AGRI-FOOD and BIOSCIENCES INSTITUTE (NI)
Agriculture Food and Environmental Science Division
(Fisheries and Aquatic Systems Branch)

Cruise Report: CO 4506
Vessel: RV *Corystes*
Date: 6th – 10th November 2006
Area: Irish Sea (north); ICES div. VIIa
Survey Type: Irish Sea Herring Larval Survey

Personnel:

S Beggs (SIC)	AFBI	6 – 10 November
G Foster	AFBI	6 – 10 November
P McCorriston	AFBI	6 – 10 November
J Peel	AFBI	6 – 10 November
I McCausland	AFBI	6 – 10 November
R Gilmore	AFBI	6 – 10 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.

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 for a total tow duration of ~15mins. The sampler was deployed in a 'V' shape, i.e. forming a double oblique tow, the lowest point of which was ~3m above the sea bed. In very shallow water a double oblique tow was taken to ensure that enough water was sampled. Onboard sensors also provided temperature, salinity and fluorescence depth profiles. Plankton samples were sorted onboard, with the herring larvae being 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 4% formaldehyde solution for future analysis.

Cruise Narrative:
The vessel departed Belfast at 20:30 on Monday 6th November and headed for the mouth of Belfast Lough and the first sampling station. After a safety briefing the survey began immediately at station 1. The vessel then proceeded in an easterly direction to survey the eastern Irish Sea and Douglas Bank area before returning to Belfast via the western Irish Sea and County Down coastline. Weather during the survey remained good to moderate allowing the sampling to be completed quickly and without incident. All stations were sampled successfully and the vessel returned to Belfast Lough in the early hours of Friday morning.

Work Completed:
All 65 stations were successfully sampled with a total volume of 10.75^6 litres of water filtered. A total of 6511 herring larvae were caught and subsequently measured to the nearest 0.1mm. Temperature, salinity and chlorophyll *a* fluorescence depth profiles were recorded at each station using the PRONET system. Station 23.2 was sampled twice to reduce the variance in the data set as the first haul captured 1172 herring larvae, while a second haul captured 445 larvae. The average of these was taken to represent the abundance of herring larvae at this station.

Preliminary Results:
Herring larvae were found to be most abundant to the south east and north of the Isle of Man (Fig. 1) and significantly less abundant in the western Irish Sea. This distribution is similar to that observed from previous years. The point estimate of production in the north eastern Irish Sea for 2006 was 4.38×10^{12}, which is above the series average of 2.94×10^{12} larvae (Fig. 2). This is the third highest production estimate in the time series. However the associated estimation error was high at 70%. Mean sea surface temperatures (°C) in the north eastern Irish Sea during 2006 were the highest in the time series and over 1°C higher than the series average. The estimated date of mean spawning fell on the 30th September which matches the mean for the time series (Fig. 3).

Acknowledgements:
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)……

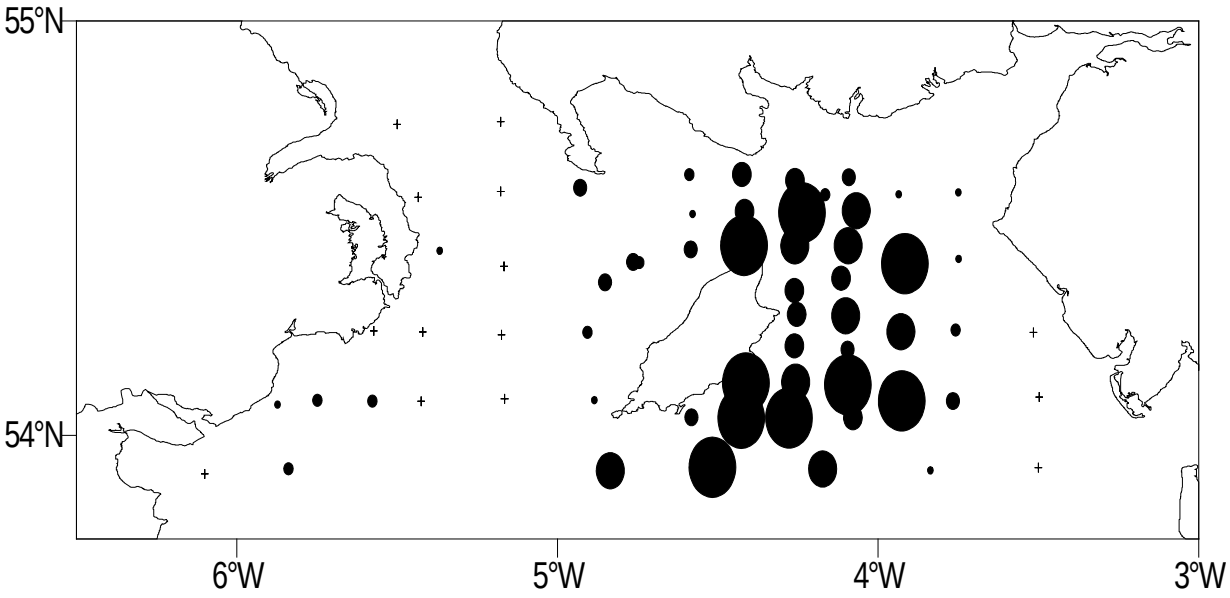

Figure 1. Stations sampled and the abundance of larval herring (no. m²) on CO4506. Areas of circles are proportional to larva abundance (maximum = 188.09 per m²).

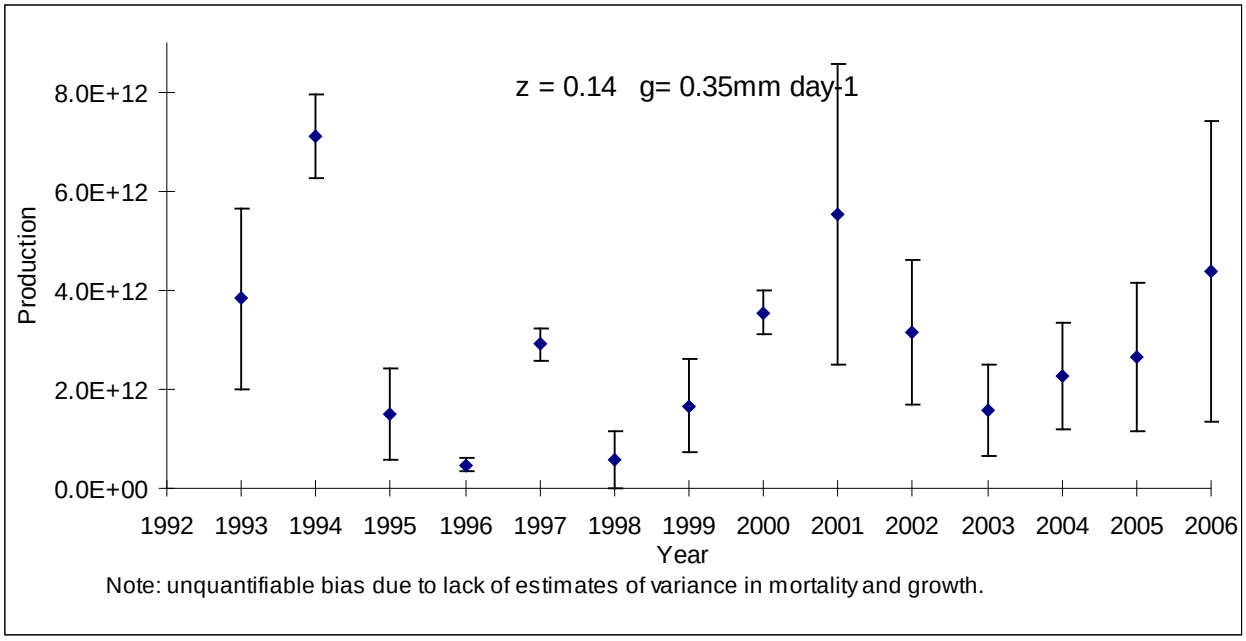

Figure 2. Estimates of larval herring production in the NE Irish Sea from 1993 to 2006. Error bars denote 1 standard error in the estimation of abundance. * Note: Production estimate for 2005 has been amended.

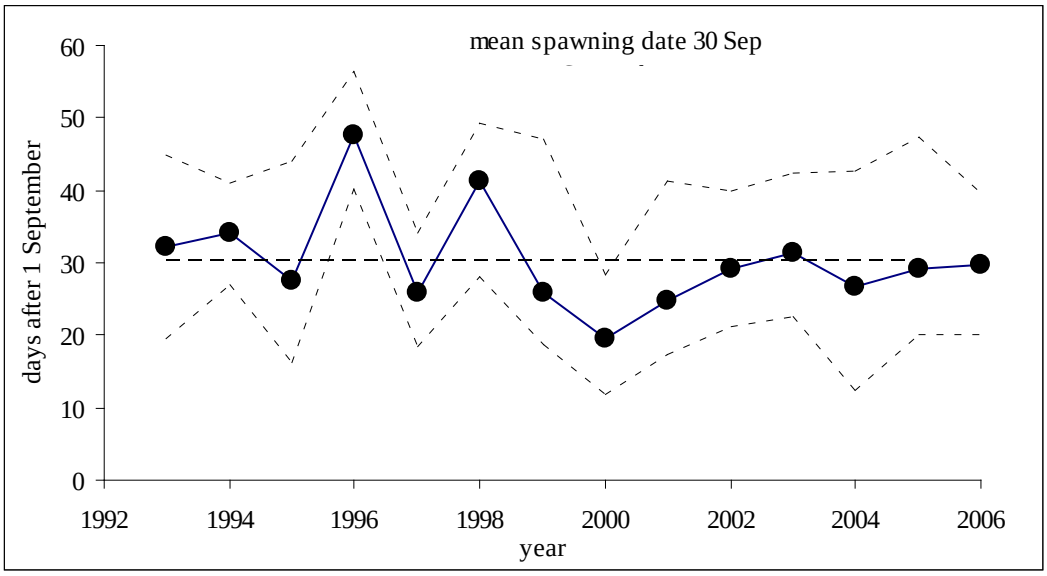

Figure 3. Mean spawning date of north eastern Irish Sea herring, estimated from larval herring abundances. Dotted lines denote the period over which 90% of the larvae caught during the survey were produced.