Cruise Report

RV Walter Herwig
WH276

Irminger Sea, 10 June – 13 July 2005

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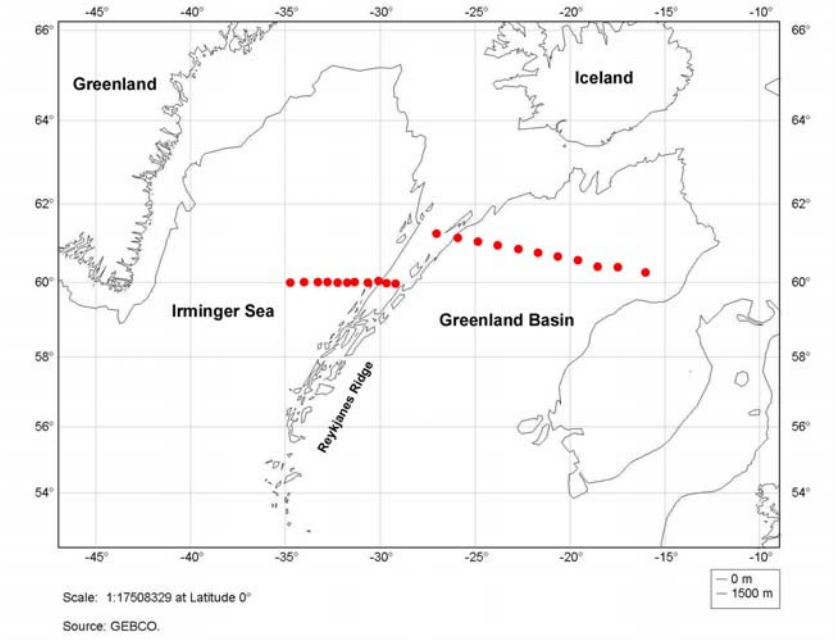
MAR-ECO zooplankton transect along 60 °N

During the international redfish-survey June/July 2005 German RV “Walther Herwig” could be additionally used to sample two MAR-zooplankton transects. Transect 1 was run on the outward bound leg, from the eastern Iceland basin to the summit of the Reykjanes Ridge, transect 2 was surveyed during the last two days of the redfish survey from the central Irminger Sea to and across the summit of the Ridge (see map in Fig. 1). The final stations above the Ridge differred by about 1.5 degrees of latitude, 16 days in time, and in spatial resolution (31 miles for transect 1, 12 to 20 miles for transect 2).



The field work was done by Hans-Christian John and Heino Fock (Hamburg), who are also in charge of investigating the fish larvae from these Multinet samples. Subsequent analysis of fish eggs and several invertebrate taxa will be done by Norwegian scientists. Just referring to fish, the survey is hoped to answer the following MAR-related questions:

1. Does the abundance and species composition of fish larvae differ between above and besides the MAR?
2. Do hydrographic fronts exist in the surface-near layers, which correlate with MAR-bottom topography, and perhaps differences in larval fish composition?
3. Cause fronts, or the MAR on its own, differences in larval fish vertical distribution, be it on community, or species-level?
4. Does larval fish transport relative to the MAR exist, or is the fish fauna of the MAR autochthonuous?

The Multinet, mouth 0.25 m², was equipped with 5 nets of 300 µm mesh-size. Hauls were made as oblique tows, and with a high average sampling speed of 1.8 m/s. The sampler was equipped with a ME-OTS CTD and lowered with closed nets down to 500 m depth, where the first net was opened. Nets 2 to 5 opened consecutively at 300m, 200 m, 100m, and 50m depth. Filtered areas, respectively volumes per step, were calculated from calibrated flowmeters in each net, blocking when the nets were closed. The samples were, on purpose, since low abundances of fish larvae had been anticipated, fairly large with an average area of 1.8

squaremeter (± 0.72m²). The samples were preserved in a buffered 4 % formaline/seawater solution.

First results:

Transect 1 resulted in a Multinet-failure at the first station due to winch breakdown. CTD-data from the upper 60 m could be retrieved with the sampler. All subsequent 10 stations for transct 1 and 11 hauls for transect 2 were successful.

During transect 1 the surface layer was found to be relatively warm (≤ 10 °C) and less saline (S≤ 35.1) all along the transect. Below the surface layer the thermal stratification increased towards west, becoming frontal at the eastern slope of the MAR (see Fig. 2). During transect 2, the surface layer became cooler and narrower from east to west. A frontal character again was revealed above the western slope of the MAR, both by almost vertically sloping isotherms and isohalines (see Fig. 3).

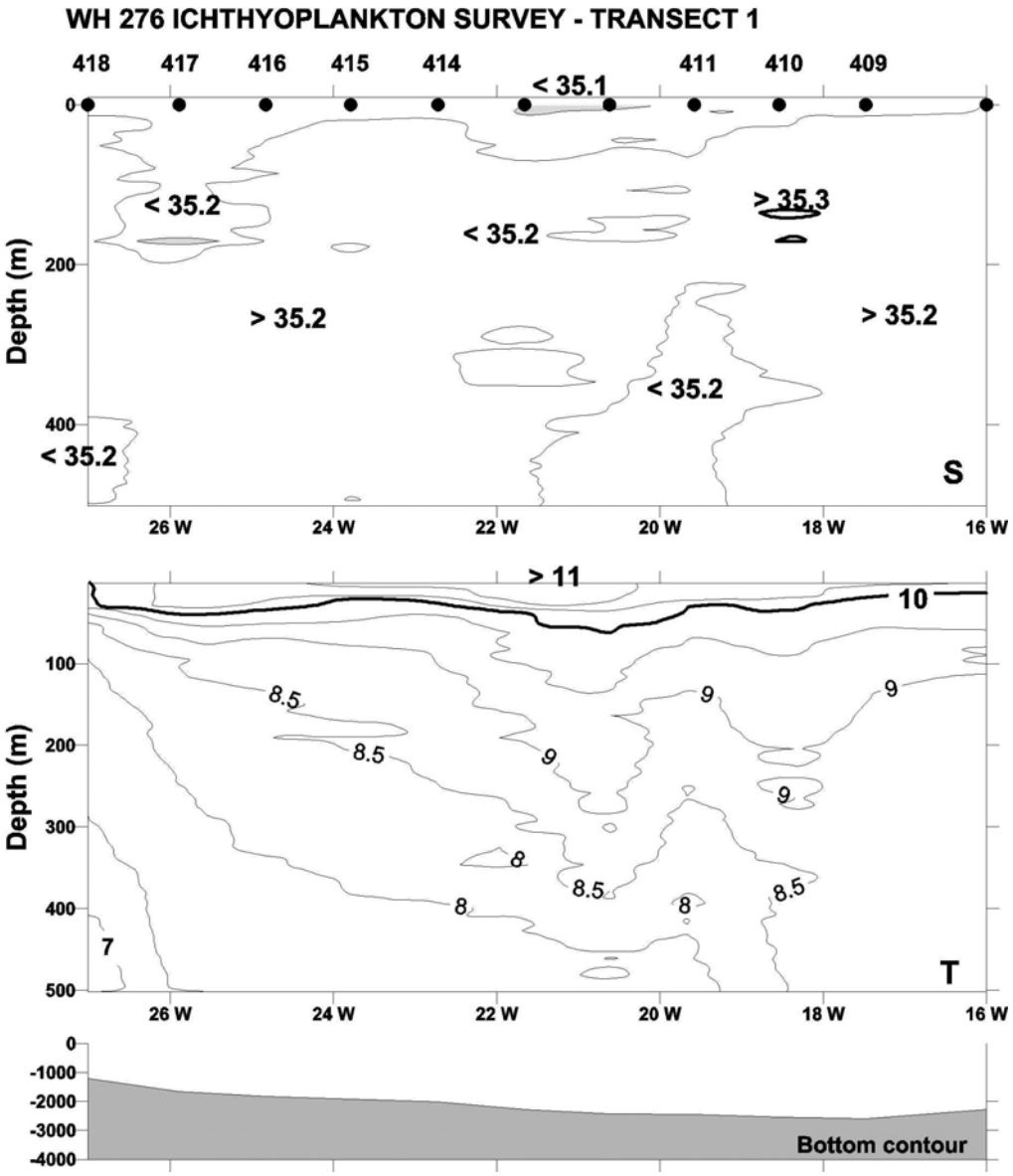


Fig. 2: Salinity (top), temperature (mid panel) and bottom profile along transect 1.

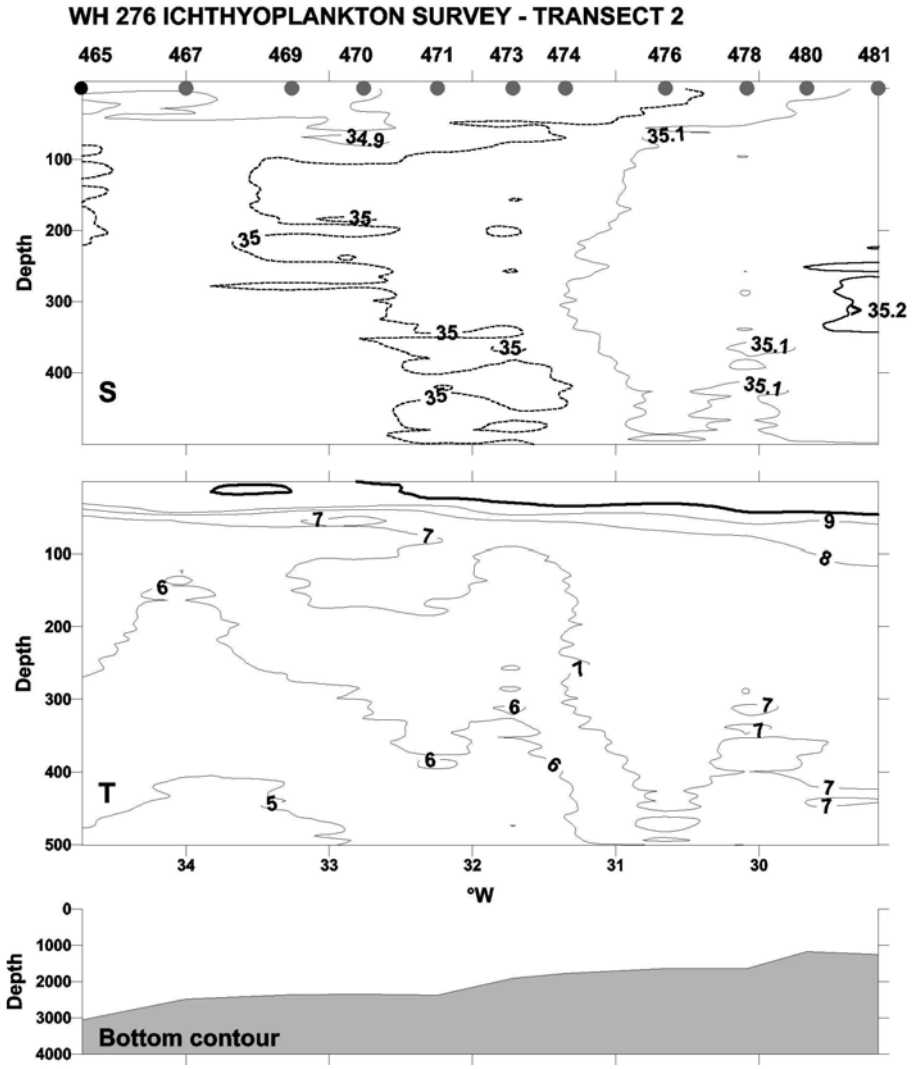


Fig. 3: Hydrography and bottom profile along transect 2 (as for Fig. 3).

At present, fish larval data are available only for transect 1. Above the Iceland Basin gross larval abundances oscillated between 60 and 100 larvae/1m². From the slope of the MAR onwards abundances decreased to minimum values on its summit (see Fig. 4). This figure shows also that the decrease in larval abundance was mostly on account of the deeper strata.

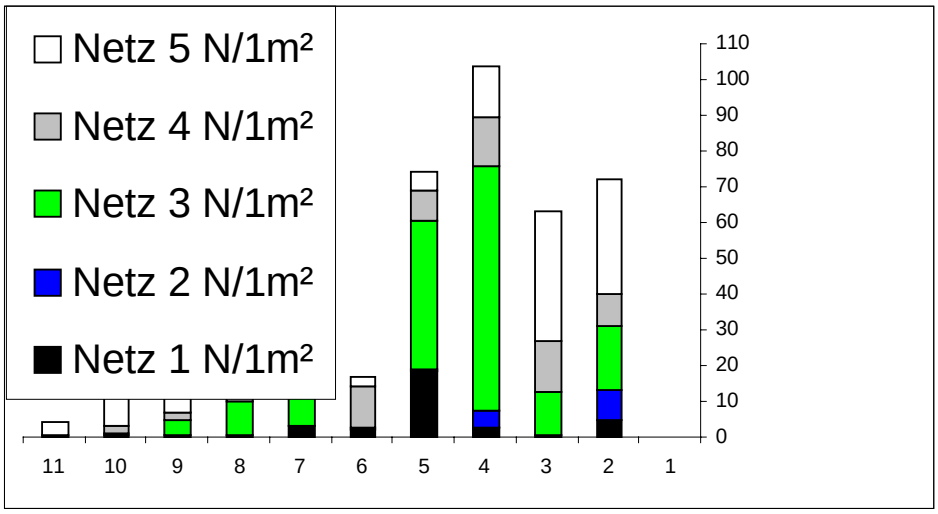


Figure 4: Gross abundances (N/1m²) of fish larvae per step along transect 1.

Dominating in these samples was lightfish *Maurolicus muelleri* with 84 % of the total catch. However, this generally deep distributed species became rare above the MAR, explaining most of the differences apparent in Fig. 4. We have so far identified 17 taxa. Above the Greenland Basin 3 to 5 taxa per station were found, above the MAR 3 to 9 species per station occurred, including some taxa not encountered in the Iceland Basin.