

Cruise Report
Cruise no. 0632

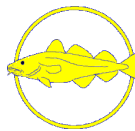
**Joint investigations on Norwegian spring-spawning herring and
blue whiting north of the Faroes**

3 – 17 May 2006

R/V Magnus Heinason OW2252



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INTRODUCTION

The main aims of this survey was to investigate the distribution and abundance of Norwegian spring spawning herring and immature blue whiting in the areas north of the Faroes and in the Norwegian Sea. Hydrographic data and plankton net samples were collected along the cruise tracks.

The cruise was part of a joint international survey (Faroes, Norway, Russia, Denmark, and Iceland) coordinated by the ICES Planning Group on Northeast Atlantic Pelagic Ecosystem Surveys (PGNAPES). Six vessels participated in the cooperative investigations, R/V *Magnus Heinason* (FO), R/V *Johan Hjort*, R/V *Håkon Mosby*, R/V *G.O. Sars* (NO), R/V *Árni Friðriksson* (IC), and R/V *Dana* (DK). Data from all vessels will be incorporated into a comprehensive report from PGNAPES covering research surveys of Norwegian spring spawning herring and blue whiting in 2006 (ICES CM 2006).

The present survey report is based on data from R/V *Magnus Heinason* only. Therefore no estimates of herring and blue whiting are given due to incomplete coverage of the whole spawning area.

MATERIAL AND METHODS

Cruise tracks with hydrographic stations (CTD), WP2 plankton stations, and pelagic trawl stations in the surveyed area are shown in Fig. 1. Acoustic data were recorded with a Simrad EK-500 echo sounder. Data from the hull mounted 38 kHz transducer were logged at sea and used in the fish abundance estimation. The area backscattering recordings (s_A) per nautical mile were averaged by each 5 nautical mile and the recordings were scrutinised on a daily basis with the EchoView 3.5 software and allocated to herring, blue whiting, plankton or other fish (e.g. lantern fish) based on regular pelagic trawling aimed at the various acoustic recordings and to a limited extent on the characteristics of the echo recordings. Details of the trawls used are given in Appendix 1.

The 38 kHz Echo sounder was operating with the following settings, as obtained from a copper sphere calibration 2/4 2006:

Max. Power	2000 W
Time varied gain	20 log R
Pulse length	Medium
Bandwidth	Wide
Angle sensitivity	21.9 dB
2-way beam angle	-20.6 dB
Sv transducer gain	27.22 dB
TS transducer gain	27.35 dB
3 dB beam width	7.02/6.86 dg
Along ship offset	0.18 dg
Athw. ship offset	-0.14 dg

A CTD was used to record temperature and conductivity (salinity) down to 1000 m depth or to the bottom. Water samples were taken from each station, with water bottles mounted on the CTD, for analysis of nutrients. CTD stations were taken every 35-45 nm (Fig. 1). WP2 plankton net samples were taken on each CTD station from surface down to 200m.

RESULTS

The cruise tracks and the surveyed area is shown in Fig. 1. The weather was excellent during the survey.

Norwegian spring spawning herring

The average s_A values of Norwegian spring spawning herring by statistical square from the *Magnus Heinason* survey are shown in Fig 2. Herring was found in most of the surveyed area where the SST was below 5°C (compare Figs 2 and 9). The temperature was lower at depth (200-250 m) where herring was during the day (up to 3 degrees lower). In the late afternoon the herring started to rise to the surface and by midnight most of the herring was in the uppermost 30m. An unknown proportion was distributed above the depth of the hull mounted acoustic transducer and thus unavailable to the recordings from the vessel. Therefore the acoustic estimates obtained during the night hours (24-02) should be considered as underestimates of the true abundance. The total abundance of Norwegian spring spawning herring in the area north of the Faroes was estimated to be about twice the amount in 2005. The length distribution of Norwegian spring spawning herring in the area north of the Faroes is shown in Fig. 4. Most of the herring was 7 and 8 years old (the 1999 and 0998 year classes), but also some old herring 1993 year-class was in the area (Fig. 5).

Blue whiting

The average s_A values of blue whiting by statistical square from the *Magnus Heinason* survey are shown in Fig 6. The highest concentrations of blue whiting were recorded just north of the Faroeplateau and north of the Iceland-Faroe Ridge. In the open ocean practically no blue whiting were found. This is unusual compared to the last few years when blue whiting was found mixed or just below the herring schools. Less blue whiting were observed in the Faroese area than last year. The length distribution of blue whiting in the Faroese area is shown in Fig. 7. Most of the blue whiting was 3 and 4 years old with some age 5 (the 2003, 2002, and 2001 year classes, Fig. 8).

It should be noted that no age 1 blue whiting was found in 2006, which is unusual during this survey during the last decade. Further that very few age 2 blue whiting (2004 year-class) was found this year, despite the relatively high representation (17% in numbers) as age 1 last year.

Combined abundance estimates of Norwegian spring spawning herring and blue whiting will be calculated during the meeting of the PGNAPES in August 2006, and reported to the ICES Northern Pelagic and Blue Whiting Fisheries Working Group (WGNPBW) in late August 2006 (ICES 2006).

The sea-surface temperature in the surveyed is shown in Fig. 9.

REFERENCES

ICES 2006. Report of the Planning Group on Northeast Atlantic Pelagic Ecosystem Surveys (PGNAPES). ICES CM 2006/RMC:08.

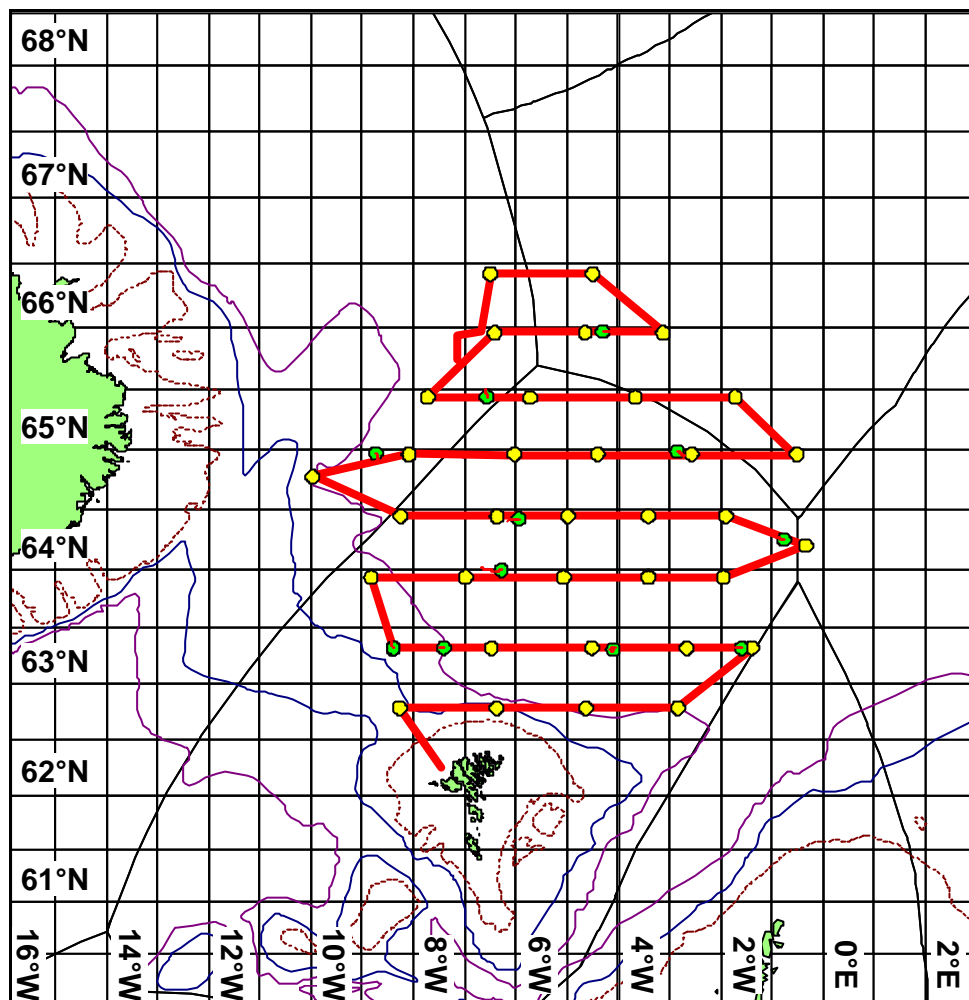


Figure 1. Cruise tracks (blue lines) with hydrographic stations (light yellow circles) and trawl stations (dark green circles) north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

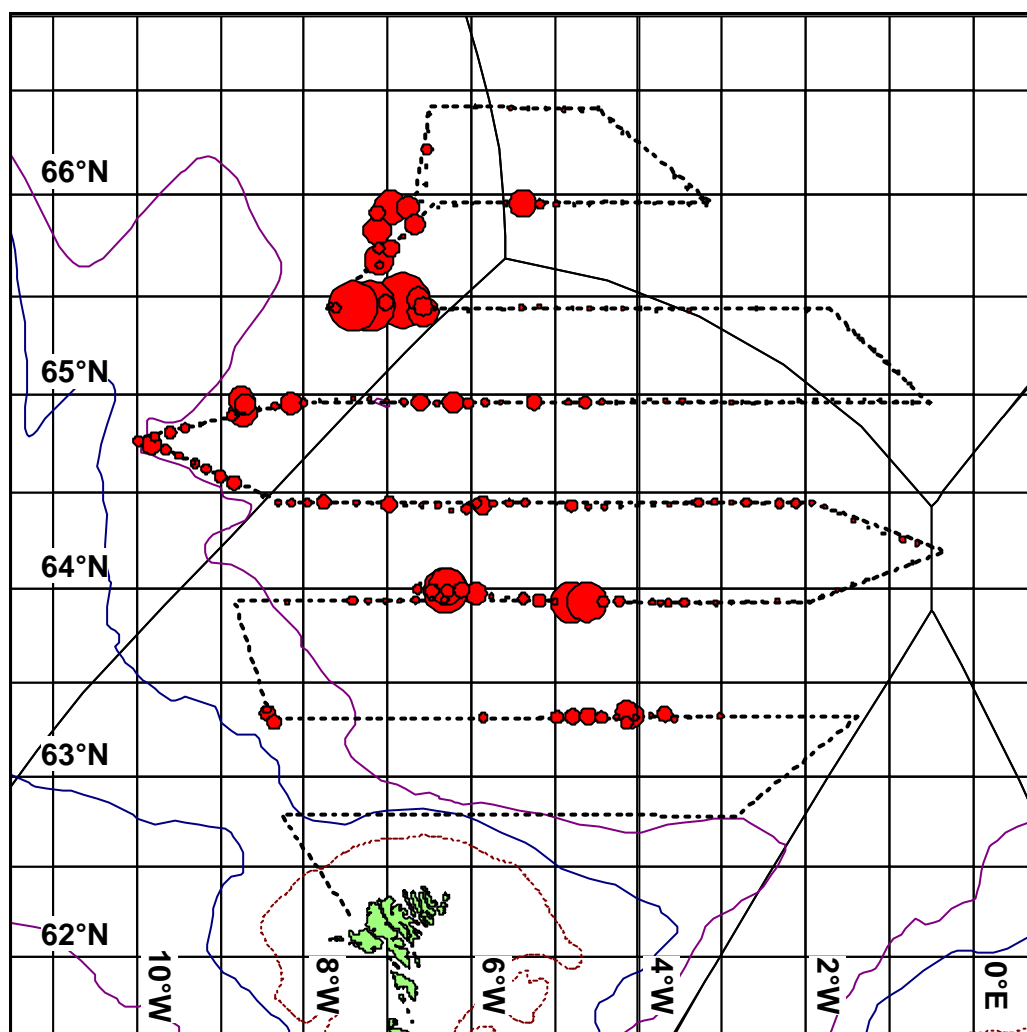


Figure 2. Integration values (s_A , m^2/nm^2) of Norwegian spring spawning herring per 5 nm along the cruise tracks, *Magnus Heinason* cruise 0632, 3-17/5 2006.

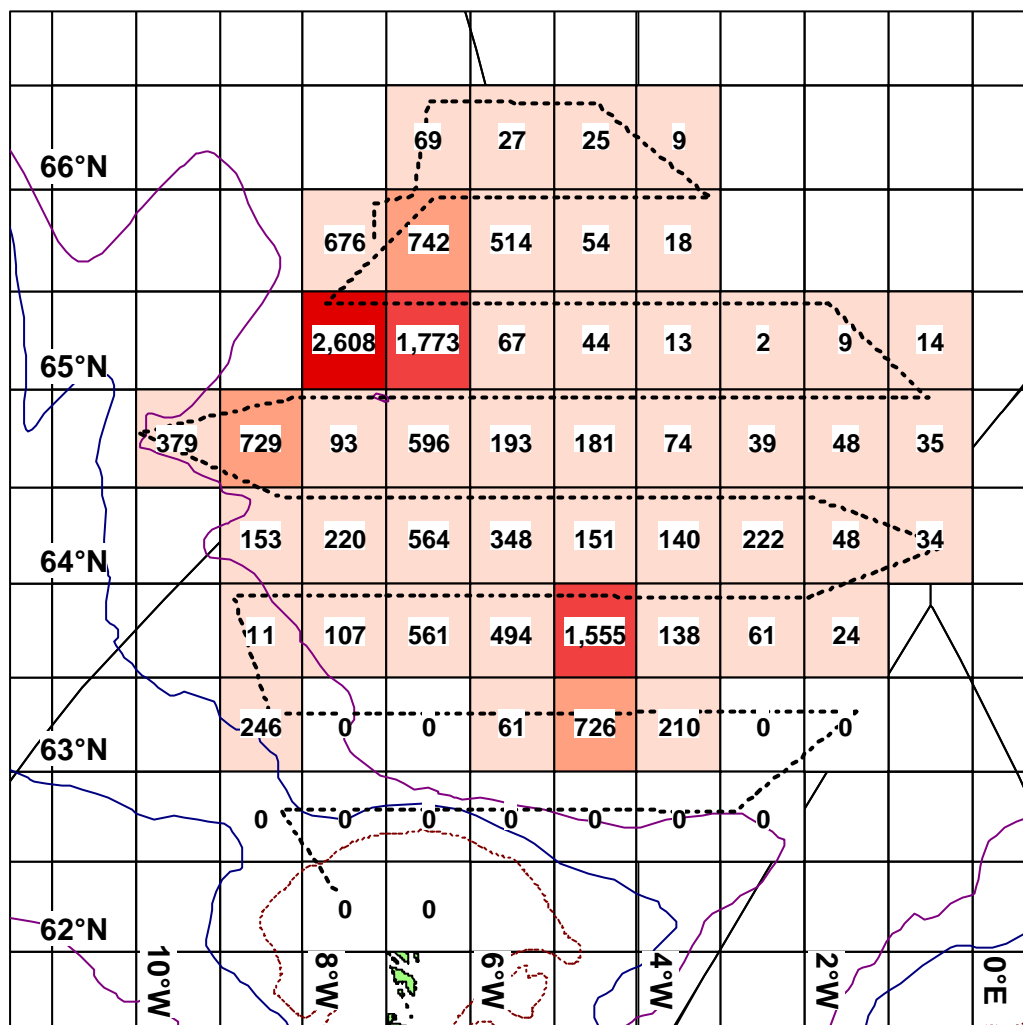


Figure 3. Mean integration values (s_A , m^2/nm^2) of Norwegian spring spawning herring per statistical square (1x2 degrees), *Magnus Heinason* cruise 0632, 3-17/5 2006.

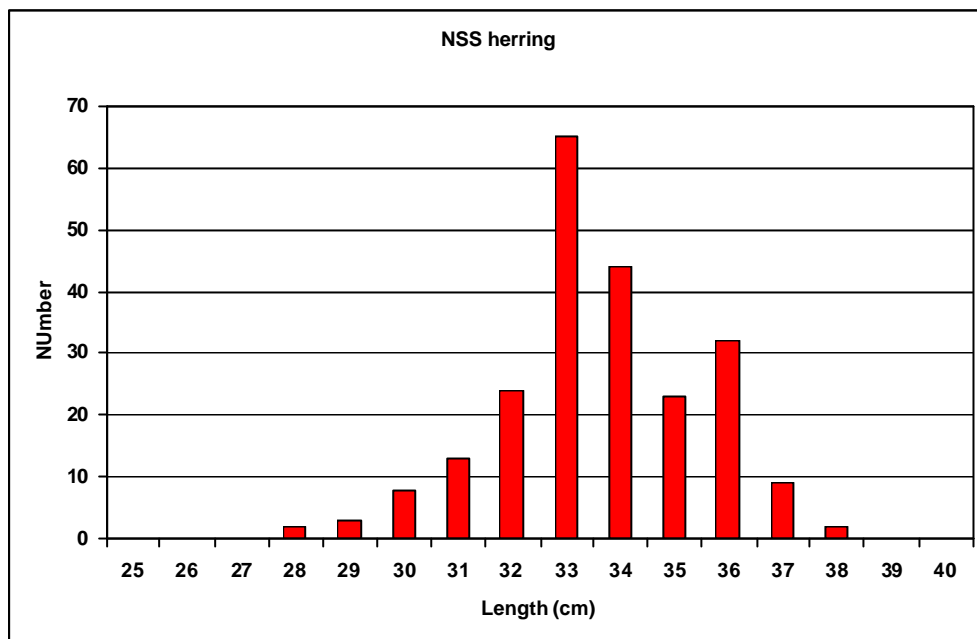


Figure 4. Length distribution of Norwegian spring spawning herring north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

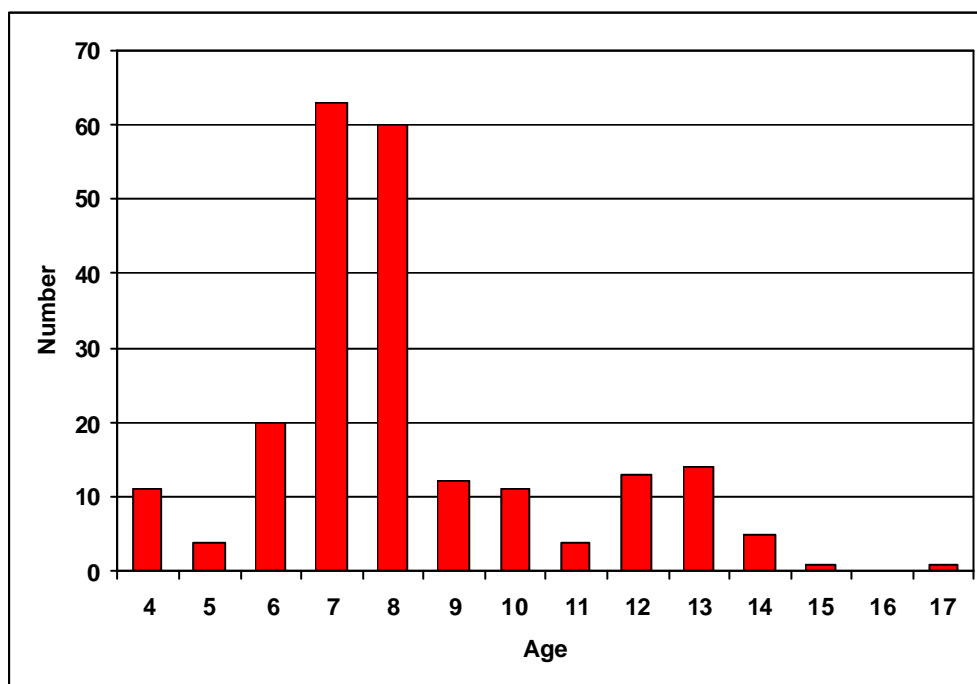


Figure 5. Age distribution of Norwegian spring spawning herring north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

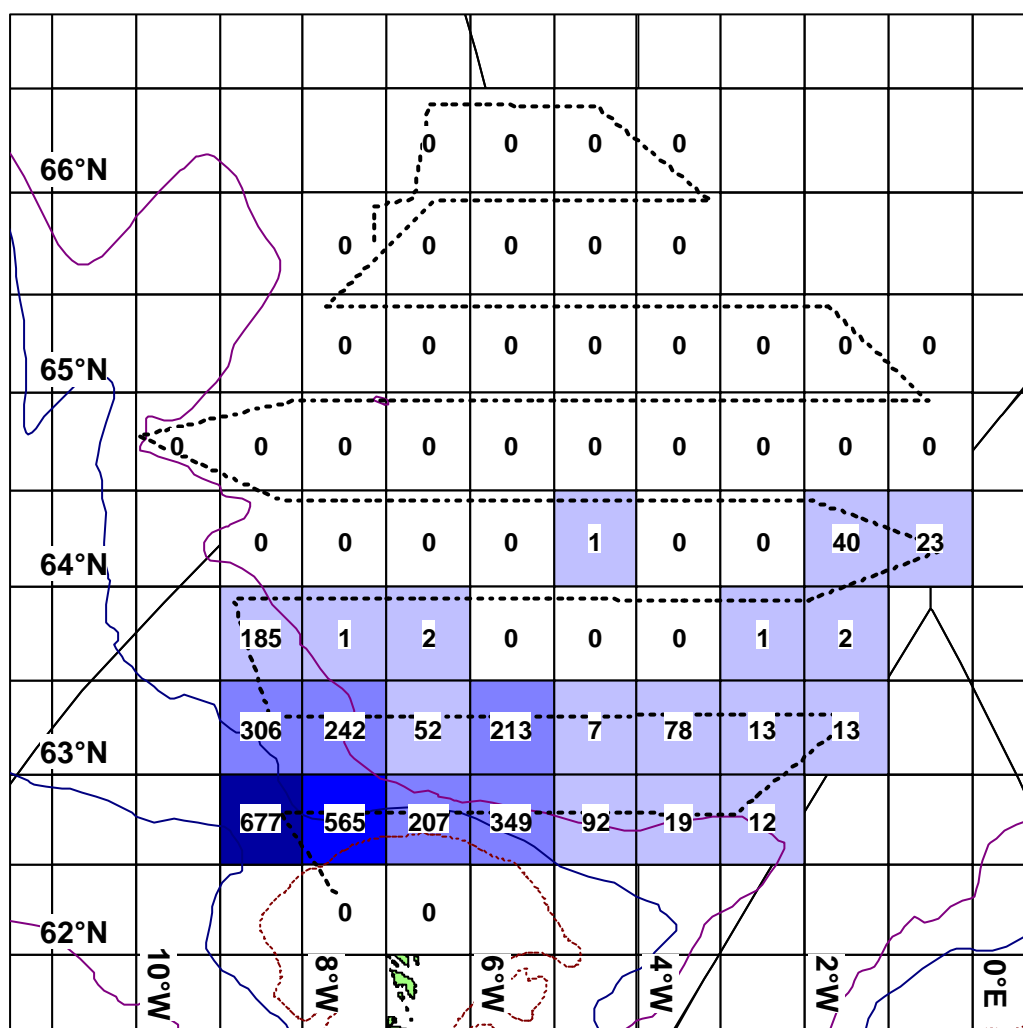


Figure 6. Mean integration values (s_A , m^2/nm^2) of blue whiting per statistical square (1x2 degrees), *Magnus Heinason* cruise 0632, 3-17/5 2006.

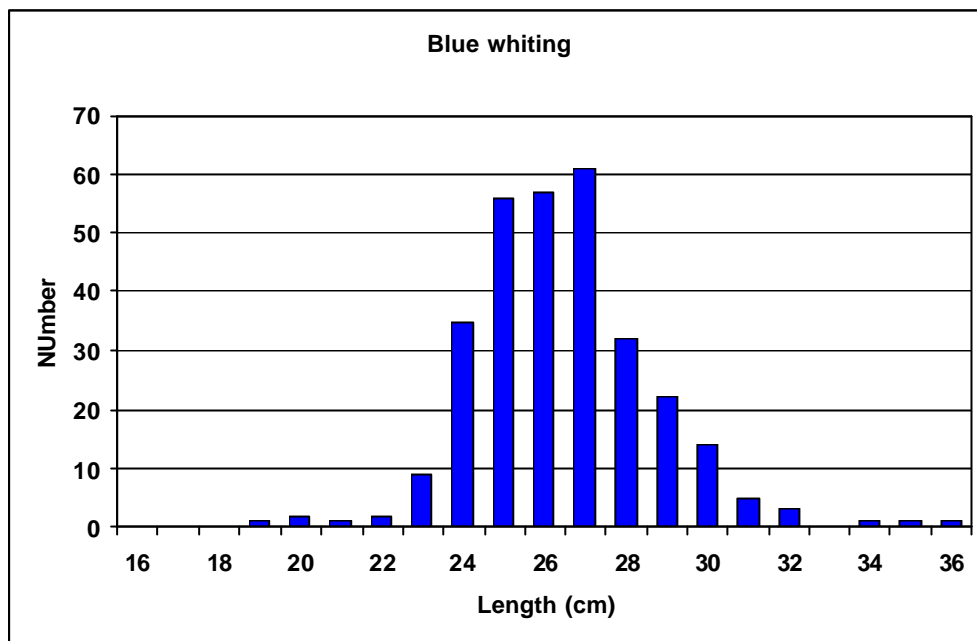


Figure 7. Length distribution of blue whiting north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

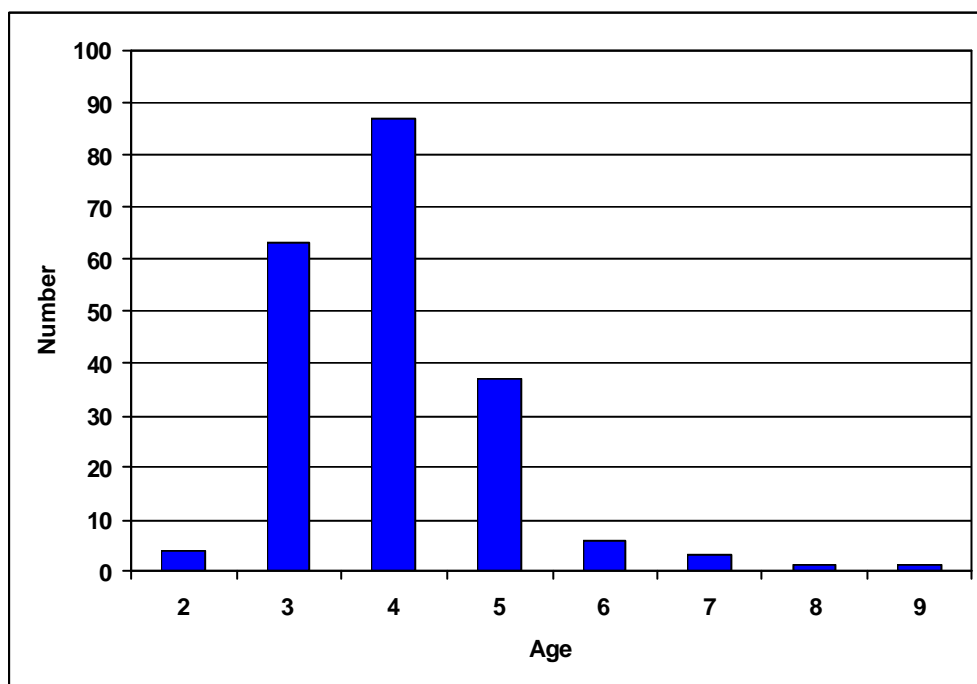


Figure 8. Age distribution of blue whiting north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

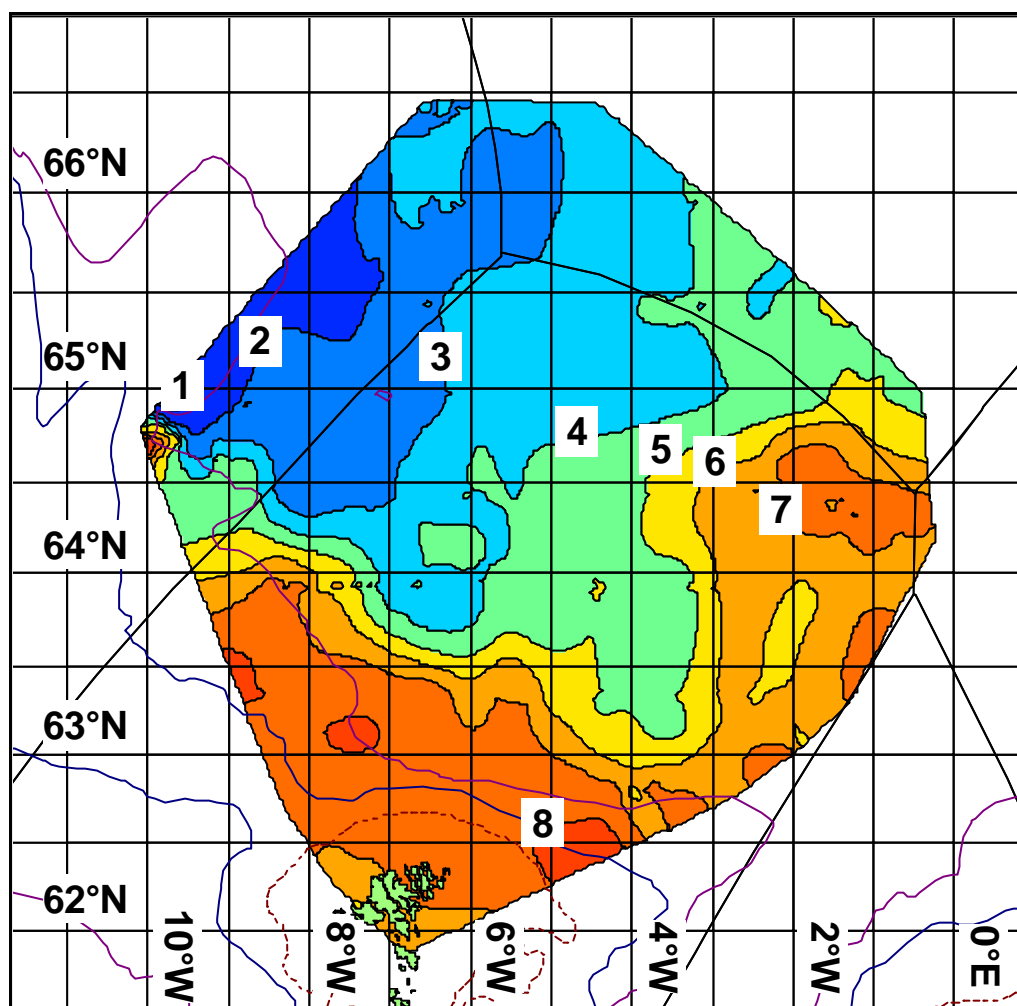


Figure 9. Sea-surface temperature north of the Faroes, *Magnus Heinason* cruise 0632, 3-17/5 2006.

APPENDIX 1

Configuration of the pelagic trawls

Details of the blue whiting trawl (Svartkjaftatrol) and mesopelagic trawl (Prikkaftatrol) used to collect the biological samples during the survey are listed below:

Circumference 640 m

Vertical opening 38-46 m (average 42 m)

Horizontal opening 58-62 (average 60 m)

Blue whiting trawl (Svartkjaftatrol): mesh size in cod-end 40 mm

Mesopelagic trawl (Prikkaftatrol): mesh size in cod-end 12 mm

Typical towing speed 3.0-4.0 (average 3.5 knots)