

CRUISE REPORT BY SÓLVÁ KÁRADÓTTIR ELIASEN

Cruise no. 1922

**Faroese part of MEGS 2019**

24 May – 4 June 2019

R/V Magnus Heinason OW2252

Participants:

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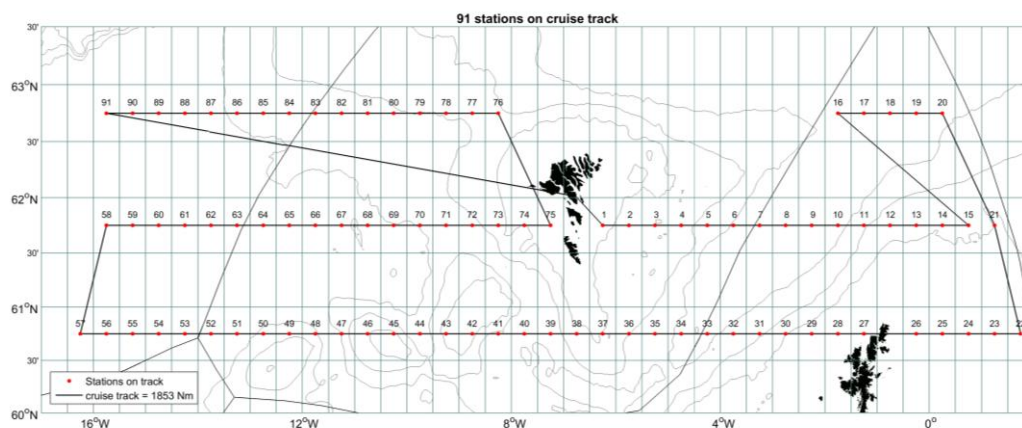
## INTRODUCTION

The MEGS survey is carried out every three years. In 2019 there were eight participating countries. Each of the eight participating countries covered a certain area in a certain period. The Faroe Islands were out in the period 23.May – 4.June.

The main aim of the cruise is to investigate the number of mackerel eggs. The preliminary area is assigned in the SISP 2019 manual, but as the results from cruises prior to the Faroese are ready, the area is always a subject to changes. The initial cruise track of R/V *Magnus Heinason* is shown in Figure 1 with 91 planned plankton stations.

In general, the first eight days of the cruise went as planned. On day eight there was a change in weather, and the remaining part of the cruise it was not possible to sample due to bad weather. Thus, only 62 of 91 planned stations were taken. Two trawl stations were both planned and taken.

The present survey report is based on data from R/V *Magnus Heinason* only. Therefore no estimate of mackerel spawning in general is given due to incomplete coverage of the distribution area and varying survey area among years.



**Figure 1 Original cruise plan of R/V *Magnus Heinason*.**

## MATERIAL AND METHODS

A Gulf VII plankton sampler with Hydro-Bios CTD and flowmeter was used to collect eggs, and pelagic trawl was used to collect biological data from adult mackerel. The sampling was carried out according to the SISP manual.

At the plankton stations, we were, in addition to the prescribed task in the SISP manual, asked to collect eggs to Matthias Kloppmann for genetic analysis.

For the adult sampling our task was to sample ovaries from 45 fish (a,b,c,d,e and f samples) and in addition to that, we aimed at sampling 100 ovaries to Thassya dos Santos Schmidt.

Trawl specifications for *Magnus Heinason*:

Circumference (m)	640
Vertical opening (m)	45–55
Mesh size in codend (mm)	40
Typical towing speed (kn)	3.0–3.5

## RESULTS

### EGG SAMPLING

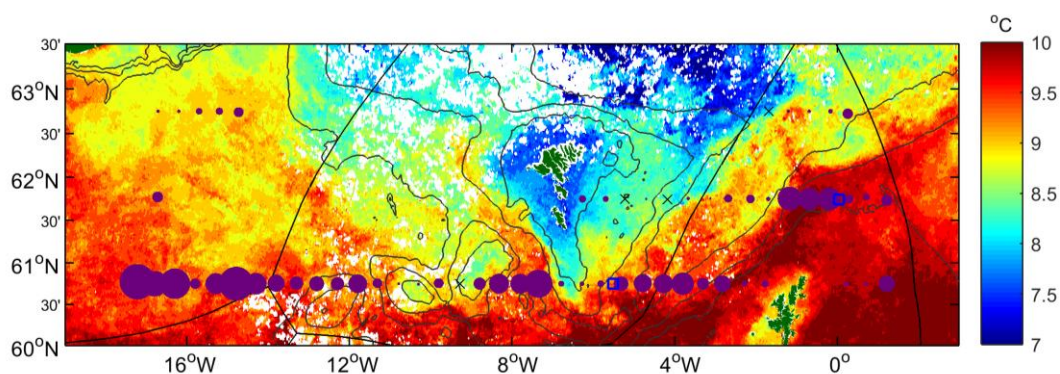
The Gulf VII sampler worked well in good weather and 62 plankton stations were taken and 3002 eggs caught and analyzed, see Figure 2-4. At the western end of the 60 45N line, mackerel eggs were still seen in the samples and it was decided to sample two more stations to the west, before turning north. Due to this additional westward sailing, it was decided to sample the remaining two lines (61 45N and 62 45N) simultaneously by doing a zig-zag sailing from one line to the other. However, this was never carried out due to bad weather.

Eggs were sorted in two groups: “mackerel” and “other”. In the staging, no distinction was made between stage Ia and Ib. An analysis of sizes of the eggs and the sea temperatures in which they were caught is shown in Figure 5-8.

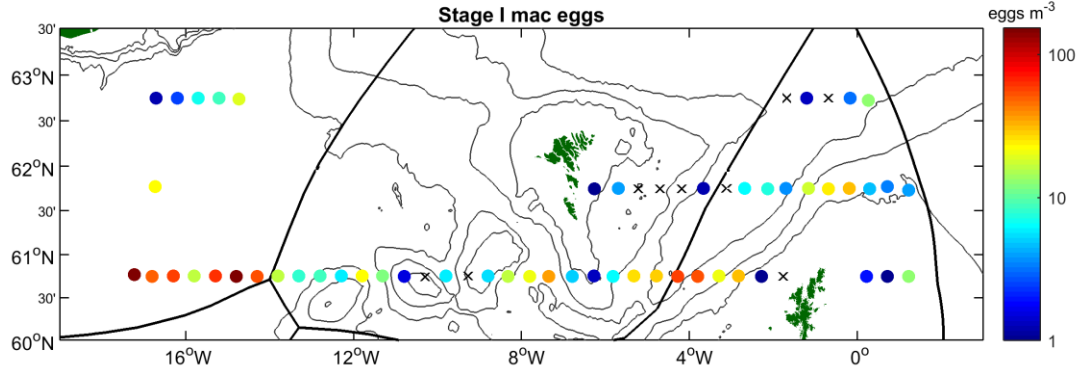
The excel datasheet with egg counts has been submitted to this year’s survey coordinator, Brendan O’Hea.

### EGGS FOR GENETIC ANALYSIS

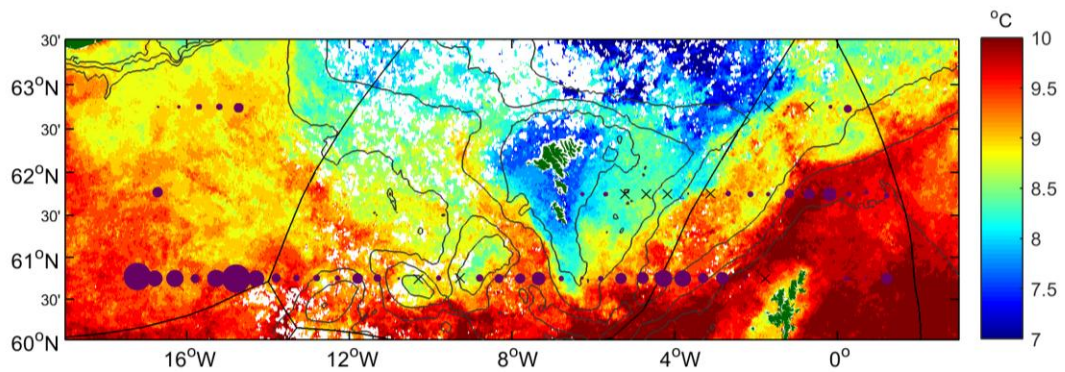
57 eggs were stored for genetic analysis and have been sent to Matthias Kloppmann. The first five of these were not included in the egg-counts, but the remaining 52 eggs were photographed before being stored in ethanol and have been included in the egg-counts.



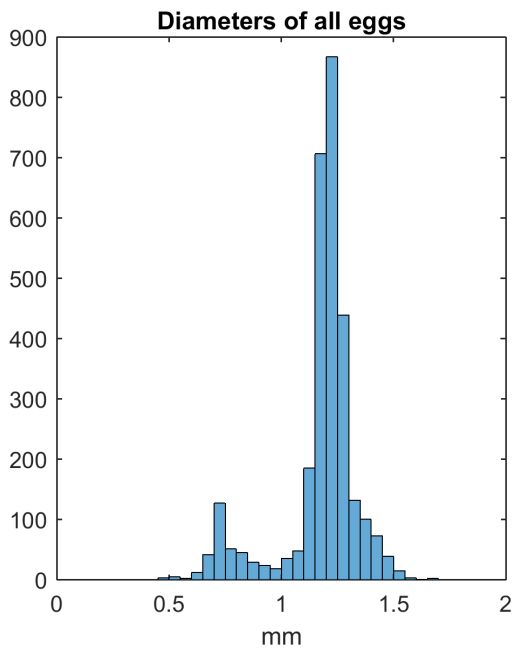
**Figure 2** Abundance of mackerel eggs (all stages) shown as size of circles. The largest circle corresponds to 240 eggs  $m^{-3}$ . “0 egg” is shown as an “x”. SST from based on remote sensing in the period 24.May – 4.June 2019 is shown in colours. Trawl stations are indicated by blue squares.



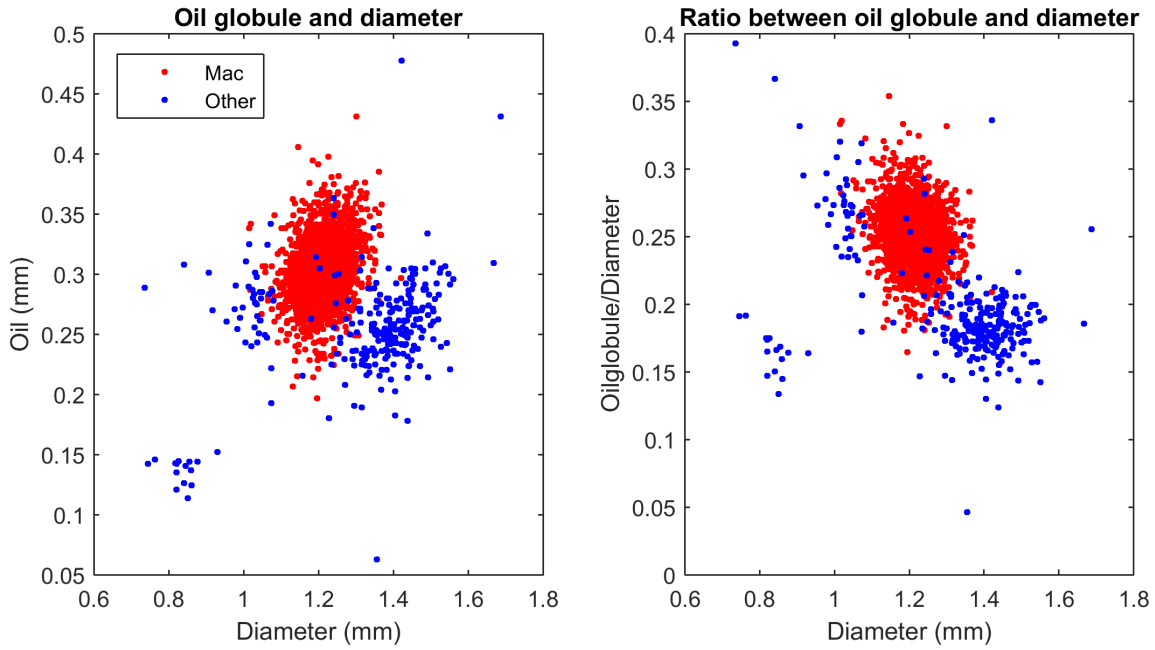
**Figure 3** Abundance of stage I mackerel eggs shown as colored circles. “0 egg” is shown as an “x”.



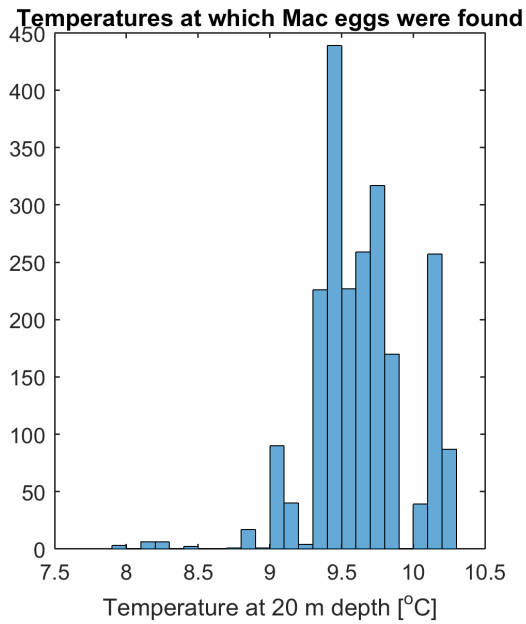
**Figure 4** Abundance of other eggs shown as size of circles. The largest circle corresponds to 134 eggs m<sup>-3</sup>. “0 egg” is shown as an “x”. SST from based on remote sensing in the period 24.May – 4.June 2019 is shown in colours.



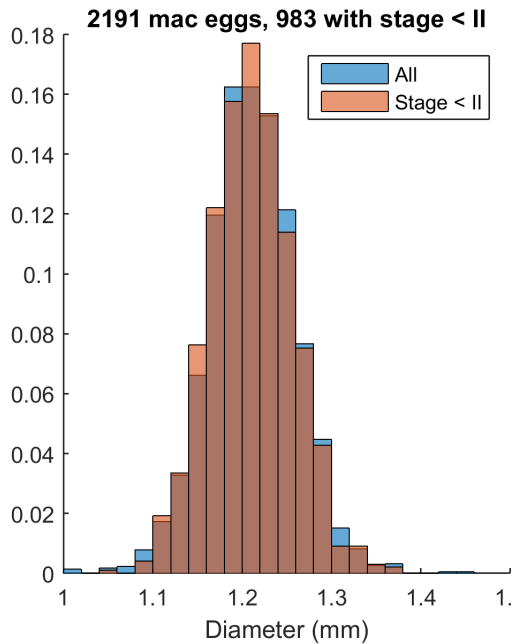
**Figure 5** Diameters of all 3002 eggs sampled on the 62 plankton stations



**Figure 6** Of the 3002 eggs found, 2434 had an oil globule. Of these, 2159 have been classified as mac eggs.



**Figure 7** Temperature at 20 m depth (as observed by the CTD) at stations where mac eggs were found.



**Figure 8 Size range of mackerel eggs.**

#### ADULT SAMPLING

Two trawl stations were taken on the cruise. On both stations the catch was a mix of herring and mackerel.

While sampling, the ovaries were weighed on board with a weight with a 1g precision (and not 0.1 g precision as it should be according to the manual).

#### *TRAWL STATION 19220016*

The position of this station is shown in the top panel in Figure 9. At this station we aimed at collecting 25 of the prescribed 45 ovaries. The catch was a mix of mackerel and herring and the caught mackerel was young, with a large proportion of un-mature fish.

#### **There were two mistakes in the handling of the catch on station 19220016:**

1. While both collecting 100 random fish, at the same time as making sure that there were equally many from four different weight categories with maturity 3-6, we got confused. In the end, we found 48 females of different sizes and thus, the sample was not done randomly from the catch!
2. It was not clear to us that we were supposed to measure and weight males, and thus, this was not carried out.

**Thus, neither the age, length and weight distribution of the catch is known, nor how large a fraction of the catch was males at station 19220016.**

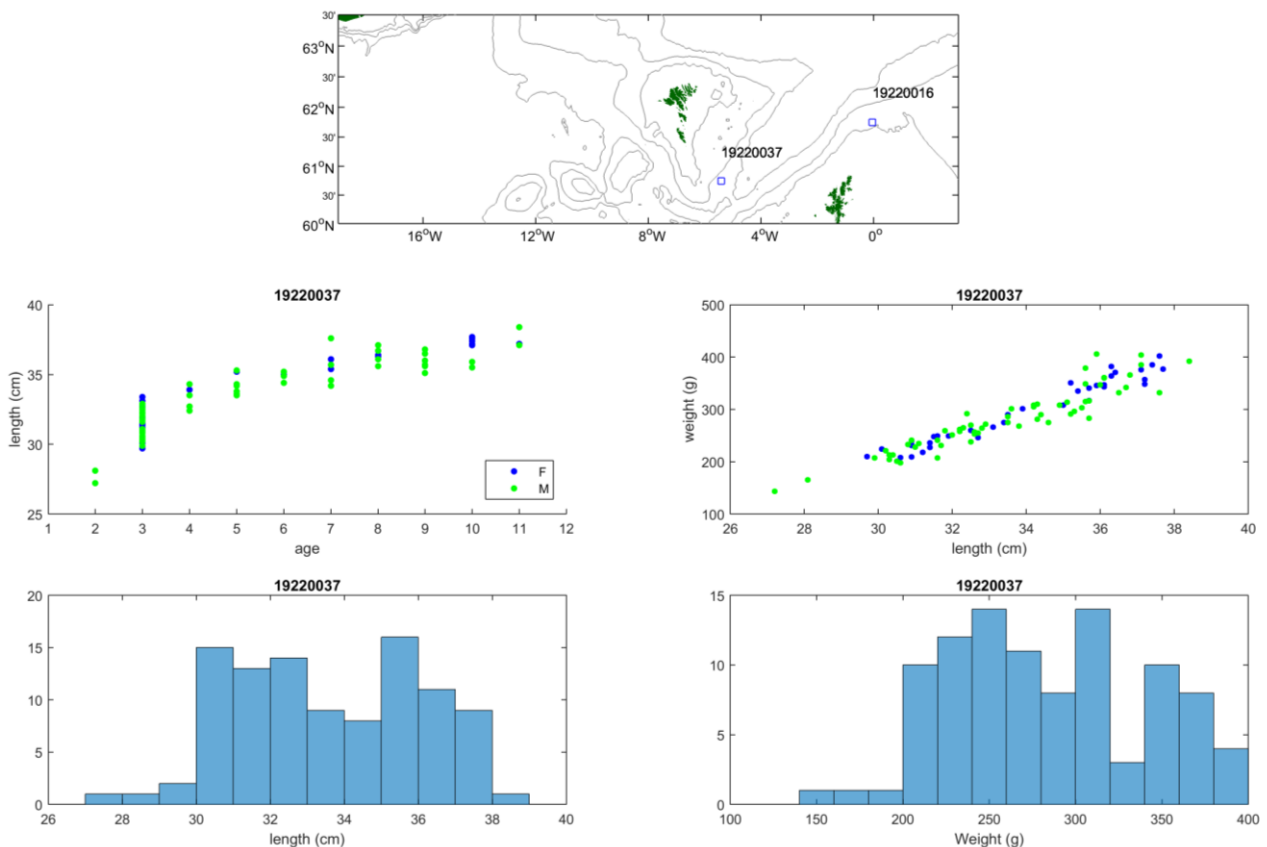
We collected 25 (a,b,c,d,e,f) ovary samples, although the e- and f-samples were carried out according to the 2016 manual. 48 fish were sampled for Thassya dos Santos Schmidt.

#### *TRAWL STATION 19220037*

At this station we aimed at collecting 20 of the 45 prescribed ovaries. The catch was a mix of mackerel and herring and 100 mackerels were randomly selected for length, weight and age measurement. As far as we are aware of, all sampling was carried out according to the SISP manual. The ratio between males and females at this station was 61 to 39 and the length, weight and age distribution is shown in Figure 9.

In addition to the 20 a,b,c,d,e and f-samples taken, 39 ovary samples were collected for *Thassya dos Santos* and one fish was used for ring-test.

The excel datasheet for adult sampling from both trawl stations has been submitted to the biological sample coordinator, Jens Ulleveit, and the samples have been sent to their respective recipients.



**Figure 9 Overview of results from trawl station 19220037. 100 mackerels were measured. Top panel: positions of the two trawl stations. Middle panels: age-length and length-weight relationships. Bottom panels: length and weight distributions.**