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Not to be cited without prior reference to the Laboratory

FRV "Scotia"

9SR86

PB

Cruise 9/86

REPORT

5-25 September 1986

Personnel

M R Heath	SSO (in charge)
I E Baird	SSO
S J Hay	HSO
P M MacLachlan	HSO
J Dunn	HSO
D L Baird	ASO
C Blanpied	(visitor) 5-15 September

Objectives

- 1 To carry out the ICES Herring Larvae Survey of the Orkney/Shetland area.
- 2 To investigate the transport and growth of herring larvae.
- 3 To collect water samples for radio-caesium analysis.

Narrative

"Scotia" sailed from Aberdeen at 1500 on 5 September and proceeded north through the Pentland Firth to the west side of Orkney. After carrying out a plankton survey, the centre of a patch of herring larvae was identified and a drifting buoy attached to a sub-surface drogue deployed close to this position at midnight on 6 September. The vessel maintained visual contact with the buoy over the following 80 hrs whilst plankton and hydrographic sampling was carried out at intervals of approximately 3 hrs. The buoy was successfully recovered on the morning of 10 September and redeployed further north later the same day. Round-the-clock sampling continued for a further 80 hrs whilst the vessel maintained visual contact with the buoy, apart from a short break on 13 September when the vessel stood by off Stromness for scientific equipment to be collected from the shore. On the evening of 13 September an Argos buoy was deployed, and after a survey of the area NW of Orkney on 14 September the vessel proceeded to Kirkwall for the mid-cruise break, arriving at 0930 the following day.

On 16 September, Scotia commenced the ICES Herring Larvae Survey of the Orkney/Shetland area. This was completed on 23 September. During this time the vessel docked briefly in Lerwick for repairs to the echosounders, and approximately 16 hrs were lost due to bad weather. During the final 2 days of the cruise, hydrographic and plankton sampling was carried out in the vicinity of Fair Isle; "Scotia" docked in Aberdeen at 0900 on 25 September.

Results

Growth and Transport Investigations

Hydrographic and biological sampling adjacent to the drifting buoys was carried out in order to investigate the growth, feeding and transport of herring larvae. The first buoy was deployed to the south of the centre of a patch of larvae and was carried east towards the Orkney Isles over the following 80 hrs. However, the centre of the patch and the second buoy moved north and then east passing the west of the North Shoal and the Orkneys. The satellite tracked Argos buoy was deployed close to the second marker. The Inmarsat telex facility on the "Scotia" was successfully used during the cruise to obtain data on the location of the Argos buoy from the computer at the French Space Centre in Toulouse, and this allowed further sampling to be carried out in the vicinity of the buoy during the last 2 days of the cruise.

Biological measurements of phytoplankton biomass and production, copepod biomass, grazing and egg production, and herring larvae weight increase per day were carried out adjacent to the buoys. Physical measurements included continuous recording of surface light intensity, and temperature and salinity both continuously at the surface, and sub-surface using water bottles and a CTD. The vertical distribution of plankton and herring larvae was investigated using the large volume pumping system and the high-speed multi-depth sampler. Some difficulties were experienced with the pumping system in heavy swell conditions but handling of the hose presented few problems. However, the pump appeared to be less effective at catching larvae during daylight than during night-time. The high-speed multi-depth sampler was extensively used during the cruise and was generally reliable and very effective at sampling herring larvae in depth strata down the water column.

ICES Herring Larvae Survey

The results of the ICES Larvae Survey were similar to those obtained during the same period in 1985. Larvae were widespread throughout the area but high concentrations were found only in a small area approximately 60 miles south of Sunburgh Head. Remarkably large numbers of large larvae (>15 mm) were found to the west of the Orkney Isles, and in view of the transport studies carried out in the first part of the cruise these were probably derived from spawning sites in Division VIa(H).

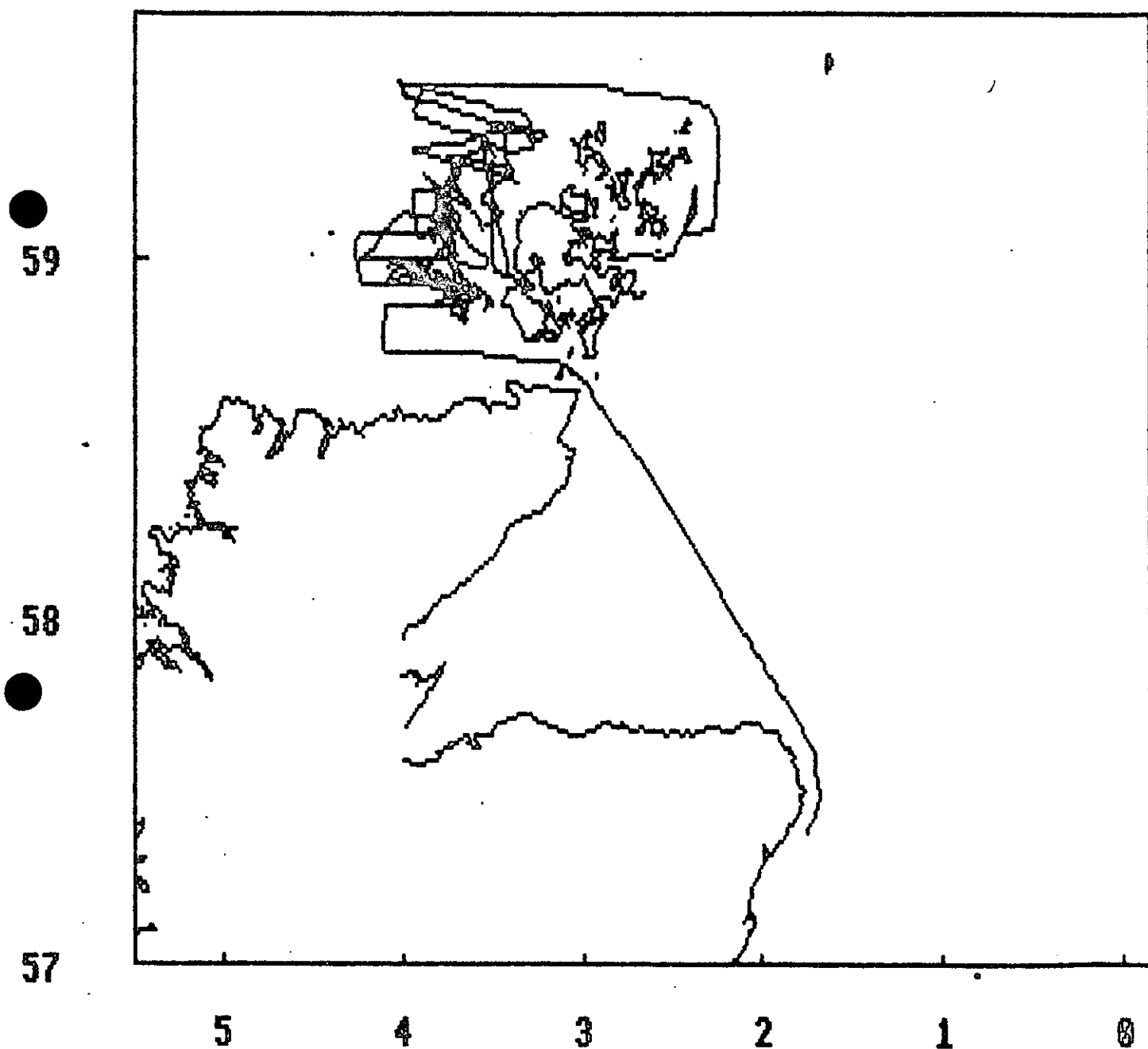
Radio Caesium Sampling

Radio caesium samples were collected in the Pentland Firth, off Fair Isle, and off Aberdeen.

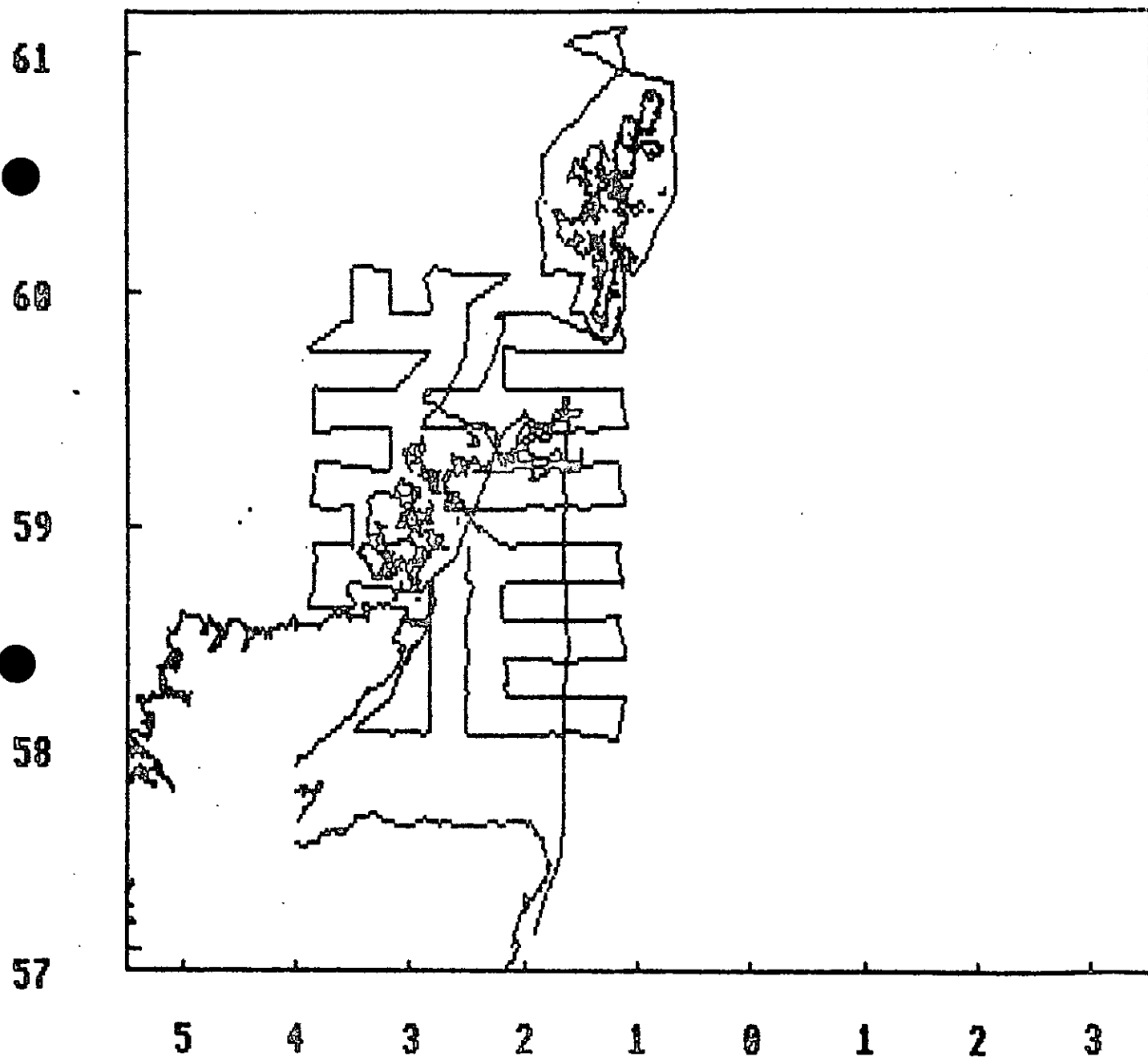
M R Heath
7 October 1986

Seen in draft: H McInnes

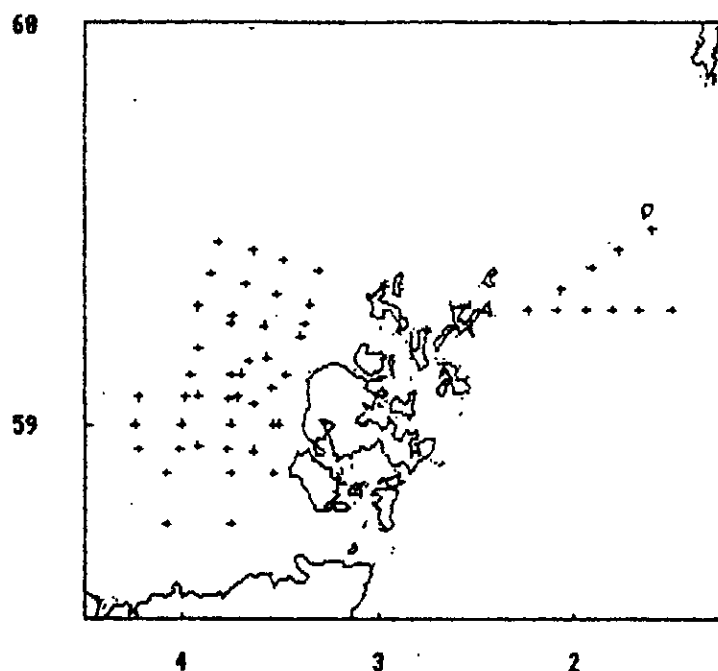
SCOTIA 9/86 Cruise track 5-15/9/86



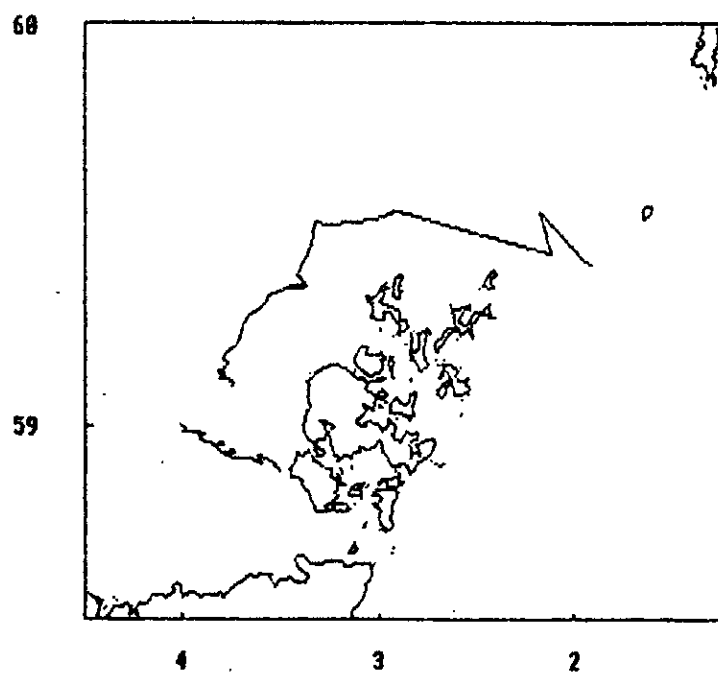
SCOTIA 9/86 Cruise track 16-25/9/86



PATCH SURVEY STATIONS 6-14/9/86 AND 23-24/9/86



DRIFTING BUOY AND ARGOS BUOY TRAJECTORIES 7-24/9/86



ICES Larval survey 16-23/9/86. Herring larvae/m2

