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## **Preliminary report on an Icelandic survey as part of the coordinated ecosystem survey with R/V Arni Fridriksson and M/V Hoffell in the Norwegian Sea in July-August 2009**

**Cruise report:** Survey number A9-2009 (Arni Fridriksson) and NYT2-2009 (Hoffell)

**Period:**

Arni Fridriksson; 4 August - 18 August

Hoffell; 18 August – 24 August

**Area:** Icelandic EEZ

**Main objective:** To study the abundance, spatial and temporal distribution and feeding ecology of the Northeast Atlantic mackerel.

**Methods.**

The R/V Arni Fridriksson surveyed the area from west to northeast Iceland. Trawl stations were worked at pre-selected positions with a distance of 25-40 nm between tows. The trawls used were a standard Salmon trawl and a small pelagic sampling trawl (WIDE BODY 500). The purpose was to use only the salmon trawl but as it was damaged twice after a relatively few tows it was inevitable to switch over to the WB 500 to complete the survey. The trawls were towed at a speed of approx. 5nm for 30 minutes at the surface. The opening of the Salmon trawl was 380m<sup>2</sup> and that of the salmon trawl 234m<sup>2</sup>. Hydrographic stations were worked at every second trawl station and on four standard hydrographic sections using SEABIRD CTD sensor with a water bottle rosette. Mackerel and herring catch at each station was sorted and weighed and otoliths and stomachs were sampled from mackerel (max. 15 otoliths and 10-15 stomachs) and in addition mackerel were measured, weighed, sexed and sexual maturation decided in 85 mackerel to fill a 100 in a sample. Also at each station with a catch max. 100 herring were measured, weighed, sexed and allocated to stock. The otoliths were stored for later age reading and the stomachs were frozen for future analyses of the contents.

Acoustic data were sampled continuously with Simrad EK60 scientific echosounders of 18, 38 and 200 kHz. A Kaijo Denki high frequency sonar was run throughout the survey.

The M/V Hoffell worked pre-determined trawl stations mainly off the north of Iceland using the same WB 500 trawl as Arni Fridriksson earlier in the month. The trawl was operated in the same way as done by Arni Fridriksson and the sampling methods of fish samples were the same. No hydrographic stations were worked on Hoffell.

Details about the trawls used:

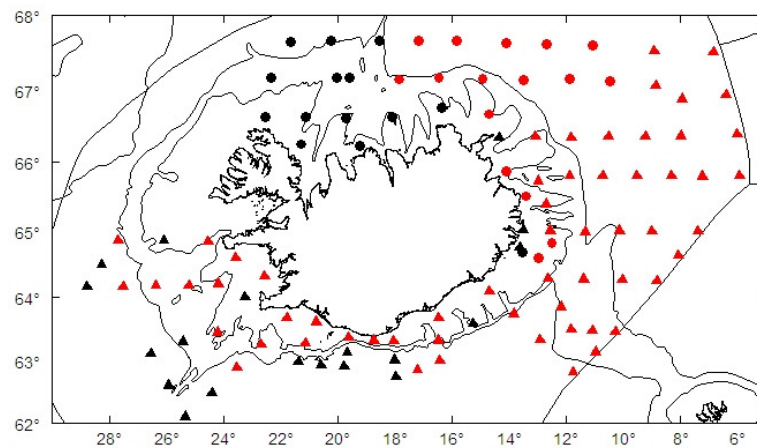
WIDE BODY trawl; opening was approx. **380 m<sup>2</sup>** (16.5 (15-18) x 23 (22-24))m

SALMON trawl; opening was approx. **234 m<sup>2</sup>** (13 X 18m)

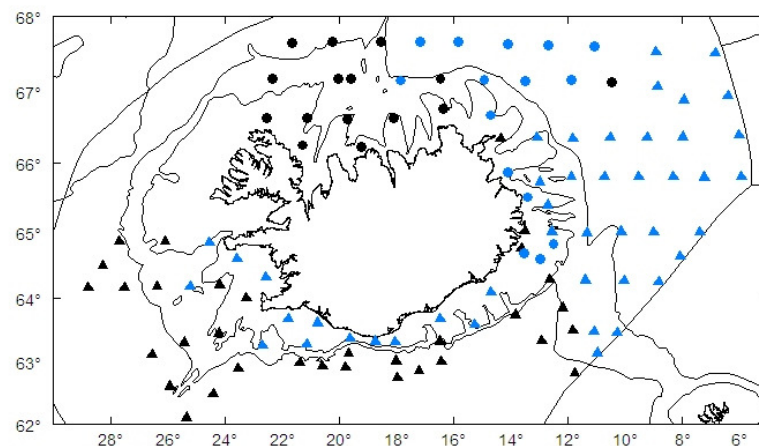
## Results

### Distribution of mackerel, herring and blue whiting

Mackerel was caught in the majority of tows except for the area off western North Iceland and similarly was the distribution of herring widespread. In figs. 1. and 2. is the survey area, the tows and the distribution of mackerel and herring shown.

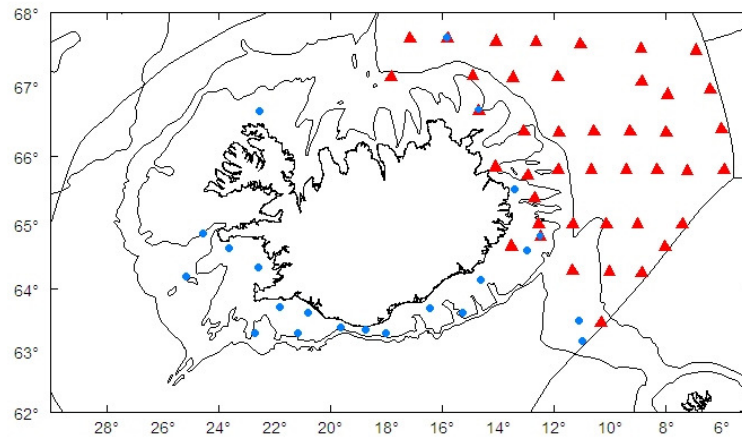


**Figure 1.** Mackerel distribution in the Icelandic area. Triangles = tows by Arni Fridriksson, circles = tows by Hoffell. Red = mackerel catch, black = no mackerel.

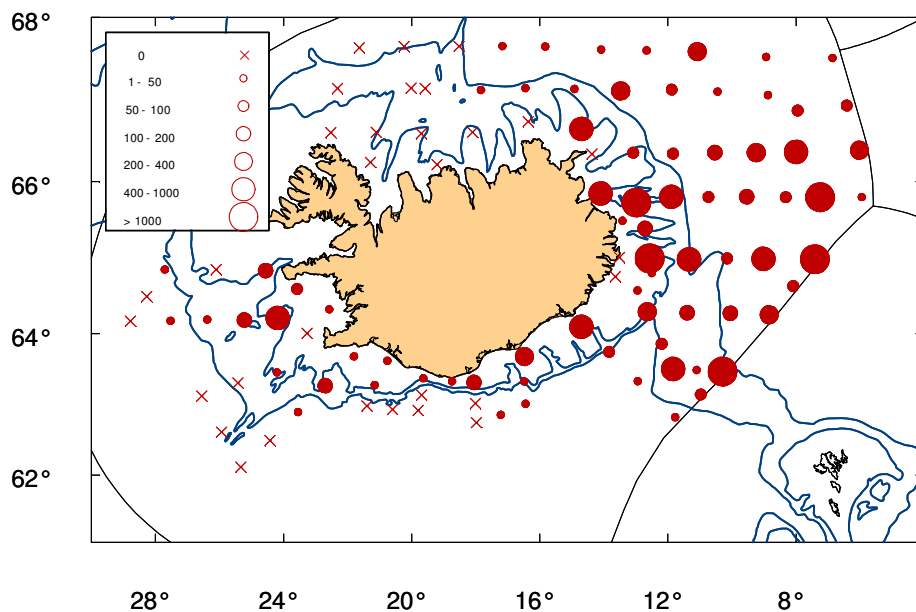


**Figure 2.** Herring distribution in the Icelandic area. Triangles = tows by Arni Fridriksson, circles = tows by Hoffell. Red = herring catch, black = no herring.

In figure 3 is shown the distribution of the Icelandic summer spawning herring (ISH) and the Norwegian spring spawning herring (NSSH). The ISH is mainly distributed to the west and south of Iceland over the shelf whereas the NSSH has both coastal- and oceanic distribution off the southeast, east and the northeast Iceland. Some mixing occurs mainly in coastal areas. The catch of mackerel at the different locations is given in Figure 4.

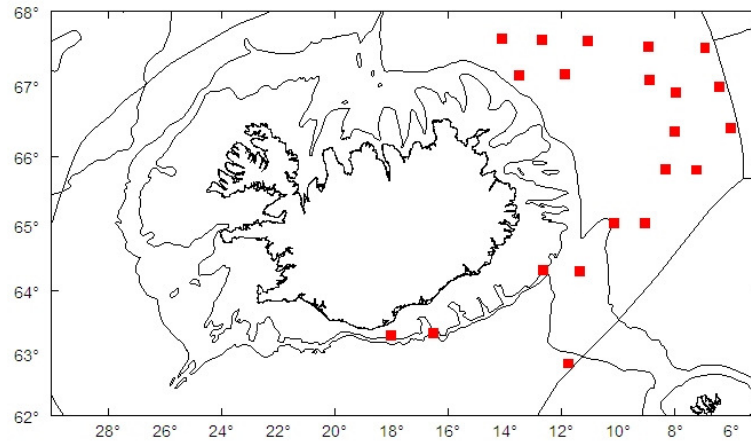


**Figure 3.** Distribution of ISH (blue circles) and NSSH (red triangles)



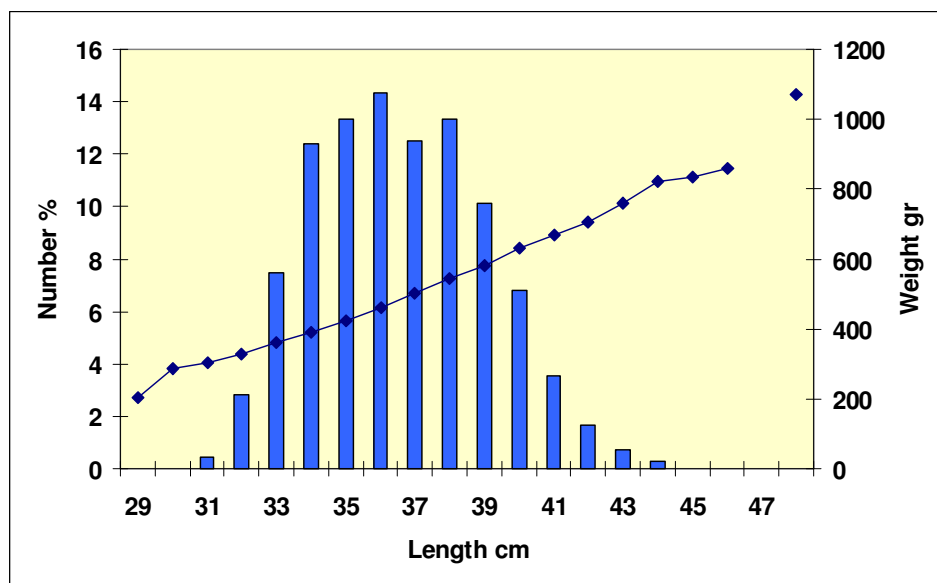
**Figure 4.** The catch (kg/hour) of mackerel in August 2009 on RV Arni Friðriksson and FV Hoffell. The data are not standardized according to trawl size.

In figure 5 is shown the distribution of blue whiting. The distribution of blue whiting was limited to the warmer waters in the Icelandic area but as only surface tows were worked that may have had considerable effect on the distribution as represented in the tows.



**Figure 5.** Distribution of blue whiting

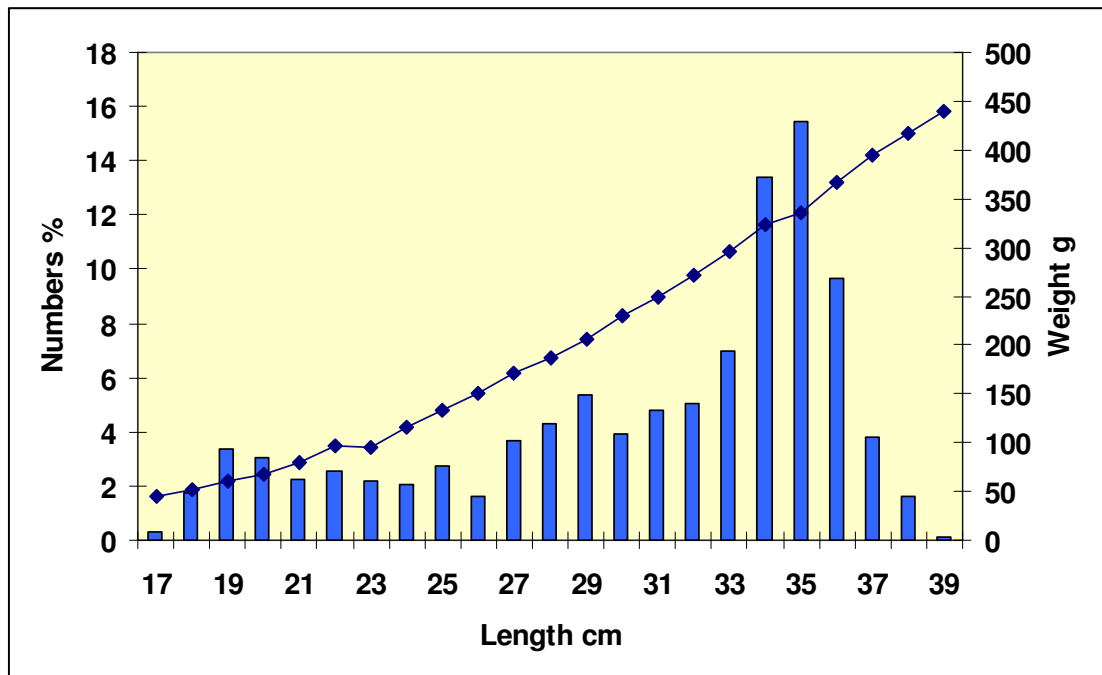
The mackerel caught in the survey ranged from 29-48 cm in length with the highest numbers ranging from 34-39 cm (Figure 6). The mean length was 36.58 cm. The weight distribution varied between 288 – 1071 g with a mean weight of 491 g.



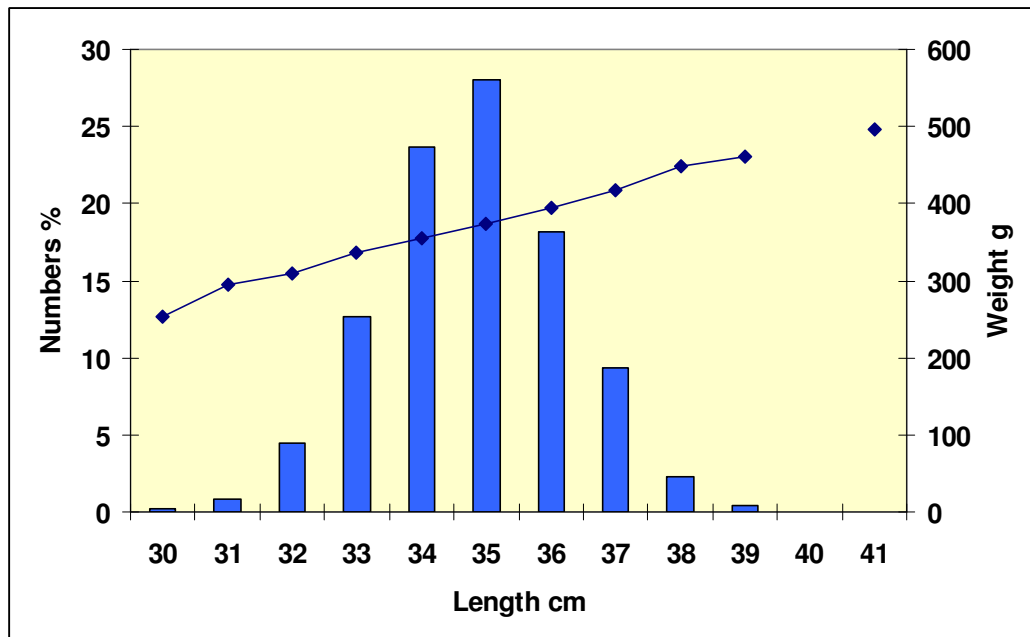
**Figure 6.** Total weight and length distribution of mackerel.

The length range of the ISH was from 17 – 39 cm and the weight distribution was from 41 – 464 g. In Figure 7 is shown the length and weight distribution of the ISH. As seen from the length distribution both immature and mature herring were caught. Of the mature part the greatest numbers ranged in length from 33-36 cm. The length and weight distribution of the NSSH is shown in Fig. 8. The length ranged from 30-41 cm and the weight from 224-538 cm. The mean length and weight were 34.79 cm and 371 g respectively. The most common length frequency was from 33-37 cm.

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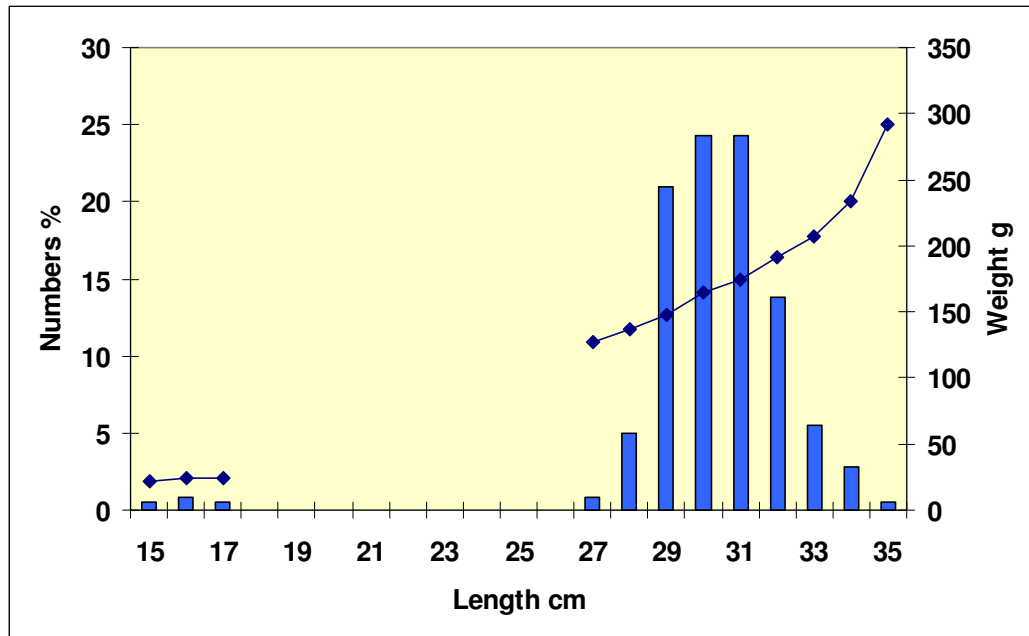


**Figure 7.** Length and weight distribution of ISH



**Figure 8.** Length and weight distribution of NSSH

The blue whiting caught in the survey ranged from 15-35 cm in length with the highest numbers ranging from 34-39 cm (Figure 9). The mean length was 30.21 cm. The weight distribution varied between 22 – 292 g with a mean weight of 168 g. Further processing of the fish data remains to be done.



**Figure 9.** Total length and weight distribution of blue whiting.

#### **Acoustic data**

The acoustic fish data collected during the cruise will be made available to Norwegian scientists for interpretation and processing.

#### **Hydrography**

R/V Bjarni Saemundsson was doing hydrographic work north of Iceland at the same time as this cruise was taking place. The hydrographic data collected by both vessels remain to be combined and processed.