Department of Agriculture and Rural Development (Northern Ireland)
Agriculture and Environmental Science Division

Cruise Report: CO 0806
Vessel: RV *Corystes*
Date: 19th – 28th February 2006
Area: Irish Sea (north); ICES div. VIIa
Survey Type: Irish Sea Egg Production Surveys

Personnel:

S Beggs (SIC)	SSO	DARDNI
J Peel	ASO	DARDNI
G Foster	SO	DARDNI
C Fox		DARDNI
I Holmes		CEFAS
C Burt		CEFAS
S Pitois		CEFAS
A brown		CEFAS
R Humphreys		CEFAS

Objectives:

i. To conduct a plankton survey using a Gulf VII plankton sampler to determine the distribution and abundance of cod (*Gadus morhua*), haddock (*Melanogrammus aeglifinus*) and plaice (*Pleuronectes platessa*) eggs.

ii. To remove fish eggs from fresh plankton samples at sea. To measure, stage and preserve these eggs in ethanol prior to species identification using a DNA technique on return to the laboratory.

iii. To collect a surface nutrient and chlorophyll sample at each of the sampling stations.

iv. To collect supplementary sub-surface environmental data using a self-logging package carried on the Gulf VII plankton samplers.

v. To collect surface salinity samples at every third station for calibration of the CTDs.

vi. To collect surface phytoplankton sample at every third station for phytoplankton species identification.

Circulation	✓
DCSO & CSO	
Ship Managers	
Fisheries Division	
ANIFPO	
NIFPO	

Comments

Signed Head of Branch

Methods:

This plankton survey was carried out as part of a collaborative program between CEFAS, DARDNI and The Marine Institute. The program was initiated to support the Irish Sea Cod Recovery Program by providing fishery-independent estimates of spawning stock biomass, using egg production surveys in 2006, 2008 and 2010. The annual egg production method requires a series of plankton surveys covering the spawning season. Sampling of adult fish is carried out over the same time period to estimate the average number of eggs produced per unit weight of female fish (fecundity). The ratio of these two estimates provides a measure of the spawning stock biomass of females, which can be converted to total SSB using an estimate of sex ratio (number of males to females in the stock). The current survey was the second in a series of five to be carried out during 2006.

The GulfVII high speed plankton sampler was deployed in a "v" shaped dive profile for a minimum of 15mins at each station. The fresh plankton sample was then sorted onboard for stage I gadoid like eggs. Up to 100 gadoid like eggs per station were staged and measured, using image analysis equipment, to the nearest 0.01mm. The eggs were then preserved individually in alcohol for further DNA analysis. The remaining plankton sample from each station was fixed in formaldehyde for further sorting at the laboratory. A PUP sample was also collected and fixed in formaldehyde for future analysis. Vertical environmental profiles of the water column were collected at each station using the PRONET system. A nutrient and chlorophyll sample were collected at each station, while a salinity and phytoplankton sample were collected at every third station. The onboard constant surface salinity and temperature logger was run throughout the cruise and data downloaded approximately every 24 hours.

Cruise Narrative:

Sunday 19 February

All scientific staff were aboard the R.V. *Corystes* by 10.30am. CEFAS staff arrived onboard the previous evening. The morning was spent unpacking and setting up equipment. During this period it became evident that a piece of equipment vital to the cruise was not onboard. The SIC and DARD staff searched the vessel and Newforge in vain for the missing equipment. The departure for the cruise was postponed until 12.00am the next day.

Monday 20 February
The missing equipment was located in Newforge and fitted onboard the R.V. *Corystes*. All scientific staff were aboard by 11.00am and the vessel set sail shortly after. The vessel set course immediately for the first station and all scientific staff attended the following two GULFVII deployments for method training purposes.

Tuesday 21 February
Work continued throughout the eastern Irish Sea and 19 stations were successfully completed.

Wednesday 22 February
Work continued in the eastern Irish Sea with a further 14 stations successfully completed.

Thursday 23 February
The south eastern Irish Sea was successfully completed, with a further 17 stations sampled.

Friday 24 February
Sampling was abandoned at 01:11 hours due to an increasing swell fuelled by strong north easterly winds. The strong winds continued throughout the day reaching Gale 8 at times.

Saturday 25 February
The strong winds and associated swell continued to be a problem with only one sample taken during a brief reduction in wind speed.

Sunday 26 February
Sampling resumed at 15:04 once the swell had reduced sufficiently to allow safe deployment of the Gulf VII sampler.

Monday 27 February
Sampling continued in the western Irish Sea despite increasing winds after a relatively calm period. A total of 14 stations were completed. The steaming time between the extended stations was increased due to the loss of one engine.

Tuesday 28 February
Sampling could only be safely carried out at two remaining stations to the lee of the Northern Irish coastline, due to strong north westerly winds. Upon completion of the final station at 04:10, the vessel set course for Belfast port.

Results:
Despite the delay in leaving port and the strong winds encountered on this cruise a total of 80 stations from the original 112 were successfully completed (Fig. 1) In total 1.47×10^7 liters of seawater were filtered with the Gulf VII plankton sampler. A total of 1316 stage I gadoid like eggs were removed, measured and individually stored in alcohol for further DNA analysis (Fig. 2). The constant salinity and temperature logger collected a total of 11063 data points providing a comprehensive map of sea

surface conditions (Fig. 3, Fig. 4). Nutrient, salinity and chlorophyll samples were successfully collected and dispatched to CEFAS, Lowestoft for analysis.

Acknowledgements:
The SIC would like to thank all scientific staff who assisted with the preparation and running of the cruise from both the DARD and CEFAS laboratories. The Officers and Crew of RV *Corystes* are thanked for their enthusiastic cooperation and dedication. Without the diligent work of the crew and scientists in often unpleasant conditions this cruise would not have been possible.

Steven Beggs — *Scientist in Charge*

Andrew Niblock — *Master* (seen in draft)

March 2006

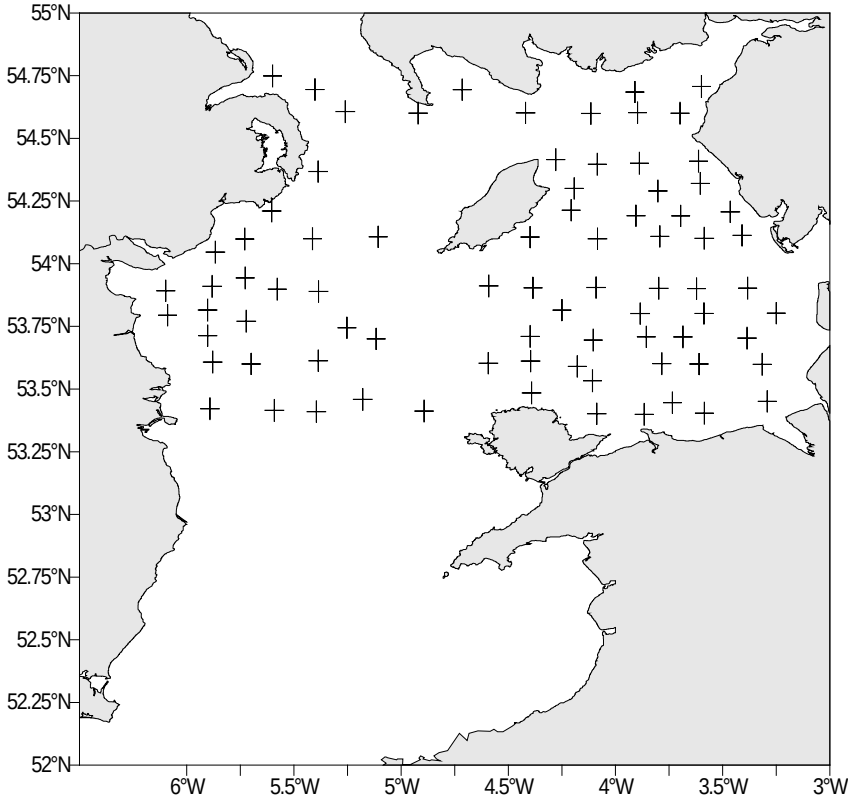

Fig. 1. Stations successfully sampled during EP02/06 using the GulfVII high speed plankton sampler.

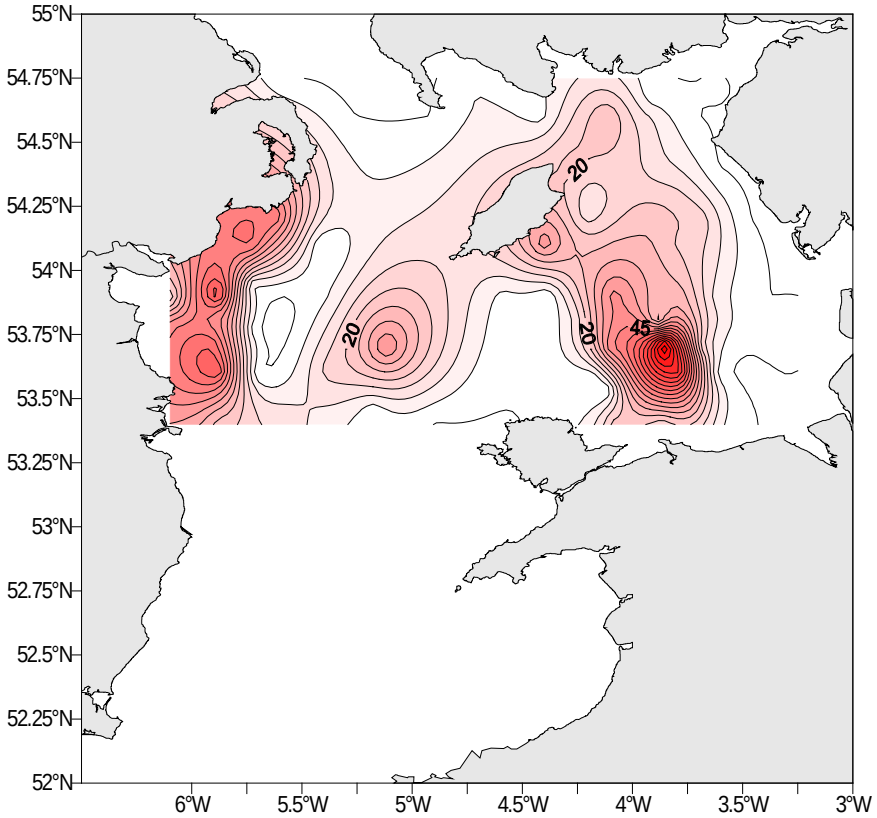

Fig. 2. Number of gadoid like stage I eggs sorted from plankton samples as a measure of relative abundance.

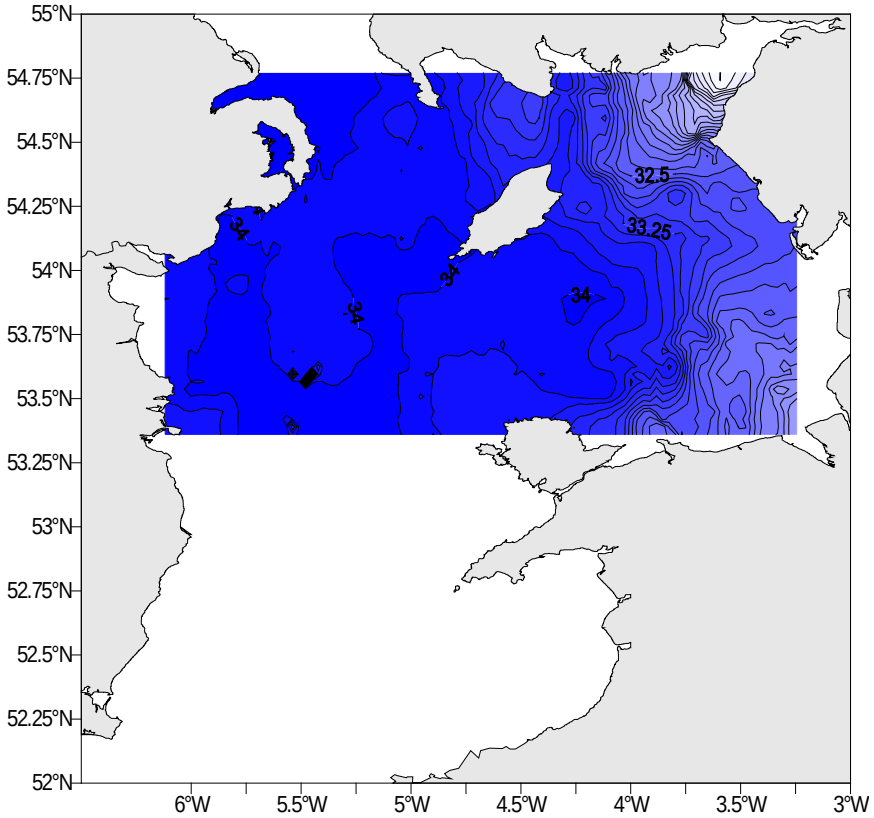

Fig. 3. Surface seawater salinity contour map of the Irish Sea

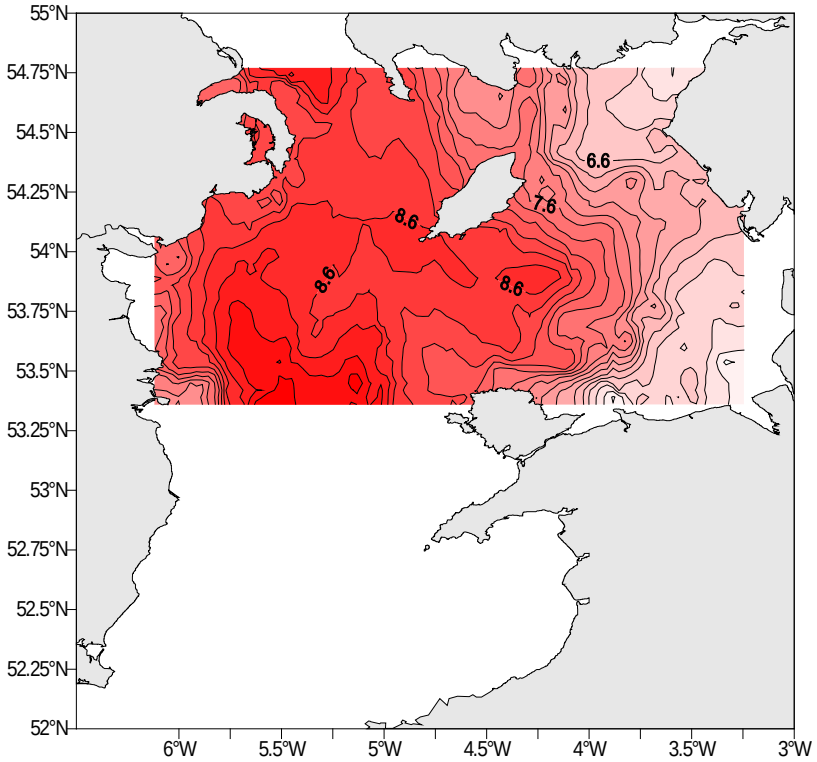

Fig. 4. Surface seawater temperature (°C) contour map of Irish Sea.