

**MINISTRY OF AGRICULTURE, FISHERIES AND FOOD  
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND**

**1995 RESEARCH VESSEL PROGRAMME**

**REPORT : RV CIROLANA : CRUISE 2**

**STAFF:**

J H Nichols	
L E Woolner	
S P Milligan	
I D Holmes	
C Fox	9-21 February
P King	"
Ms E Alesworth (PEML)	"
Ms I Biegala (PML)	"
Ms L Vikanes (IMR, Norway)	9-12 February
P Connolly (DOM, Dublin)	13-17 February
Ms M O'Neill (DOM, Dublin)	17-23 February
B Riches	21 February-2 March
Mrs A Winpenny	21 February-2 March
R Head (PML)	21 February-2 March

**DURATION:** Left Lowestoft 1600h 9 February 1995  
Arrived Lowestoft 0930h 2 March 1995  
(all times are Greenwich Mean Time)

**LOCALITY:** Eastern and Western Irish Sea, Cardigan Bay.

**AIMS:**

1. To sample fish eggs on a grid of stations throughout the Irish Sea and in Cardigan Bay using a 76cm unencased high speed plankton sampler. The area will be sampled twice during the cruise.
2. To take additional samples in selected areas where fish eggs are abundant. These samples will be sorted live and prepared for specific identification by ISO-electric focussing.
3. To take profiles of temperature and salinity at each plankton sampling station using the sampler mounted Guildline CTD unit.
4. To take discrete surface salinity samples at each station for CTD sensor calibration.
5. To collect zooplankton samples for ATCase measurements and for testing the regional copepod model.
6. To take trawl samples to collect ovaries of plaice and cod for the estimation of Atresia and spawning duration.

## NARRATIVE:

RV CIROLANA left Lowestoft at 1600h 9 February and steamed through the English Channel in poor weather throughout 10 February, aiming for the southern end of Cardigan Bay at 1500h 11 February. After completing sampling gear trials, the plankton survey grid was started at 1930h. Ms L Vikanes was put ashore in Holyhead at 1300h 12 February after which the plankton survey was continued into Liverpool Bay. The survey progressed in this area in continuing poor weather with persistent SW winds between force 6-8. P Connolly joined the vessel from Holyhead at 1600h 13 February after which the survey progressed south of Anglesey and across to the Irish coast. In spite of the strong SW winds we were able to continue sampling along the Irish coast until 1800h 15 February. A total of 17 hours was spent sheltering off the north-east Irish coast over the following 24 hours. Only a further two stations in the North Channel were completed during a brief respite in the weather. The survey resumed at 1530h 16 February and continued southwards. P Connolly was disembarked at Dun Laoghaire by ships workboat and Ms M O'Neill joined the vessel at 1500h 17 February. The plankton survey then proceeded in much improved weather to the east of the Isle of Man. The survey was completed at 1400h 19 February after one further halt for bad weather between 2130h 18 February and 0930h on the following day.

The next 36 hours were spent trawling off the Cumbrian coast and east of Douglas. On the morning of 21 February staff were changed at Holyhead where poor weather again prevented the use of the ship's workboat.

The second plankton survey grid was started off Holyhead at 1130h 21 February and progressed round into Liverpool Bay. By midnight a severe SW gale prevented further work and the vessel remained hove to throughout the night and for most of the following day. Two further stations were completed during temporary lulls in the weather on 22 February, but at 2100h the decision was made to make for the Irish coast. The survey was restarted 20nm off Dundalk Bay at 0900h 23 February in rapidly improving conditions. Ms M O'Neill was put ashore at Dun Laoghaire, by ships workboat, at 1600h. The survey then progressed in fine weather and without incident until its completion at the southern end of Cardigan Bay at 1030h 27 February.

Trawling began off New Quay and Aberporth at 1230h and continued through until 0100h on the following day. This completed the work programme and course was then set for Lowestoft. After an uncomfortable passage, in persistent SW force 6-9 winds, RV CIROLANA docked at 0930h on 2 March.

## RESULTS

1. A total of 100 stations were sampled with the 76cm HSTN on the first survey grid between 11 and 19 February (Figure 1). Six stations west of the Isle of Man and south of Luce Bay were not sampled because of poor weather.

Recently spawned plaice eggs were found at the southern end of Cardigan Bay, in Liverpool Bay, off the Cumbrian coast and off the Irish coast from Dundalk south to Dublin Bay. A few cod size eggs were also found in each of those areas except Cardigan Bay.

Shortly after the second survey began on 21 February it was stopped for bad weather for a total of thirty three hours. In view of this major time loss at the beginning, the proposed grid was modified to ensure that there would be adequate coverage of the most important areas. Five stations in deep water at the north-western corner of the grid were lost together with one station at the south. Nine rectangles with double stations were modified to a single central sampling position. A total of ninety one stations were sampled (Figure 2).

Plaice eggs were more abundant on the second survey in both Liverpool Bay and off the Irish coast. However, abundances off the Cumbrian coast, in the Solway Firth and in Cardigan Bay were still low. Again, a few cod size eggs were found in Liverpool Bay and off the Cumbrian coast. Off the Irish coast, between Dundalk and Dublin Bays, cod size eggs were more abundant than on the first survey.

Plankton biomass was generally low over most of the sampled areas on both surveys, with the exception of a few stations, in the western Irish Sea and east of the Isle of Man, where the Euphausid *Meganyctiphanes norvegica* was abundant.

2. Samples of mainly early stage eggs were sorted live, measured, staged and identified microscopically from standard HSTN hauls. Each egg was placed in an individual compartment in a tray and deep frozen (-80°C) for subsequent identification by iso-electric focussing. A total of 284 eggs from nine stations on the first survey and 426 eggs from eleven stations on the second survey were collected. The stations were selected by examination of samples from areas where identification problems were likely to arise.

Planned shipboard analysis of these samples was not possible once Ms Vikanes had left the ship.

3. Profiles of temperature and salinity were taken at each of the 191 HSTN deployments on both survey grids. Surface salinity was low, <32ppt, over much of the eastern half of the area between the Isle of Man and the Cumbrian coast. Temperatures there were also the lowest (<6°C) recorded on the surveys. There was a halocline, up to 3ppt, in this area at about 10m depth which generated stratification parameter values up to 70Jm<sup>-3</sup> (ST198). Some structure also occurred in the deep water, >100m, west of the Isle of Man where there was a layer of warmer, higher salinity water in the bottom 25 metres.
4. A surface salinity sample was taken at each HSTN station on both surveys. Duplicate samples were taken at 33 of those stations. The samples will be returned to the laboratory for analysis and for comparison with the results from the sampler Guildline CTD. They will also be used to calibrate the Chelsea instruments continuous surface water sampler.
5. A total of 16 sites, 8 in areas of potentially high fish egg production and 8 in potentially low areas, were selected for zooplankton sampling. Samples were taken from close to the bottom to the surface using a double WP2-200µm plankton net. All sixteen sites were sampled on each of the two HSTN surveys.

The sample from one codend was deep frozen (-80°C) for subsequent ATCase analysis. The sample from the other codend was split into three aliquots, one for species enumeration was fixed in formaldehyde. The second aliquot was further split into three samples on GF/F filters for subsequent elemental analysis. The third aliquot was used to pick out female *Calanus* which were incubated for 24 hours to calculate egg production rates. These data will be used to further validate the PML copepod production model for the Irish Sea.

At each of the HSTN stations on both surveys 250ml surface water samples were filtered either as duplicate or triplicate samples. They will be used for fluorometric analysis of chlorophyll 'a' and for the estimation of total particulate carbon. The samples were deep frozen and will be returned to PML for analysis.

6. A total of fourteen Granton trawl hauls were made, twelve off the Cumbrian coast and two east of Douglas. No difficulties were experienced with any of the tows although one of the hauls east of Douglas yielded a large bag of 'brittle stars'. Catches consisted mainly of small whiting, pout and flounders with on average a half basket of plaice, a few sole and a few cod. Whole gonads were removed from 134 female plaice, 49 female sole and 12 female cod. They were individually fixed in 4% formaldehyde and returned to the laboratory for analysis of fecundity or atresia. Many of the female plaice were either running or had hyaline eggs in the ovary, and 2% were spent. The female cod and sole were mainly in stage IV and below. Otoliths were taken from 136 plaice, 50 cod and 79 sole. The sole otoliths will be used to supplement the laboratory sampling programme for Division VIIa.

A total of seven Granton trawl hauls were made at the southern end of Cardigan Bay. Catches here were dominated by a wide size range of thornback rays (*Raia clavata*), and small whiting. Whole gonads were removed from 147 female plaice and 15 female sole and returned to the laboratory for fecundity and atresia analysis. The female plaice were mainly in late maturity stages with 18% being spent. All the sole caught in this area were female, half of them immature and the remainder in maturity stage 3 or 4. Otoliths were taken from 151 plaice and 30 sole.

J H Nichols  
10 March 1995

SEEN IN DRAFT: M Willcock Master  
R Graham SFM

INITIALLED: J W Horwood

DISTRIBUTION:

Basic list+	O Kjesbu IMR Bergen
Staff on cruise	G Dahle IMR Bergen
M G Pawson	Cumbria SFC
M Armstrong DANI	North Western & North Wales SFC
M Dickey-Collas DANI	South Wales SFC
R Nash PEML	MAED, FCO for Ireland
P R Witthames	

Figure 1

CIROLANA CRUISE 2/1995 GRID 1

SHOWING :  
STATION POSITION  
STATION NUMBER  
COASTLINE

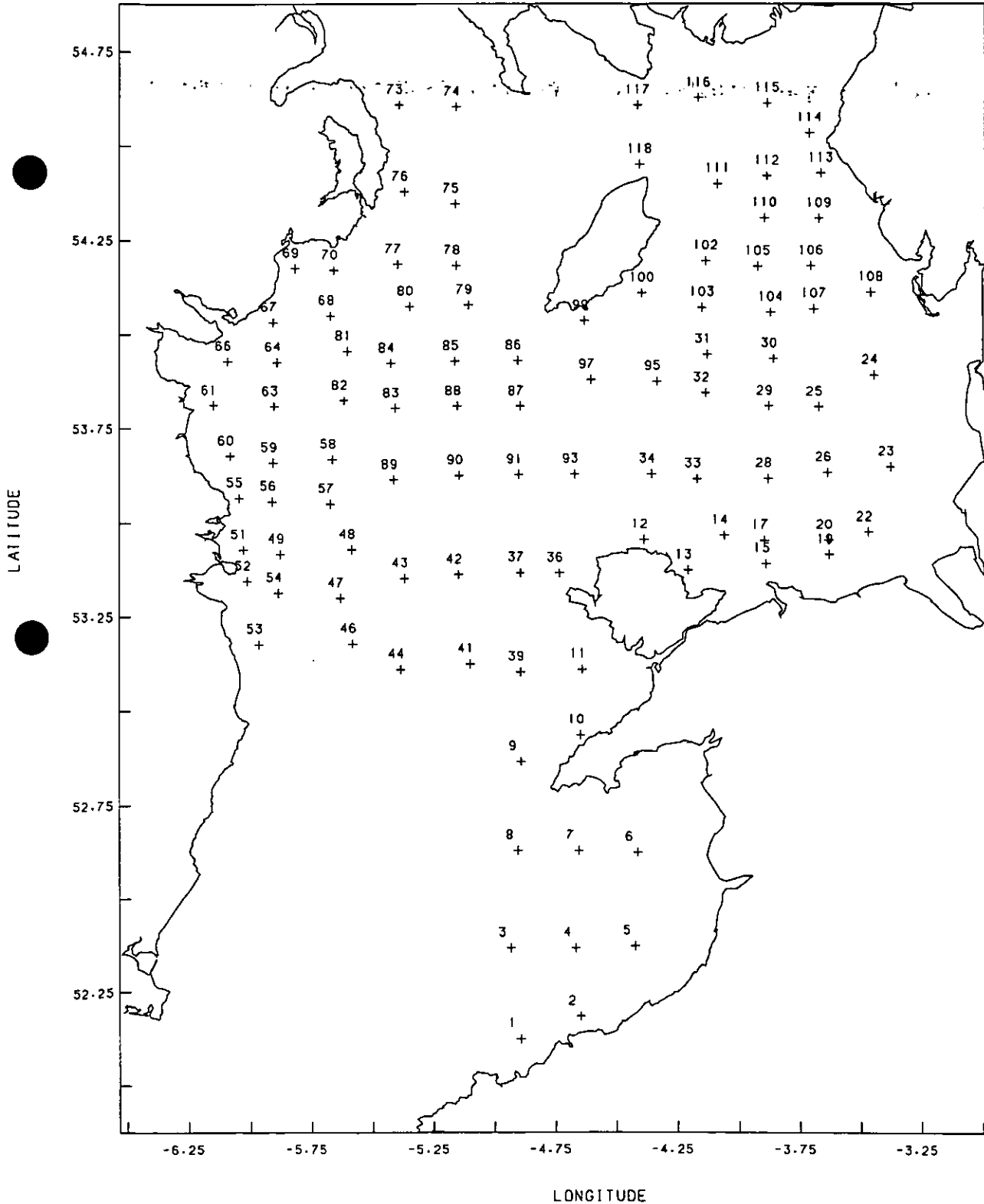


Figure 2

CIROLANA CRUISE 2/1995 GRID 2

SHOWING :  
STATION POSITION  
STATION NUMBER  
COASTLINE

