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FRV *Scotia*

Cruise 1403S

**REPORT**

16–30 September 2003

**Loading:** Aberdeen

**Unloading:** Aberdeen

**Personnel**

G Slesser	In charge
S Hughes	
J Beaton	
D Lichtman	
N Collie	
M Rose	
T Sherwin	SAMS
P Provost	SAMS
S Mendez	University of Aberdeen
R Swift	University of Aberdeen

**Gear**

SeaBird CTD's, ADCP's, SonoBuoys, Acoustic releases.

**Objectives**

1. To perform a hydrographic survey along the JONSIS standard section in the northern North Sea.
2. To perform hydrographic surveys along the standard Faroe Shetland Channel sections.
3. To service two ADCP moorings in the Faroe-Shetland Channel.
4. To deploy an ADCP mooring near the Wyville - Thomson Ridge for SAMS.
5. To perform a hydrographic survey along the standard Rockall section.
6. To perform hydrographic surveys in the area north east of Rockall up to the Wyville – Thomson Ridge area.
7. To perform ad-hoc towed array acoustic recordings for cetaceans and deployment of sonobuoys for Aberdeen University Zoology Department

**Out-Turn Days per Project:** 10 days - AE11r; AE1190 – 5 days

## Narrative

*Scotia* sailed from Aberdeen at 1300 (all times are GMT) on Tuesday 16 September for the JONSIS standard section. On route a test dip of the 911+ CTD was performed. CTD measurements and water sampling commenced at 0515 on Wednesday 17 September and was completed at 1626 on the same day (Stns 516-527). *Scotia* then proceeded to the start of the Fair Isle - Munken section for further CTD measurements and water sampling. Work started at 0054 on Thursday 18 September. This section was completed at 0017 on Friday 19 September (Stns 528-541). Ships passage was made to the start of the Nolso-Flugga section where CTD stations commenced at 0556. At the first station of the section bottle firing problems were encountered on the CTD carousel. The carousel was found to be faulty and was replaced with the Sealogger CTD carousel. Two stations later a termination fault developed in the sea cable. This caused a further delay while the sea cable was re-terminated. It was unclear whether the two problems were linked. The section was completed at 0912 on Saturday 20 September (Stns 542-557) and passage was made to the NWOCE mooring position NWSD (60°26.99'N 004°22.56'W).

Due to weather conditions on the morning of Sunday 21 September the recovery of the ADCP moorings were postponed. While waiting for the weather conditions to abate a comparison ADCP survey between the vessel mounted ADCP and the moored ADCP at position NWSD was initiated. This continued till 2000 on Sunday 21 September. The following morning with better weather conditions the two ADCP moorings NWSD and NWSE (60°16.50'N 004°20.00'W) were recovered. Passage was then made to Lerwick to service the ADCPs and for the mid cruise break. *Scotia* docked on Tuesday at 0645 on 23 September. The data logged by the ADCPs were successfully downloaded. The batteries of one of the ADCPs were replaced. The other ADCP belonging to the Faroese Fisheries Laboratory was replaced by a FRS ADCP.

The *Scotia* left Lerwick on Wednesday at 2100 on 24 September and proceeded to the position of the NWOCE mooring NWSE. This mooring (60°16.57'N 04°20.10'W) was successfully deployed on Thursday at 1015 on 25 September. This was followed by the deployment of the NWOCE mooring NWSD (60°27.20'N 04°22.65'W) at 1230.

The start of the overflow survey of the Wyville - Thomson Ridge, a joint FRS / SAMS investigation, commenced on Thursday at 2012 on 25 September with a section of 11 CTD stations (Stns 561-571) along the ridge. This work being a continuation of the work began during *Scotia* Cruise 7 in April of this year. This was followed by the deployment of the SAMS mooring (60°14.35'N 08°52.10'W, 1117 m) on Friday at 1500 on 26 September.

*Scotia* then conducted a CTD section (Stns 572-584) from the Ymir Ridge across the SAMS mooring position and onto the Faroe Bank. Subsequently four CTD sections were undertaken along the SE side of the Bank roughly between the 200 m and 1000 m contours and evenly spaced between the Faroe Bank Channel and the Wyville - Thomson Ridge (Stns 585-613). The final work involved repeating two stations about 3.6 nm apart in about 500 m of water at the western end of the ridge (Stns 614-628). This work was conducted between 26-28 September. In the early hours of Monday 29 September *Scotia* proceeded to Aberdeen, where she berthed at 0630 on Tuesday 30 September.

## Results

The weather conditions throughout the trip were reasonably good throughout except for a mid cruise period when poor weather conditions prevented mooring recovery and any other work for a period of 21 hours between 1000 on 21 September to 0700 on 22 September.

1. The JONSIS standard section in the northern North Sea was surveyed.

2. The two standard Faroe Shetland Channel sections were surveyed.
3. The two Nordic WOCE ADCP moorings NWSD and NWSE were recovered successfully and the data downloaded. One ADCP was re-deployed, the other replaced by an FRS ADCP. The recovered ADCP data will be processed in the laboratory by in-house software.
4. The SAMS ADCP mooring was successfully deployed along with a current meter and temperature mini-loggers south of the Wyville-Thomson Ridge.
5. There was no time to carry out this objective.
6. The investigation was successfully completed in full with a total of 68 CTD profiles being conducted. In general the bottom waters were significantly warmer than those found in the previous April. It would appear that relatively little overflow was taking place at the time of the survey. Further analysis of the data collected from these stations will be worked up in the laboratory.
7. Passive acoustic surveys for cetaceans were carried out in the Faroe - Shetland Channel from the *Scotia* between the 16-30 September. Surveys were conducted using a towed hydrophone array (0.2-150 kHz), and for the first time a high frequency click detector (30-150 kHz) was run to detect harbour porpoise clicks (135 kHz). The hydrophone array was towed between standard hydrographic stations along Fair Isle - Munken and Nolso - Flugga standard hydrographic sections as well as in the area of the Wyville - Thomson ridge, where travel times between stations exceeded one hour, and between hydrographic sections. Towed array surveys were also carried out during transits between mooring deployment and recovery sites. Most of the ship's track was surveyed, corresponding to around 2500 km of acoustic monitoring effort. Every 15 minutes one minute listening stations were carried out. In total, 345 listening stations were made. Sperm whales were detected in only 2.6% of all stations and dolphin species were detected in 22.9% of all stations. Four sightings, all of unidentified baleen whale groups were made. Low frequency recordings (0.0001-0.2 kHz) were made using sonobuoys deployed at hydrographic stations separated by 30 kilometers or in water depths greater than 600 m. 22 sonobuoys were deployed. Fin whales were detected in over 50% of the sonobuoys stations. Blue whales were also detected.

Throughout the cruise, sea surface temperature, salinity and fluorescence recordings were made using a Sea-Bird SBE21 Thermosalinograph and Sea Point Fluorometer. Detailed results of the hydrographic data collected during the cruise will be made available as the data are worked up and interpreted in the laboratory.

G Slesser  
15 October 2003

Seen in draft: Captain P Barratt