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

1988 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 8

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF:

P O Johnson (to 7 Oct)
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B F Riches)

DURATION:

30 September 2330 h - 20 October 1700 h

AIMS:

1. To participate in the ICES coordinated herring larvae survey in region IVB.

2. To study drift, growth, condition, age and mortality of herring larvae.

3. To examine the vertical distribution of herring larvae in different hydrographic regimes.

4. To identify herring larvae predators.

5. To study visual avoidance of plankton samplers by herring larvae.

6. To recover eight current meter rigs from off the north-east coast of England.

NARRATIVE: (all times GMT)

RV CIROLANA sailed from Lowestoft at 2330 h 30 September, and started the standard herring larvae survey at 0730 h on the following day. Sampling progressed without interruption until 0845 h 4 October when four Argos buoy systems were released in the vicinity of latitude 54°50'N; longitude 00°50'E, as part of the NERC North Sea project.

The survey was restarted at 1230 h and proceeded in reasonable weather until the early hours of 7 October when increasing south-westerly winds slowed the progress. The survey was completed at 1120 h on that day and passage was then made for the Tyne.

Staff changes were made by pilot boat off the Tyne between 1400 h and 1500 h 7 October. On completion the vessel steamed to a sheltered anchorage off Scarborough arriving at 1920 h in a severe south-westerly gale, and remaining there until 0800 9 October.

A grid of fifteen TTN stations was then sampled off the Yorkshire coast to locate a suitable density of herring larvae for further study. An Argos buoy system was realeased at the chosen location at 0900 h 10 October and work progressed in the vicinity of this buoy over the following two days. Hauls were made with the MAFF/LHPR system, three types of TTN nose cone, the standard system - for larvae collection and the Granton trawl. Work in this area finished with the recovery of the buoy at 1520 h 12 October and the completion of a six station TTN grid at 0145 h 13 October.

The vessel then steamed to an area off the Dogger (latitude 54°21'N; longitude 01°52'E) to which the first of the four NERC Argos buoys had drifted. All four systems were located using the NERC UHF and VHF direction finding equipment, and were recovered by 1315 h. On the return passage to the Whitby area some larvae collection tows were made.

At 0745 h 14 October the recovery of eight north-east coast current meter-rigs was begun. This progressed in excellent conditions and was completed at 1650 h on the same day.

A transect line of ten TTN stations running north-east from Tees Bay was sampled between 1800 h 14 October and 0300 h 15 October. Collection tows and LHPR sampling was then done in relation to the thermal stratification found. The Argos system was re-laid in an area of high herring larvae abundance and weakly stratified water at latitude 54°59'N longitude 00°40'W, at 1315 h 15 October. Further sampling with the LHPR and standard TTN was done using the buoy as a marker, over the following day.

Additional collection tows were taken further south, latitude 54°35'N; longitude 00°30'W on 16 October before a second transect line was run out to locate more strongly stratified water further east. Further collection tows and LHPR hauls were done along this transect on 17 October and were completed at the inshore end 12 nml off Whitby at 0140 h 18 October.

A five station MIK trawl survey, started at 0400 h 18 October, was completed in the vicinity of the Argos buoy at 1050 h on the same day. The Argos buoy system was located and recovered at 1150 h. After two further TTN stations and in increasing south-easterly winds, course was set for a rendezvous with the Dutch vessel 'Rose Marie' which had just stared sampling the standard herring larvae grid. A series of six comparative tows with this vessel, were made between 1650 h and 1900 h in an area of high herring larvae numbers off Whitby. An LHPR was then towed at 20 m depth for one and half hours through this larvae patch to examine spatial variability. This was completed in rapidly deteriorating weather conditions at 2215 h 18 October and the remainder of the night was spent making little progress eastwards towards the start of the final larvae survey grid. The south-easterly gale prevented any further work until 1700 h 19 October, when the first of nine standard stations east of longitude 00°30'E was sampled. The final station was completed at 0725 h 20 October when course was set for Lowestoft, arriving there at 1700 h.

RESULTS:

1. A total of 111 stations was completed on the standard survey between 1-7 October (Figure 1). Herring larvae were found on most stations

although numbers of <10 mm larvae were much lower than in the same period last year. Medium sized larvae and larvae >15 mm were widespread and appeared to be more abundant than in previous years. Small larvae were again found on the western edge of the Dogger in the vicinity of the SW Patch.

In view of the participation of the Dutch vessel 'Rose Marie' in the standard survey for the second half of October, our committment was reduced. However because of bad weather only nine stations of a grid of twenty four stations east of longitude 00°30'E were completed.

Eighteen stations north of latitude 54°40'N sampled on transect lines after 14 October will contribute to the standard survey for the final period

2. The Argos buoy system, on trial loan from NERC, was deployed for periods of 2 days and 3 days in separate herring larvae patches. In the relatively calm conditions prevailing during these deployments, residual movement of the buoys was small and they appeared to maintain good contact with their respective larvae distributions.

Relocating the buoy after a period away from it was successful using the NERC, UHF and VHF systems. However this did ultimately require visual contact at up to 500 m which can be difficult in a choppy sea. (Comments and suggestions are the subject of a separate report from Captain Willcock). In this context it is pleasing to record the re-location and recovery of the four NERC systems which had all lost their poorly attached cruciform drogues.

Numerous samples were taken in the vicinity of the two Argos buoy releases and fixed for subsequent analysis of either herring larvae age, length/dry weight relationships or RNA/DNA ratios. Samples were also taken for these analyses from other areas of the herring larvae distribution.

No attempt was made to examine herring mortality.

3. After some initial teething troubles, mainly resolved whilst sheltering in Scarborough Bay, the new MAFF/LHPR system worked extremely well. The deck control unit is a vast improvement over the 'Benthos' system and consideration should perhaps be given to marketing it. The only operational problem experienced was caused by a poor quality nylon roll which varied in width and jammed the mechanism.

Two series of 24 hour deployments, eleven hauls in total, were made in separate herring larvae patches and in association with the Argos buoy releases. Three further hauls were made in other areas including one in strongly stratified water ($50\ J\ m^{-3}$) at latitude 55°N; longitude 00°20'E.

4. Two bottom trawl hauls were made in an area where herring larvae were abundant, 20 nml east of Scarborough. The stomachs of length stratified samples of whiting, grey gurnard and mackerel were taken for subsequent examination of gut contents. Samples of small gadoids and other small fish were fixed whole for the same purpose. One length stratified sample of herring was frozen for routine sampling at the laboratory.

5. An experiment to examine the effect of different types of nose cone on herring larvae avoidance of samplers, was conducted in association with the two Argos buoy releases. A total of 59 deployments of three types of nose cone was made with concurrent in situ measurement of light.

Table 1

Nose cone	Number of hauls		
	Daylight	Dusk	Darkness
Standard grey fibreglass	9	1	9
Standard stainless steel	9	1	9
Dutch ring type stainless steel	9	1	11

One deployment of the LHPR at a single depth (20 m) towed for 1½ hours (1 min samples) was made to examine herring larvae spatial variability at the 100 m scale. These data may be important in the interpretation of the results of the visual avoidance experiment.

6. Eight current meter rigs which have been operational since 2 September 1988 were successfully recovered in one day. One meter was lost and two meters slightly damaged on one of the rigs. Data was processed on board and indicated a 90% success rate.

J H Nichols
1 November 1988

SEEN IN DRAFT: MJW, RG

INITIALLED: DJG

DISTRIBUTION:

Basic list +

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J H Nichols
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M Sherlock
K Medler
B F Riches
Dr V Christensen
Dr A Corten

DIVE PROFILE CIROLANA 8/88 GRID 1

SHOWING :
STATION NUMBER
COASTLINE