**Agri-Food and Biosciences Institute**
Agriculture, Food and Environmental Science Division
Fisheries and Aquatic Ecosystems Branch

**Cruise Report:** CO 4508
**Vessel:** RV *Corystes*
**Date:** 6th – 17th November 2008
**Area**: Irish Sea (north); ICES div. VIIa
**Survey Type**: Herring Larval Survey & Enhanced Irish Sea Herring Survey

**Personnel:**

| | | |
|---|---|---|
| S Beggs (SIC) | AFBI | 6 – 17 November |
| P McCorriston | AFBI | 6 – 17 November |
| J Peel | AFBI | 6 – 17 November |
| I McCausland | AFBI | 6 – 17 November |
| G Brady | AFBI | 6 – 17 November |
| G Marshall | AFBI | 6 – 17 November |

**Objectives:**

i. To estimate the production of larvae herring in the Irish Sea as part of the time series of biomass indices used in the ICES assessment.

ii. To collect and fix herring larvae for future growth studies

iii. To collect and fix plankton samples for recruitment studies

iv. To estimate the distribution, abundance and population structure of herring as part of enhanced Irish Sea herring survey

**Methods:**
A Gulf VII High Speed Plankton sampler was deployed at a series of fixed sampling stations shown ( Fig.1 ). The sampler was towed at between 3-5 knots passing steadily through the water column in a 'V' shape, i.e. forming a double oblique tow, the lowest point being ~3 -2 m above the sea bed. In shallow water (<25m) a double, double oblique tow was taken to ensure an adequate sample. Onboard sensors provide temperature, salinity and fluorescence depth profiles. Plankton samples were sorted onboard, with the herring larvae counted and measured to the nearest 0.1mm before being transferred to alcohol for preservation. Numbers of zooplankton predators (i.e. ctenophores) and large crustacea were also recorded. The remaining plankton sample was bottled and preserved in a 4% formaldehyde solution.

The acoustic survey was carried out using the hull mounted 38 kHz transducer and EK-60 echo sounder. A survey speed of 10 knots was maintained were possible. Acoustic data was collected in 15-minute intervals and archived using Echoview software. A thermosalinograph was run continuously to log surface temperature and salinity.

**Cruise Narrative:**
The vessel departed Belfast on the evening of the 6th November and headed directly for the first sampling station at the mouth of Belfast Lough. The Gulf VII sampler was deployed successfully and the vessel continued to the next station. Weather conditions further offshore proved changeling and sampling was suspended until daylight. A further station was sampled in the morning before the decision to return to Belfast was made. The vessel remained in port until the 11th November due to persistent gale force winds. Upon returning to sea the vessel made her way south along the eastern Irish coastline before heading west towards the Isle of Man and English coast. The larval survey was completed by the 14th November whereupon the enhanced acoustic survey commenced. The vessel completed the acoustic transect encompassing the Isle of Man and southern Scottish coastlines before returning to Belfast on the 17th November.

**Work Completed:**
A total of 62 stations were successfully sampled with the Gulf VII. From those samples a total of 1873 herring larvae were removed, identified and measured. Salinity, temperature, and depth profiles were recorded at each station using a seabird CTD system attached to the frame of the Gulf VII. Acoustic data were recorded from the enhanced herring survey. A thermosalinograph was run continuously during this part of the survey to log surface temperature and salinity.

**Preliminary Results:**
As in previous years herring larvae were found to be most abundant to the north east of the Isle of Man and Douglas Bank spawning ground (Fig.1). In common with more recent years a number of larvae were also caught in the region of the Mourne ground suggesting spawning activity in this area. The point estimate of production in the north eastern Irish Sea, used as an indicator of spawning stock biomass in the assessment of Irish Sea herring, was 1.68 x $10^{12}$ (Fig. 2).

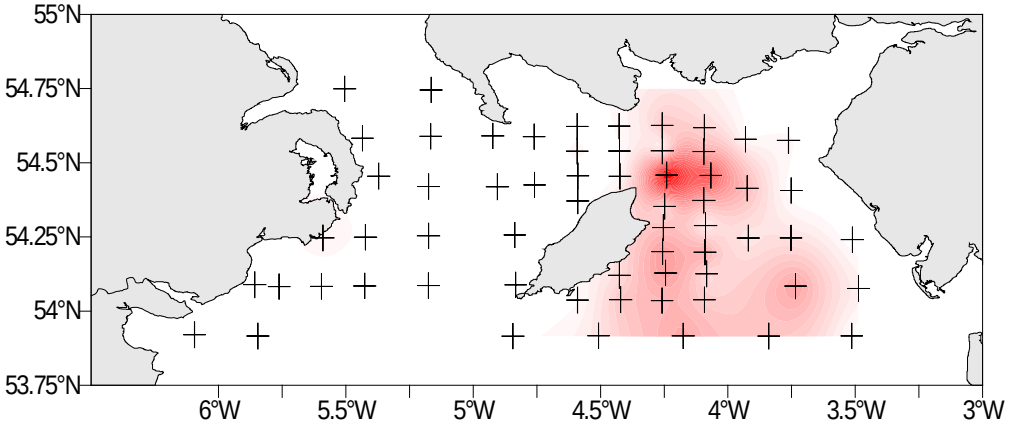


**Figure 1**. Spatial distribution of abundance of larval herring ( no. m² ) on CO4508. Areas of shading are proportional to larva abundance ( maximum = 71.01 per m² ).

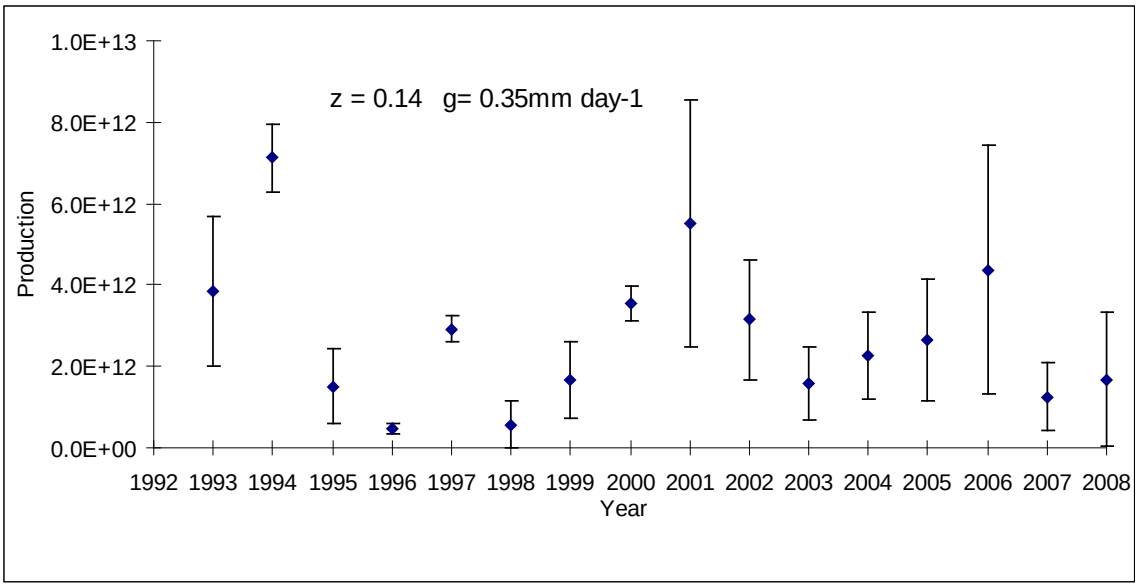


**Figure 2.** Estimates of larval herring production in the NE Irish Sea from 1993 to 2008. Error bars denote 1 standard error in the estimation of abundance.

**Acknowledgments:**
The Master and Crew of *RV Corystes* are thanked for their assistance and cooperation in ensuring the successful completion of the survey. The scientific staff are commended for their thorough and efficient work throughout the survey and general good humour and teamwork which was crucial to the successful completion of the survey.
Signed:

Scientist in charge ( SIC )……..date ……

Head, AESD Aquatic Systems…… date ……

Master ( seen in draft )……