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Blue Whiting (Micromesistius poutassou, Risso 1810)  
investigations in Faroese Water in May - June 1978.

by

Stein Hjalti í Jákupsstovu  
Fiskirannsóknarstovan  
Debessartröð, 3800 Tórshavn  
Faroe Islands

### Abstract.

Five echoabundance surveys in Faroese waters in May-June 1978 indicate that more than  $2 \times 10^6$  tons of blue whiting is found in the area during the peak season in May. It is also shown that although the highest mean densities are found on the western side of the Faroe plateau significant amounts of blue whiting are also recorded in the Faroe-Shetland channel.

### Introduction.

Since 1975 there has been a growing fishery for blue whiting in May-June in Faroese waters. The fishery is on newly spent fish presumably migrating from the spawning area west of the British Isles to the feeding areas in the Norwegian Sea.

As the fishery in 1978 was expected to exceed 100.000 t it was felt necessary to monitor this migration through Faroese waters using an acoustic abundance estimate program.

In this paper a preliminary report of this work is presented.

### Material and methods.

The research vessel used, "Jens Chr. Svabo" is equipped with an Simrad Ek 38 echosounder. In conjunction worked a Simrad echo integrator with two channels integrating the recordings from 100 m to 500 m.

It is not possible to use a midwater trawl with "Jens Chr. Svabo" at the depths in question. The identifying of the records is therefore based on information from the Faroese fleet fishing for blue whiting in the area.

The scattering layres during daytime between 350 and 550 m depth stem almost exclusively from blue whiting and as we only integrated in the day light periode we are quite confident about the identification.

So far the main fishing area for blue whiting in Faroese waters have been along the southern and western part of the Faroe Plateau. Considerable amounts of blue whiting, however, have also been reported from the Faroe-Shetland channel at the same time (Sahrhage 1977, Jákupsstovu and Nakken 1971) and included in the area to be surveyed was also the Faroe-Shetland channel. The aim was to do several surveys during the season, and in order to get them as synoptic as possible no survey should last longer than 5 days.

The theoretical basis for acoustic abundance estimation is outlined by Forbes and Nakken (1972). The integrator was reset manually at half hourly intervals. The area was divided into 5 subareas and the mean integrator value within each calculated.

The instruments were not calibrated before the surveys and the noise level on the ship is too high to allow any single fish counts. Fortunately however we got the opportunity to do a ship to ship calibration together with R/V "Scotia" when she was working in the area. We very much appreciate this opportunity.

The ship to ship calibration was done 16/6-1978 from 09.45 GMT to 16.30 GMT. In that time the distance between N 61°59' W 4°16' and N 61°31' W 4°40' was sailed, with "Jens Chr. Svabo" approximately one cable length behind and to the side of "Scotia".

The integrators were reset manually at 15 minutes intervals. The setting of the instruments on "Jens Chr. Svabo" was the same as used during the surveys.

The output from the integrator on "Scotia" is tonnes/square kilometer and in fig. (1) these value are plotted against the corresponding mm deflection values from "Jens Chr. Svabo". This gives a regression line of the form.

$$\text{Tonnes/km}^2 = 1,63 \text{ mm} - 2,76$$

with a correlation coefficient of 0.95. Unfortunately most of the values obtained were small giving a clustering at the base. The few high values however fit the regression line fairly well.

#### Results and discussion.

Survey track and relative fish density is shown in fig. 2. Mean integrator values and absolute abundance calculated from the ship to ship calibration on areas and time periods is in table 1.

A considerable amount of blue whiting was already found around the Faroe plateau during the last week of April with the highest values recorded during the first week of May. A considerable reduction in abundance was recorded in the north western area in the second week of May while the abundance in the south western area remained fairly high throughout May.

The highest mean density in the Faroe-Shetland channel was recorded in the second week of May.

If the fish recorded in area 1 and 2 is supposed to migrate northwards on the western side of the plateau and those recorded in areas 3, 4 and 5 are supposed to migrate north on the eastern side the following estimates of blue whiting found in the surveyed areas can be reached at in thousand tonnes.

Time period	Western area	Eastern area	Total
26-28/4	515	-	-
1-4/5	1604	426	2030
8-12/5	868	852	1720
22-26/5	815	-	-
5-9/6	-	194	-

This indicates that using the Aberdeen calibration constant of 34 dB/kg at least 2 million tonnes of blue whiting is found in the Faroe area during the peak season in May. It is further indicating that although the mean density is lower in the Faroe-Shetland channel than in the Faroe Bank-Faroe Plateau channel. A considerable amount of blue whiting is found there in May.

The density pattern found from the surveys was also reflected by the commercial fishery. This started in the last week of April and continued to the first week

of June. The main catches were taken in area 2, 1 and 3 in the same order. Some catches were taken on the eastern side in the second half of May.

The length distribution of the blue whiting caught in the Faroe area (fig. 3) in May 1978 was quite similar to the length distribution of the fish caught in the St. Kilda area in April, supporting the theory that the fishery is based on the same stock.

#### Litterature.

- Forbes, S.T. and Nakken, O. (ed) 1972: Manual of methods for fisheries resource survey and appraisal. Part 2, FAO Manual in Fisheries Science No 5 1972.
- Jákupsstovu, S.H.í and Nakken, O. 1971: Blue whiting surveys in the Norwegian Sea in April-May 1971. Fiskets Gang, 57: 605-607.
- Sahrhage, D. 1977: Investigations on blue whiting (*Micromesistius poutassou*) in the Shetland-Faroe Islands area during May-June 1977. ICES CM. 1977/H:9.

TABLE 1

Mean integrator values (in mm) deflection and total abundance divided on areas and time periods.

Time periods	Area	Width km <sup>2</sup>	Mean integrator value mm	Mean abundance T/km <sup>2</sup>	Total abundance tons
26-28/4	1	3580	28,3	20,3	72682
	2	5067	110,6	87,4	442882
	3	5955	71,3	55,3	329328
1-4/5	1		266,7	214,6	768304
	2		205,8	164,9	835782
	3		56,1	43,0	255830
	4	7904	10,4	5,7	45052
	5	10308	18,2	12,1	124731
8-12/5	1		54,5	41,6	149030
	2		177,5	141,9	718952
	3		69,5	53,9	320839
	4		55,6	42,5	335209
	5		26,7	19,0	195785
22-26/5	1		90,4	70,9	253910
	2		139,3	110,8	561239
	3		34,2	25,1	149391
5-9/6	1		15,6	10,0	35719
	3		11,6	6,7	39943
	4		18,3	12,1	95606
	5		10,3	5,6	58386

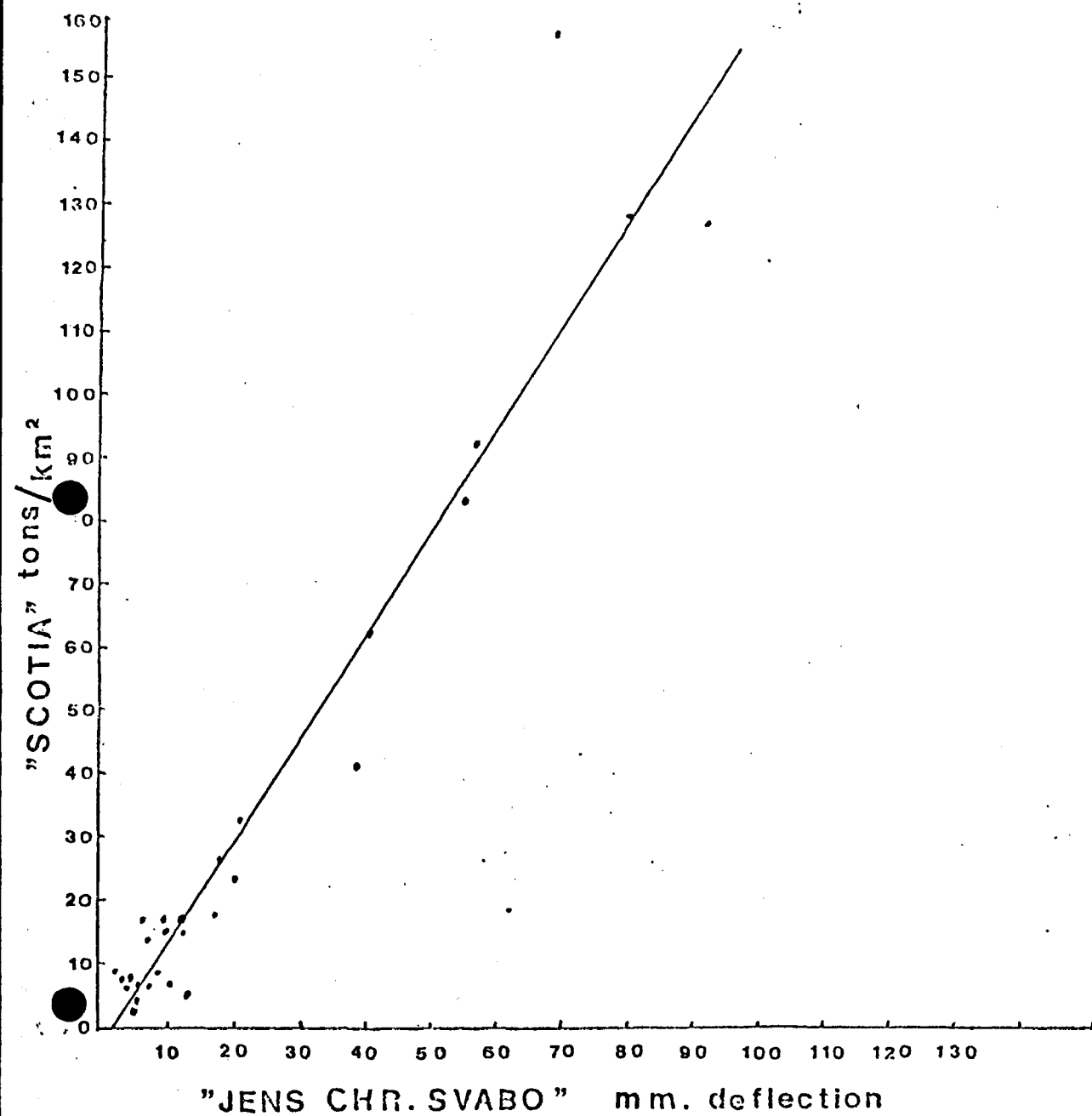
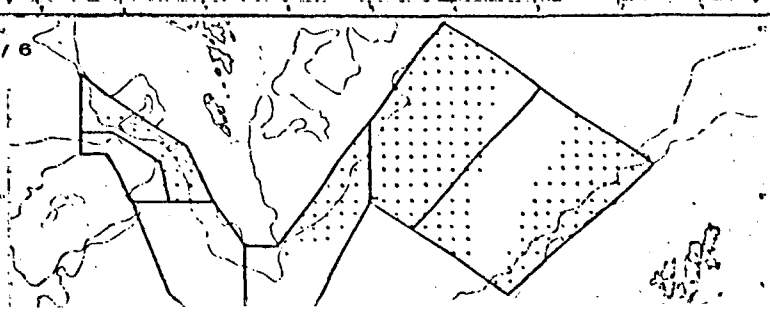
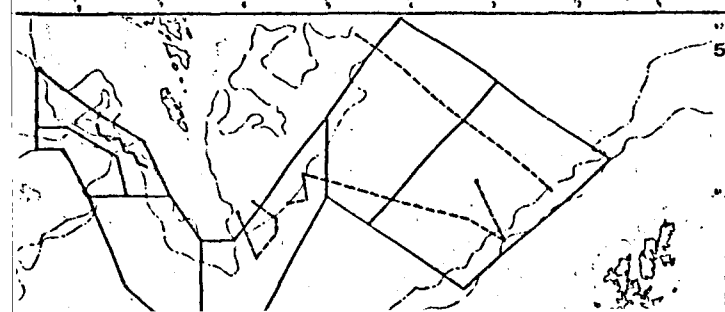
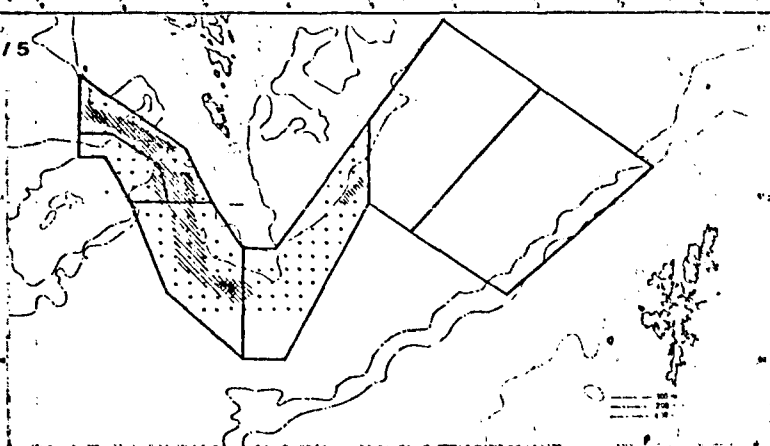
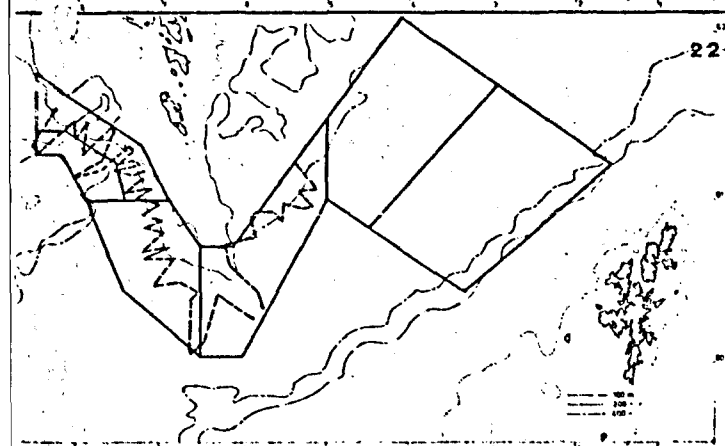
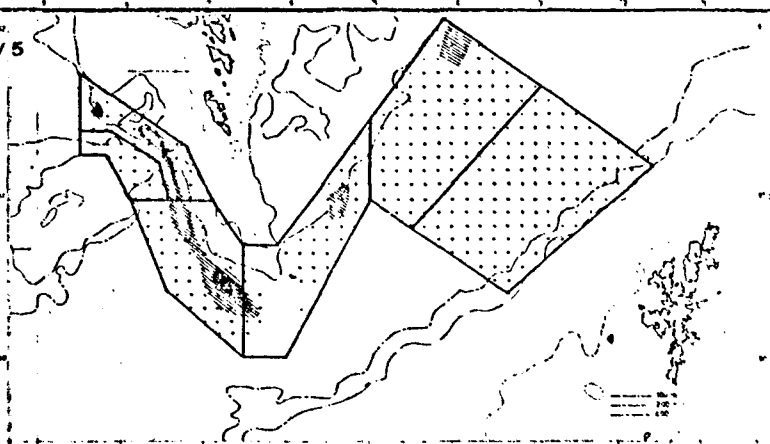
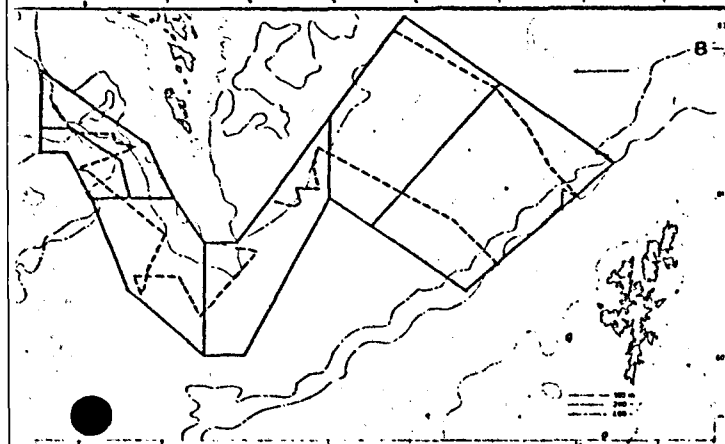
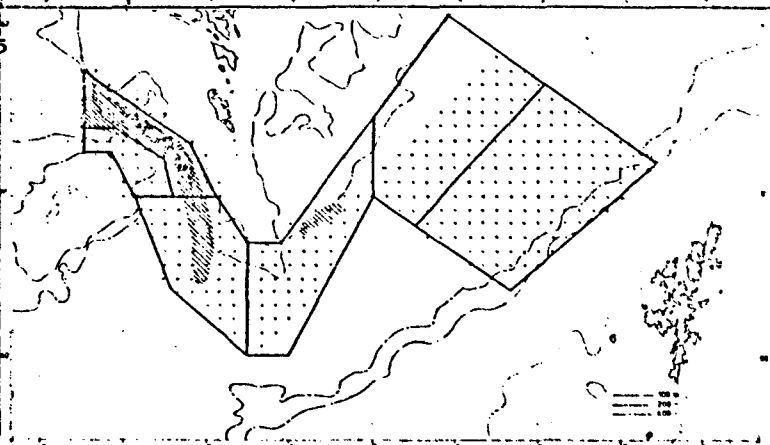
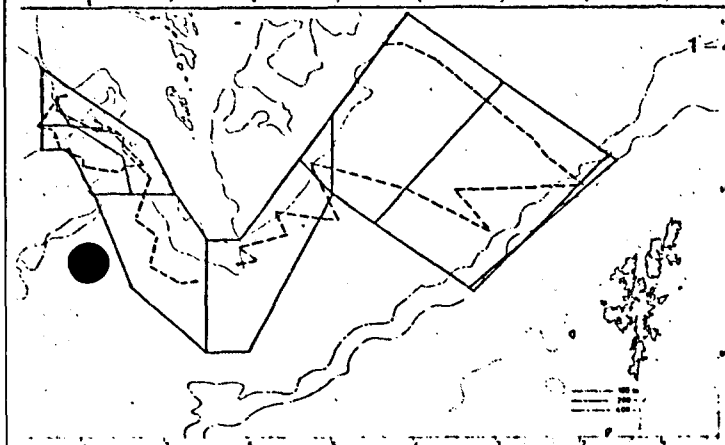
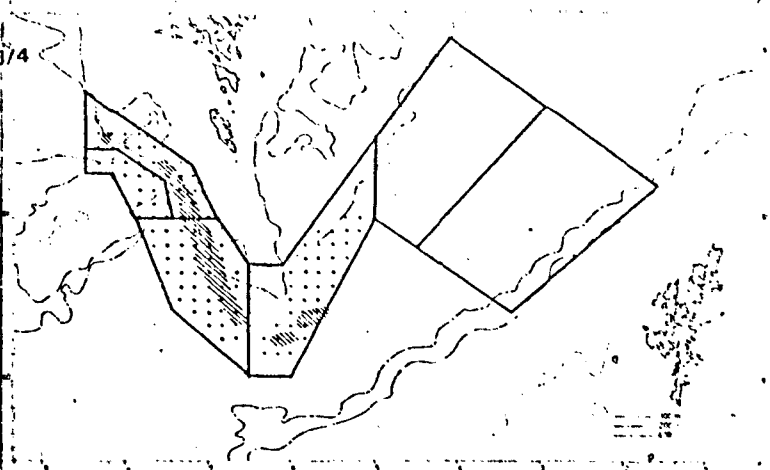
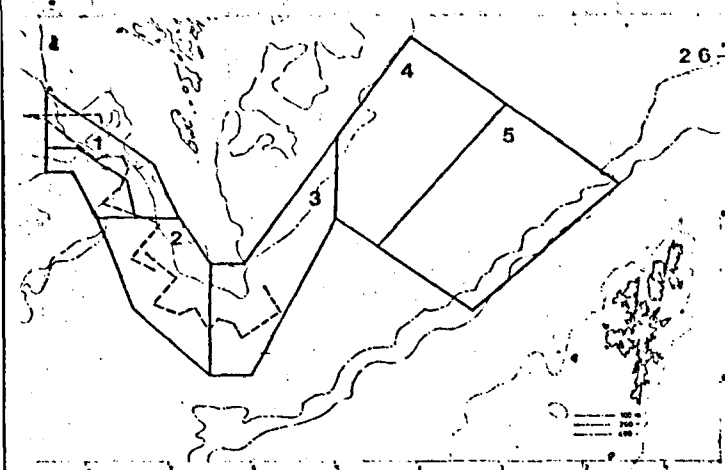


Fig. 1. Ship to ship calibration. "Scotia" - "Jens Chr. Svabo"  
18/6-1978.

Fig. 2. Survey tracks and relative fish abundance. "Jens Chr. Svabo"  
26/4 - 9/6-1978. The numbers refer to the area mentioned in  
the text and in table 1.

Integrator values	0 - 99 mm	dotted area
	100 - 499 -	single hatched area
	500 - 999 -	double hatched area
	> 1000 -	treble hatched area



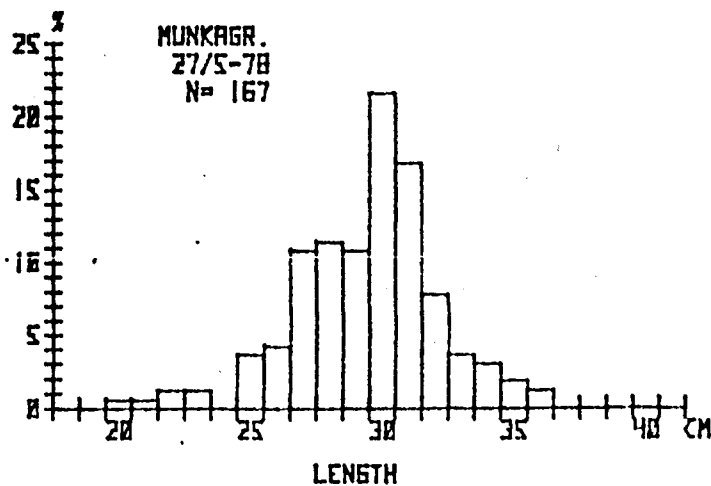
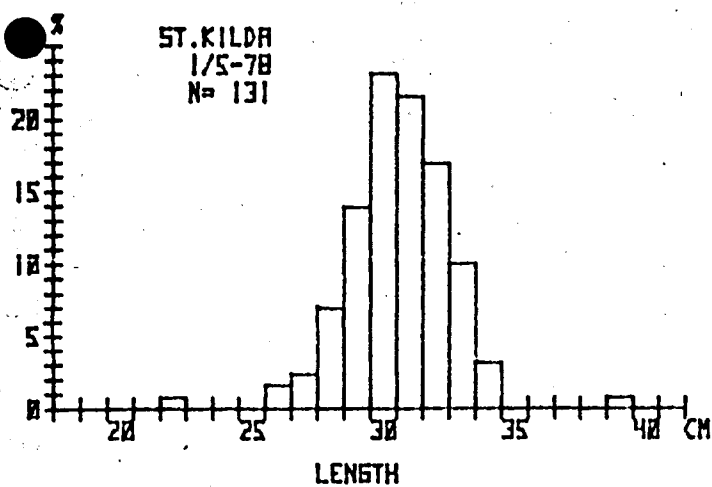
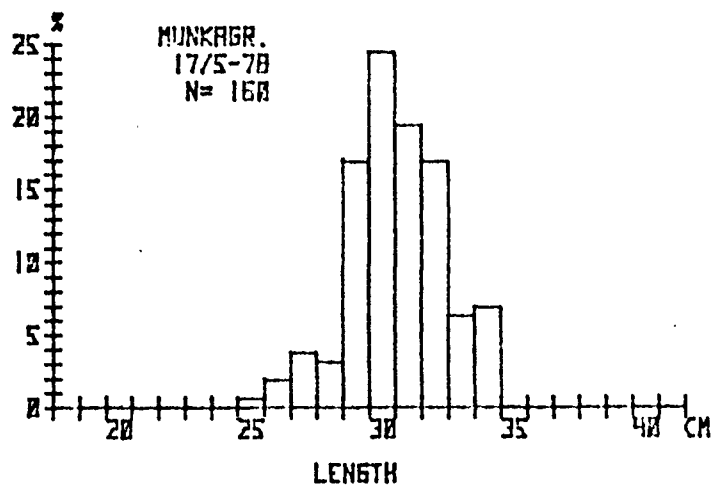
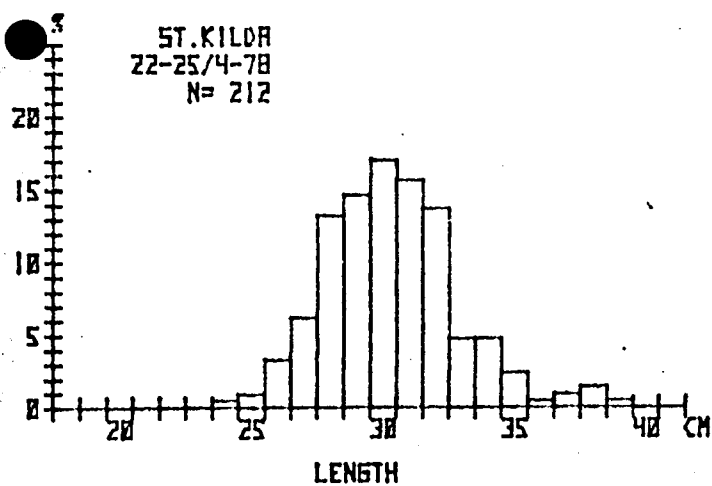
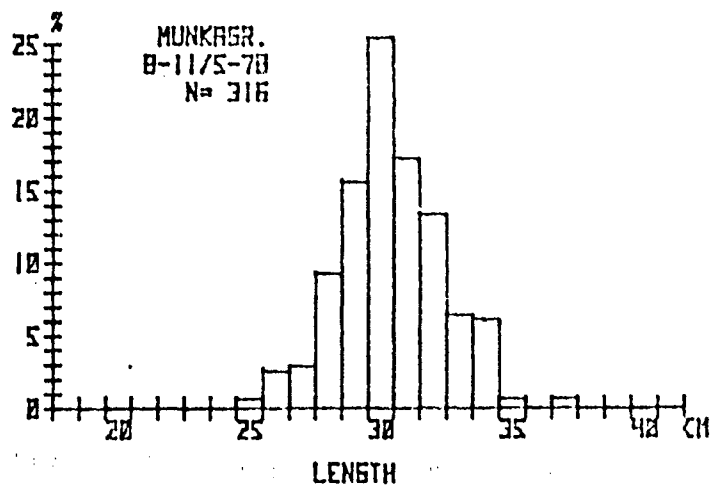
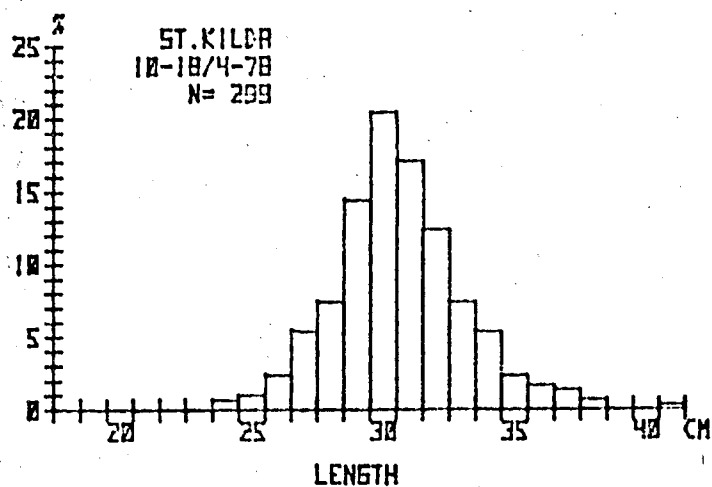


Fig. 3. Length distribution of blue whiting from commercial landings divided on time periods and areas.