

Indexed
1
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FRV SCOTIA
CRUISE 10/87

10SR87

Report

7-27 October 1987

Personnel

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Objectives

1. To carry out a survey of the distribution of herring larvae, plankton and hydrographic parameters in the northwestern North Sea.
2. To perform a series of intensive studies of the vertical distribution of herring larvae.
3. To collect water samples for radio-caesium analysis.

Narrative

"Scotia" sailed from Aberdeen at 0900 on 7 October. Video recordings of sampling operations around oil platforms were carried out during the day and the personnel involved in this disembarked by pilot boat at 1800. Test deployments of scientific equipment were then carried out and completed at 0400 the following morning whereupon a survey grid was commenced. Between 8 October and 15 October a plankton and hydrographic survey of a region from the UK coast to 02°30'E, and 55°15'N to 60°00'N was completed (Figure 1). An Argos buoy was deployed during the early hours of 15 October and the vessel docked in Kirkwall for the mid-trip break at 1430 the same day.

"Scotia" sailed from Kirkwall at 1100 on 16 October. A current meter mooring was then laid and an Argos buoy released on the morning of 17 October at a position approximately 20 miles east of Orkney, and the first of the vertical distribution studies commenced. Bad weather prevented work throughout 18 October, but operations recommenced in the early hours of 19 October and proceeded to completion on the morning of 21 October. After lifting the current meter mooring and recovering the Argos buoy, "Scotia" headed east to investigate a report of light failure on a mooring deployed during "Scotia" cruise 9/87, and search for a faulty Argos buoy. However bad weather again curtailed operation

until late on 22 October when the vessel ran to Fraserburgh for a member of scientific staff to disembark. The second vertical distribution study was commenced at a position approximately 60 miles ENE of Peterhead on 23 October and completed on 26 October. The current meter mooring and Argos buoy were then recovered, and after inspecting a mooring deployed during "Scotia" 9/87, the vessel proceeded to Aberdeen, docking at 0900 on 27 October.

Results

The distribution of herring larvae in the North Sea between the Northumberland coast and Fair Isle was surveyed during the first part of the cruise. Four main centres of concentration were located: off Lindisfarne; on the Aberdeen Bank; approximately 60 miles ENE of Peterhead, and to the east of the Orkney Isles. In the south the larvae were predominantly smaller than 15 mm long and were located within 30 miles of the coast. However in the northern North Sea larvae were predominantly larger than 15 mm and were widespread, high concentrations being found even to the east of the Greenwich meridian.

Temperature stratification of the water column was particularly strong in the south of the survey area, surface to bottom temperature differences of more than 5°C being relatively common. Chlorophyll concentrations in this area exceeded 3 mg/m³, and coincided with the highest rates of copepod egg production. In the area occupied by larvae in the northern North Sea, the water column was generally isothermal or only weakly stratified, chlorophyll concentrations were less than 1 mg/m³, and copepod egg production was very low.

Two investigations of the vertical distribution of larvae were carried out during the second half of the cruise. In both cases the larvae showed a strong diurnal rhythm in aggregation, being dispersed through the water at night and aggregated at approximately 30 m depth during day-time. The Argos buoy deployed during the first study (east of Orkney) was carried approximately 30 miles south between 17 and 21 October, confirming that larvae in this region were being transported by the Fair Isle current. The second vertical distribution study was carried out in weakly stratified water in the central northern North Sea. In this area, larvae were generally restricted to the surface layer, and the Argos buoy deployed during this study was carried rapidly ENE, approximately along the 100 m depth contour. Salinity and temperature data indicated that this study site was located close to the extension of the Fair Isle current within the North Sea, which flows eastwards from the Scottish coast towards the Skaggeak.

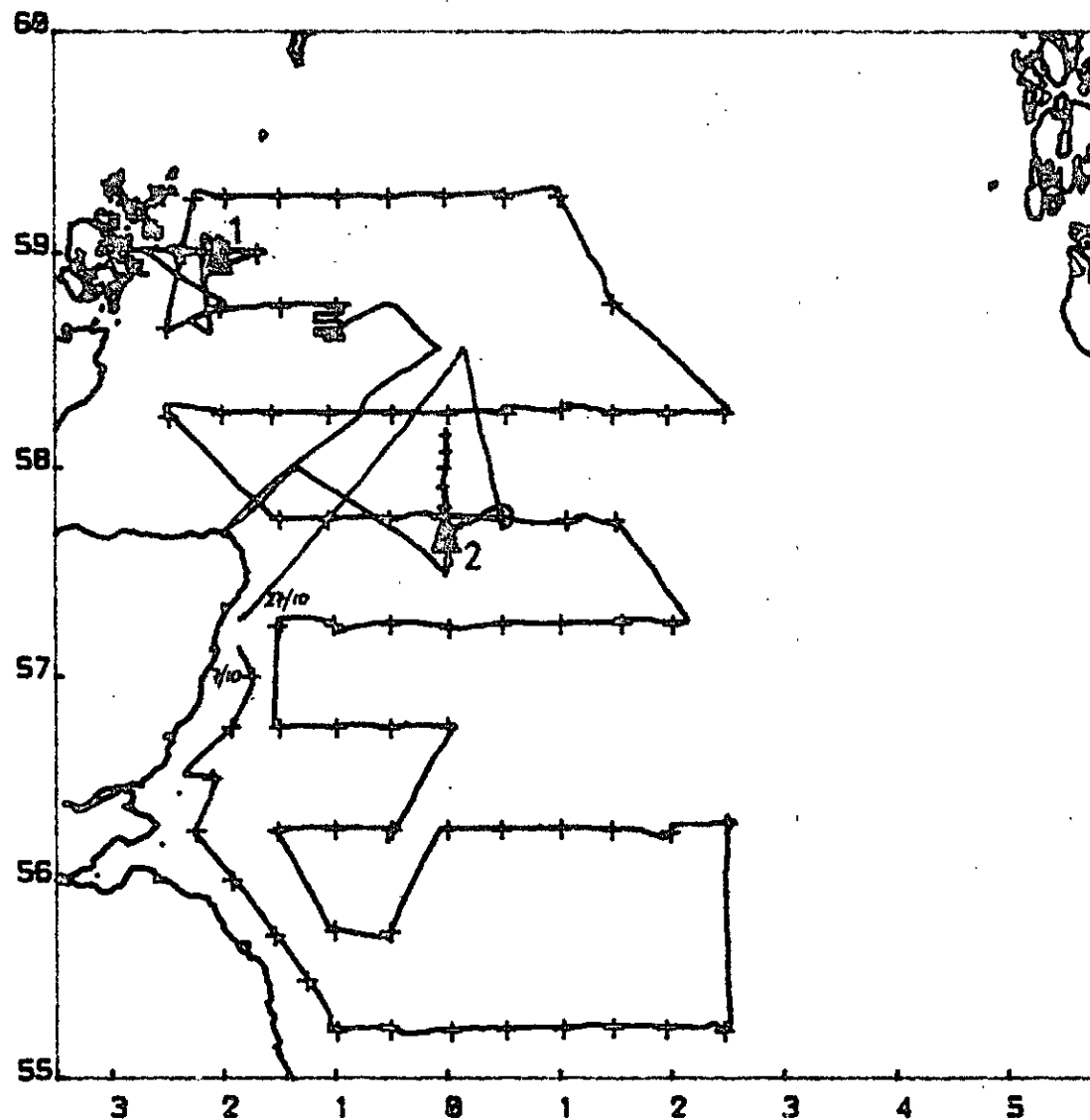
During the cruise, water samples for radio-caesium analysis were collected off Aberdeen, Arbroath and the Pentland Firth.

M Heath

6 November 1987

Seen in draft: N E McInnes, CO

SCOTIA 10/87 7-27/10/87



- Δ^1 17-21/10 Current meter mooring
Argos buoy release
98 plankton samples
- Δ^2 23-26/10 Current meter mooring
Argos buoy release
88 plankton samples