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LD

FRV "Scotia"

4SR87

Cruise 4/87

Report

22 April - 12 May 1987

Personnel

P Hopkins	HSO (in charge)
R Mitchell	SSO
D McKay	HSO
J Dunn	HSO
Mrs M Black	HSO
J Hutcheon	SO
F Armstrong	SO
D Stuart	PTO
D Beveridge	ASO
Miss S M Turner	(University of East Anglia)
Mrs G Malin	(University of East Anglia)
S Benn	(NCC) (22 April - 4 May)

Objectives

1. To carry out an acoustic survey for herring in the central and northern North Sea.
2. To collect samples for racial studies on North Sea herring.
3. To collect biological data on North Sea mackerel.
4. To collect stomachs for a study on the potential impact of herring and mackerel predation on other fish stocks.
5. To collect plankton samples for data on available prey.
6. To test and develop the multidepth plankton sampler.
7. To collect samples of fish for parasitological studies and for calorimetry studies.
8. To collect water samples for radio caesium monitoring.
9. To measure the amounts of dimethyl sulphide produced by certain species of phytoplankton (UEA).
10. To record seabird abundances and distributions (NCC).
11. To test the ability of the plankton winch to haul an Isaacs Kidd Net.

Narrative

"Scotia" sailed from Aberdeen at 0915 on 22 April. From 0930-1630, calibrations of the ship's log were carried out and a new wire on the plankton winch was streamed. Over half the length of wire was lost when the wire snapped on streaming. A new wire was picked up at Aberdeen and "Scotia" set sail at 1830 bound for Orkney to calibrate the acoustic equipment in Inganess Bay.

On passage to Orkney, "Scotia's" assistance was requested in a search for a crashed Buccaneer aircraft off Caithness. Searching continued until 1530 on 23 April, when passage to Orkney was resumed. Calibration of the acoustic equipment was successfully completed by 2300 on 23 April.

Echo integration commenced west of Foula at 0630 on 24 April. Integration continued during daylight hours until 3 May, when poor weather held up work. Trawl hauls were made to identify echotraces. Catch rates were generally low, and on 27-28 April four successive hauls with the PT160 pelagic trawl contained no fish. The BT137 bottom trawl was therefore rigged on 29 April and remained in use until the half landing. Because of low catch rates and limited time, the objective of taking plankton hauls at trawl positions was abandoned.

"Scotia" docked at Stavanger early on 4 May. The cruise track for the first half is shown in Figure 1.

"Scotia" set sail from Stavanger at 0900 on 5 May. The PT160 pelagic trawl was again rigged and echo integration and trawling were resumed. The plankton winch was tested using the Isaacs Kidd net on 10 May before moving into Inganess Bay to carry out a second calibration of the acoustic equipment. The cruise track for the second half is shown in Figure 2.

Water samples were taken at intervals to measure the concentrations of dimethyl sulphide (University of East Anglia). Samples were also taken for the analysis of phytoplankton abundance and concentrations of chlorophyll, phosphate and nitrate.

Throughout the cruise, hours of darkness were spent testing the multidepth plankton sampler.

Results

Midwater echotraces were generally sparse. Areas with most frequent catches of adult herring were east of Shetland, Bergen Bank and the Patch. Large concentrations of juvenile herring were found south of Dutch Bank. Twenty-nine hauls were made and a total of 761 herring otoliths were taken. Approximately 1000 stomachs were collected for the identification of prey species. In addition, about 800 herring were weighed for the calculation of a weight-length relation. Vertebral counts were made on selected samples for racial studies.

Mackerel were caught in any quantity in only one haul. This was using the BT137 bottom trawl to the south of Bergen Bank, when 156 mackerel in the size range 31-48 cm were caught. A total of 51 ovaries were taken for fecundity estimation.

The multiple depth sampler was deployed on 61 occasions and a series of tests carried out on the system. These indicate that a heavy payload of instrumentation can be carried by the sampler. New software was also successfully tested and a new design of motor successfully completed its sea trials. Modifications to the flowmeter and its electronics have resulted in improved performance.

About 170 seawater samples were taken to measure dimethyl sulphide (DMS) concentrations. In addition, intra- and extra- cellular concentrations of dimethyl sulphonid propionate (DMSP), the precursor of DMS, were measured to determine the breakdown of extracellular DMSP to DMS in different water types. Patches of very high DMS and DMSP concentrations were found which appeared to be associated with phytoplankton distribution (UEA).

Samples of fish were collected and frozen for parasitological and calorimetry work.

Caesium samples were taken at the following positions.

Fair Isle 59°30'N 2°W

Aberdeen 57°10'N 1°55'W

Additional caesium samples were taken at the following locations.

59°15'N 2°29'E
59°45'N 2°29'E
60°15'N 2°25'E
60°45'N 2°24'E
60°45'N 1°25'E
61°00'N 0°

Surface temperatures and salinities were measured at 10 minute intervals throughout the cruise.

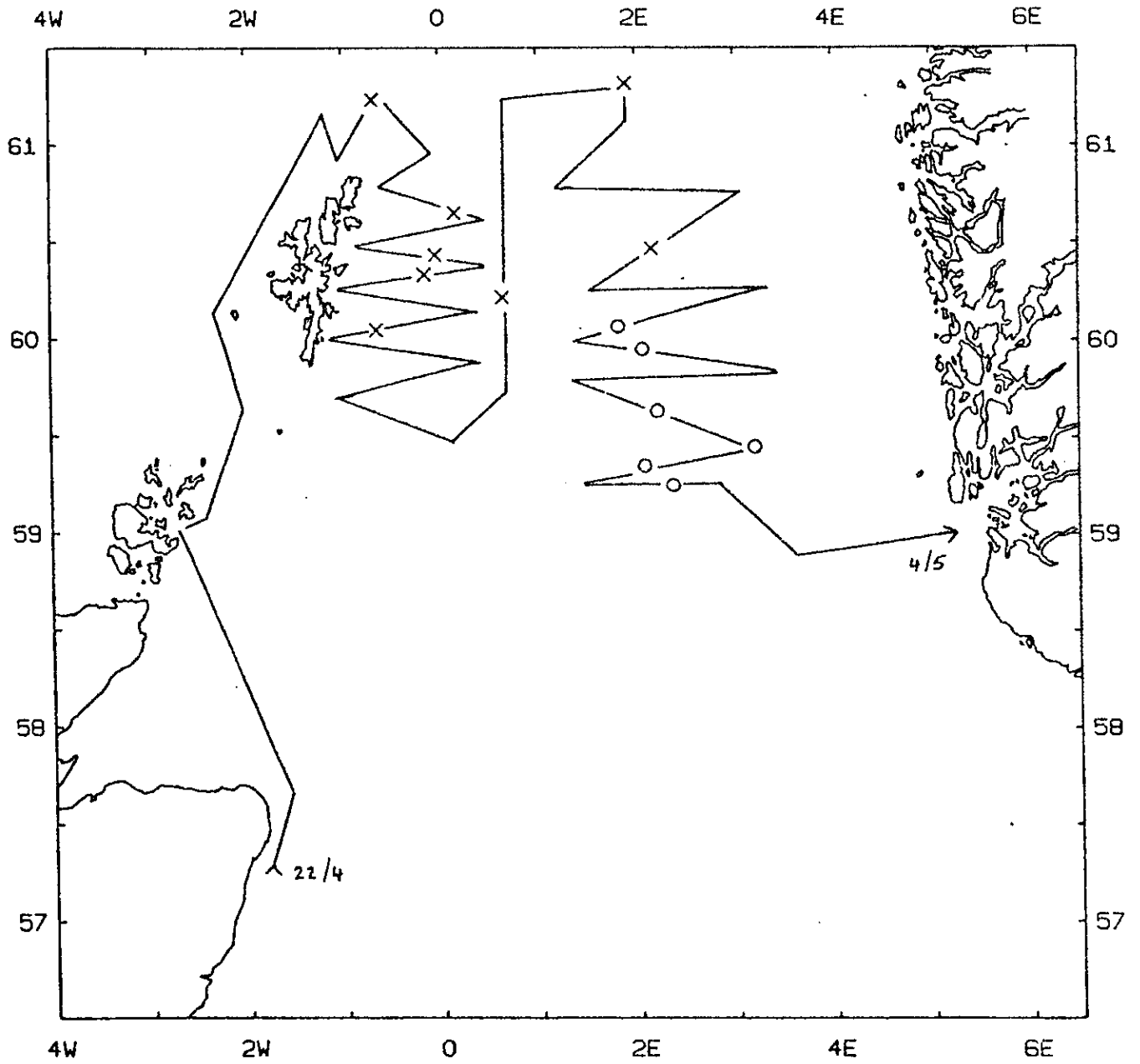
A total of 4060 minutes were spent recording seabird abundances at sea (NCC).

The plankton winch successfully deployed and hauled the Isaacs Kidd net.

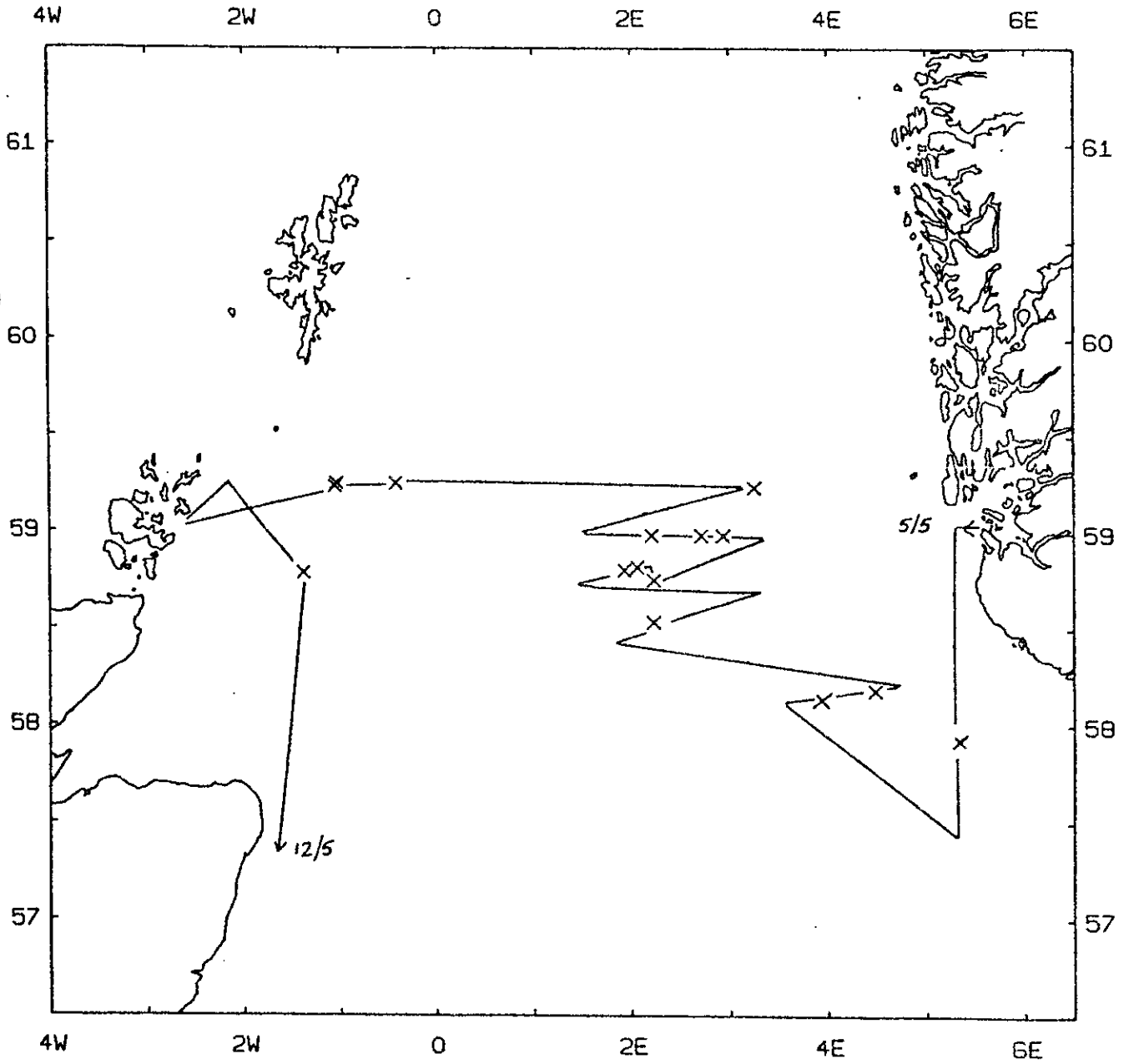
P Hopkins

2 June 1987

Seen in draft: N McIver



O Bottom trawl
X Pelagic trawl



X Pelagic trawl