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FRV *Scotia*

Cruise 1803S

REPORT

8-22 December 2003

Personnel

J Dunn	(In charge)
S Hay	
J Hunter	
E Armstrong	Part 2
N Collie	
J Beaton	
S Robinson	
M Rose	
S Fielding (NERC)	Part 2
A Mair	Part 2
J MacLeod (CNM)	

Project: AE11r - 15 days

Sampling gear: Hydrographic CTD; Plankton nets (ARIES), Dual Methot net.

Fishing gear: Midwater trawl PT 160

Area: Northwestern North Sea-Faroe Shetland Channel, and North Sea (Fladden ground)

Objectives

1. To conduct routine hydrographic sampling at stations along the standard JONSIS, Fair Isle-Munken and Nolso-Flugga survey lines.
2. To conduct plankton and hydrographic sampling with ARIES in the Faroe Shetland Channel.
3. To conduct plankton and hydrographic sampling with ARIES at stations on the Fladden ground.
4. To conduct fishing operations at selected areas on the Fladden ground.

Results

The survey was conducted in generally poor weather conditions, with only short breaks of moderate sea conditions.

1. The JONSIS standard section in the northern North Sea was surveyed completely, and the two standard Faroe Shetland Channel sections were surveyed in a shortened

- programme due to weather and time constraints.
2. Plankton and water samples were collected using ARIES and a Dual Methot net in the Faroe Shetland Channel
 3. Plankton samples and acoustic data were collected over a grid of stations on the Fladen ground using an ARIES system fitted with the Behemoth system, using 120 Khz, 200 Khz and 38 Khz transducers. ARIES was also fitted with 600Khz and 1200 Khz ADCPs. A Dual Methot net was deployed on the scattering layers seen on the echo sounder.
 4. A PT160 net was deployed on fish marks identified during surveys of the Fladen ground area.

Throughout the cruise surface temperature, salinity and fluorescence recordings were made using a Sea-bird SBE21 Thermosalinograph and a Sea Tech Fluorometer.

A total of 49 stations were completed using the Seacat 925 + CTD.

Detailed results of the hydrographic data collected during the cruise will be made available as the data is worked up and interpreted by the laboratory.

A total of 120 plankton samples were taken during the survey.

The ARIES plankton sampling system functioned 100% during the survey.

From each ARIES haul 70 C5 Calanus were picked out (if available). Twenty of them were preserved in liquid nitrogen for lipid analysis, twenty were frozen at -20 for isotope ratios, and thirty were preserved in ethanol, for DNA analysis.

Methot net samples had Euphausids picked out which were preserved as per the Calanus protocol. Target species were *Meganicthiphanes Norvegica* and *Thysanoessa Longicaudata* or in the absence of these, any other abundant euphausiid species.

The Bran and Luebbe auto analyser worked very efficiently, during the cruise, and easily kept pace with the number of samples being produced. A total of 560 samples were processed for total oxidised nitrogen, silicate and phosphate. Results will be available when data is fully worked up by the laboratory.

The EA500 and EK500 echo sounders were run continuously during the cruise and their output logged.

Narrative

Scotia sailed from Aberdeen at 1215 hours on Monday 8 December in choppy weather to an area of deep water about two hours distant from Aberdeen to commence test deployment of the CTD system. The plankton winch was also tested with a one ton weight. A problem was discovered with the 911 seabird system on the CTD this initially was thought to be a software problem. *Scotia* made passage to the easternmost end of the Jonsis line while instrument engineers worked on the CTD problem.

Scotia commenced the Jonsis line sampling at 0600 hours on Tuesday 9 December, after the CTD top and bottom frames were transferred from the 911 system. Sampling on the line was continued in marginal weather and completed at 1830 hours without incident. *Scotia* commenced the Fair Isle – Munken stations at 0130 hours Wednesday 10 December in very heavy weather. This dramatically slowed passage between stations and by 2400 hours the vessel was only at Fim 6a, it was becoming obvious that given the weather conditions we were

going to struggle to complete all the remaining stations in the available time.

In consultation with FRS Aberdeen a revised station list was worked out. A faulty OPC system was replaced when a suspect bulkhead connector was discovered prior to one deployment, *Scotia* completed the revised Fair Isle – Munken line at 0730 hours on Thursday 11 December.

The vessel then set course for the northern end of the Nolso-Flugga line in heavy swell and strong winds. Two stations were dropped from the northern end of the line and work started at 1300 hours on Thursday 11 December and continued along the modified station list for the line in very poor weather. Unfortunately another OPC system failed during a deployment of ARIES and had to be replaced.

Scotia completed the revised line at 2030 hours on Friday 12 December when the vessel was made secure for passage to Aberdeen in a heavy swell and gale force winds.

Scotia docked in Aberdeen at 1945 hours on the evening of Saturday 13 December.

The vessel sailed again from Aberdeen at 0900 hours on Monday 15 December and proceeded to an area to the north of Aberdeen to carry out inclination tests on an ARIES system fitted with two ADCPs and the Behemoth system. These were delayed for about an hour due to a leak in the cooling system of the ship's hydraulic system.

Testing of the orientation of the ARIES frame and the systems in it continued, revealing various problems, which were dealt with by instrument engineers.

Sampling started at the south west corner of a grid of stations at 0250 hours on Tuesday 16 December and *Scotia* proceeded in a very confused swell east and west deploying the ARIES system and CTD's. After the second deployment the 38 Khz transducer was found to have failed on the first station, and that the sea ram on the seabird CTD had also failed.

Work continued on the inner matrix of stations, but in the early hours of Wednesday morning a control card failed in the winch system caused the CTD to be hauled back to the surface faster than it should have been, but quick thinking on the part of the winch man prevented any damage to the CTD.

The card was replaced and the system tested and work continued unabated on the outer group of stations through the night of Wednesday 17 December, but on Thursday morning 18 December a transistor failed in the 20/20 system rendering the winch system for the ship inoperable at 0845 hours.

It was replaced within an hour and then tested before the last ARIES station was completed and the ARIES system moved on to the side deck to clear the trawl deck for Pelagic fishing operations.

All available OPC, Seabird, and selected acoustic data to date was sent ashore for evaluation. A transect was chosen for *Scotia* to survey based on acoustic information gained from the matrix of stations completed in the previous two days. The transect was surveyed by 1530 hours just as daylight failed without a single fish mark being seen.

Scotia then proceeded to the middle station of the east most outer line of stations and worked northward and west overnight deploying ARIES and Dual Methot Net in a very heavy swell and freshening wind.

A zig zag course was surveyed by *Scotia* south and west on Friday 20 December through the deepest part of the Fladen ground looking for fish marks. A suitable mark was found at 1545 hours and the pelagic net was shot. Unfortunately during the deployment the netsonde

cable snapped and the net had to be recovered to allow a replacement netsonde to be fitted. Soon after the net was shot again it became obvious that there was a problem and the net was recovered. On recovery of the net the wings on the starboard side were found to be twisted. Once these were cleared the net was shot again and towed through a small fish mark, however while the starboard door was being recovered, the back strap broke making recovery of the net difficult. The net was eventually recovered but there were only four fish in the codend.

Scotia completed six stations on the inner grid overnight, deploying a Dual Methot net on the scattering layers observed on the sounder, until 0830 hours on Saturday 20 December.

A zig zag survey was commenced at 0900 hours and a small fish mark was located and shot on at 1000 hours. The net was hauled at 1310 hours without incident, there were only a few fish in the codend.

Scotia continued with a zig zag survey pattern looking for fish marks until daylight faded at 1530 hours when a course was set for station eight of the inner group of stations.

A dual Methot net was deployed at this station and one more in a freshening wind which had reached in excess of fifty knots when it was decided to suspend work and dodge the vessel. With the forecast for more extreme weather and an increasing sea state and wind it was decided to abandon the remaining stations and make for Aberdeen at 08 00 hours. *Scotia* docked in Aberdeen at late afternoon on 21 December.

I would like to thank Captain Ramsay, the officers and crew of *Scotia* for their help during the cruise.

J Dunn
9 January 2004

Seen in draft: P Barrat, OIC *Scotia*

Circulation List: Cruise Programmes and Reports

SCOTIA VESSEL

Programmes - Mr J A Morrison for approval. Reports - Mr J A Morrison for approval.
Issue two copies of Record of Haul and Station Numbers pro-forma with Scientist-in-Charge's copy of *Scotia* and *Clupea* programmes.
Two xerox copies of track chart for reports to be sent to Dr L Rickards.

PROGRAMMES ONLY

Lab staff

Mr J T M Hunter
Mr T Reid
Mr P J Copland
Mr J Dunn
Mr A Beaton
Mr G Howard
Security

Non-lab staff

Island Cmdr Faroes (Faroes only)
Flag Officer, Denmark (Danish part of N Sea only)
Coastguard
Dr J Baxter

PROGRAMMES AND REPORTS

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Dr J Molloy
R de Clerck
Mr B Stewart
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Controller Coastal Ops - A Stewart
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