



**Cruise Report:** CO 2207

**Vessel:** RV *Corystes*

**Date:** 28<sup>th</sup> May – 15<sup>th</sup> June 2007

**Area:** Irish Sea (north); ICES div. VIIa

**Survey Type:** Gulf VII & MIK Net Juvenile Gadoid Survey / Mooring Service

**Personnel:**

S Beggs (SIC)	AFBI	28 May – 15 June
P McCorrison	AFBI	28 May – 15 June
I McCausland	AFBI	28 May – 15 June
B Stewart	AFBI	10 June – 15 June
R Gilmore	AFBI	10 June – 15 June
G Brady	AFBI	28 May – 8 June
G Marshall	AFBI	28 May – 1 June
P Irvine	AFBI	3 June – 8 June
M Lilley	Univ. Of Swansea	28 May – 15 June

**Objectives:**

- i. To investigate the distribution and abundance of juvenile gadoids in the Irish Sea (VIIaN).
- ii. To collect and preserve juvenile fish for future otolith analysis.
- iii. To maintain and service the Irish Sea insitu monitoring programme at open sea station 38A.

**Methods:**

A grid of stations were sampled during daylight hours with a Gulf VII plankton sampler fitted with 280µm mesh (Figure 1a). The sampler was deployed in a “V” shaped dive profile. Environmental data was uploaded during the dive via the data logging system PRO-NET, providing vertical profiles of water temperature, salinity and fluorescence. Plankton samples collected were examined for fish larvae, crustaceans and gelatinous organisms. Gelatinous organisms and crustaceans were identified, weighed and enumerated before being discarded. Fish larvae were identified to species where possible, before being stored in alcohol. The sorted plankton sample was bottled and 4% formaldehyde added for storage purposes.

During the hours between sunset and sunrise the MIK net was deployed. A Scanmar depth sensor unit was used to monitor the “V” shaped deployment of the MIK net. The resulting catch was sorted and all gelatinous organisms, crustaceans and fish identified, weighed and enumerated. Fish larvae and juveniles were measured to the nearest 0.1mmTL and stored in alcohol for future

research. During the 3<sup>rd</sup> week of the survey the routine servicing of the offshore mooring buoy took place.

### **Cruise Narrative:**

The R.V. Corystes left Belfast docks at 19:00 on the 28th May 2007. A short stop was made in Belfast Lough while the Scanmar depth sensor was calibrated, before continuing to the first MIK net station. Sampling began shortly after midnight and continued throughout the night. At sunrise the Gulf VII sampler was deployed whereupon a communication problem between the sampler and PRO-NET system became apparent. This problem persisted throughout the survey despite the efforts of the scientific personnel to locate and rectify it. As a substitute and back-up for the PRO-NET system a mechanical flowmeter was attached to the Gulf VII to calculate internal water volumes filtered. Due to the communication problems physical data was only recorded from the top 50m of the water column. During the first week of the survey a total of 24 MIK and 34 Gulf VII deployments were made. The R.V. Corystes returned to Belfast early on the morning of Friday 1<sup>st</sup> June, and attempts were made to correct the problems encountered with the Gulf VII sampler.

The second week of the survey saw the R.V. Corystes leaving Belfast Docks and heading directly for the eastern Irish Sea, where a total of 29 MIK and 53 Gulf VII stations were successfully sampled. These provided complete spatial coverage of the eastern Irish Sea. Due to the high presence of algal material in the water column the nose cone diameter was reduced on the Gulf VII sampler. Despite this action clogging of the 280 µm mesh net presented a problem. The R.V. Corystes returned to Belfast Docks on the morning of Friday 8th June.

The final week of the survey took place in the western Irish Sea area. Problems with the data communication from the Gulf VII again arose in the deeper stations (>46m). The offshore mooring buoy was successfully recovered, serviced and redeployed during Monday morning and early afternoon. Sampling with the Gulf VII and MIK continued until Thursday when poor weather suspended operations. The vessel held position in region of the remaining MIK stations awaiting a lull in conditions. With a continuation of the strong winds forecasted the decision was made to return to Belfast. The R.V. Corystes docked in Belfast on Friday morning.

### **Work Completed:**

A total of 77 MIK and 121 Gulf VII deployments were completed during the 3 week survey (Figures 1a-1c). Physical data was collected at each Gulf VII station and biological samples preserved for future analysis. The offshore mooring buoy was successfully serviced and redeployed. A PhD student studying jellyfish provided specialised knowledge on the identification of these animals and undertook various observations throughout the Irish Sea as part of his research. Marine cetaceans and basking sharks were observed during the survey and their positions noted.

### **Preliminary Results:**

From the MIK net data the annual juvenile gadoid abundance index was calculated for whiting, haddock and cod (Table 1). The abundance of juvenile gadoids in the water column depends on the initial number that reach metamorphosis and individual growth and mortality rates. Due to the temporal variability in the settlement of both cod and haddock the series of abundance used to show likely year-class strength is constructed from the maximum estimate from that year (either May or June). This is not the case with whiting, which remain pelagic for much longer and therefore are estimated from the June survey abundance.

<b>Year</b>	<b>Cod</b>	<b>Haddock</b>	<b>Whiting</b>
<b>1994</b>	<b>57.4</b>	<b>47</b>	<b>777.9</b>
<b>1995</b>	<b>6.9</b>	<b>1.7</b>	<b>225.1</b>
<b>1996</b>	<b>66.3</b>	<b>47.8</b>	<b>397.0</b>
<b>1997</b>	<b>5.7</b>	<b>14.5</b>	<b>205.0</b>
<b>1998</b>	<b>0</b>	<b>2.5</b>	<b>59.3</b>
<b>1999</b>	<b>26.2</b>	<b>15.4</b>	<b>91.4</b>
<b>2000</b>	<b>6.1</b>	<b>1.7</b>	<b>39.8</b>
<b>2001</b>	<b>9.6</b>	<b>17.1</b>	<b>166.5</b>
<b>2002</b>	<b>3.4</b>	<b>1.2</b>	<b>19.1</b>
<b>2003</b>	<b>3.2</b>	<b>4.3</b>	<b>148.5</b>
<b>2004</b>	<b>25.8</b>	<b>26</b>	<b>100.7</b>
<b>2005</b>	<b>11.4</b>	<b>8.3</b>	<b>135.2</b>
<b>2006</b>	<b>9</b>	<b>40.2</b>	<b>118.2</b>
<b>2007</b>	<b>0</b>	<b>3.8</b>	<b>81.5</b>

Table 1. Time series of pelagic juvenile abundance of cod, haddock and whiting from 1994 to 2007. The fish are aged approximately 2-3 months and are caught just prior to settlement. (Nos. per 1000 m<sup>2</sup>).

The estimates of abundance for all 3 species were lower than 2006 values (Figure 2). The most notable reductions on last years estimates were the haddock and cod indices. Haddock recruitment is known to be highly variable and the strong recruitment seen last year will not have yet started contributing to the SSB and recruitment this year. No cod juveniles were caught during the present survey, a situation that last occurred in 1998.

Considering the historical correlation between the MIK net and October groundfish survey 0-group cod abundance estimates, it is likely that cod recruitment in 2007 has been very poor (Figure 3). The low whiting abundance estimates continue the recent flat trend in recruitment for this species.

Examination of the seawater temperature data from the insitu monitoring programme at open sea station 38A shows that 1998 and 2007 are both years in which higher than average winter bottom seawater temperatures were recorded (Figure 4). The relationship between higher seawater temperatures and lower cod recruitment in the Irish Sea is recognised but the underlying mechanisms remain unknown.

Gadoid distributions showed that whiting were found extensively throughout both the eastern and western Irish Sea (Figure 5). Haddock were mainly caught in the western Irish Sea with a smaller abundance located to the east of the Isle of Man (Figure 6).

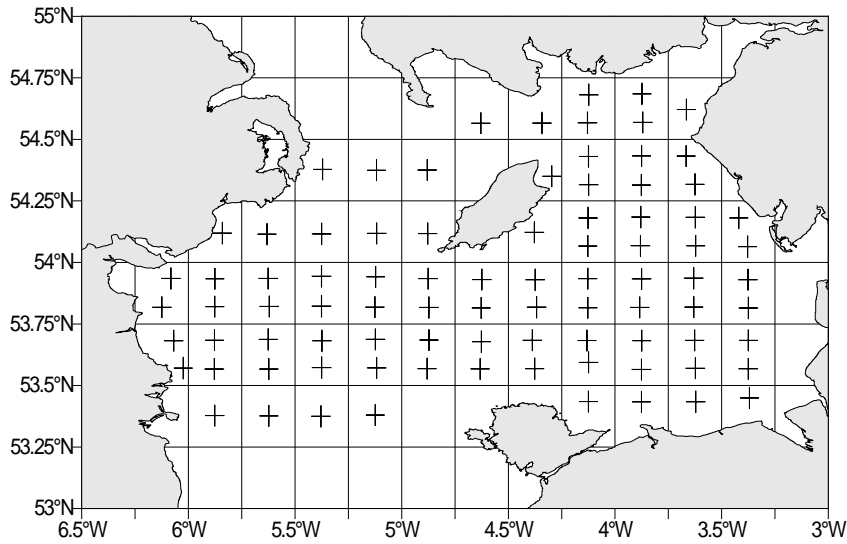


Figure 1a. Location of Gulf VII stations sampled during CO2207. Western Irish Sea stations (west of 4.75°W) sampled during week 1 and 3. Eastern Irish Sea stations sampled during week 2 only.

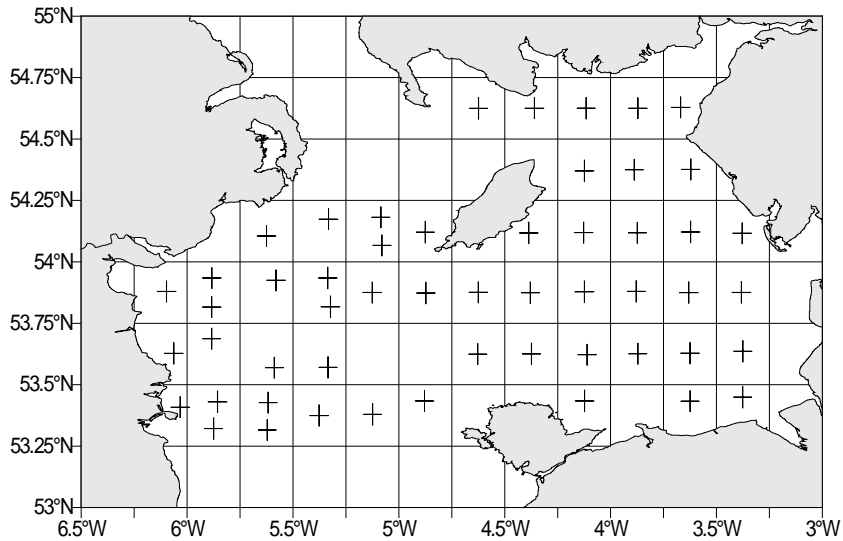


Figure 1b. Location of MIK net stations sampled during CO2207 week 1 and 2. Western Irish Sea stations (west of 4.75°W) sampled during week 1. Eastern Irish Sea stations sampled during week 2.

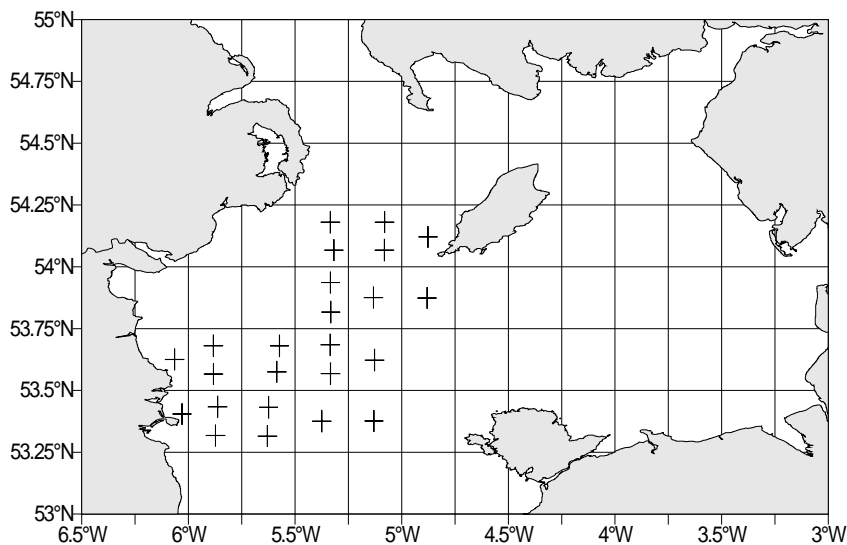


Figure 1c. Location of MIK net stations sampled during CO2207 week 3.

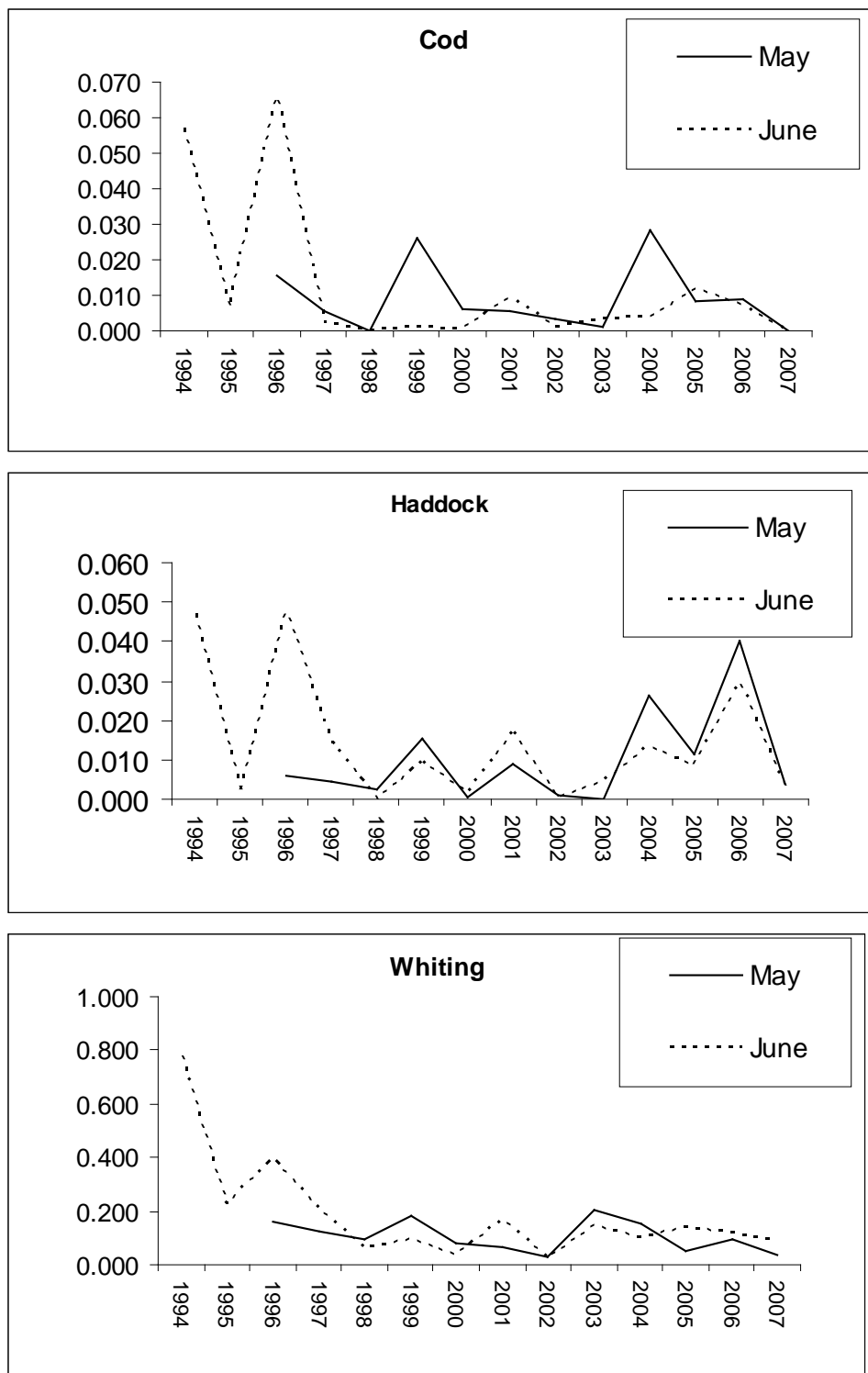


Figure 2. Time series of MIK net survey estimates of pelagic juvenile cod, haddock and whiting in the western Irish Sea from 1994 to 2007.

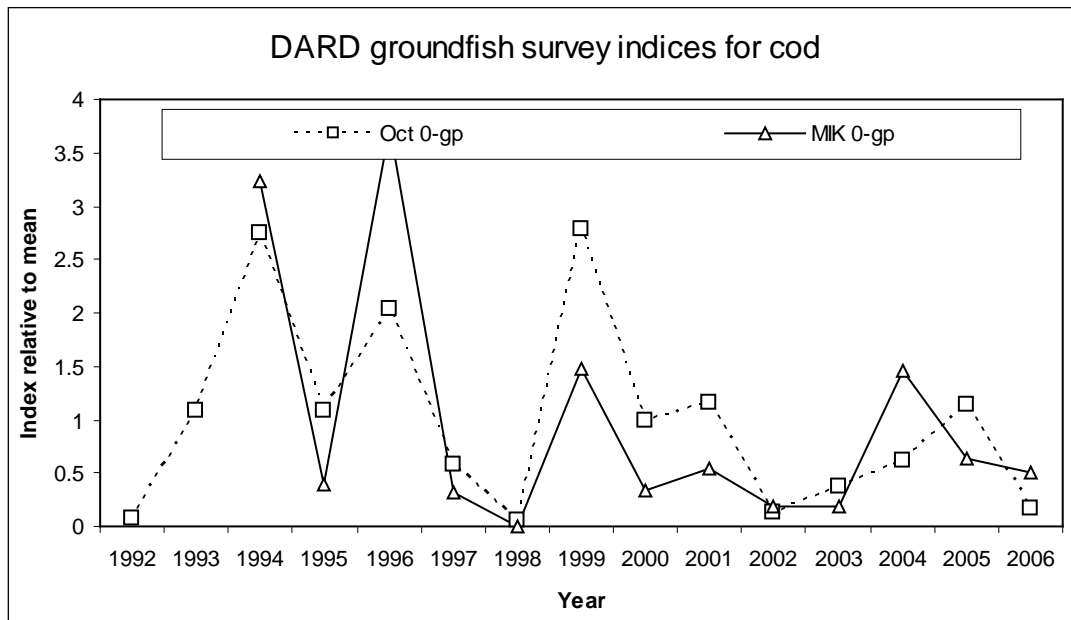


Figure 3. Historic correlation between juvenile cod abundance from MIK net surveys conducted in May/June and Groundfish surveys conducted in October.

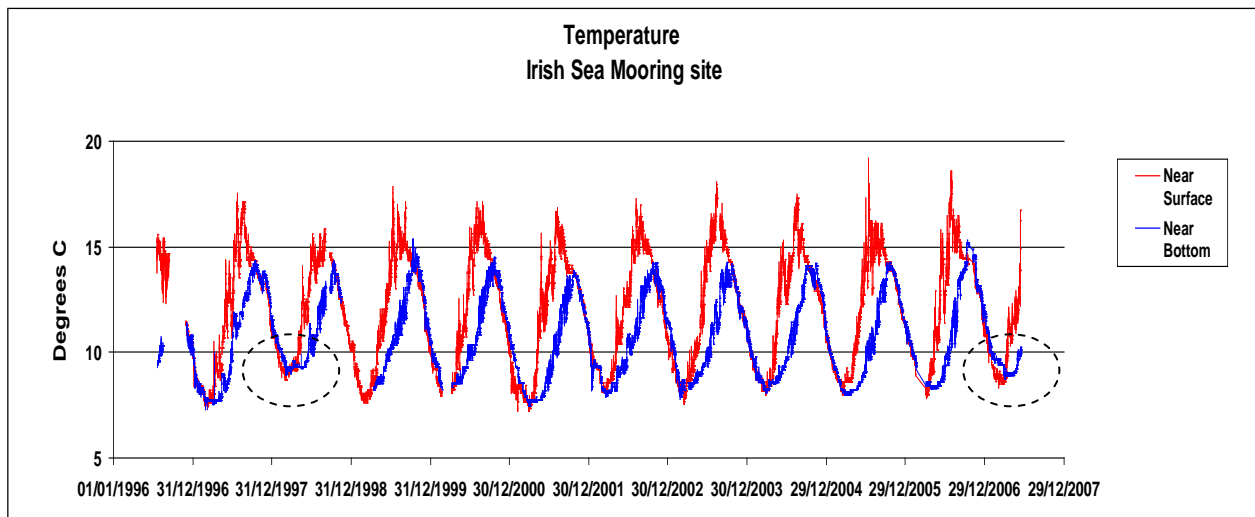


Figure 4. Time series of seawater temperature data collected from the insitu monitoring programme at open sea station 38A. Dashed circles highlighting years with above average bottom temperatures.

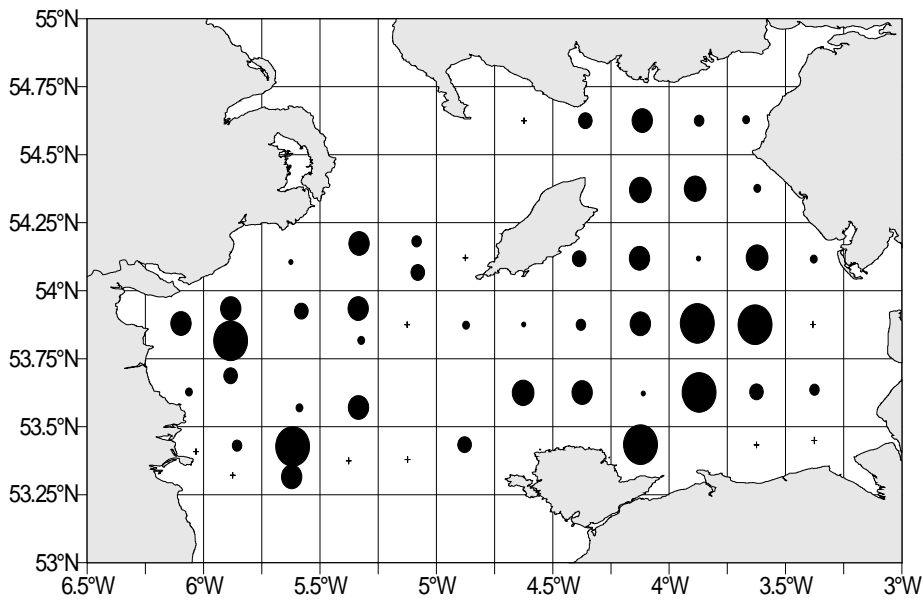


Figure 5. Spatial abundance (ind.m<sup>-2</sup>) of juvenile whiting in the Irish Sea caught by the MIK net. Diameter of circles correspond to abundance with highest abundance 0.245 ind.m<sup>-2</sup>. Cross represents zero catch.

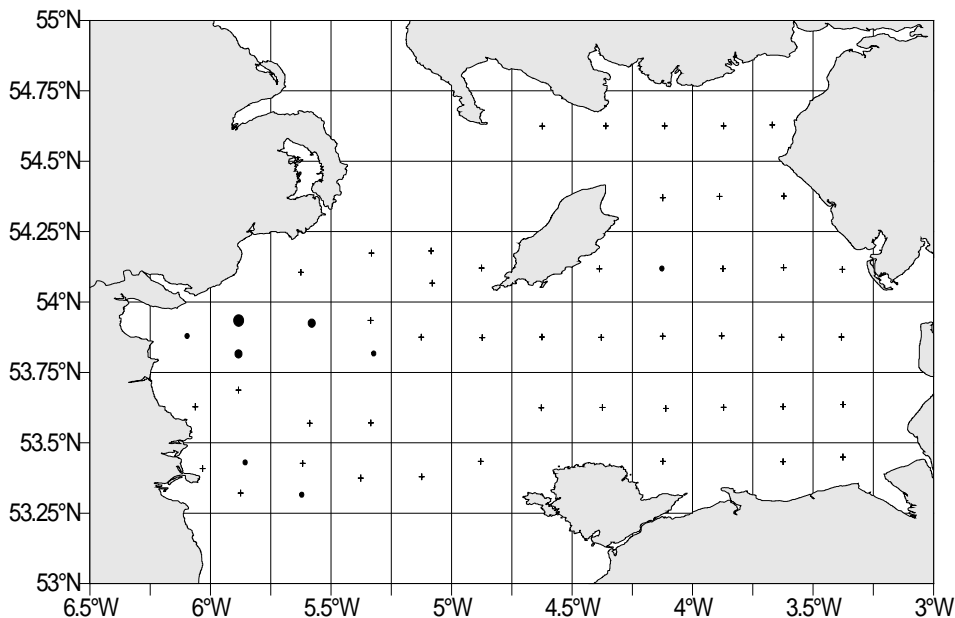


Figure 6. Spatial abundance (ind.m<sup>-2</sup>) of juvenile haddock in the Irish Sea caught by the MIK net. Diameter of circles correspond to abundance with highest abundance 0.023 ind.m<sup>-2</sup>. Cross represents zero catch.

**Acknowledgements:**

The Master and Crew of *RV Corystes* are thanked for their assistance and cooperation in ensuring the successful undertaking of the survey. The scientific staff are commended for their thorough and efficient work throughout the survey.

Signed:

Scientist in charge ( SIC ).....date .....  
 Head, AESD Aquatic Systems..... date .....  
 Master (seen in draft).....