2824	19,8
7	3	68,0	2667	8,0	2	70,0	2915	5,8
8	3	69,3	3050	9,2	4	66,8	2683	10,7
9					2	77,0	4010	8,0
10								
11	1	62,0	2220	2,2				
12								
Total	161			198	64			93
%	72			68	28			32

Areacode 0310, 0311, 0312 - Sleppen

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	4	16,8	33	0,1				
2	8	28,9	216	1,7	7	30,7	259	1,8
3	10	45,3	843	8,4	7	43,9	721	5,1
4	31	57,1	1665	51,6	36	55,0	1440	51,8
5	21	63,9	2380	50,0	40	62,8	2122	84,9
6	12	68,1	2963	35,6	14	70,6	2963	41,5
7	3	84,3	5307	15,9	3	80,7	4547	13,6
8	1	85,0	5050	5,1	3	80,7	5577	16,7
9	1	73,0	3660	3,7	1	97,0	7910	7,9
10	1	79,0	4230	4,2				
11								
12								
Total	93			176	111			223
%	46			44	54			56

Table 10. Length (cm) and weight (g) at age of Coastal cod and North-East Arctic cod at different areas along the coast. Coastal and N-E Arctic cod are separated by the otolith-structure.

Areacode 0301, 0303, 0306, 0307, 0308, 0313 - Østhavet

Age years	Coastal cod				N-E Arctic cod			
	No.	Length (cm)	Weight (gram)	Biomass (kg)	No.	Length (cm)	Weight (gram)	Biomass (kg)
1	1	14,0	20	0,0	1	27,0	150	0,1
2	18	28,5	195	3,5	5	32,8	302	1,5
3	75	41,4	680	51,0	8	47,6	956	7,7
4	27	54,9	1626	43,9	34	54,1	1383	47,0
5	18	64,6	2582	46,5	13	60,3	1936	25,2
6	18	68,6	3098	55,8	4	59,0	1895	7,6
7	2	68,5	2415	4,8	3	68,3	3030	9,1
8					1	69,0	3010	3,0
9	4	78,5	4100	16,4	1	65,0	2530	2,5
10								
11								
12								
Total	163			222	70			104
%	70			68	30			32

Table 11. . Length (cm) at age (year) for Coastal cod from the survey during the autumn of 1992.

Area	Age (year)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Malangen 0504	20,8	28,2	**36,1**	**43,4**	46,9	52,1	51,0	55,0		102,5	98,0				
West - Troms (1)	17,0	27,7	**41,0**	**52,3**	49,5	63,0	65,0	60,0	89,0		86,0				
Balsfjord 0539	20,8	25,8	34,4	41,8	47,3	58,0	55,0	80,5	73,5						
Ullsfjord 0428	18,9	26,6	33,0	39,7	42,5	50,4	60,3	55,5	60,0	92,0					
Lyngenfjord 0429	19,2	27,6	36,1	42,4	51,4	61,8	65,5		74,5	67,8					
Loppa - Sørøya (2)	19,5	29,0	42,2	50,7	57,3	64,1	73,8	69,0	63,0		58,5				
Kvenangen 0427	19,2	27,5	34,7	44,3	56,1	63,1	62,4	63,9	69,5	79,0					
Raasa 0411,0412		31,5	45,4	54,4	58,8	63,2	66,5		87,0	66,0					111,0
Altafjord 0415	18,7	29,2	37,8	45,4	51,8	56,8	60,0		58,0						
Revsbotn 0414	20,4	27,8	34,9	45,0	57,8	65,4	74,0		85,0						
Hjelmsøy (3)	18,2	28,2	39,3	52,5	57,5	65,7	68,0	69,3			62,0				
Sleppen (4)	16,8	28,9	45,3	57,1	63,9	68,1	84,3	85,0	73,0	79,0					
Tanafjord 0305	18,0	27,6	36,0	49,2	54,3	59,1	61,0	58,5	59,3						
Porsanger 0324	19,3	28,0	34,4	46,3	49,2	54,7	55,7	58,6	58,6	57,9	56,3		60,0		
Østhavet (5)	14,0	28,5	41,4	54,9	64,6	68,6	68,5		78,5						
Laksefjord 0325	18,0	30,3	37,4	47,0	53,4	57,8	60,4								
Varanger 0302	17,0	26,4	40,9	53,7	61,0	64,4	70,5	69,0	63,2	82,0					

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 12. . Weight (gram) at age (year) for Coastal cod from the survey during the autumn of 1992.

Area	Age (year)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Malangen 0504	81	212	455	833	1061	1523	1393	1640		12100	9950				
West - Troms (1)	35	230	693	1286	1504	2727	2675	1960	7343		5140				
Balsfjord 0539	72	152	378	710	1063	1828	1350	4465	4100						
Ullsfjord 0428	65	177	345	670	803	1317	2153	1710	2380	7885					
Lyngenfjord 0429	57	189	455	766	1385	2343	2763		3810	5101					
Loppa - Sørøya (2)	60	228	695	1221	1784	2414	3635	3345	2346		1620				
Kvenangen 0427	62	183	392	812	1709	2431	2296	2703	2941	4080					
Raasa 0411,0412		296	875	1507	1909	2499	2895		7643	2760					15500
Altafjord 0415	58	225	465	817	1404	1786	2163		2195						
Revsbotn 0414	44	147	340	840	1867	2638	4000		5370						
Hjelmsøy (3)	48	193	549	1301	1780	2710	2667	3050			2220				
Sleppen (4)	33	216	843	1665	2380	2963	5307	5050	3660	4230					
Tanafjord 0305	50	218	442	1176	1611	2082	2471	1775	2105						
Porsanger 0324	65	205	376	1014	1236	1683	1626	2068	2025	1941	1846		1860		
Østhavet (5)	20	195	680	1626	2582	3098	2415		4100						
Laksefjord 0325	40	239	489	961	1430	1566	2044								
Varanger 0302	44	170	657	1432	2180	2479	3508	3200	2473	6660					

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

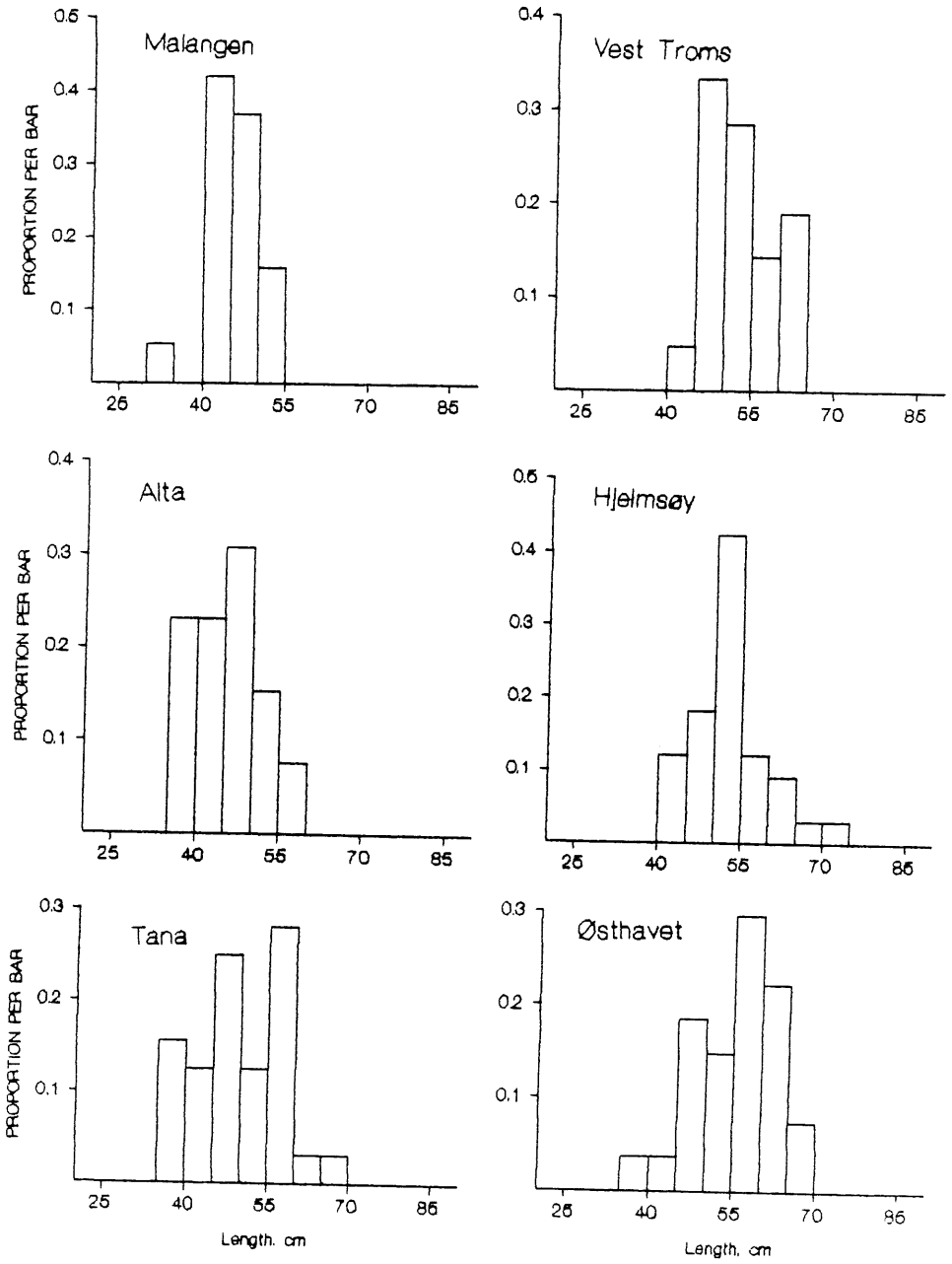


Fig. 7. **Length frequency distribution of 4 year old coastal cod.**

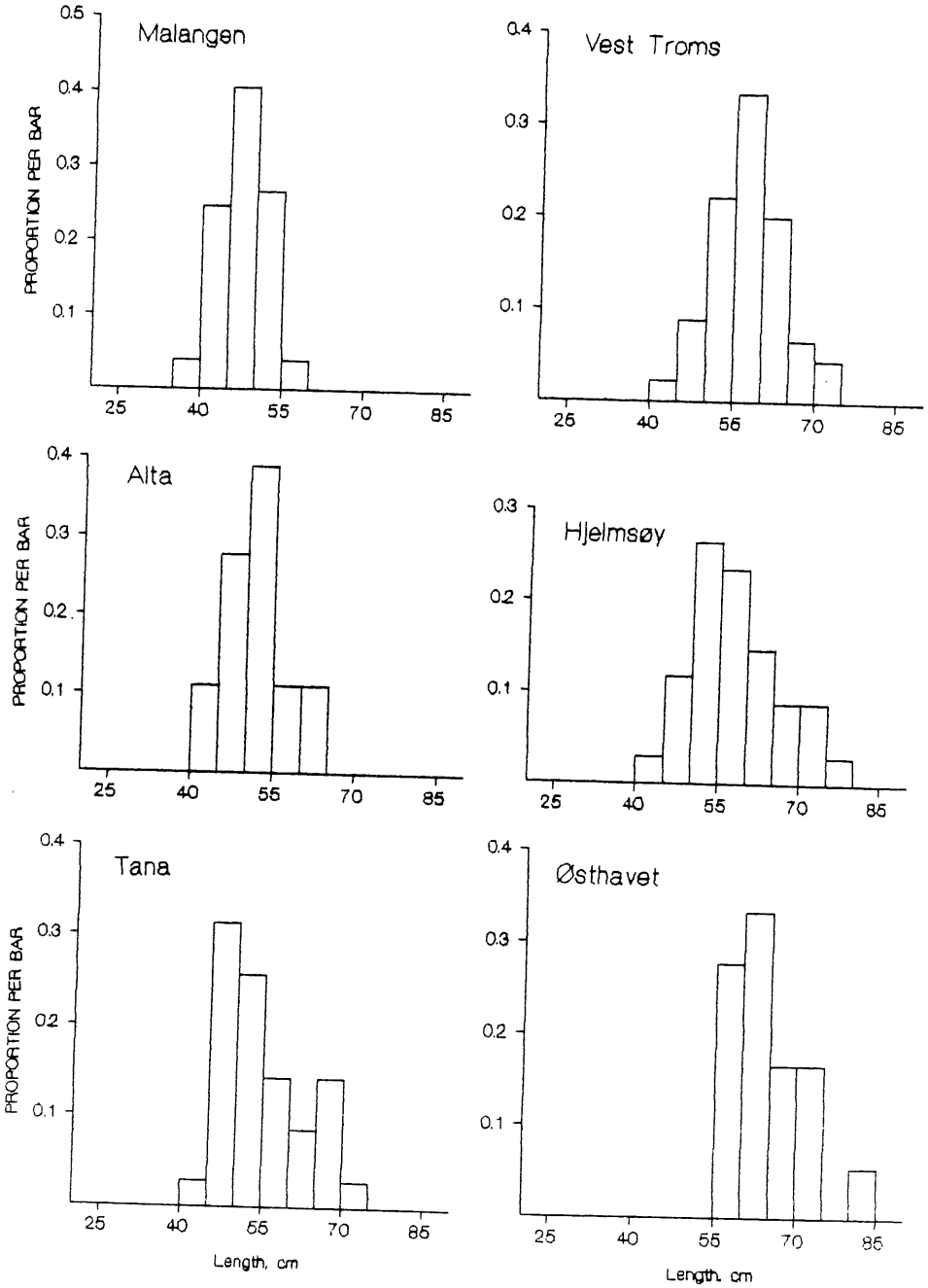


Fig. 8. **Length frequency distribution of 5 year old coastal cod.**

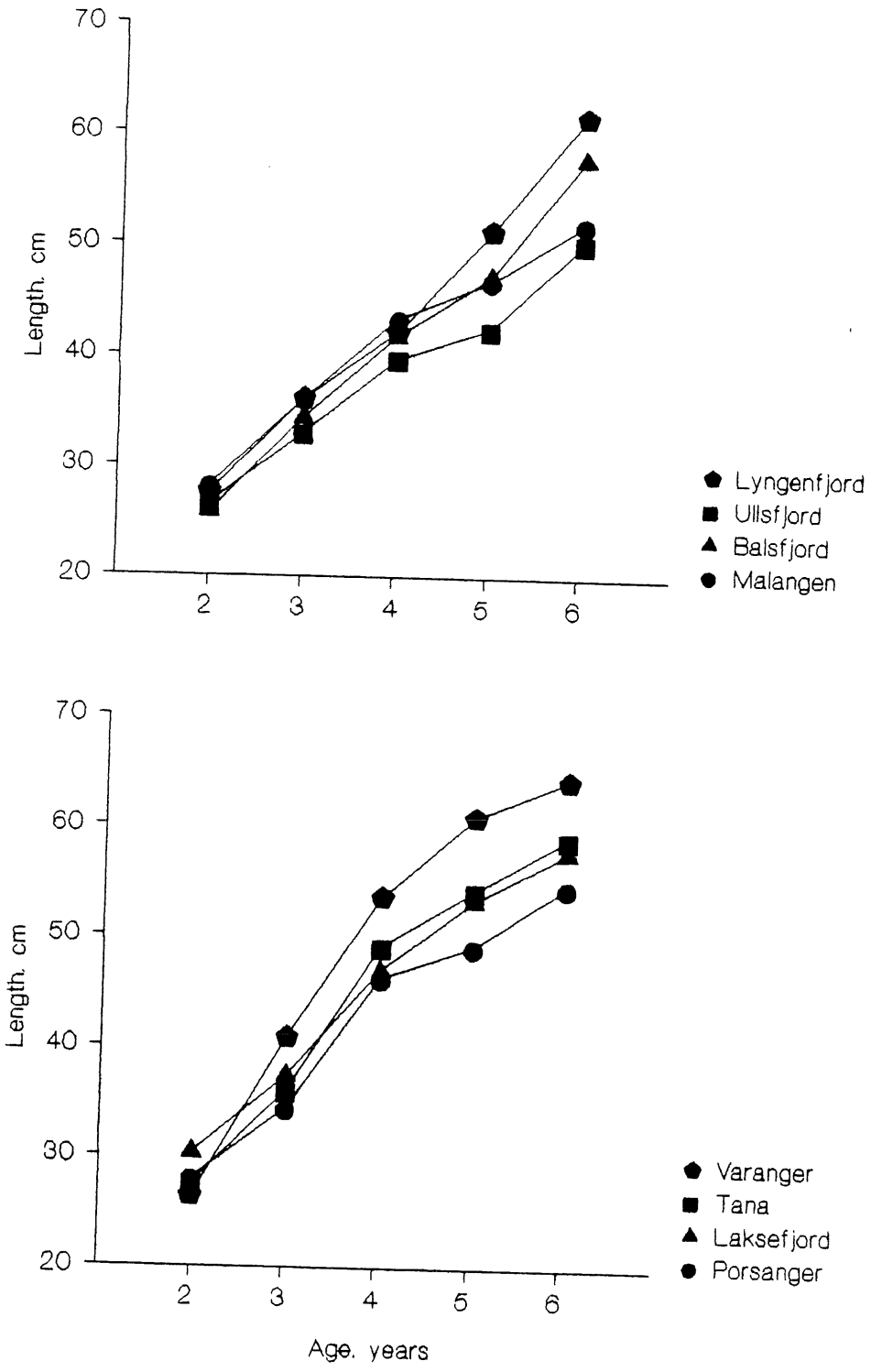


Fig. 9. Average total length related to age in coastal cod from fjords in the western (upper graph) and eastern part (lower graph) of the investigated region.

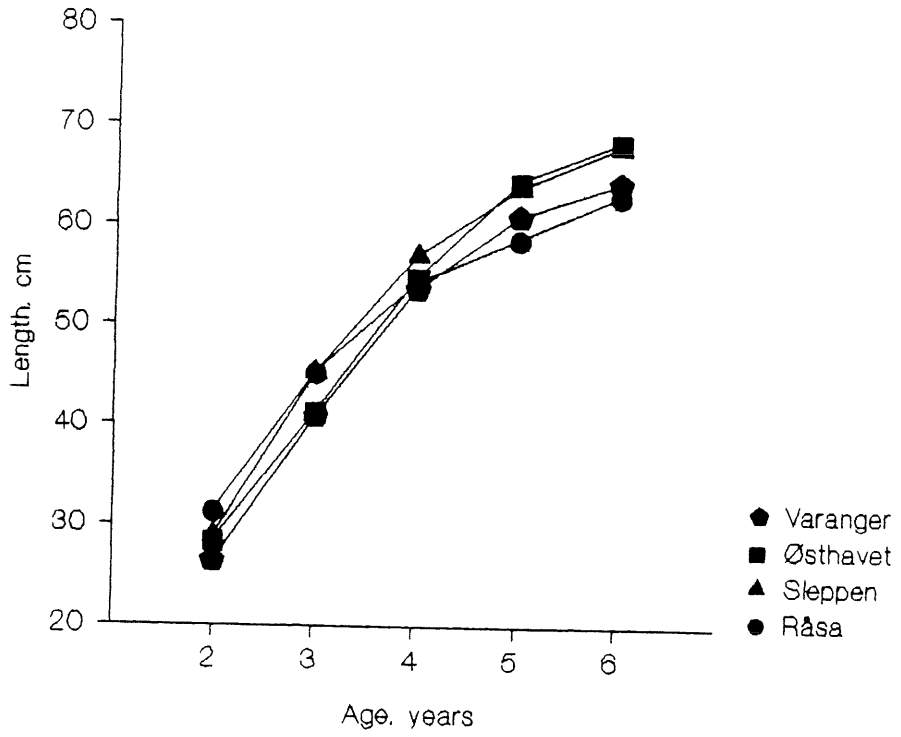


Fig. 10. **Average total length related to age in coastal cod from four areas in the eastern part of the investigated region.**

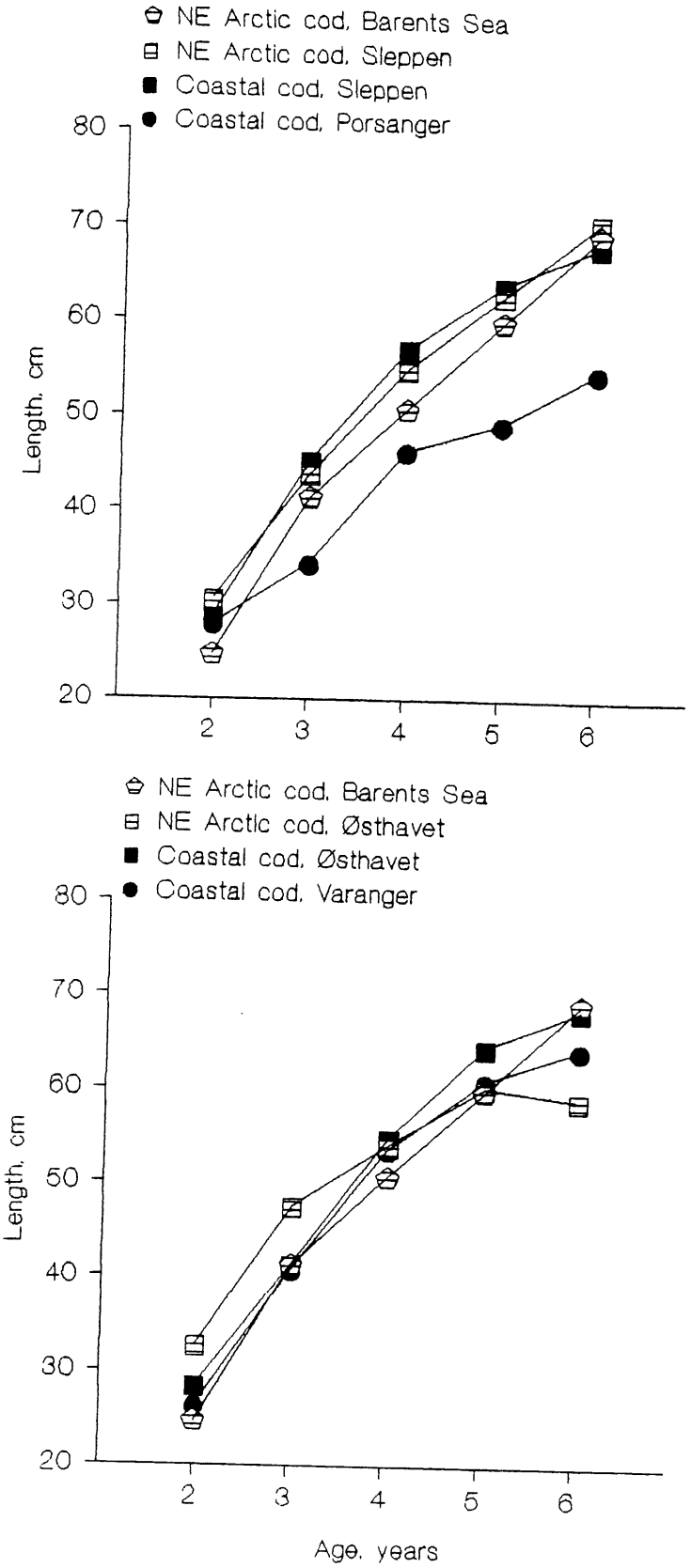


Fig. 11. **Average total length related to age in coastal and NE Arctic cod from fjords and shelf waters in two eastern parts of the investigated region, compared with average length of NE Arctic cod extracted from Anon. (1992).**

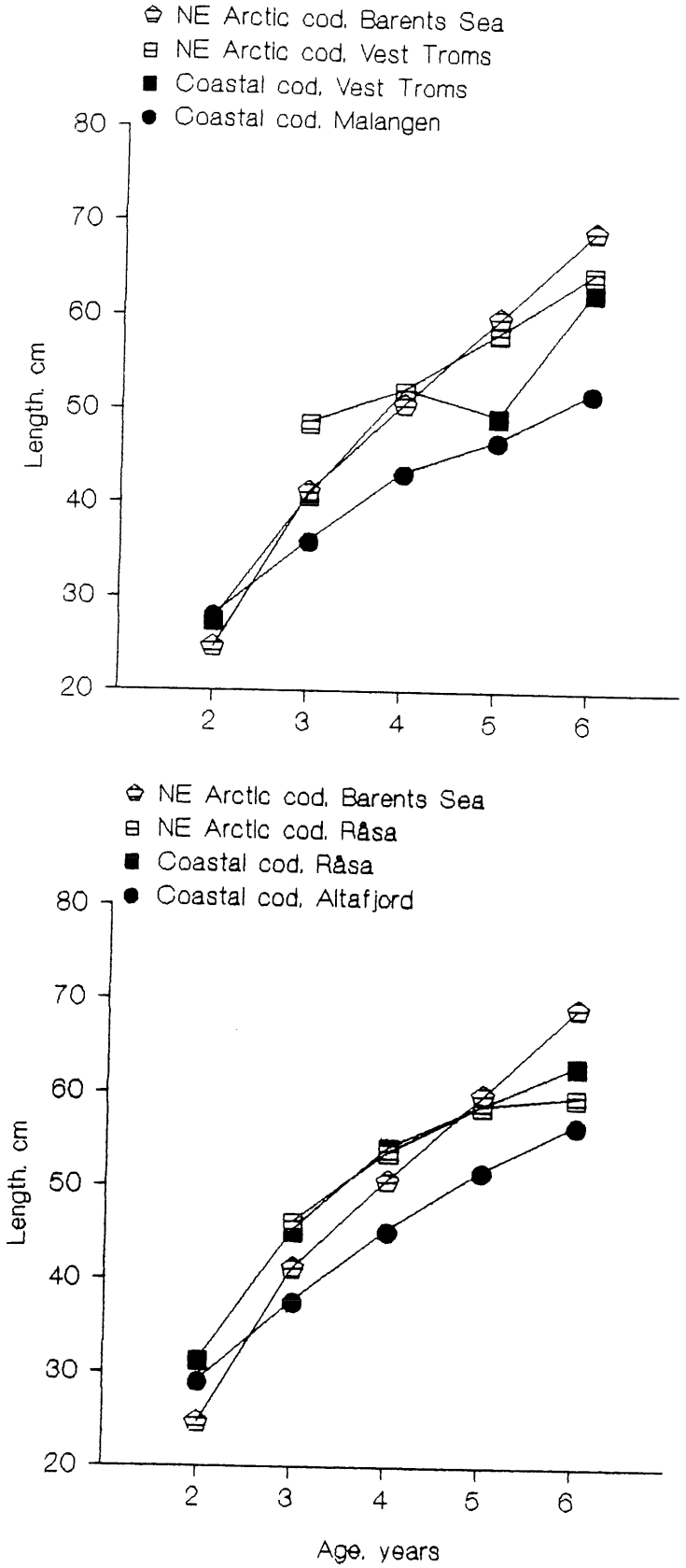


Fig. 12. Average total length related to age in coastal and NE Arctic cod from fjords and shelf waters in two western parts of the investigated region, compared with average length of NE Arctic cod extracted from Anon. (1992).

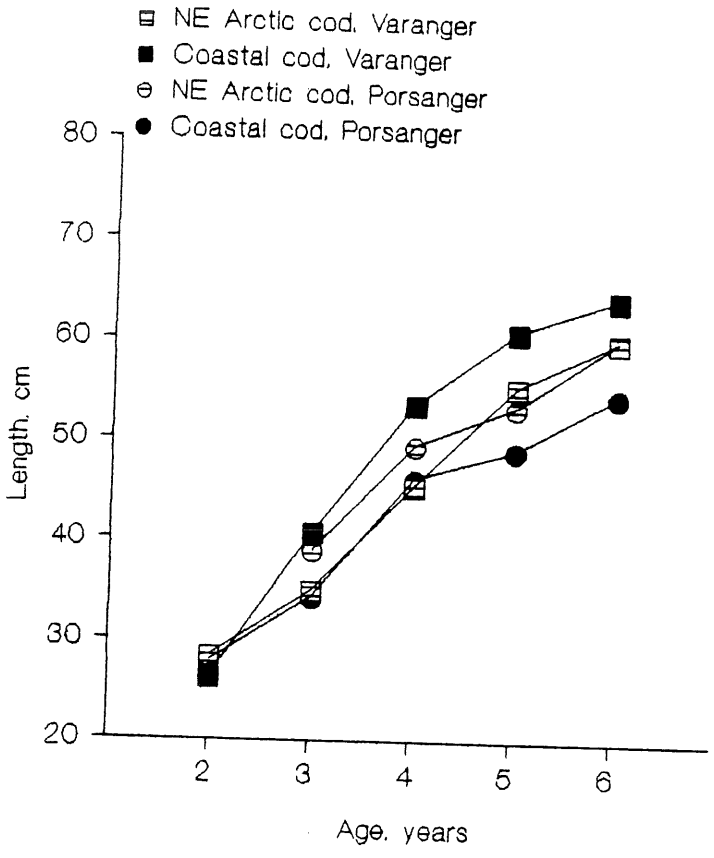


Fig. 13. Average total length related to age in coastal and NE Arctic cod from two fjords in the eastern part of the investigated region.

Table 13. . Percent maturity at age (year) for Coastal cod from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	N
Malangen 0504	0	0	3	11	59	85	86	100		100	100					244
West - Troms (1)	0	0	33	57	80	100	100	100	100		100					113
Balsfjord 0539	0	0	17	55	59	80	100	100	100		100					377
Ullsfjord 0428	0	0	5	53	75	75	100	100	100	100						364
Lyngenfjord 0429	0	0	2	34	84	100	100		100	100						320
Loppa - Sørøya (2)	0	0	3	8	70	92	100	100	100		100					112
Kvenangen 0427	0	0	0	23	78	95	100	86	100	100					100	309
Raasa 0411,0412		0	9	72	90	100	100		100	100						174
Altafjord 0415	0	2	10	46	83	92	100		100							141
Revsbotn 0414	0	0	5	31	93	100	100		100							111
Hjelmsøy (3)	0	0	7	15	68	72	67	100			100					161
Sleppen (4)	0	0	0	42	8	86	100	100	100	100						93
Tanafjord 0305	0	0	4	22	71	92	100	100	100							227
Porsanger 0324	0	0	1	17	64	94	100	100	100	93	100		100			245
Østhavet (5)	0	0	8	59	89	94	100		100							163
Laksefjord 0325	0	0	8	47	85	98	100									209
Varanger 0302	0	0	6	41	72	63	100	100	100	100						324

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Tot. N = 4407 othol.
Coastal cod = 83,7 %
N-E Arctic cod = 16,3 %

Table 14. . Percent maturity at age (year) for North-East Arctic cod from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	N
Malangen 0504			0	0												6
West - Troms (1)			33	70	71	78		100		100						30
Balsfjord 0539			0	31	70	80	100		100							39
Ullsfjord 0428			0	47	94											32
Lyngenfjord 0429	0			0	50			100								9
Loppa - Sørøya (2)	0		0	50	75	100		100	100							18
Kvenangen 0427	0	0	0	50	100	100	100			100						18
Raasa 0411,0412			0	57	79	96	100	100								94
Altafjord 0415	0	0	0	0	50	50										18
Revsbotn 0414							100	100	100							9
Hjelmsøy (3)		0	0	33	9	29	50	100	100							64
Sleppen (4)		0	0	33	78	100	100	100	100							111
Tanafjord 0305		0	0	30	88		100	100		100						27
Porsanger 0324			0	0	50	83	100	100								36
Østhavet (5)	0	0	13	15	38	50	100	100	100							70
Laksefjord 0325				33	75	100	100	100	100							18
Varanger 0302		0	4	21	79	67	100	100	100							121

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Tot. N = 4407 othol.
Coastal cod = 83,7 %
N-E Arctic cod = 16,3 %

Table 15. . Biomass (tonnes) of Coastal cod and N-E Artic cod in each yearclass from the survey during the autumn of 1992 .

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540	3	31	46	57	302	85	28	5		66	28					651
West - Troms (1)	4	74	668	3108	5381	7927	224	586	833	355	562					19722
Balsfjord 0539	6	51	76	336	343	59	15	43	123							1052
Ullsfjord 0428	10	43	64	243	708	72	29	15	11	71						1266
Lyngenfjord 0429	19	182	257	178	1069	771	53		113	303						2945
Loppa - Sørøya (2)	30	115	792	753	1981	1469	134	326	548		63					6211
Kvenangen 0427	4	68	118	183	393	445	134	112	104	48					91	1700
Raasa 0411,0412		60	585	1656	2821	1171	265	125	340	44						7067
Altafjord 0415	19	168	135	148	276	288	77		25							1136
Revsbotn 0414	9	61	286	290	604	624	253	111	189							2427
Hjelmsøy (3)	14	143	1466	1290	3318	640	486	729	166		59					8311
Sleppen (4)	5	174	675	3922	4642	1832	628	964	209	142						13193
Tanafjord 0305	1	88	247	471	796	574	252	21	70							2520
Porsanger 0324	7	98	771	789	1276	2281	529	381	532	696	557		62			7979
Østhavet (5)	107	251	2098	6691	6799	3973	381	0	1182							21482
Laksefjord 0325	2	11	192	509	778	507		57								2056
Varanger 0302	28	295	2486	3621	3669	876	673	311	485	307						12751
TOTAL	268	1913	10962	24245	35156	23594	4161	3786	4930	2032	1269	0	62	0	91	112469

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 16. .Numbers (x1000) of Coastal cod and N-E Artic cod in each yearclass from the survey during the . autumn of 1992

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540	37	146	101	68	285	56	20	3		5	3					724
West - Troms (1)	114	322	964	2417	3578	2907	84	299	113		109					10907
Balsfjord 0539	83	336	201	473	323	32	11	10	30							1499
Ullsfjord 0428	154	243	186	363	882	55	13	9	5	9						1919
Lyngenfjord 0429	333	963	565	232	772	329	19		30	59						3302
Loppa - Sørøya (2)	500	504	1140	617	1110	609	37	97	234		39					4887
Kvenangen 0427	65	372	301	225	230	183	58	41	35	12						1528
Raasa 0411,0412		203	669	1099	1478	469	92		44	16					6	4070
Altafjord 0415	328	747	290	181	197	161	36		11							1951
Revsbotn 0414	205	415	841	345	324	237	63		35							2465
Hjelmsøy (3)	292	741	2670	992	1864	236	182	239			27					7243
Sleppen (4)	152	806	801	2356	1950	618	118	191	57	34						7083
Tanafjord 0305	20	404	559	401	494	276	102	12	33							2301
Porsanger 0324	108	478	2051	778	1032	1355	325	184	263	359	302		33			7268
Østhavet (5)	5350	1287	3085	4115	2633	1282	158		288							18198
Laksefjord 0325	50	46	393	530	544	324										1887
Varanger 0302	636	1735	3784	2529	1683	353	192	97	196	46						11251
TOTAL	8427	9748	18601	17721	19379	9482	1510	1182	1374	540	480		33		6	88483

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 17. . Biomass (tonnes) of Coastal cod in each yearclass from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540	3	31	40	57	208	85	28	5		66	28					551
West - Troms (1)	4	74	369	2077	4629	5546	149	586	833		562					14829
Balsfjord 0539	6	51	70	292	280	28	4	43	40							814
Ullsfjord 0428	10	43	62	161	597	72	29	15	11	71						1071
Lyngenfjord 0429	18	182	257	174	1043	771	53		90	303						2891
Loppa - Sørøya (2)	23	115	777	614	1687	1189	61	157	548		63					5234
Kvenangen 0427	3	64	113	158	367	430	120	112	104	31					91	1593
Raasa 0411,0412		60	466	886	1713	854	114	125		44						4262
Altafjord 0415	14	151	108	125	239	248	75		25							985
Revsbotn 0414	9	61	286	290	604	624	87	111	117							2189
Hjelmsøy (3)	14	92	1200	1081	2129	455	282	337	166		59					5815
Sleppen (4)	5	85	420	1957	1721	846	338	226	67	142						5807
Tanafjord 0305	1	79	227	358	568	573	223	9	70							2108
Porsanger 0324	6	86	503	505	1003	1754	433	305	468	613	491		55			6222
Østhavet (5)	18	176	1823	3231	4409	3497	132									13286
Laksefjord 0325	2	11	192	481	699	473										1858
Varanger 0302	28	278	2285	2336	1936	551	436	149	173	307						8479
TOTAL	164	1639	9198	14783	23832	17996	2564	2180	2712	1577	1203	0	55	0	91	77994

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 18. Numbers (x1000) of Coastal cod in each yearclass from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540	37	146	91	51	285	56	20	3		5	3					697
West - Troms (1)	114	322	643	1637	3167	2005	56	299	113		109					8465
Balsfjord 0539	83	336	188	416	279	16	4	10	20							1352
Ullsfjord 0428	154	243	181	283	804	55	13	5	5	9						1751
Lyngenfjord 0429	321	963	565	226	755	329	19		20	59						3258
Loppa - Sørøya (2)	417	504	1102	472	967	487	19	49	234		39					4288
Kvenangen 0427	57	353	291	204	217	179	53	41	35	8					6	1445
Raasa 0411,0412		203	545	579	899	322	46		44	16						2654
Altafjord 0415	273	699	234	157	177	138	36		11							1726
Revsbotn 0414	205	415	841	345	324	237	13		12							2391
Hjelmsøy (3)	292	474	2116	839	1112	170	109	102			27					5242
Sleppen (4)	152	430	471	1090	671	285	59	48	29	34						3269
Tanafjord 0305	20	379	530	306	402	276	93	6	33							2044
Porsanger 0324	108	478	1656	577	929	1202	300	164	263	359	302		33			6370
Østhavet (5)	2675	1007	2788	1821	1529	1049	63		230							11163
Laksefjord 0325	50	46	393	487	496	305										1776
Varanger 0302	636	1650	3301	1352	775	202	110	49	98	46						8218
TOTAL	5594	8648	15936	10843	13788	7312	1012	774	1147	536	480	0	33	0	6	66110

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 19. . Spawning Stock Biomass (tonnes) of Coastal cod in each yearclass from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540			1	6	123	72	24	5		68	28					327
West - Troms (1)			122	1184	3703	5546	149	586	833		562					12685
Balsfjord 0539			12	161	210	22	4	43	40							492
Ullsfjord 0428			2	59	349	38	20	11	8	50						537
Lyngenfjord 0429			5	59	730	771	53		90	303						2011
Loppa - Sørøya (2)			23	49	1181	1094	61	157	548		63					3176
Kvenangen 0427				36	286	409	120	96	104	31					91	1173
Raasa 0411,0412			42	638	1541	854	114	125		44						3358
Altafjord 0415		3	11	58	198	228	75		25							598
Revsbotn 0414			14	90	562	626	87	111	117							1607
Hjelmsøy (3)			84	162	1448	328	189	337	166		59					2773
Sleppen (4)				822	138	728	338	226	67	142						2461
Tanafjord 0305			9	79	403	527	223	9	70							1320
Porsanger 0324			5	86	642	1649	433	305	468	570	491		55			4704
Østhavet (5)			146	1906	3924	3287	132									9395
Laksefjord 0325			16	226	594	464										1300
Varanger 0302			137	958	1393	347	436	149	173	307						3900
TOTAL	0	3	629	6579	17425	16990	2458	2160	2709	1515	1203	0	55	0	91	51817

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 20. . Spawning Stock (in numbers x 1000) of Coastal cod in each yearclass from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540			2	7	116	47	17	3		6	3					201
West - Troms (1)			176	921	2462	2034	56	299	113		109					6170
Balsfjord 0539			32	227	198	12	3	10	10							492
Ullsfjord 0428			6	88	435	29	9	6	3	6						582
Lyngenfjord 0429			11	77	527	329	19		24	59						1046
Loppa - Sørøya (2)			33	40	662	453	17	47	234		39					1525
Kvenangen 0427				44	167	168	52	36	35	8					6	516
Raasa 0411,0412			48	423	807	342	39			16						1675
Altafjord 0415		13	24	71	141	128	35		11							423
Revsbotn 0414			41	107	301	237	22		22							730
Hjelmsøy (3)			153	125	813	121	71	110			27					1420
Sleppen (4)				494	58	246	64	45	18	34						959
Tanafjord 0305			20	67	250	253	90	5	33							718
Porsanger 0324			13	85	519	980	266	147	231	294	266		30			2831
Østhavet (5)			215	1172	1520	1061	55									4023
Laksefjord 0325			33	235	415	296										979
Varanger 0302			209	669	639	140	124	47	70	46						1944
TOTAL	0	13	1016	4852	10030	6876	939	755	804	469	444	0	30	0	6	26234

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 21. . Biomass (tonnes) of N-E Artic cod in each yearclass from the survey during the autumn of 1992.

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540			6		94											100
West - Troms (1)			299	1031	752	2381	75		355							4893
Balsfjord 0539			6	44	63	31	11		83							238
Ullsfjord 0428			2	82	111											195
Lyngenfjord 0429	1		0	4	26				23							54
Loppa - Sørøya (2)	7		15	139	294	280	73	169								977
Kvenangen 0427	1	4	5	25	26	15	14			17						107
Raasa 0411,0412			119	770	1108	317	151	340								2805
Altafjord 0415	5	17	27	23	37	40	2									151
Revsbotn 0414							166		72							238
Hjelmsøy (3)		51	266	209	1189	185	204	392								2496
Sleppen (4)		89	255	1965	2921	986	290	738	142							7386
Tanafjord 0305		9	20	113	228	1	29	12								412
Porsanger 0324	1	12	268	284	273	527	96	76	64	83	66		7			1757
Østhavet (5)	89	75	275	3460	2390	476	249		1182							8196
Laksefjord 0325				28	79	34		57								198
Varanger 0302		17	201	1285	1733	325	237	162	312							4272
TOTAL	104	274	1764	9462	11324	5598	1597	1946	2233	100	66	0	7	0	0	34475

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 22. .Numbers (x1000) N-E Artic cod in each yearclass from the survey during the autumn of 1992 .

	Age (year)															
Area	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15+	TOTAL
Malangen 0540	0	0	10	17	0	0	0	0		0	0					27
West - Troms (1)	0	0	321	780	411	902	28	0	0	0	0					2442
Balsfjord 0539	0	0	13	57	44	16	7	0	10							147
Ullsfjord 0428	0	0	5	80	78	0	0	5	0	0						168
Lyngenfjord 0429	12	0	0	6	17	0	0	0	10	0	0					44
Loppa - Sørøya (2)	83	0	38	145	143	122	19	49	0		0					599
Kvenangen 0427	8	19	10	21	13	4	5	0	0	4					0	83
Raasa 0411,0412		0	124	520	579	147	46	0	0	0						1416
Altafjord 0415	55	48	56	24	20	23	0		0							225
Revsbotn 0414	0	0	0	0	0	0	50	0	23							74
Hjelmsøy (3)	0	267	554	153	752	66	73	137	0		0					2001
Sleppen (4)	0	376	330	1266	1279	333	59	143	29	0						3814
Tanafjord 0305	0	25	29	95	92	0	9	6	0	0						257
Porsanger 0324	0	0	395	201	103	153	25	20	0	0	0		0			898
Østhavet (5)	2675	280	297	2294	1104	233	95	0	58							7035
Laksefjord 0325	0	0	0	43	48	19	0	0	0							111
Varanger 0302		85	483	1177	908	151	82	49	98							3033
TOTAL	2833	1100	2665	6878	5590	2170	498	408	227	4	0	0	0	0	0	22374

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 23. Length (cm) and weight (g) at age of haddock at different areas along the coast.

Areacode 0540 - Malangen

Age years	Haddock			
	No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	3	24.7	150	0.5
2	28	38.1	571	16.0
3	31	45.2	1010	31.3
4	19	50.5	1430	27.2
5	5	56.4	1950	9.8
6	3	58.3	2073	6.2
7	4	57.3	2058	8.2
8	3	60.7	2610	7.8
9	9	61.7	2580	23.2
10				
11+				
Total	105			130.2

Areacode 0539 - Balsfjord

Age years	Haddock			
	No.	Length (cm)	Weight (gram)	Biomass (kg)
0	1	14.0	24	0.0
1	39	23.4	122	4.8
2	25	35.6	491	12.3
3	13	44.9	969	12.6
4	7	50.7	1428	10.0
5	2	51.8	1441	2.9
6	1	55.0	1840	1.8
7				
8				
9	1	65.0	2583	2.6
10				
11+				
Total	89			47.0

Areacode 0428 - Ullsfjord

Age years	Haddock			
	No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	10	24.2	170	1.7
2	123	36.6	511	62.9
3	54	44.5	1035	55.9
4	5	50.4	1410	7.1
5				
6				
7				
8				
9				
10				
11+				
Total	192			127.5

Areacode 0429 - Lyngenfjord

Age years	Haddock			
	No.	Length (cm)	Weight (gram)	Biomass (kg)
0	1	14.0	20	0.0
1	37	23.6	130	4.8
2	181	33.8	402	72.8
3	73	42.0	785	57.3
4	1	60.0	2010	2.0
5	1	54.0	1790	1.8
6	2	52.5	1478	3.0
7				
8	2	57.5	1769	3.5
9				
10				
11+				
Total	298			145.2

Table 24.. Length (cm) and weight (g) at age of haddock at different areas along the coast.

Areacode 0427 - Kvænangen

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	3	13,7	26	0.1
1	58	23,4	123	7.1
2	83	35,5	435	36.1
3	48	43,8	857	41.1
4	13	50,0	1320	17.2
5	1	57,0	2880	2.9
6	3	56,3	1317	4.0
7				
8	1	60.0	2474	2.5
9				
10				
11+				
Total	210			110.9

Areacode 0404, 0405, 0413 - Loppa/Sørøya

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	9	13,9	31	0.3
1	20	23,6	132	2.6
2	41	35,3	458	18.8
3	27	44,5	934	25.2
4	21	53,5	1567	32.9
5	4	56,8	1955	7.8
6	2	60.0	2080	4.2
7	2	62.0	2380	4.8
8	2	63,5	2565	5.1
9	2	60,5	2455	4.9
10	1	64.0	2520	2.5
11+				
Total	131			109.1

Areacode 0415 - Altafjord

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	131	23,4	124	16.2
2	37	38,6	619	22.9
3	23	43,9	929	21.4
4	2	53,5	1580	3.2
5				
6				
7	1	61.0	2730	2.7
8	1	65.0	3380	3.4
9	1	61.0	2590	2.6
10				
11+				
Total	196			72.4

Areacode 0414 - Revsbotn

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	1	15.0	50	0.1
1	17	21,8	109	1.9
2	78	37,6	553	43.1
3	70	45,5	1011	70.8
4	25	52,4	1535	38.4
5	5	57,8	2050	10.3
6	3	57.0	1917	5.8
7	4	64,7	2762	11.0
8	10	63,3	2716	27.2
9	3	68.0	3394	10.2
10	1	66.0	3381	3.4
11+				
Total	217			222.0

Table 25 Length (cm) and weight (g) at age of haddock at different areas along the coast

Areacode 0324 - Porsanger

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	6	21.5	102	0.6
2	160	31.4	347	55.5
3	4	35.0	460	1.8
4	1	51.0	1280	1.3
5				
6				
7				
8	1	65.0	3222	3.2
9				
10				
11+				
Total	172			62.5

Areacode 0325 - Laksefjord

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	25	21.9	107	2.7
2	90	31.7	315	28.4
3	1	38.0	560	0.6
4	1	53.0	1450	1.5
5				
6				
7				
8				
9				
10				
11+				
Total	117			33.0

Areacode 0305 - Tanafjord

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	16	19.7	63	1.0
2	241	27.1	206	49.6
3	44	37.7	624	27.5
4	10	51.6	1505	15.1
5	2	55.0	1850	3.7
6				
7	1	52.0	1340	1.3
8	3	62.3	2547	7.6
9				
10				
11+				
Total	317			105.8

Areacode 0302 - Varanger

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	45	20.2	79	3.6
2	160	30.5	301	48.2
3	90	40.8	701	63.1
4	14	47.6	1079	15.1
5				
6	1	62.0	2290	2.3
7				
8	1	61.0	2250	2.3
9	1	64.0	2250	2.3
10				
11+				
Total	312			136.7

Table 26. Length (cm) and weight (g) at age of haddock at different areas along the coast.

Areacode 0401, 0402, 0403, 0409, 0410, 0530, 0531, 0535 - Western Troms

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	10	15,5	38	0.4
1	108	23,3	118	12.7
2	215	32,6	363	78.0
3	18	42,5	812	14.6
4	41	51.0	1381	56.6
5	14	52,9	1596	22.3
6	11	56,2	1820	20.0
7	2	56.0	1810	3.6
8	2	57,5	2050	4.1
9	5	57,4	2074	10.4
10				
11+				
Total	210			222.9

Areacode 0411, 0412 - Råsa

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	8	14,6	27	0.2
1	31	21,5	91	2.8
2	70	34,9	464	32.5
3	63	44,9	930	58.6
4	83	50,8	1336	110.9
5	10	54,9	1648	16.5
6	7	55,9	1777	12.4
7	5	59.0	2242	11.2
8	2	63,3	2360	4.7
9	2	55,5	1945	3.9
10				
11+				
Total	281			253.7

Areacode 0424, 0425, 0426 - Hjelmsøy

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0	9	14,7	29	0.3
1	112	20,4	88	9.9
2	208	31,8	339	70.5
3	68	41.0	708	48.1
4	41	51,8	1433	58.8
5	10	56,3	1840	18.4
6	2	58,5	2010	4.0
7	2	65,5	3420	6.8
8				0.0
9	2	63.0	2295	4.6
10				
11+				
Total	445			221.4

Areacode 0310, 0311, 0312 - Sleppen

Age years	Haddock No.	Length (cm)	Weight (gram)	Biomass (kg)
0				
1	70	19,7	59	4.1
2	45	27,6	212	9.5
3	9	34,2	410	3.7
4	2	50,5	1476	3.0
5				
6	1	58.0	2280	2.3
7	1	65.0	2850	2.9
8	1	55.0	1660	1.7
9	1	67.0	3150	3.2
10				
11+				
Total	130			30.3

Table 27. Length (cm) and weight (g) at age of haddock at different areas along the coast.

Areacode 0301, 0303, 0306, 0307, 0308, 0313 - Østhavet

	Haddock			
Age years	No.	Length (cm)	Weight (gram)	Biomass (kg)
0	4	15.0	35	0.1
1	18	20,4	96	1.7
2	135	32,2	387	52.2
3	89	40,9	752	66.9
4	18	45,8	1104	19.9
5	1	50.0	1180	1.2
6				
7	2	61,5	2465	4.9
8				
9				
10				
11+				
Total	210			147.0

Table 28. . Length (cm) at age (year) for haddock from the survey during the autumn of 1992.

Area	Age (year)											
	0	1	2	3	4	5	6	7	8	9	10	11+
Malangen 0504		24.7	38.1	45.2	50.5	56.4	58.3	57.3	60.7	61.7		
West - Troms (1)	15.5	23.3	32.6	42.5	51.0	52.9	56.2	56.0	57.5	57.4		
Balsfjord 0539	14.0	23.4	35.6	44.9	50.7	51.8	55.0			65.0		
Ullsfjord 0428		24.2	36.6	44.5	50.4							
Lyngenfjord 0429	14.0	23.6	33.8	42.0	60.0	54.0	52.5		57.5			
Loppa - Sørøya (2)	13.9	23.6	35.3	44.5	53.5	56.8	60.0	62.0	63.5	60.5	64.0	
Kvenangen 0427	13.7	23.4	35.5	43.8	50.0	57.0	56.3		60.0			
Raasa 0411,0412	14.6	21.5	34.9	44.9	50.8	54.9	55.9	59.0	63.3	55.5		
Altafjord 0415		23.4	38.6	43.9	53.5			61.0	65.0	61.0		
Revsbotn 0414	15.0	21.8	37.6	45.5	52.4	57.8	57.0	64.7	63.3	68.0	66.0	
Hjelmsøy (3)	14.7	20.4	31.8	41.0	51.8	56.3	58.5	65.5		63.0		
Sleppen (4)		19.7	27.6	34.2	50.5		58.0	65.0	55.0	67.0		
Tanafjord 0305		19.7	27.1	37.7	51.6	55.0		52.0	62.3			
Porsanger 0324		21.5	31.4	35.0	51.0				65.0			
Østhavet (5)	15.0	20.4	32.2	40.9	45.8	50.0		61.5				
Laksefjord 0325		21.9	31.7	38.0	53.0							
Varanger 0302		20.2	30.5	40.8	47.6		62.0		61.0	64.0		

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Table 29. . Weight (gram) at age (year) for haddock from the survey during the autumn of 1992.

	Age (year)											
Area	0	1	2	3	4	5	6	7	8	9	10	11+
Malangen 0504		150	571	1010	1430	1950	2073	2058	2610	2580		
West - Troms (1)	38	118	363	812	1381	1596	1820	1810	2050	2074		
Balsfjord 0539	24	122	491	969	1428	1441	1840			2583		
Ullsfjord 0428		170	511	1035	1410							
Lyngenfjord 0429	20	130	402	785	2010	1790	1478		1769			
Loppa - Sørøya (2)	31	132	458	934	1567	1955	2080	2380	2565	2455	2520	
Kvenangen 0427	26	123	435	857	1320	2880	1317		2474			
Raasa 0411,0412	27	91	464	930	1336	1648	1777	2242	2360	1945		
Altafjord 0415		124	619	929	1580			2730	3380	2590		
Revsbotn 0414	50	109	553	1011	1535	2050	1917	2762	2716	3394	3381	
Hjelmsøy (3)	29	88	339	708	1433	1840	2010	3420		2295		
Sleppen (4)		59	212	410	1476		2280	2850	1660	3150		
Tanafjord 0305		63	206	624	1505	1850		1340	2547			
Porsanger 0324		102	347	460	1280				3222			
Østhavet (5)	35	96	387	752	1104	1180		2465				
Laksefjord 0325		107	315	560	1450							
Varanger 0302		79	301	701	1079		2290		2250	2250		

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

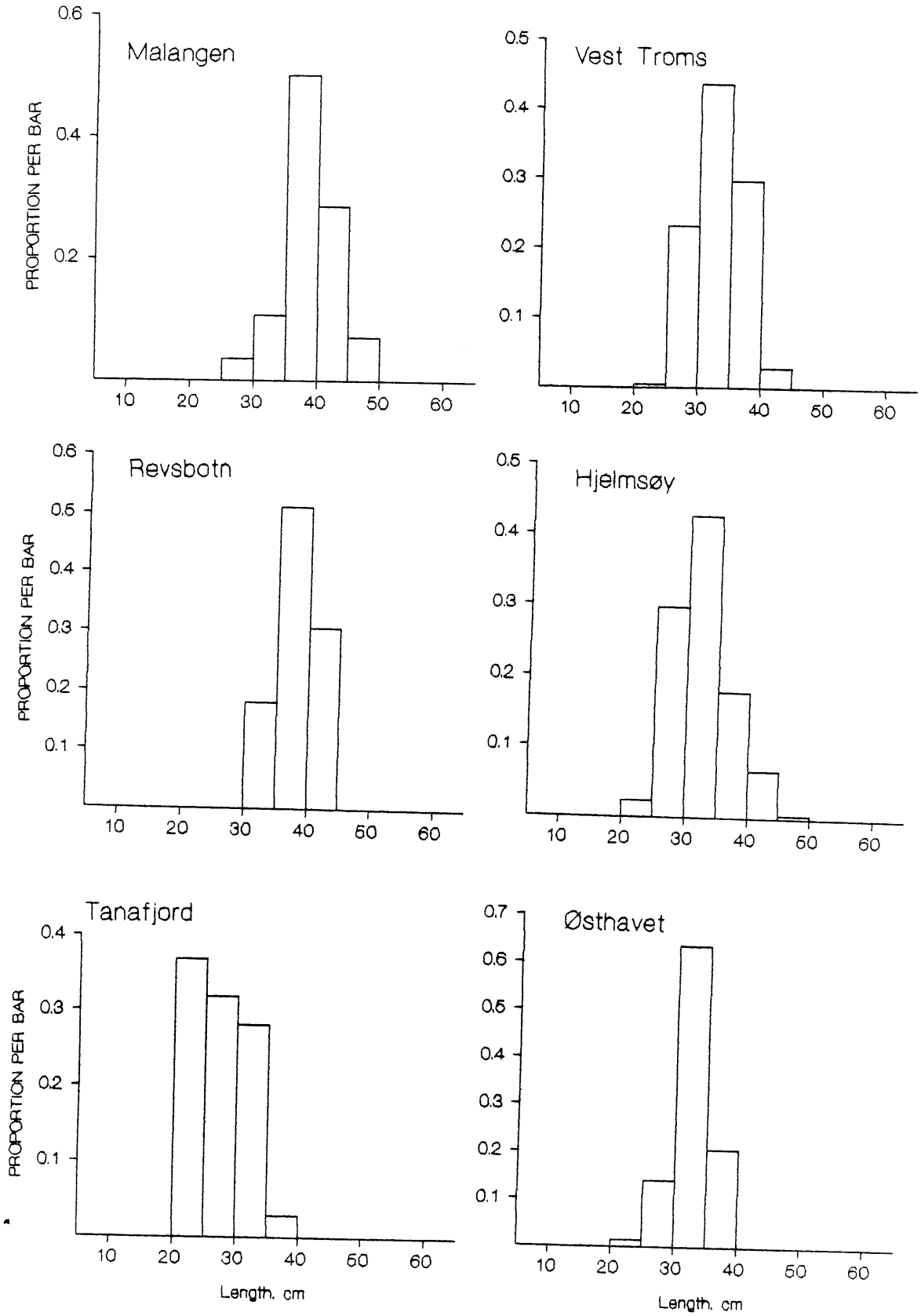


Fig. 14. Length frequency distribution of 2 year old haddock.

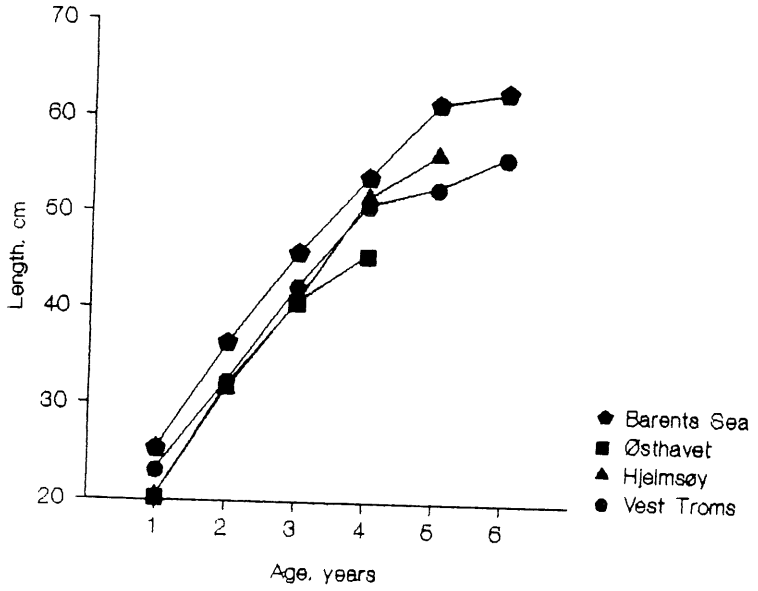


Fig. 15. Total length related to age in coastal haddock from three shelf areas in the investigated region, compared to Barents Sea haddock caught 4-6 months later, reported by Anon. (1993).

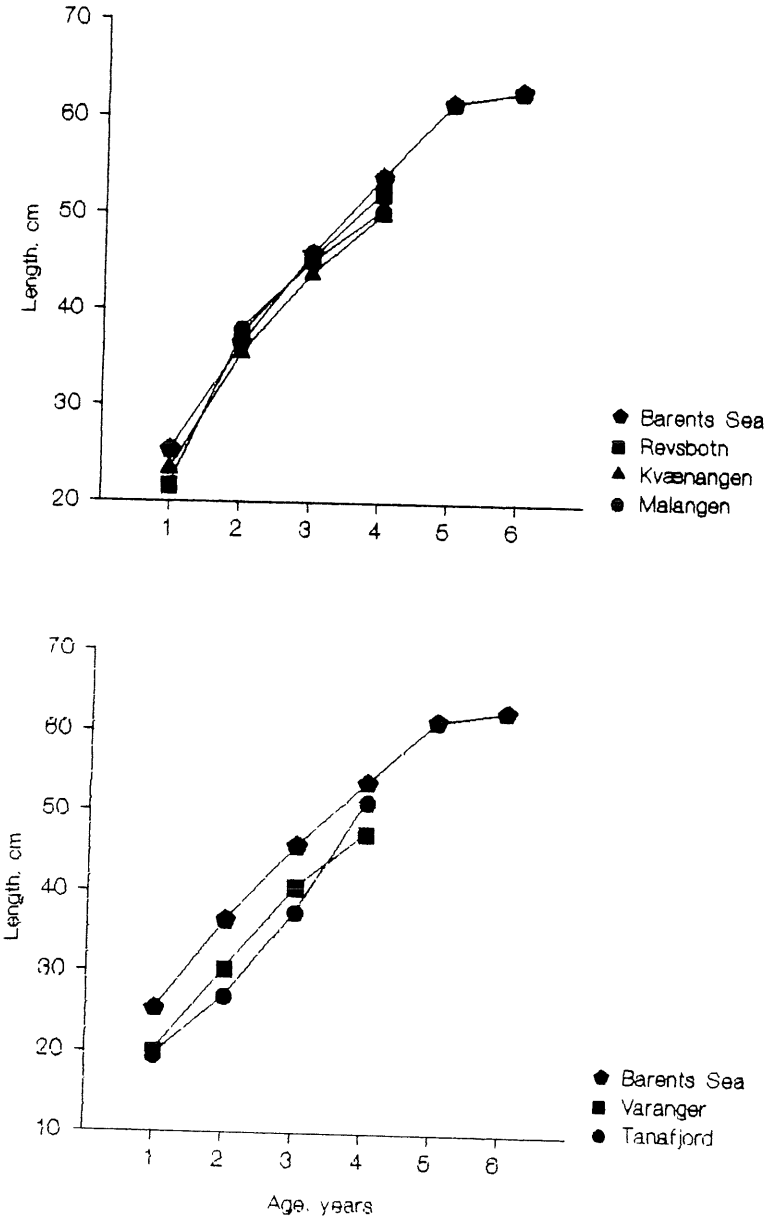


Fig. 16. Total length related to age in coastal haddock from three fjords in the western area (upper graph) and two fjords in the eastern area (lower graph) in the investigated region, compared to Barents Sea haddock caught 4-6 months later, reported by Anon. (1993).

Table 30. . Percent maturity at age (year) for haddock from the survey during the autumn of 1992.

Area	Age (year)												
	0	1	2	3	4	5	6	7	8	9	10	11+	N
Malangen 0504		0	11	81	90	100	100	100	100	100			99
West - Troms (1)	0	1	10	28	98	100	91	100	100	100			426
Balsfjord 0539	0	0	20	15	57	100	100			100			89
Ullsfjord 0428		0	7	80	80								192
Lyngenfjord 0429	0	0	3	38	100	100	100		100				298
Loppa - Sørøya (2)	0	0	7	74	91	100	100	100	100	100	100		131
Kvenangen 0427	0	0	11	71	69	100	100		100				210
Raasa 0411,0412	0	0	9	65	86	100	100	100	100	100			281
Altafjord 0415		0	0	35	100			100	100	100			196
Revsbotn 0414	0	0	6	63	80	100	100	100	100	100	100		217
Hjelmsøy (3)	0	0	0	24	66	80	100	100		100			454
Sleppen (4)		0	0	0	100		100	100	100	100			130
Tanafjord 0305		0	0	16	90	100		100	100				317
Porsanger 0324		0	0	0	0				100				172
Østhavet (5)	0	0	0	13	39	100		100					267
Laksefjord 0325		0	0	0	100								117
Varanger 0302		0	1	14	29		100		0	100			312

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

Tot. N = 3596 otholits

Table 31. . Biomass of haddock on each yearclasss from the survey during the autumn of 1992.

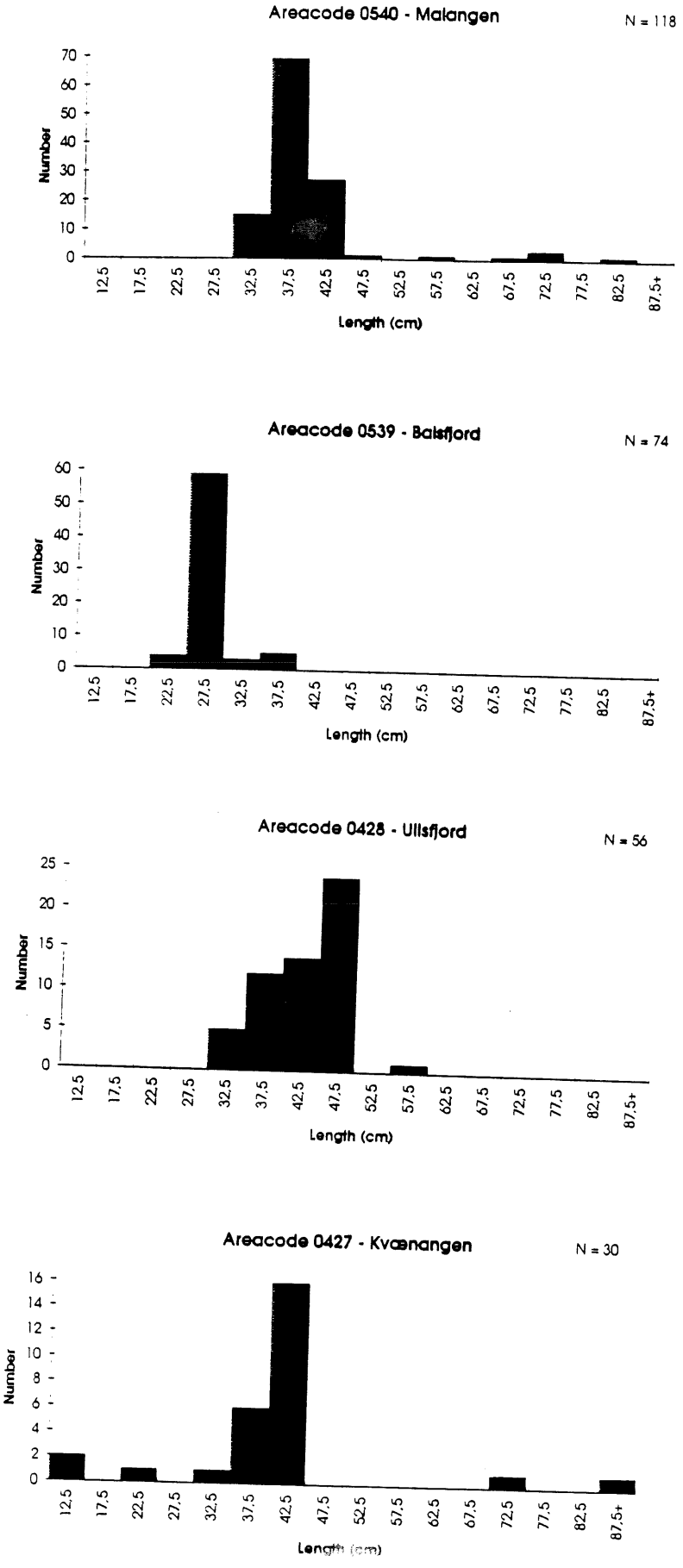
Area	Age (year)												
	0	1	2	3	4	5	6	7	8	9	10	11+	TOTAL
Malangen 0540		2	78	153	135	48	30	40	38	38			562
West - Troms (1)		665	3557	1054	4097	2470	1563	312	127	827			14672
Balsfjord 0539		9	22	25	18	5	3			5			87
Ullsfjord 0428		2	79	70	9								160
Lyngenfjord 0429		19	279	220	8	7	11		14				558
Loppa - Sørøya (2)	21	308	539	816	1125	248	135	155	164	158	81		3750
Kvenangen 0427		60	214	224	118	10	19	13	21	12			691
Raasa 0411,0412		97	531	894	1831	260	214	114	120	67			4128
Altafjord 0415		106	150	138	21			18	22	17			472
Revsbotn 0414		26	599	966	533	142	80	153	377	141	47		3064
Hjelmsøy (3)		401	2916	1763	1794	579	176	190		127			7946
Sleppen (4)		1424	3798	1450	1184		976	1220	710	1348			12110
Tanafjord 0305		28	1358	753	411	101		37	209				2897
Porsanger 0324		38	3458	115	79				201				3891
Østhavet (5)		306	8374	7354	2495	88		370					18987
Laksefjord 0325		70	703	50	38								861
Varanger 0302		116	1049	1344	327		74		73	73			3056
TOTAL	21	3677	27704	17389	14223	3958	3281	2622	2076	2813	128	0	77892

(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303

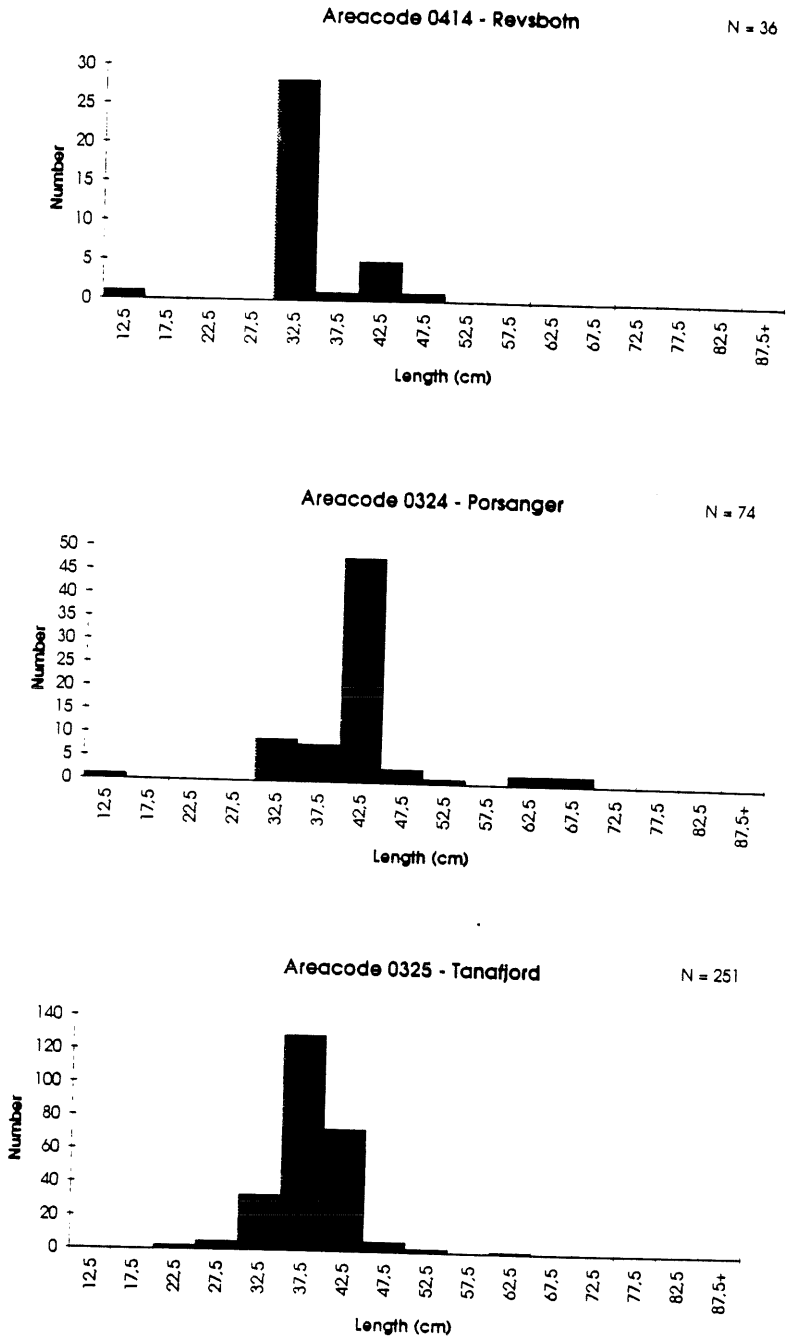
Table 32. . Numbers (x1000) of haddock on each yearclasss from the survey during the autumn of 1992.

Area	Age (year)												
	0	1	2	3	4	5	6	7	8	9	10	11+	TOTAL
Malangen 0540		13	137	151	94	25	14	19	15	15			484
West - Troms (1)		5636	9799	1298	2967	1548	859	172	62	399			22739
Balsfjord 0539		74	45	26	13	3	2			2			164
Ullsfjord 0428		12	155	68	6								240
Lyngenfjord 0429		146	694	280	4	4	7		8				1144
Loppa - Sørøya (2)	677	2333	1177	874	718	127	65	65	64	64	32		6197
Kvenangen 0427		488	492	261	89	3	14		8				1357
Raasa 0411,0412		1066	1144	961	1371	158	120	51	51	34			4956
Altafjord 0415		855	242	149	13			7	7	7			1279
Revsbotn 0414		239	1083	955	347	69	42	55	139	42	14		2985
Hjelmsøy (3)		4557	8602	2490	1252	315	88	56		55			17414
Sleppen (4)		24136	17915	3537	802		428	428	428	428			48101
Tanafjord 0305		444	6592	1207	273	55		28	82				8681
Porsanger 0324		373	9965	250	62				62				10712
Østhavet (5)		3188	21638	9779	2260	75		150					37090
Laksefjord 0325		654	2232	89	26								3001
Varanger 0302		1468	3485	1917	303		32		32	32			7271
TOTAL	677	45681	85397	24293	10601	2381	1672	1031	958	1078	46	0	173814

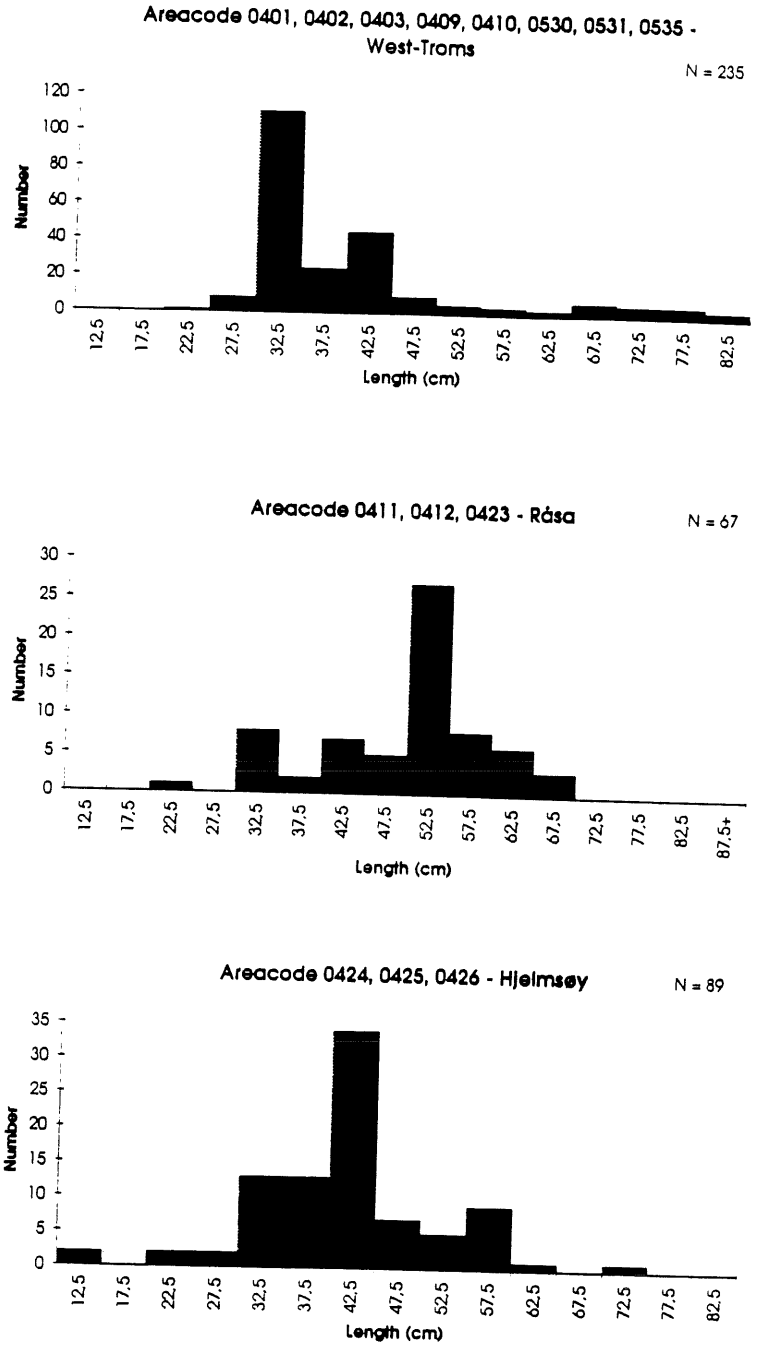
(1) includes 0530,0531,0535,0401,0402,0403,0409,0410
(2) includes 0404,0405,0413
(3) includes 0424,0425,0426
(4) includes 0310,0311,0312
(5) includes 0306,0307,0308,0313,0301,0303



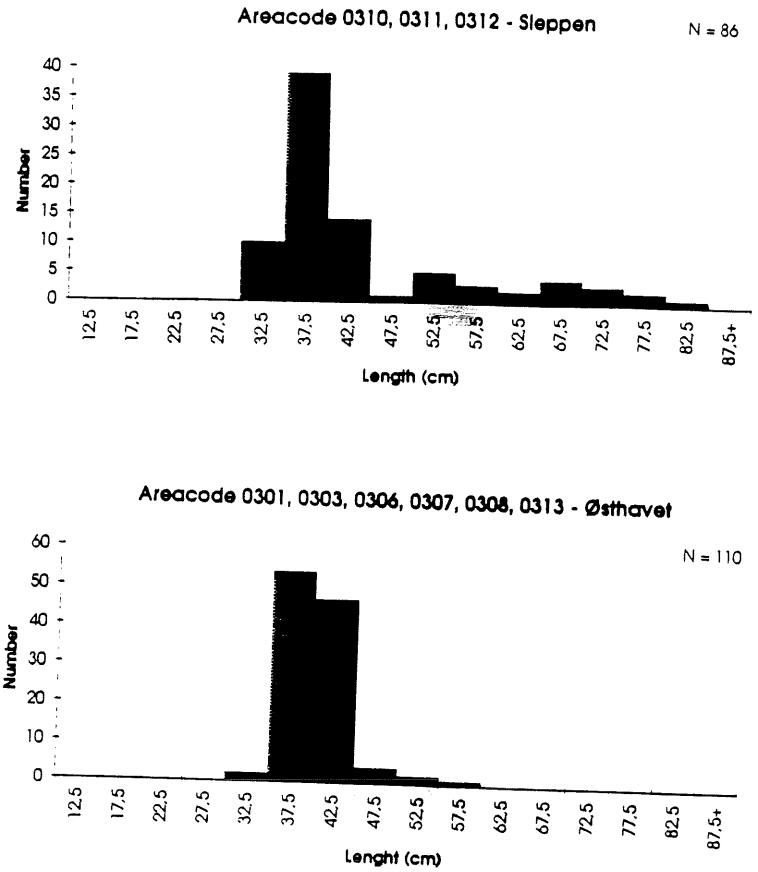
Figur 17. Length distribution of saithe (*Pollachius virens*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



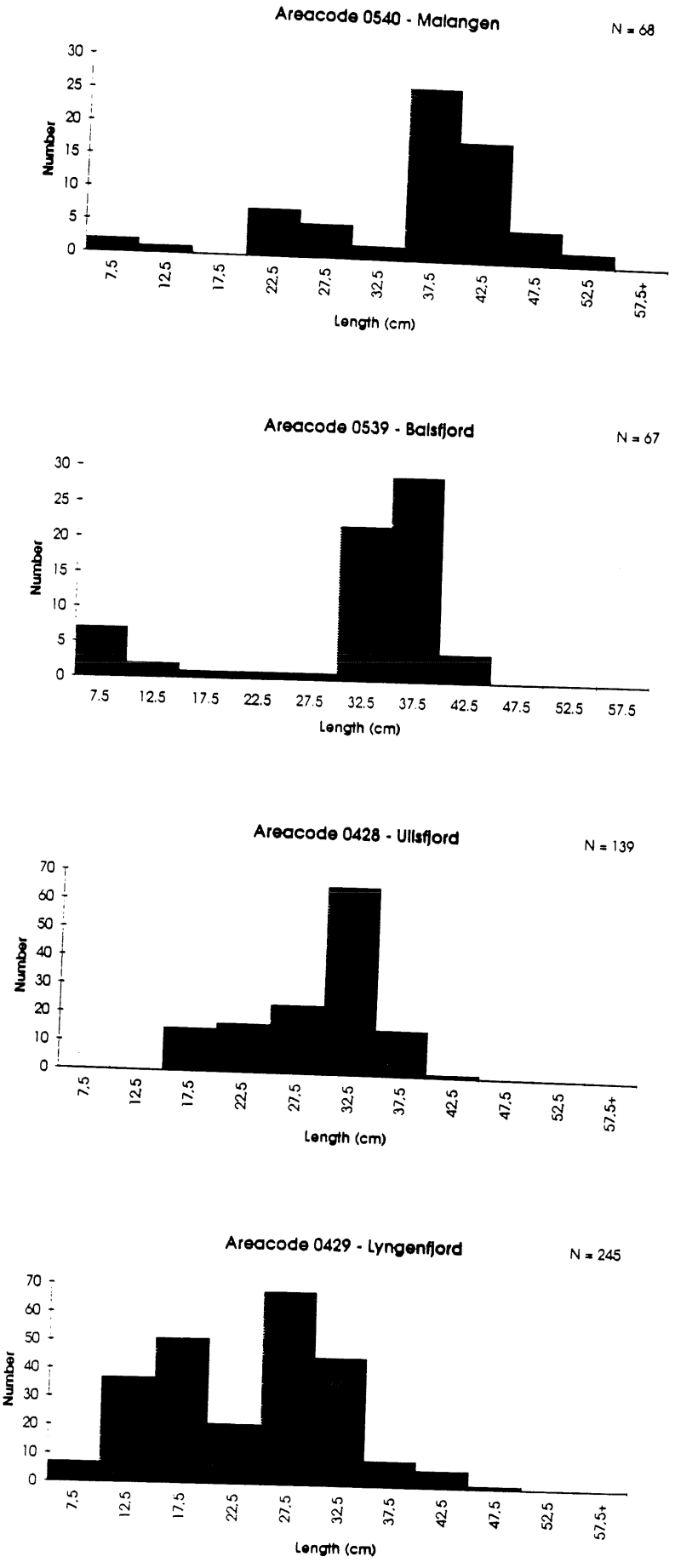
Figur 18. Length distribution of saithe (*Pollachius virens*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



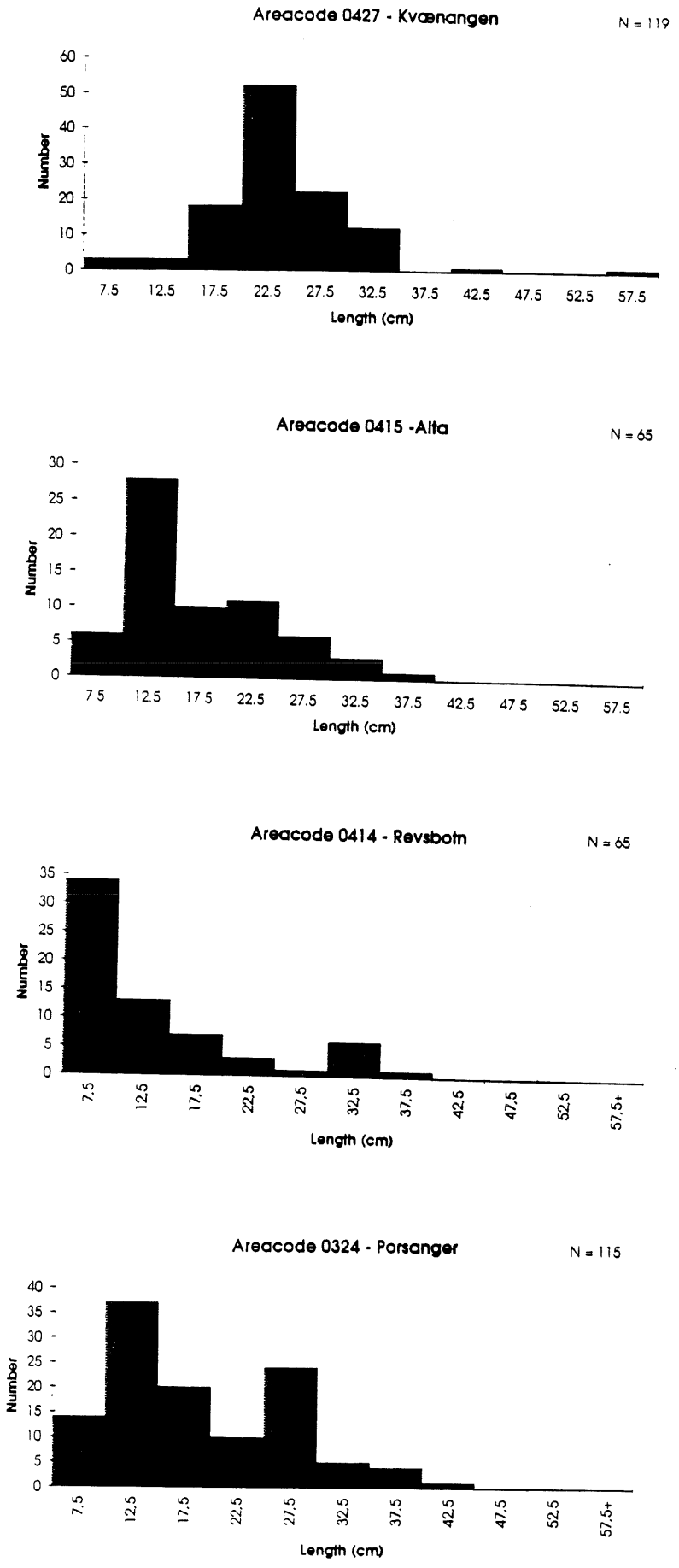
Figur 19. Length distribution of saithe (*Pollachius virens*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



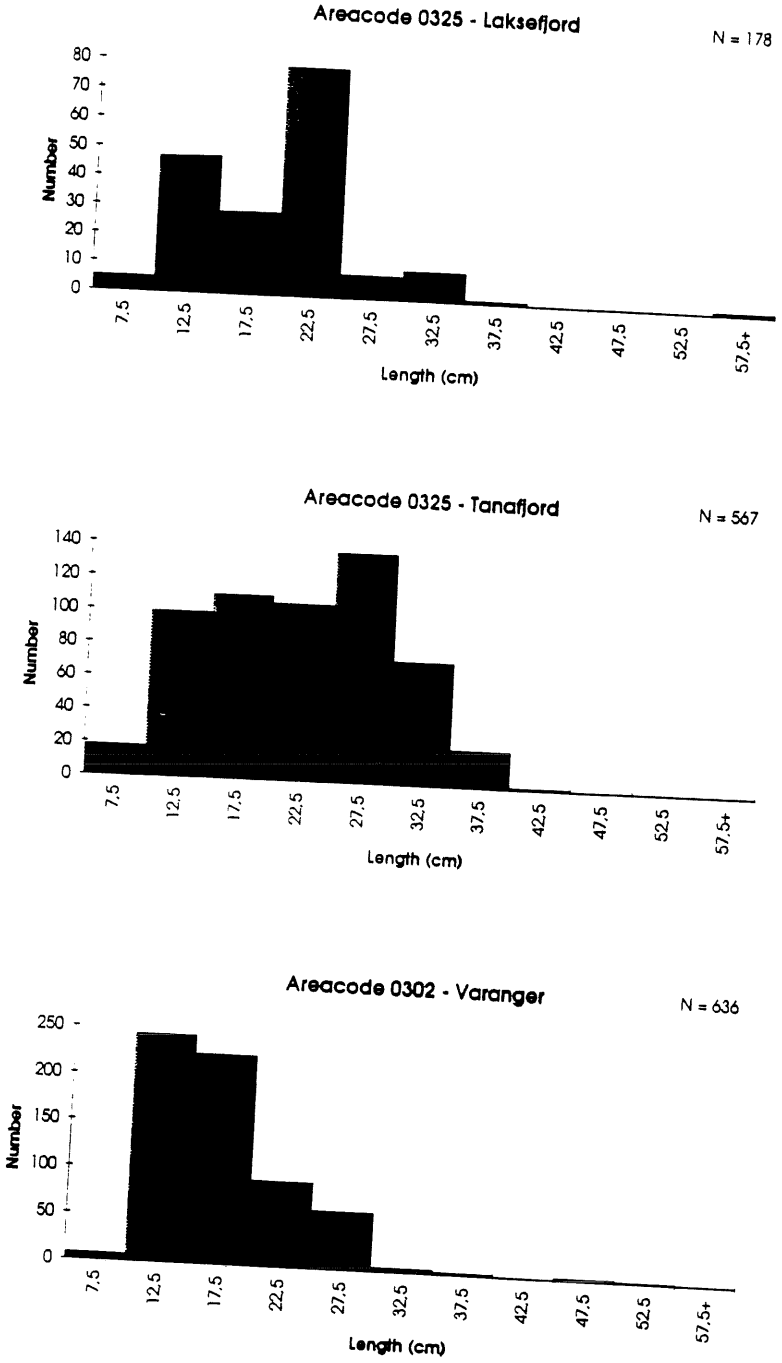
Figur 20. Length distribution of saithe (*Pollachius virens*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



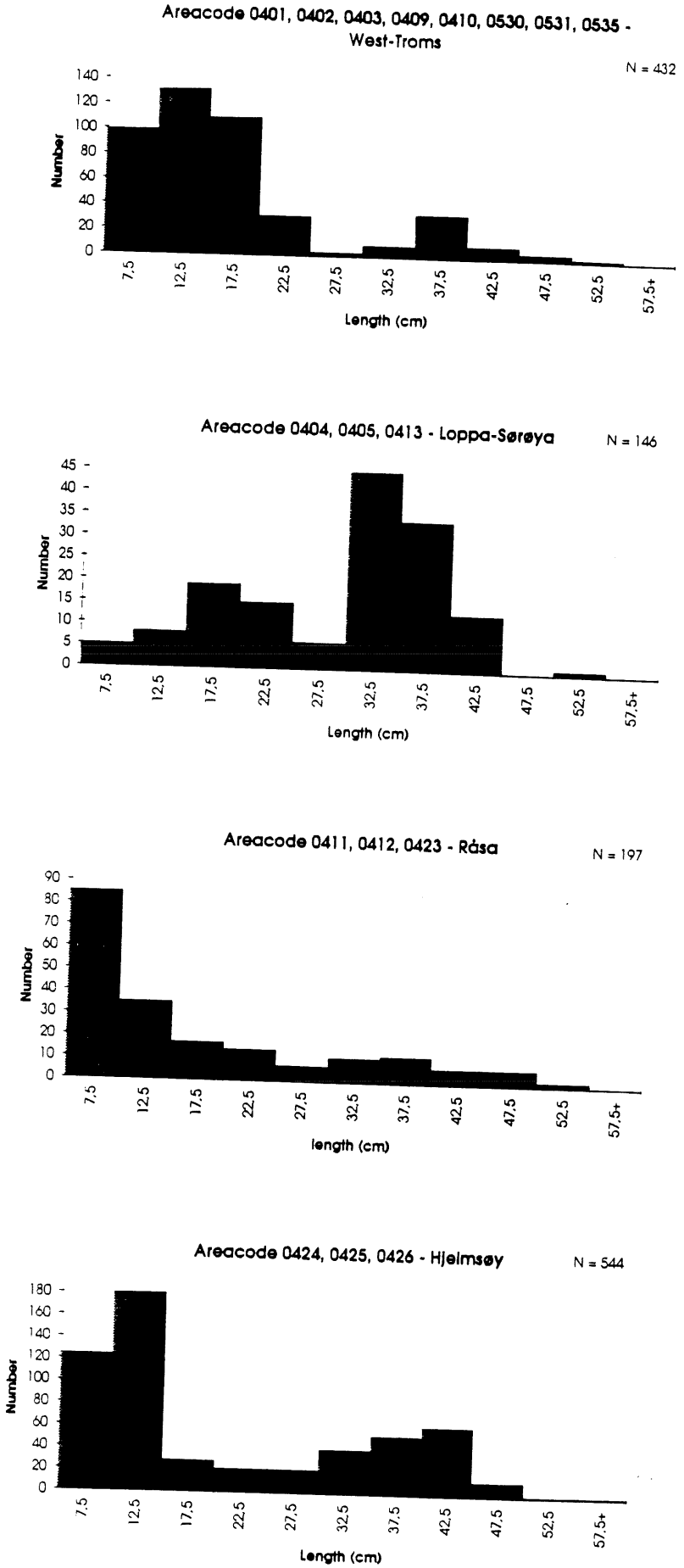
Figur 21. Length distribution of redfish (*Sebastes* sp.) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



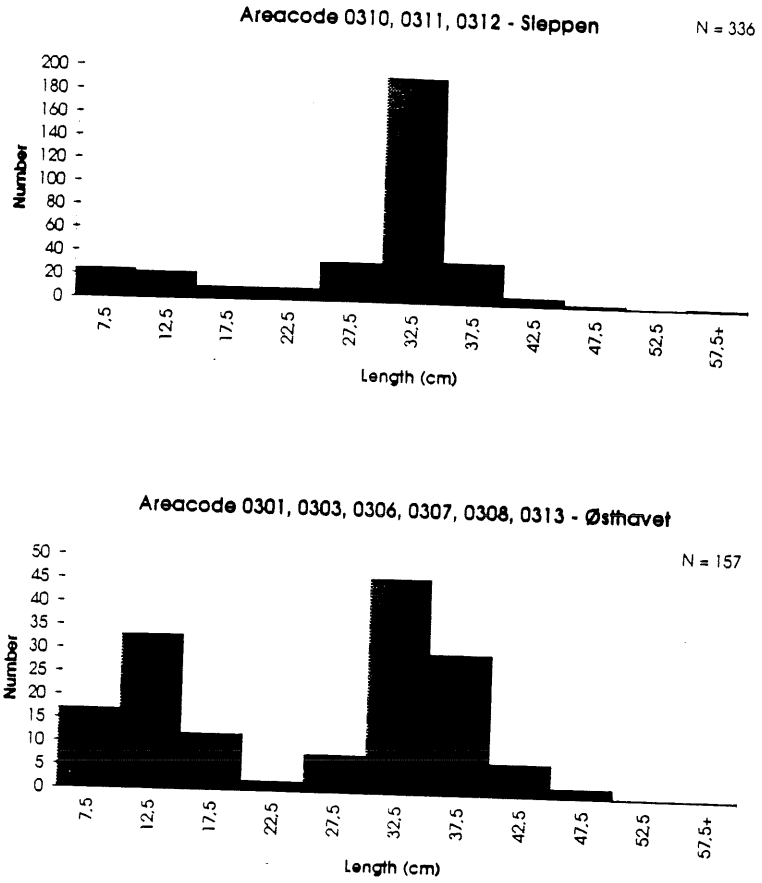
Figur 22. Length distribution of redfish (*Sebastes* sp.) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



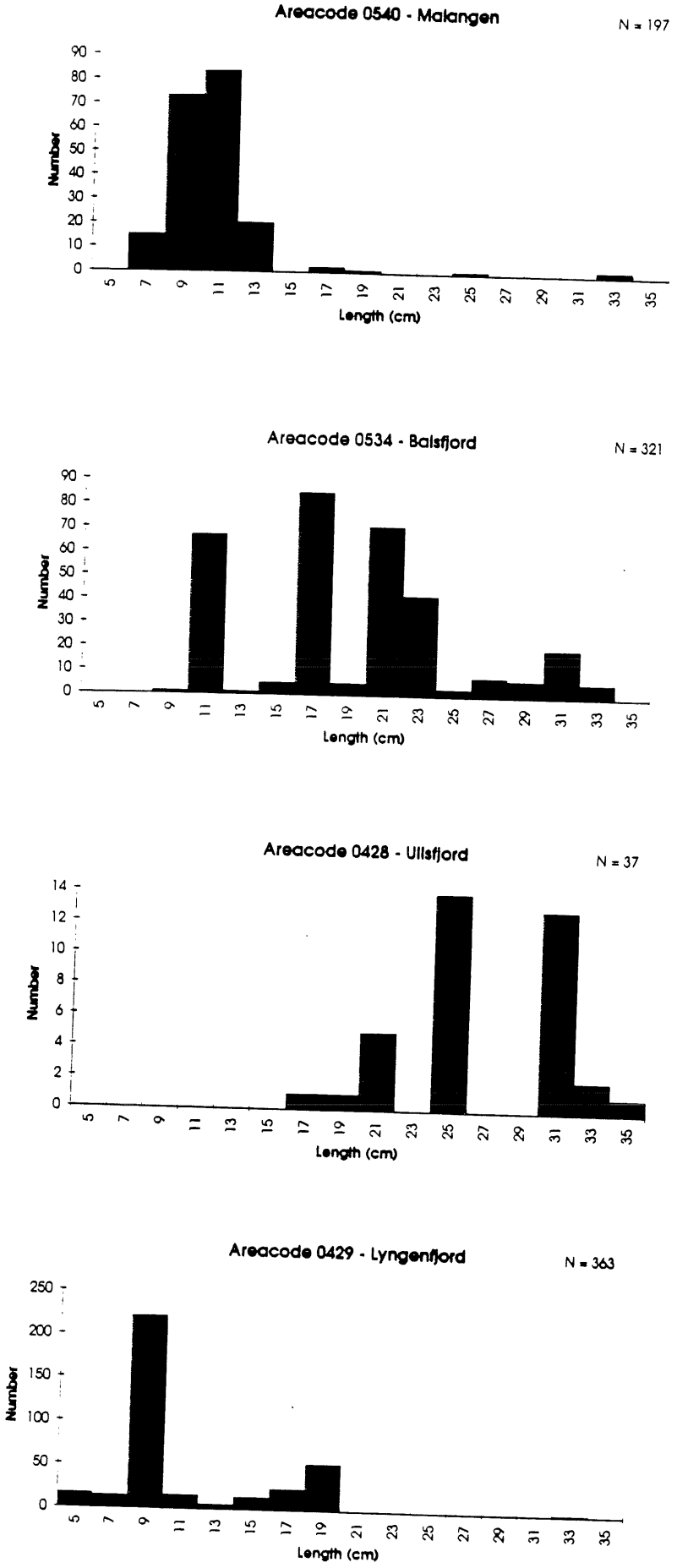
Figur 23. Length distribution of redfish (*Sebastes* sp.) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



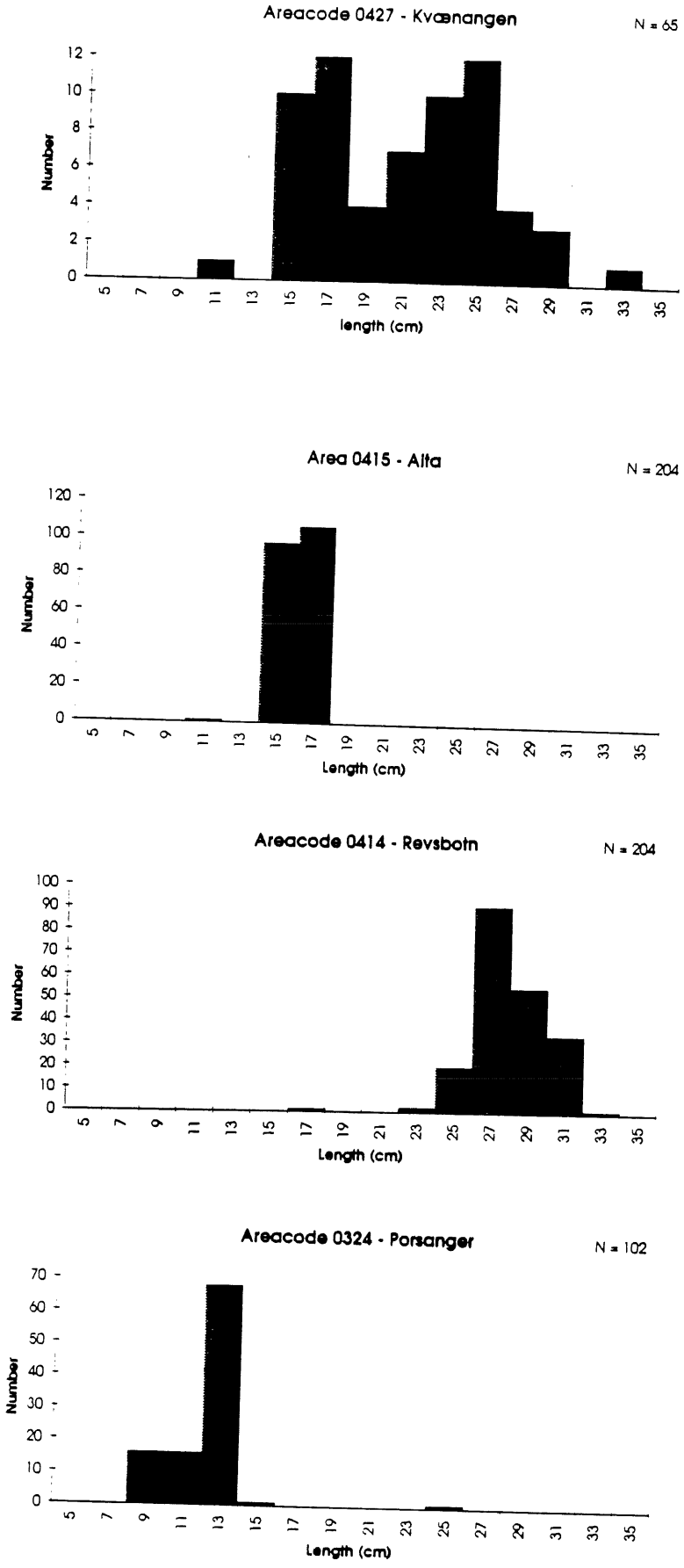
Figur 24. Length distribution of redfish (*Sebastes* sp.) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



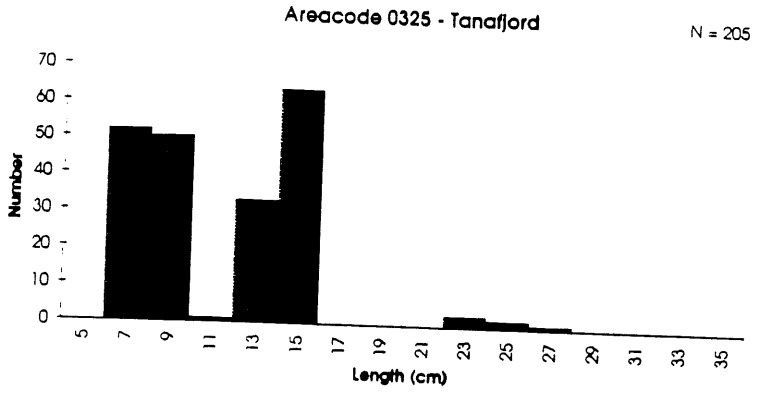
Figur 25. Length distribution of redfish (*Sebastes* sp.) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



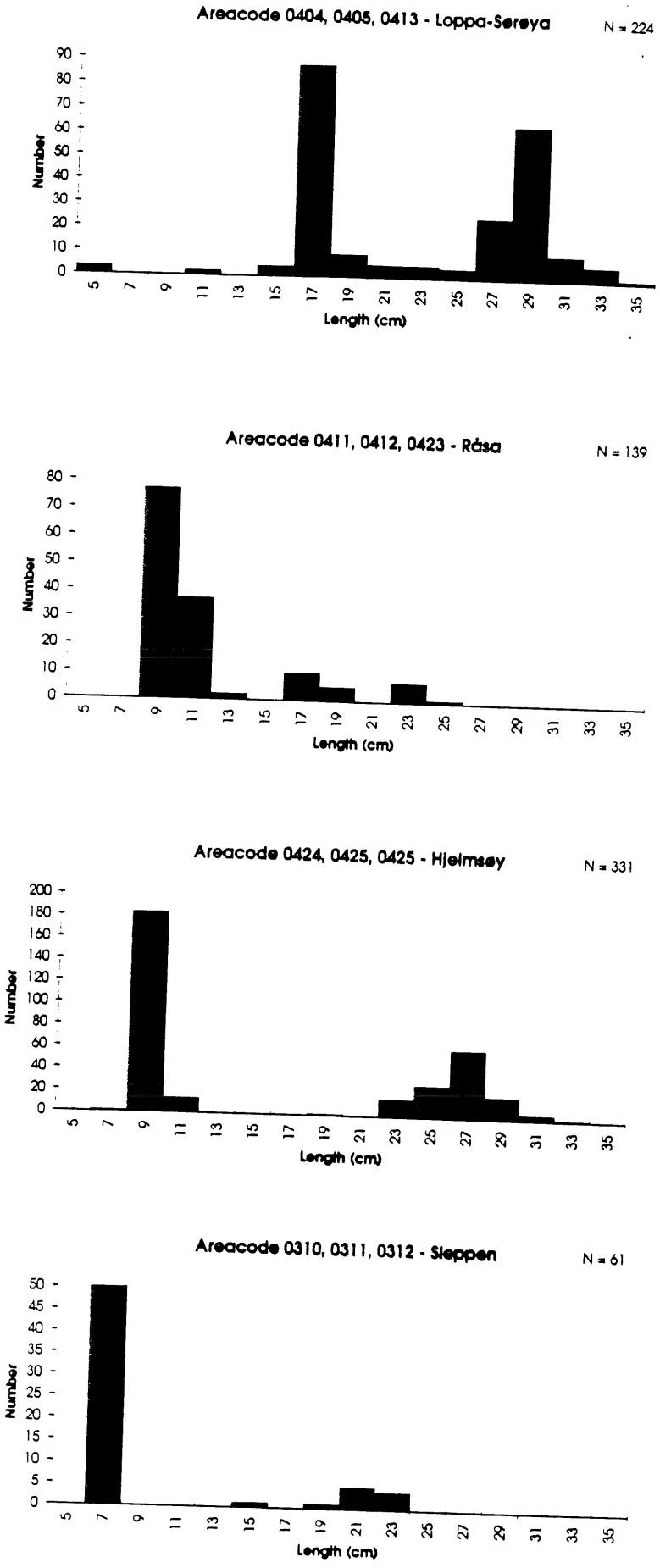
Figur 26. Length distribution of herring (*Clupea harengus*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



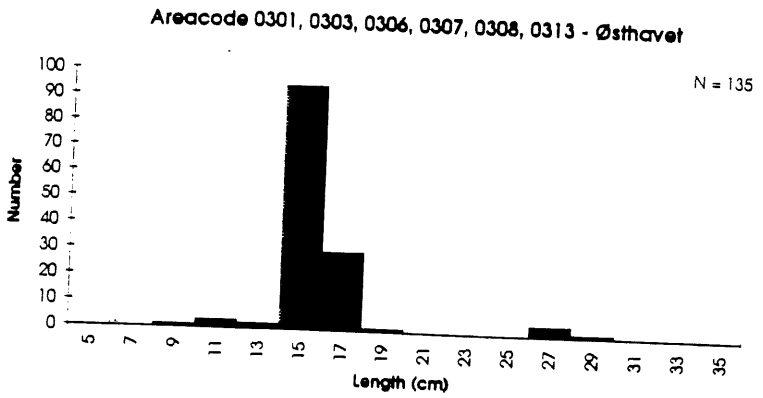
Figur 27. Length distribution of herring (*Clupea harengus*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



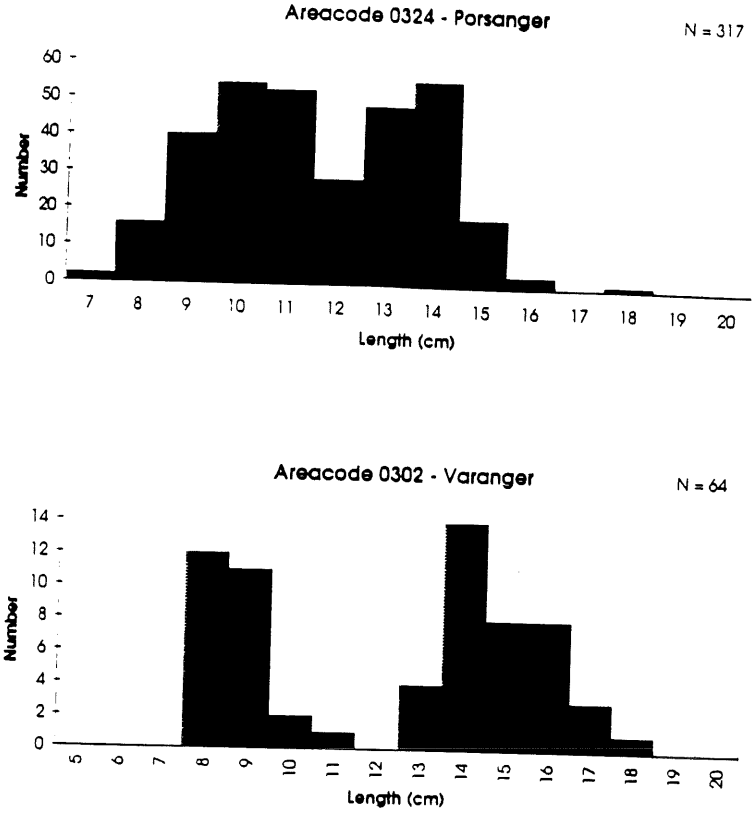
Figur 28. Length distribution of herring (*Clupea harengus*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



Figur 29. Length distribution of herring (*Clupea harengus*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



Figur 30. Length distribution of herring (*Clupea harengus*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.



Figur 31. Length distribution of capelin (*Mallotus villosus L.*) from various areas off the coast and the fjords in Finnmark and Troms in August-October 1992.

Figur 32

Malangen: Area definitions for systematic grouping of tagging-recapture data.

Table 33.

STÅLVIKBOTN, First capture = First release (area A)

Time of recapture		Number tagged	Number recaptured	Recapture site versus area				
Year	Period	Accumulated		A	B	C	D	E
First	Jan-June	1269	32	20	6	6	-	-
	July-Dec		33	27	5	-	1	-
Second	Jan-June	1269	21	12	6	2	1	-
	July-Dec		15	10	3	-	2	-
Third	Jan-June	874	12	5	6	1	-	-
	July-Dec		7	7	-	-	-	-
Forth	Jan-June	511	9	7	2	-	-	-
	July-Dec		-	-	-	-	-	-
Fifth	Jan-June	234	1	1	-	-	-	-
	July-Dec		-	-	-	-	-	-
SUM (number)			130	89	22	9	4	-
%			100,0	68,5	21,5	6,9	3,1	0,0

Change in distribution during the year

Period	Number recaptured	Recapture site versus area				
		A	B	C	D	E
Jan-June	75	45	20	9	1	-
	(%)	(60,0)	(26,7)	(12,0)	(1,3)	(0)
July-Des	55	44	8	-	3	-
	(%)	(80,0)	(14,5)	(0)	(5,5)	(0)