

Preliminary Cruise Report

Cruise no. 1718

Faroese part of International Ecosystem Survey in the Norwegian Sea (IESNS) 2017

4 – 15 May 2017

R/V Magnus Heinason OW2252

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INTRODUCTION

The main aim of this survey was to investigate the distribution and abundance of Norwegian spring spawning herring and blue whiting in the Norwegian Sea north off the Faroe Islands (yellow transects in **Figure 1**). Zooplankton and hydrographic data were collected for each 60 nm along the cruise tracks.

The cruise was part of the joint International Ecosystem Survey in the Norwegian Sea (IESNS). Five parties and research vessels (see text table below) took part in the survey, coordinated by the “Working Group of International Pelagic Surveys” (WGIPS) in ICES. The results from all vessels combined will be used in the assessment of Norwegian spring spawning herring by the “Working Group on Widely Distributed Stocks” (WGWIDE) in September 2017.

In general, the cruise went as planned, although it was too windy to trawl in on part of the survey area. As a consequence, the number of herring and herring otoliths sampled was lower than initially planned.

Ship	Nation
M. Heinason	Faroes
G.O. Sars	Norway
F. Nansen	Russia
Árni Friðriksson	Iceland
Dana	Denmark (EU)

The present survey report is based on data from R/V *Magnus Heinason* only. Therefore no estimate of abundance of Norwegian spring spawning herring is given due to incomplete coverage of the area.

MATERIAL AND METHODS

Cruise tracks with hydrographic stations (CTD and WP2 net), and pelagic trawl stations in the surveyed area are shown in **Figure 2**. Acoustic data were recorded with a Simrad EK-60 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 nautical mile and the recordings were scrutinised on a daily basis with the EchoView 8 software and allocated to primarily herring or blue whiting, and to some extent also to plankton or other fish (e.g. myctophids) based on pelagic trawling aimed at the various acoustic recordings. The 38 kHz Echo sounder was calibrated prior to this year’s surveys with a standard copper sphere.

RESULTS

Norwegian spring spawning herring

The preliminary results from the Faroese investigations in May 2017 indicate lower abundances of Norwegian spring spawning herring in Stratum 3 (approximately the Faroese EEZ, **Figure 1**) as compared to the last three years. The transects surveyed by the Faroese vessel changes somewhat among years and this can also affect the observed biomass. Generally, the abundance of herring was low in the southern part of the survey area and lowest in the eastern part (**Figure 3**). The abundance in the northern part of the survey area was comparable to the last two years. In south most of the herring was observed in the top 50 metres, although during daytime there were also small schools at 200-300 m depth (**Figure 4**). In north the herring was mostly observed in schools at 150-300 m depth – often mixed with blue whiting. The herring caught on the eastern part of the first three transects ranged from 8 to 37% spring spawners, based on the center of the otoliths.

The length distribution of Norwegian spring spawning herring (**Figure 5**) shows a mean length of 33.0 cm. Four and five year old herring were caught widely in the survey area and comprised 16% of all age-read herring. The age distribution does not have distinctive peaks – this may partly be due to small samples.

Blue whiting

The preliminary results from the Faroese investigations in May 2017 indicated similar or somewhat higher quantities of blue whiting in the Faroese area compared to 2016. The sum of the s_A values of blue whiting per nautical mile along the cruise tracks from the *Magnus Heinason* survey are shown in **Figure 6**.

The length distribution of blue whiting is shown in **Figure 7**. The mean length was 26.2 cm and the length distribution peaked at 25 cm. Age groups 3,4 and 5 were most abundant in the trawl catches.

Mackerel

Mackerel was only caught in one surface haul in the southern area. The mean length of mackerel was 34.8 cm (**Figure 8**). The age distribution is also shown in **Figure 8**.

Plankton and hydrography

Temperature and salinity casts down to 1000 m if possible were taken along the track; the vertical isotherms down to 500 m based on 19 CTD stations are shown in **Figure 4**. All 19 planned CTD-stations and zooplankton stations along the tracks were taken. Dry weights of zooplankton from WP2 samples are shown in **Figure 9**.

Survey effort for *Magnus Heinason* 4 – 15 May 2017:

Effective survey period	Length of cruise track (nm)	Trawl stations	CTD stations	Plankton sampling	Aged fish herring/ blue whiting	Length-measured fish
5-13/5	1351	13	19	19	221/355	249/1170

Trawl specifications for *Magnus Heinason*:

Circumference (m)	640
Vertical opening (m)	45–55
Mesh size in codend (mm)	40
Typical towing speed (kn)	3.0–4.0

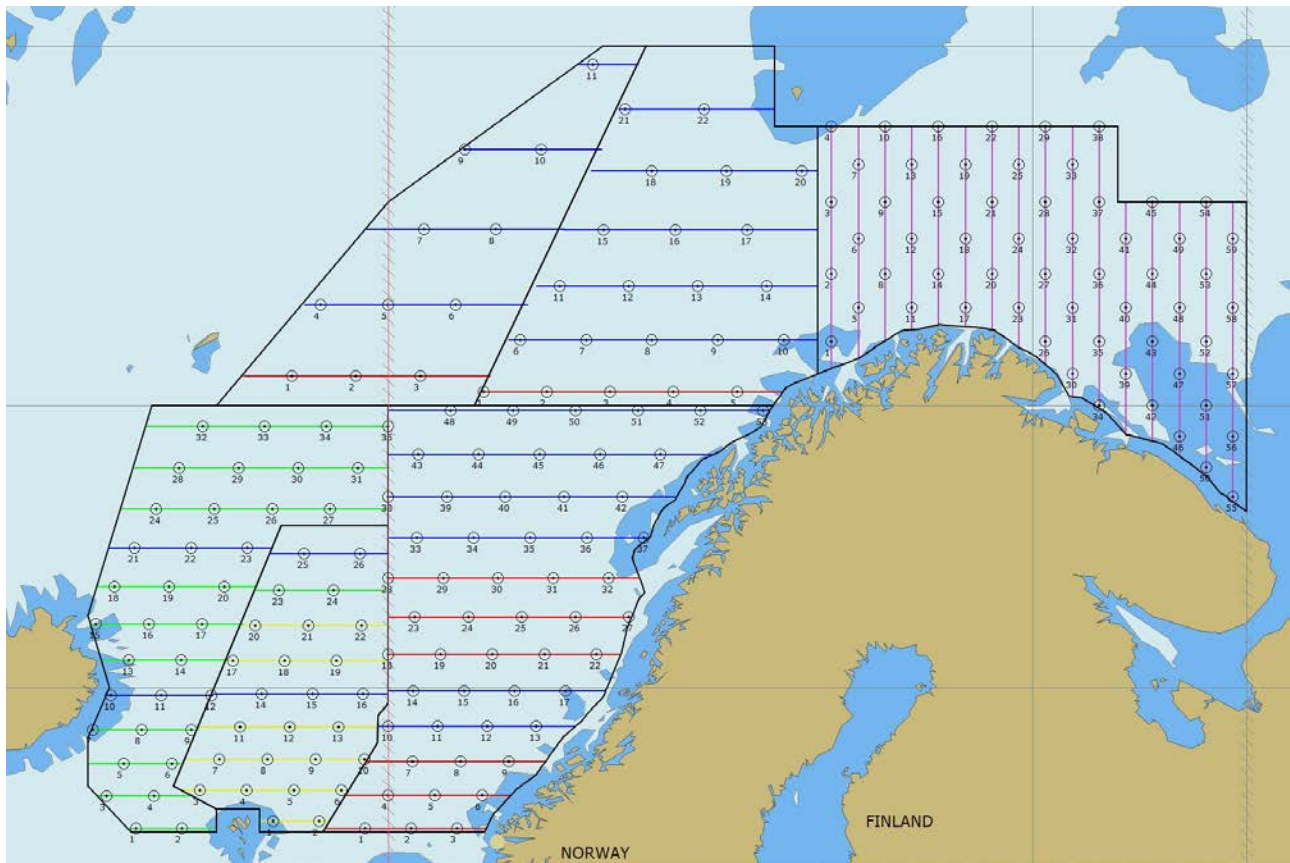


Figure 1. Cruiseplan for the International Ecosystem Survey in the Norwegian Sea in May-June 2017. The participating vessels were: *Árni Friðriksson* IS, *G.O. Sars* NO, *Dana* EU, *Magnus Heinason* FO and *Fridtjof Nansen* RU. *Magnus Heinason* covered the yellow transects in Faroese EEZ and into Icelandic and international waters.

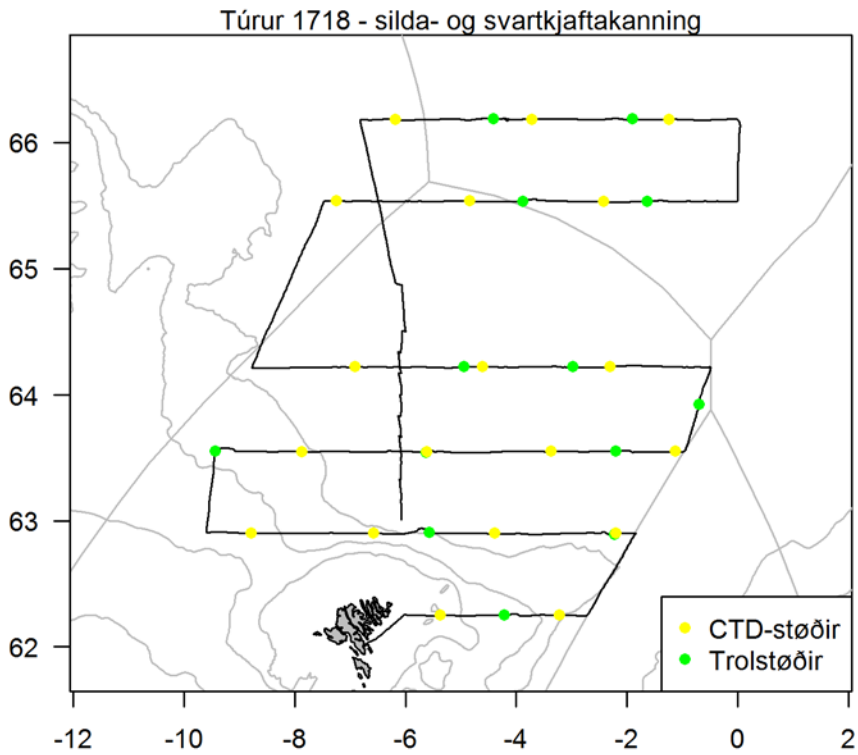


Figure 2. Cruise tracks with hydrographic stations (yellow circles) and trawl stations (green circles) north of the Faroes, *Magnus Heinason* cruise 1718, 4-15 May 2017. The total covered distance was 1650 nautical miles.

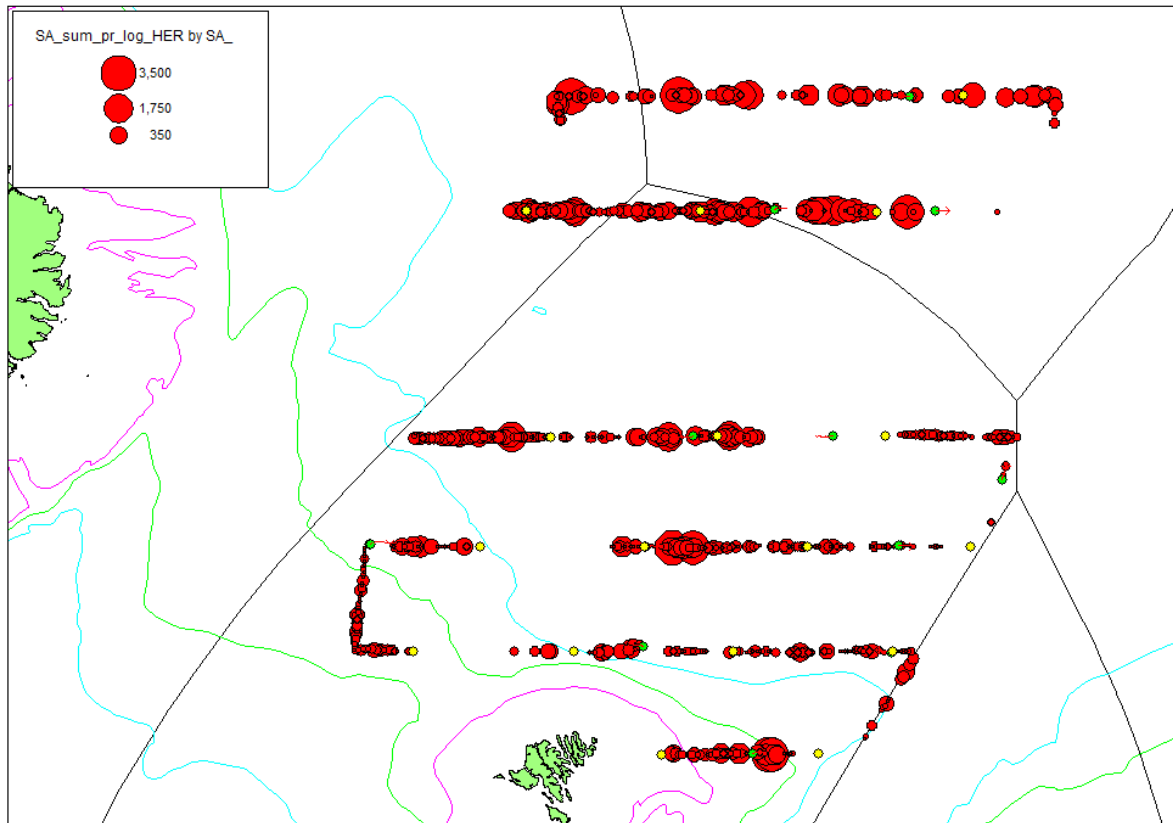


Figure 3. Integration values (s_A , m^2/nm^2) of Norwegian spring spawning herring* per each nm along the cruise tracks, *Magnus Heinason* cruise 1718, 4-15 May 2017. The size of the circles corresponds to amount of fish. *) On the three southernmost transects, trawl samples showed mixture of autumn and spring spawners, see text.

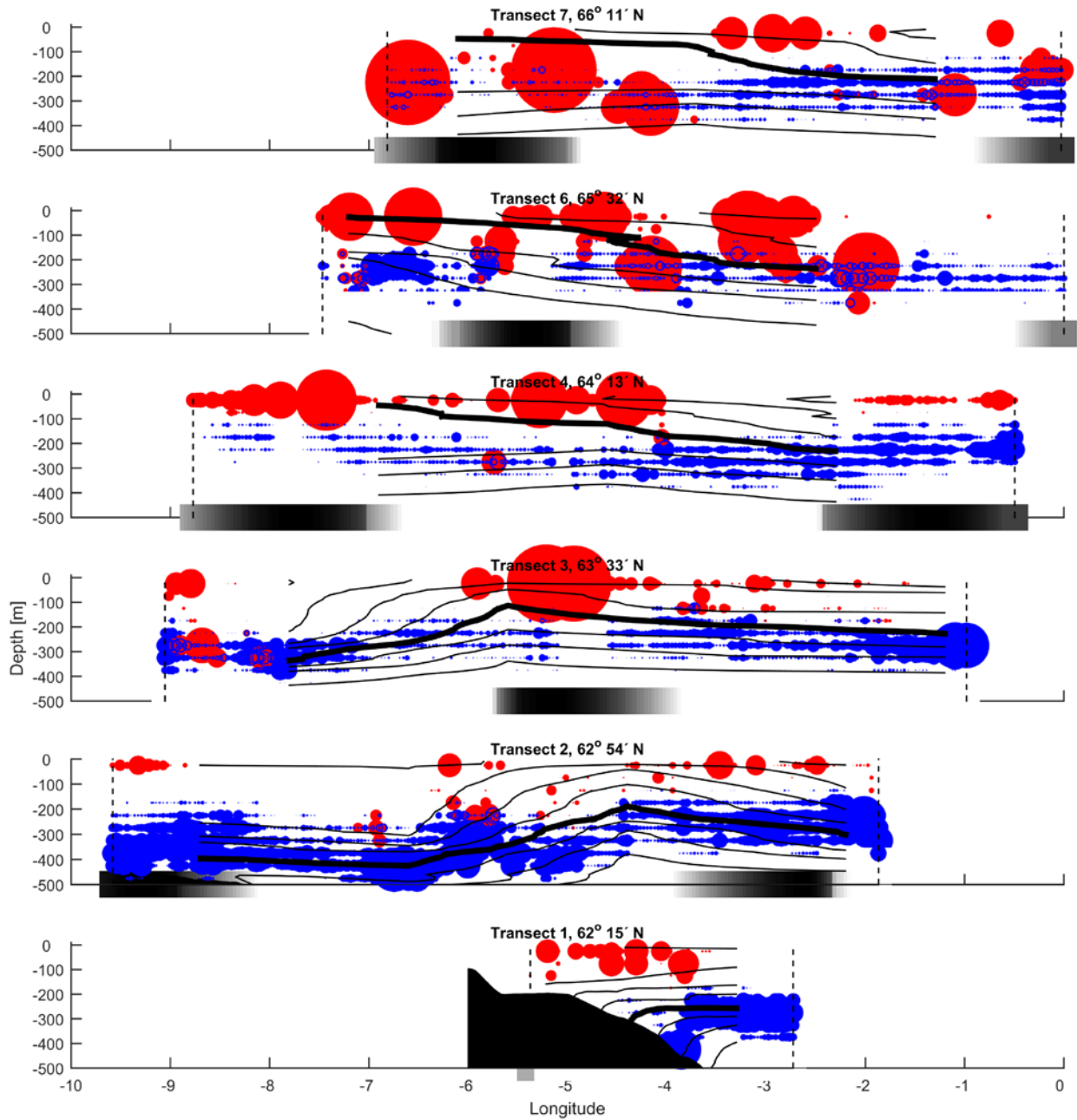


Figure 4. Vertical distribution of herring (red) and blue whiting (blue) per each nm along the cruise tracks, *Magnus Heinason* cruise 1718, 4-15 May 2017. The black contour lines are isotherms based on temperature casts, the 4°C isotherm is marked with a heavier line. Time of day is indicated at the bottom of each transect, showing the darkest hours in black.

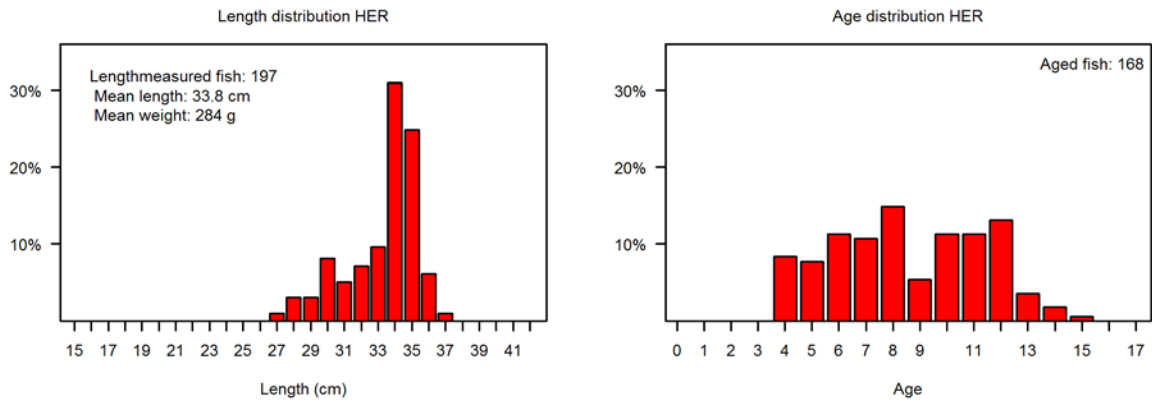


Figure 5. Length and age distribution of Norwegian spring spawning herring* north of the Faroes, *Magnus Heinason* cruise 1718, 4-15 May 2017. *) On the three southernmost transects, trawl samples showed mixture of autumn and spring spawners, see text – the age distribution is based on fish classified as spring spawners.

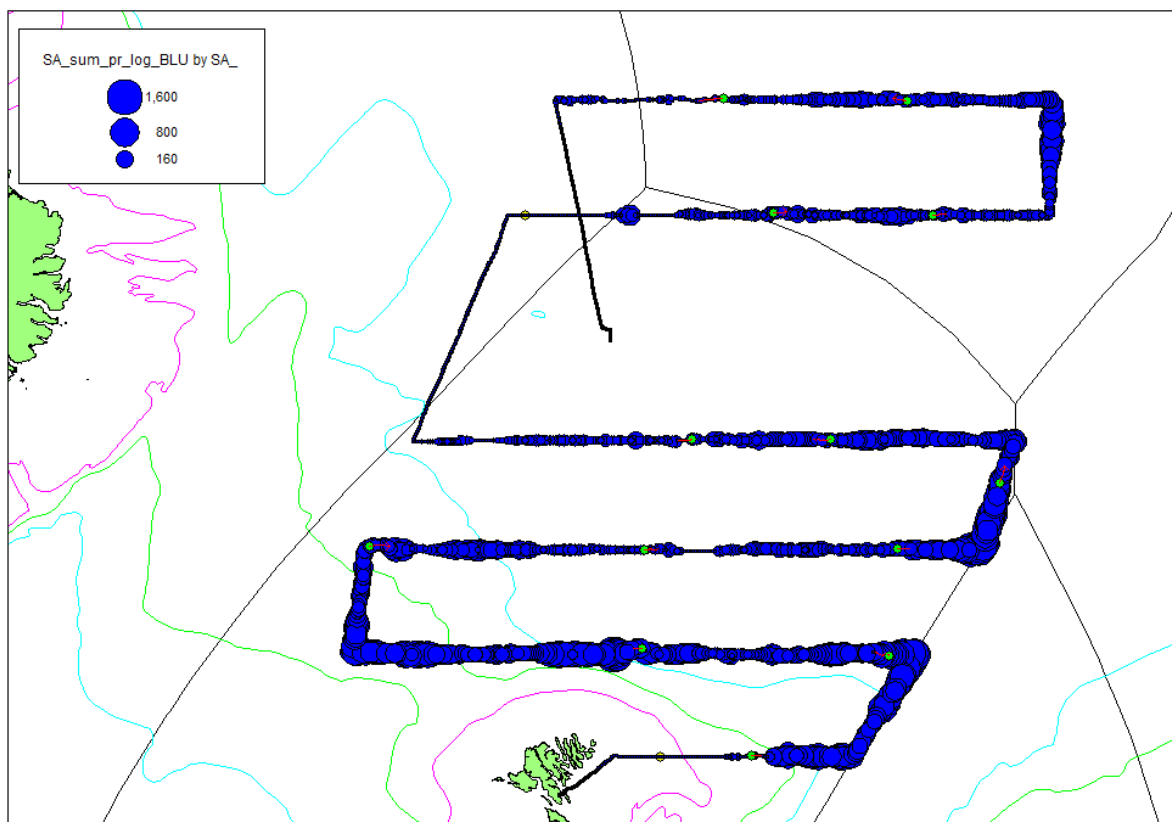


Figure 6. Integration values (s_A , m^2/nm^2) of blue whiting per each nm along the cruise tracks, *Magnus Heinason* cruise 1718, 4-15 May 2017. The size of the circles corresponds to amount of fish.

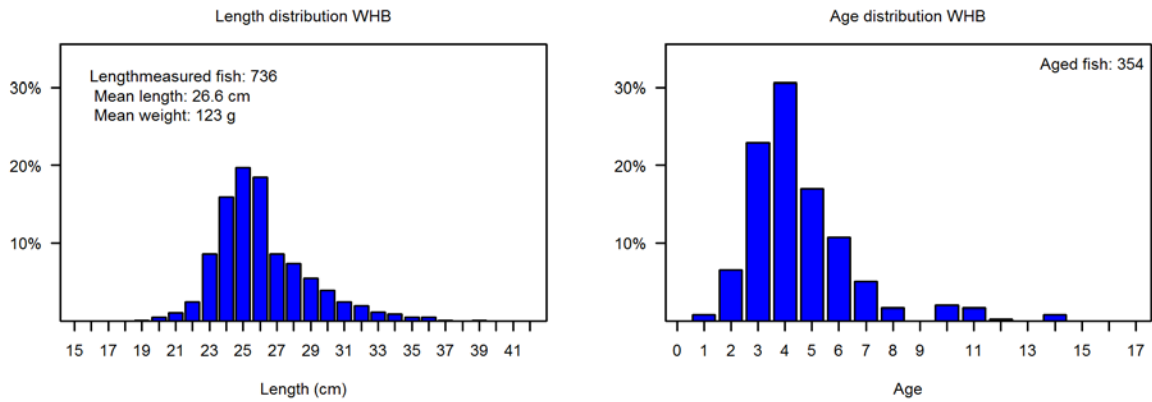


Figure 7. Length and age distribution of blue whiting north of the Faroes and in international waters, *Magnus Heinason* cruise 1718, 4-15 May 2017.

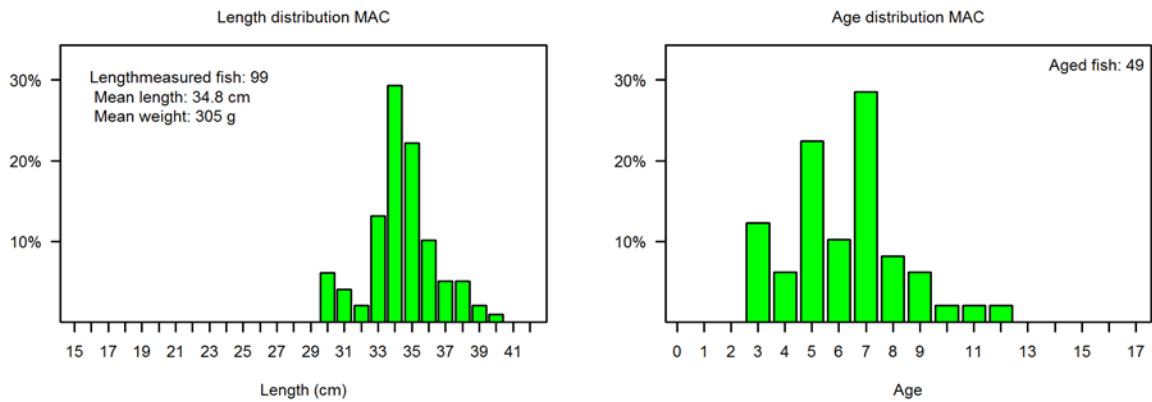


Figure 8. Length distribution of mackerel north of the Faroes, *Magnus Heinason* cruise 1718, 4-15 May 2017.

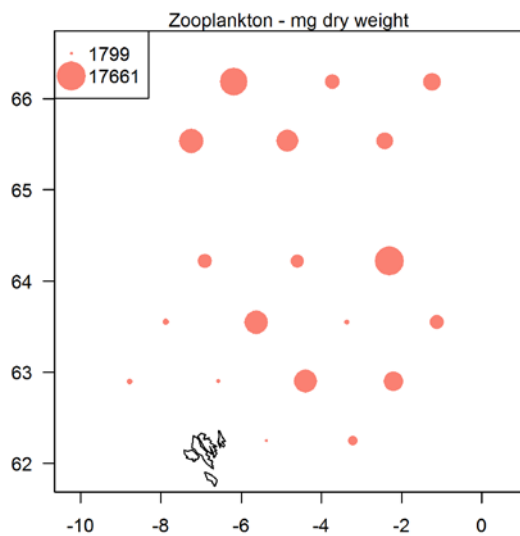


Figure 9. Distribution of zooplankton – WP2 samples, *Magnus Heinason* cruise 1718, 4-15 May 2017.