

Cruise Report
Cruise no. 1051

Joint investigations on mackerel and herring north of the Faroes

8 - 23 July 2010

M/V Finnur Fríði XPPX



Jan Arge Jacobsen
Leon Smith
Eirikur Danielsen



HAVSTOVAN
FAROE MARINE RESEARCH INSTITUTE
POBox 3051 - FO 110 Tórshavn, Faroe Islands

INTRODUCTION

The main aims of this survey was to investigate the distribution and abundance of mackerel and Norwegian spring-spawning herring in the areas north of the Faroes (Norwegian Sea) as part of a joint Norwegian, Faroese and Icelandic survey.

The cruise was part of a joint international survey coordinated by three of the Coastal States of mackerel: Norway, Faroes and Iceland. Four vessels participated in the cooperative investigations, the chartered M/V *Finnur Fríði* (FO), MV *Libas og Brennholm* (NO), and RV *Árni Friðriksson* (IS). Data from all vessels will be incorporated into a comprehensive report at the ICES WGNAPES (Working Group on Northeast Atlantic Pelagic Ecosystem Surveys, formerly Planning Group, PGNAPES) and submitted to the ICES WGWIDE (WG on herring, blue whiting and mackerel) in late August 2010.

The present survey report is based on data from M/V *Finnur Fríði* only. Therefore no biomass estimates are given due to incomplete coverage.

MATERIAL AND METHODS

Cruise tracks with pelagic (surface) trawl stations, hydrographic stations (CTD) and plankton stations (WP2) in the surveyed area are shown in **Fig. 1**. A “Vónin 640 m” pelagic trawl was towed at the surface (using buoys on the wingtips) for one hour at predefined positions. The towing speed was on average 4.4 knots. The doors used were 5.5 m² and weighted 750 kg. Biological measurements from the trawl haul included length and weight measurements of at least 100 fish of each target species, in addition to 15 samples of otoliths and stomachs, as well as sex and maturation stage. Acoustic data were recorded with a Simrad EK60 echo sounder. Data from the hull mounted 38 and 200 kHz transducers were logged at sea with LSSS and EchoView and used in the fish abundance estimation. The area backscattering recordings (s_A) per nautical mile were averaged by each nautical mile and the recordings were scrutinised on a daily basis and allocated to mackerel, herring, blue whiting, plankton or other fish (e.g. pearlside, lantern fish) based on the pelagic trawling. The 38 kHz and 200 kHz echo sounders were calibrated prior to survey following standard procedures.

RESULTS

Mackerel: The main conclusion from the Faroese investigations in July 2010 was that mackerel was distributed in all sampled positions in the area north of the Faroes, and herring was mostly located in the areas with lower temperatures, i.e. in the northwestern part of the surveyed area (**Fig. 2**).

The vertical distribution of mackerel was from the surface and down to 50 m depth (sometimes down to 75 m), and could be seen as very small schools or as a thin undulating layer very close to surface. Due to the very shallow vertical distribution, they were in many areas found to be above the 13 m depth layer where the acoustic recordings started, and thus could not be registered by the acoustic equipment.

The largest (and also heaviest and oldest) mackerel was found in the western parts of the surveyed areas (**Figs 3-5**). In the central and western areas most of the mackerel was 3 years and older while in the eastern areas the 2 year olds were found.

Herring: Herring were mainly caught in the areas with lower temperatures, i.e. in the northwestern part of the surveyed area (**Fig. 2**) that is influenced by the East Icelandic Current (**Figs 10-11**). The herring could be seen as small schools in or just below the mackerel in the sea. The mean weight of

herring was 33.3 g and mean weights 313 g (**Figs 6**), and most of the herring were between 6-8 years (**Fig 7**). In the eastern part of the surveyed area a significant proportion of the herring were of autumn-spawning type, i.e. not the Norwegian spring-spawning herring, but could be either parts of the northern North Sea herring stock or of the Faroese autumn-spawning herring stock, which both seem to feed further out in the Norwegian Sea during summer than previously.

Blue whiting: The blue whiting was distributed in a wide area below 100 m depth and down to 400 m depth in a loose scatter. In the western area predominantly 2-3 year old fish was found while in the central area the older fish were distributed (**Figs 8-9**).

Plankton: The abundance of plankton (mainly copepods, *Calanus*) will be calculated at a later stage. However, the impression was that the abundance was higher in the western part of the surveyed area.

Hydrography: The sea-surface temperature (SST) in the surveyed area is shown in **Fig. 10**. Temperature at 50 depth in **Fig 11**.

Other species: The pearlside (*Maurollicus mülleri*) was found in the upper scattering layer (10-100 m depth) throughout the surveyed area.

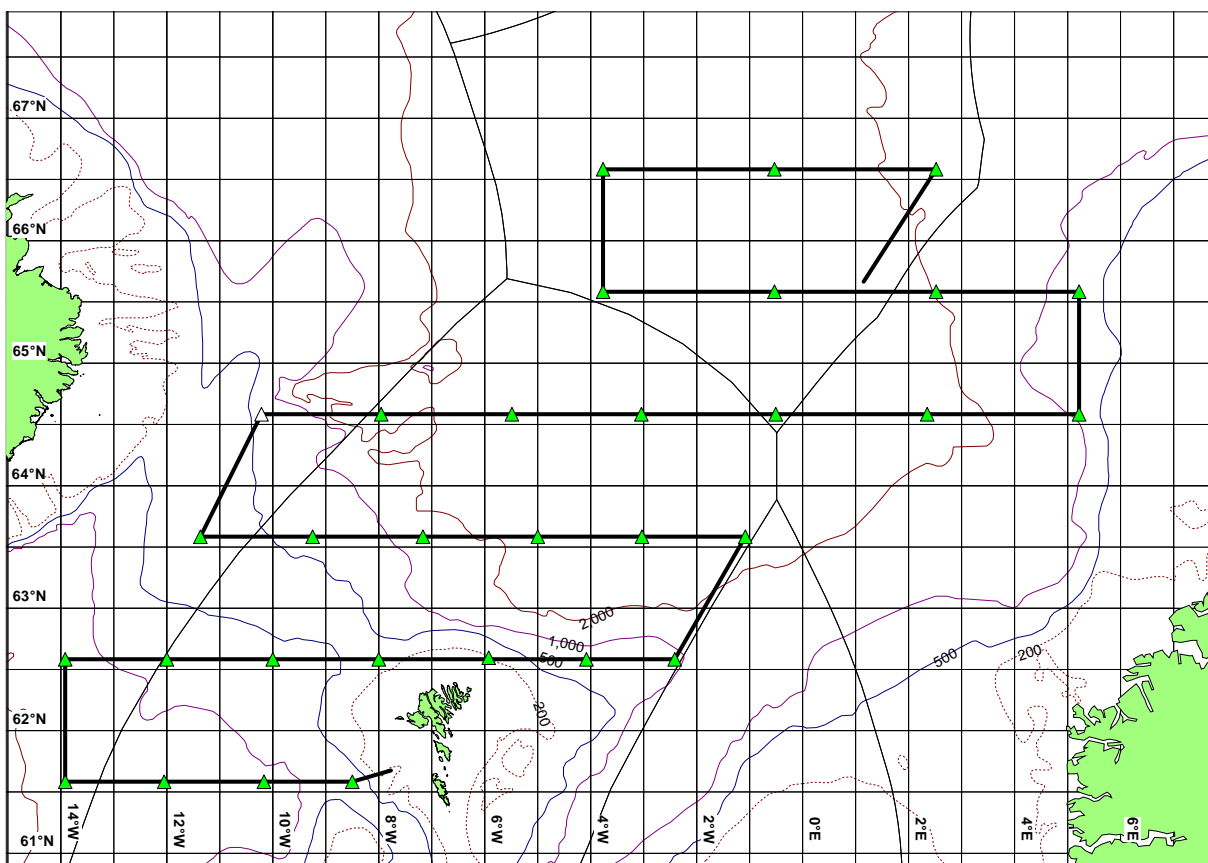


Figure 1. Cruise tracks (black lines) with trawl stations (green triangles), where also a hydrographic and a plankton station was taken in the areas north of the Faroes. M/V *Finnur Friði* cruise 1051, 8-23/7 2010. Over 2200 nm were covered.

FF1051: Catch pr. Nautical mile, Mackerel (green) and Herring (red)

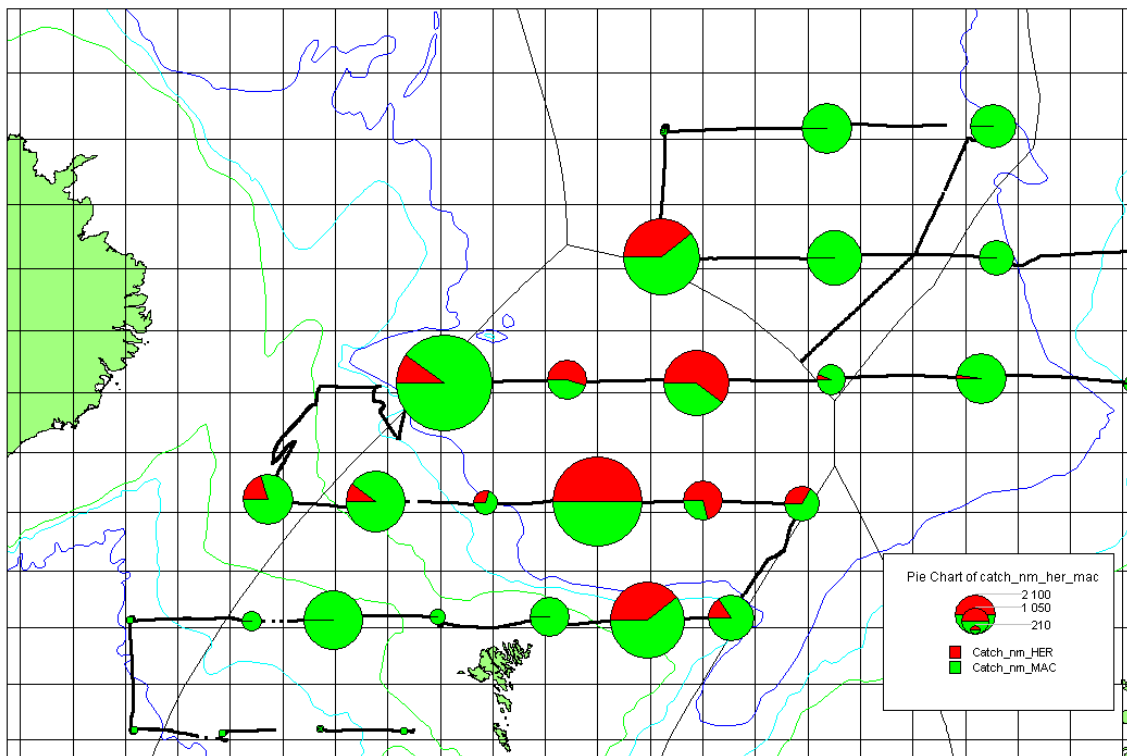


Figure 2. Catch proportions (kg) of mackerel (green) and herring (red) per nm towed at the predefined surface trawl stations. The size of the circles corresponds to amount of fish. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

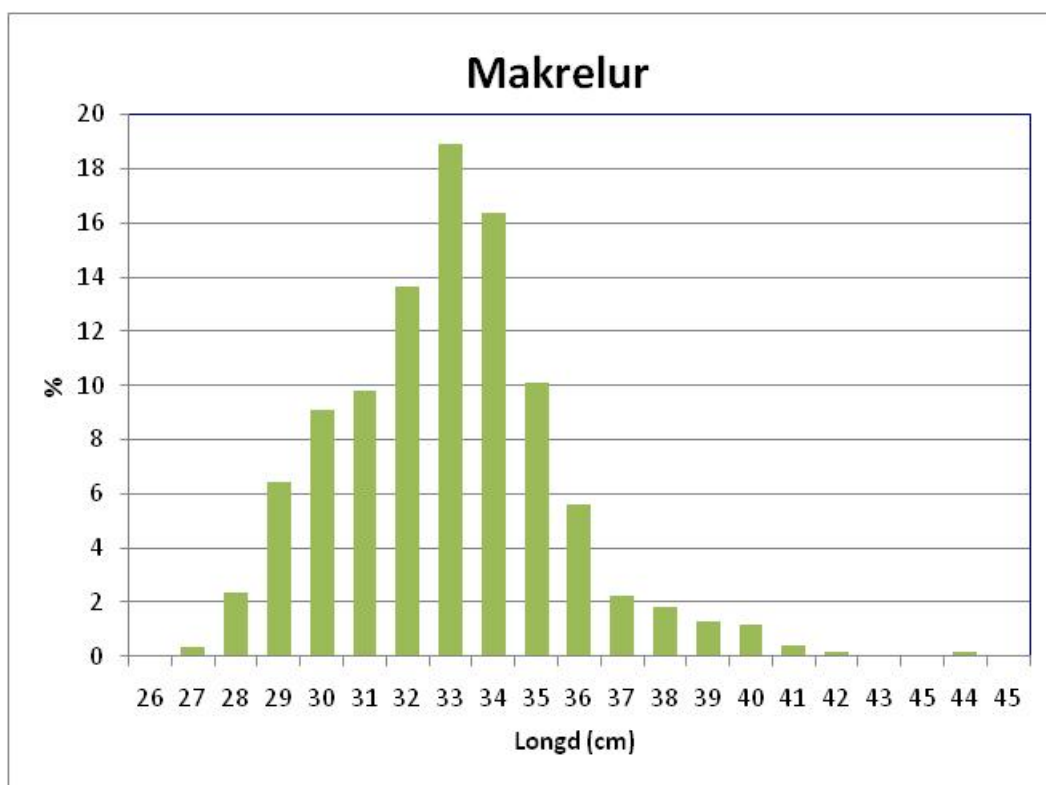


Figure 3. Length distribution of mackerel north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

FF1051: MACKEREL mean Weight pr. station.

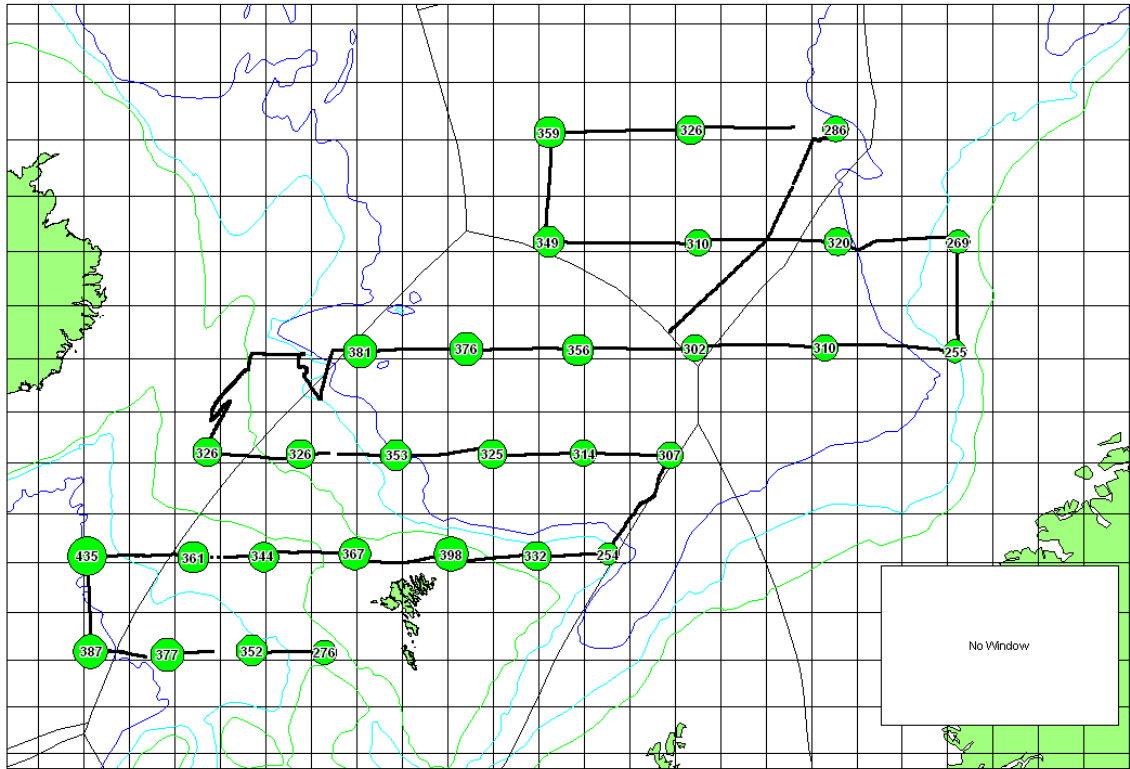


Figure 4. Mean weight of mackerel north of the Faroes. The mean length was 33.4 cm and mean weight was 329 g. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

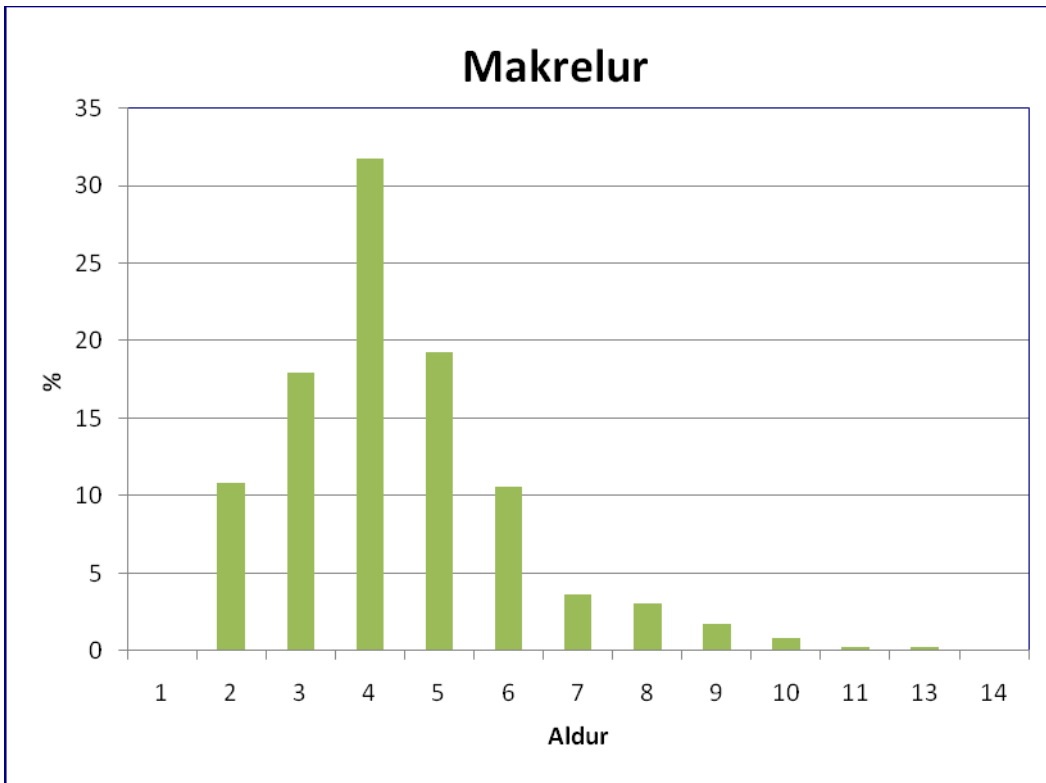


Figure 5. Age distribution of mackerel north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

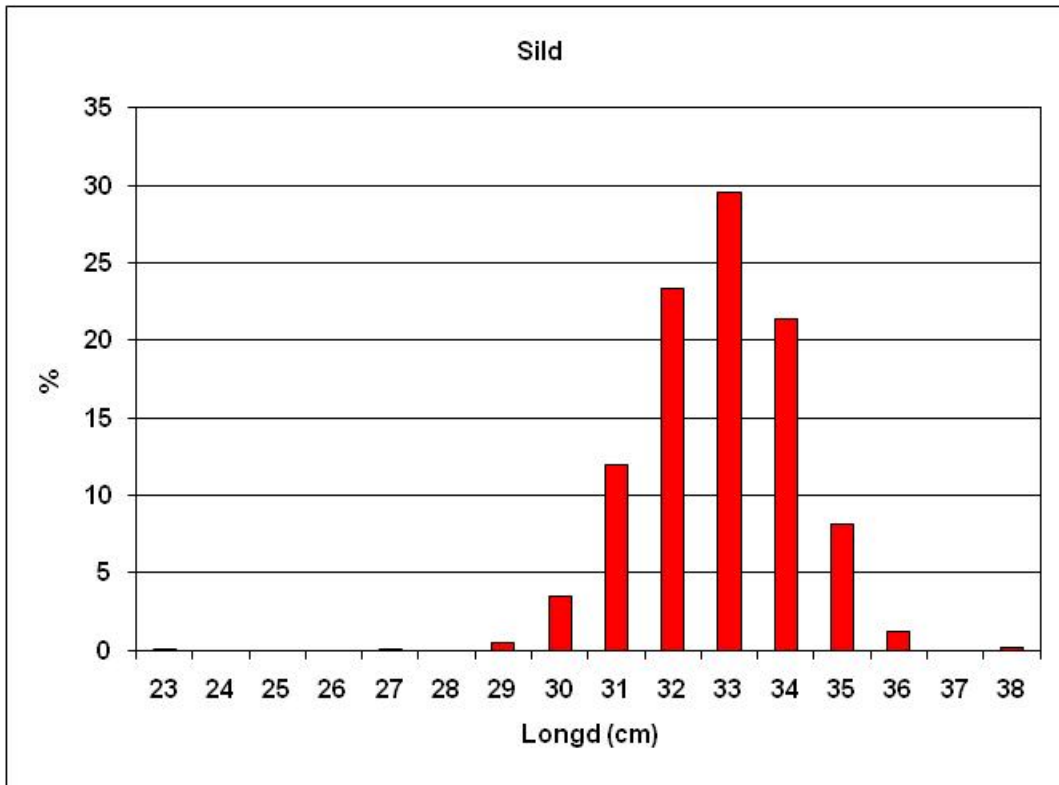


Figure 6. Length distribution of herring north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010. The mean length was 33 cm and mean weight was 313 g.

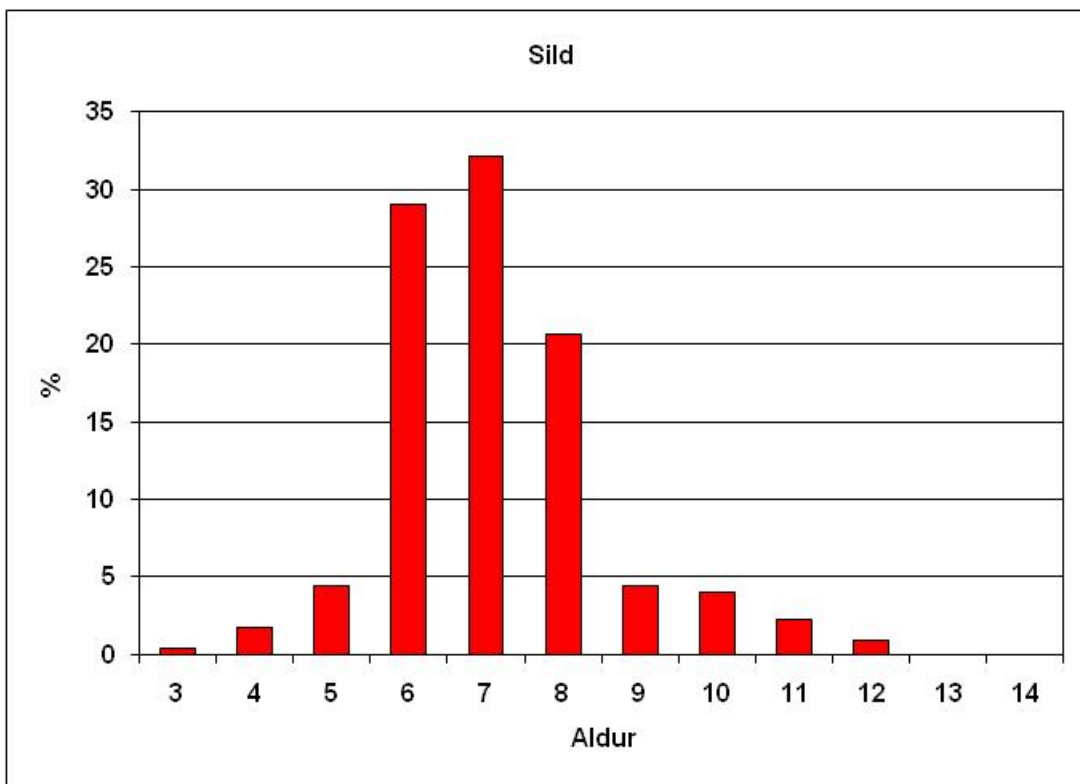


Figure 7. Age distribution of herring north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

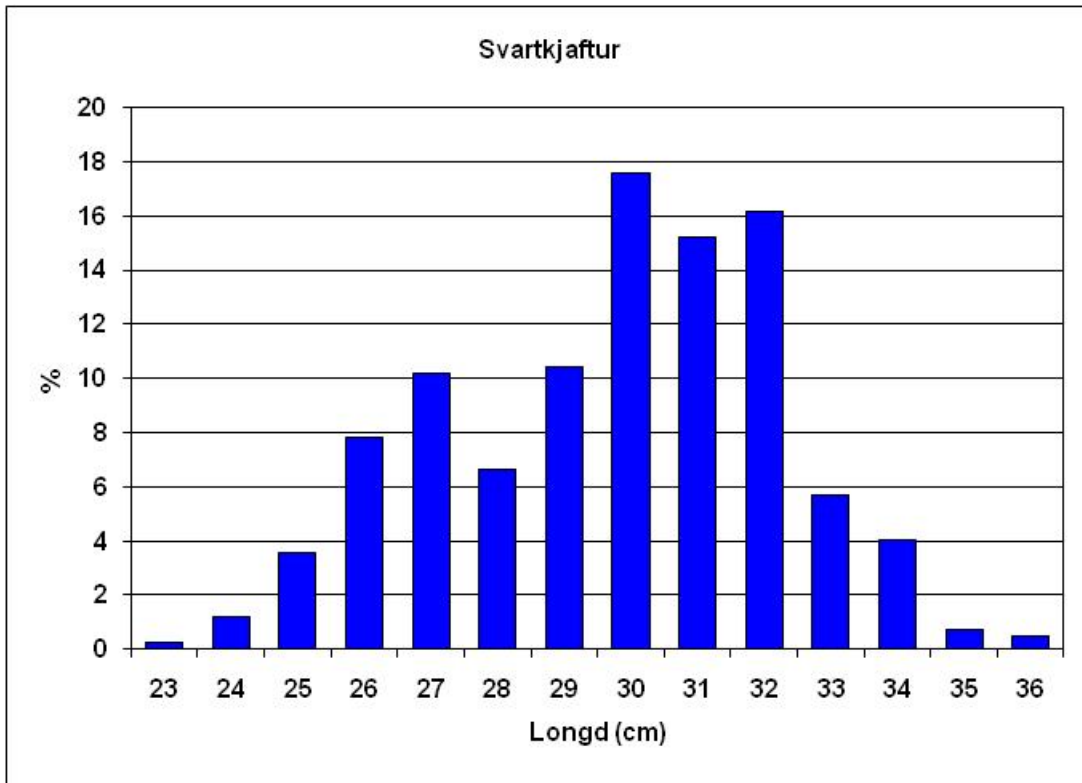


Figure 8. Length distribution of blue whiting north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010. The mean length was 30 cm and mean weight was 160 g.

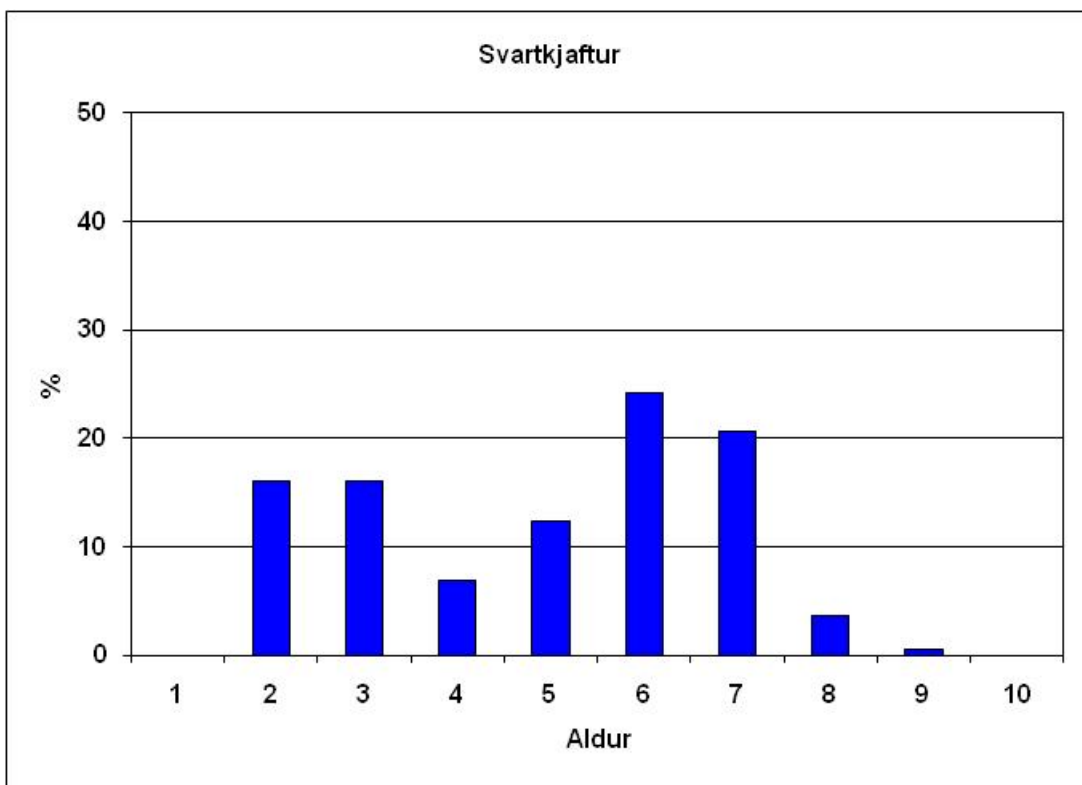


Figure 9. Age distribution of blue whiting north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

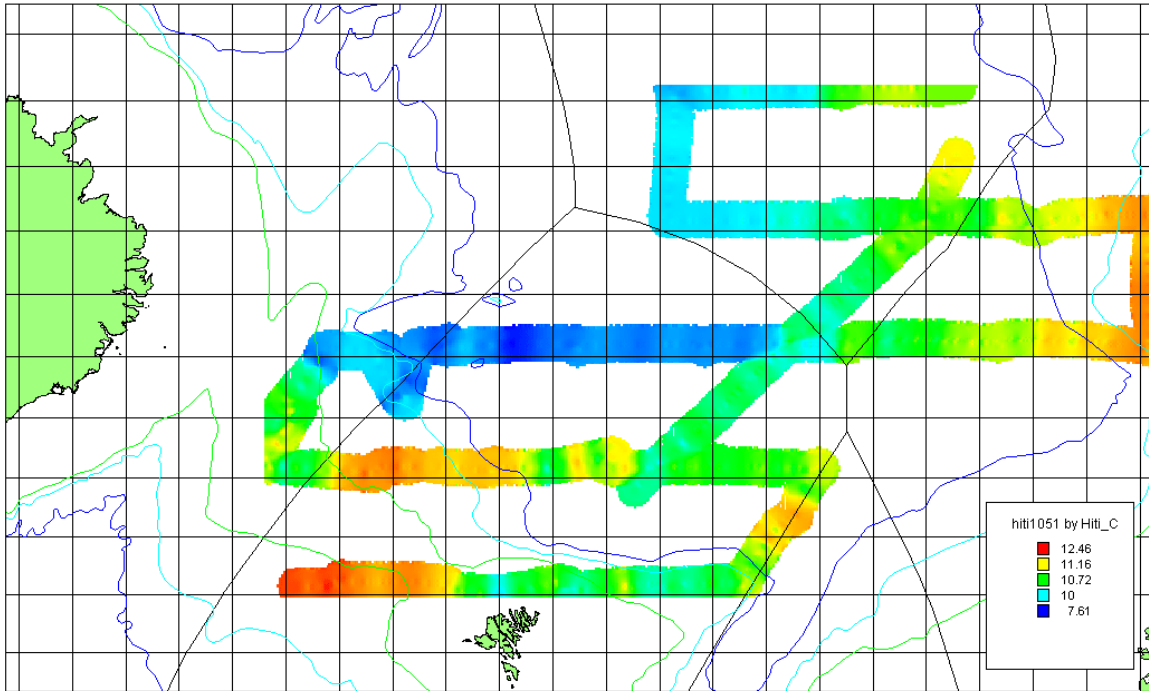


Figure 10. Sea-surface temperature ($^{\circ}\text{C}$) north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.

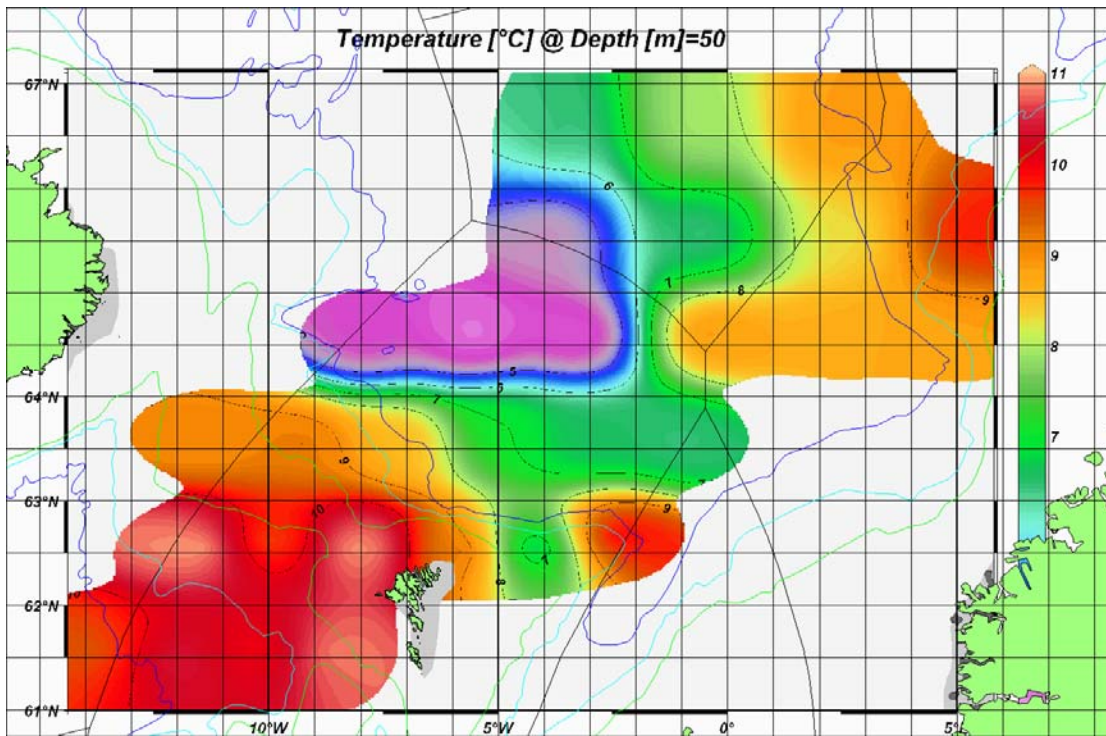


Figure 11. Temperature ($^{\circ}\text{C}$) at 50 m depth north of the Faroes. M/V *Finnur Fríði* cruise 1051, 8-23/7 2010.