Report - FRV Scotia, Cruise 1404S

R1/12, Not to be cited without prior reference to the FRS Marine Laboratory, Aberdeen

REPORT

4–18 October 2004

Loading: Aberdeen
Unloading: Aberdeen

Personnel

G Slesser	In charge
S Hughes	
J Beaton	
D Lichtman	
M Rose	
C Shepherd	Hydrographic Office
E Koutsoubos	University of Oulu
S Mendes	University of Aberdeen
C Emblng	University of St Andrews

Gear
SeaBird CTDs, ADCPs, 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 recover two current meter moorings south of the Wyville-Thomson Ridge.

5. To deploy a current meter mooring west of the Shetland Islands.

6. To deploy two current meter moorings east of the Shetland Islands.

7. To carry out coastal hydrographic surveys.

8. 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: Ae11r0, 5 days: Ae1190

was identified and repaired. The Two ADCPs were re-deployed. The recovered ADCP data will be processed in the laboratory by in-house software.

4. The two current meter moorings south of the Wyville-Thomson Ridge were not recovered as these are now to be recovered later in the year. However CTD hydrographic sections were worked in the vicinity of the current meter moorings to provide background data for the later analysis of the current meter data when recovered.

5. The current meter mooring for this objective was successfully deployed.

6. The two current meter moorings for this objective were successfully deployed.

7. Coastal CTD sections were carried out East of Scotland, West of the Hebrides and in the South Minch area.

8. Passive acoustic surveys for cetaceans were carried out in the Faroe-Shetland Channel from *Scotia* between the period 4-18 October 2004. Surveys were conducted using a towed hydrophone array (0.2-150 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, West Hebrides, the Minch and the North Sea, where travel times between stations exceeded 30 minutes. On several occasions the *Scotia* steaming speed between hydrographic stations was reduced to allow enough time to tow the hydrophone. Towed array surveys were also carried out during transits between mooring deployment and recovery sites. Around 140 hours of acoustic monitoring effort were carried out which corresponds to around 2550 km. Two-minute listening stations were carried out every 15 minutes. In total, 477 listening stations were made. Sperm whales were detected in 3.5% of all stations (Fig. 2) and dolphin species were detected in 27.5% of all stations (Fig. 3). There were also 2 sightings, one of a group of unidentified baleen whales (probably fin whales) and the other a group of common dolphins. Recordings were automatically made for 30 seconds every 2 minutes together with long continuous recordings carried out when in the presence of whales or dolphins either vocalizing close to the vessel or emitting unusual sounds.

Low-frequency, one-hour recordings (0.0001-0.2 kHz) were made using sonobuoys deployed at hydrographic stations separated by 30 kilometers or in water depths greater than 300 m. 27 sonobuoys were deployed. Post processing of these recordings will be carried out by René Swift in order to detect vocalizations of baleen whales.

It is planned that the towed hydrophone array data will be analysed by Sónia Mendes (Aberdeen University), and Clare Embling (Sea Mammal Research Unit) independently as part of their PhD research projects.

Throughout the cruise, sea surface temperature, salinity and fluorescence recordings were made using a Sea-Bird SBE21 Thermosalinograph and Sea Point Fluorometer. Surface samples were taken throughout the cruise to calibrate these data. The fluorometer data continues to show the same problem that has persisted over the past few months. This is the “ramping” up of the fluorometer data as the cruise continues. Further discussions with the Engineering Services Group are continuing to resolve this problem. Detailed results of the hydrographic and ADCP data collected during the cruise will be made available as these data are worked up and interpreted in the laboratory.

G Slesser
25 October 2004

Narrative

Scotia sailed from Aberdeen at 1200 (all times are GMT) on Monday 4 October for the first of two E Scotland CTD hydrographic sections. Sampling commenced at the first station of these sections at 1347. The last station on the second section was completed at 1733 on Tuesday 6 October (Stns 420-439). *Scotia* then proceeded to the start of the JONSIS standard section. CTD measurements and water sampling commenced at 1935 on Tuesday 5 October and was completed at 0735 on Wednesday 6 October (Stns 440-451).

Passage was then made to the proposed position for deployment of the outermost East of Shetland current meter mooring (Fig. 1). This mooring (60º28.54'N 000º07.71'W) was deployed at 1730 and followed by a line of CTD stations through this mooring position (Stns 452-458). On completion the second East of Shetland current meter mooring (60º34.44'N 000º37.90'W) was laid at 0758 on Thursday 7 October. Passage was then made to the proposed West of Shetland current meter mooring position (Fig. 1) and this mooring (60º45.83'N 001º27.12'W) was laid at 1313 on Thursday 7 October. This was followed by working a line of stations (Stns 459-463) through this current meter mooring position.

Scotia then proceeded to the start of the Nolso - Flugga section for further CTD measurements and water sampling. Work started at 2139 on Thursday 7 October. A break of four hours was required during this section to make repairs to the CTD caused by a faulty cable. This section was completed at 0618 on Saturday 9 October (Stns 464-479). Ships passage was then made to the start of the Fair Isle - Munken section where CTD stations commenced at 1121. The section was completed at 0816 on Saturday 10 October (Stns 480-493) and passage was made to the NWOCE mooring position NWSE (60º16.87'N 004º19.51'W).

ADCP mooring NWSE was recovered at 1128 on Saturday 10 October followed by the recovery of ADCP mooring NWSD (60º26.93'N 004º22.13'W) at 1326. *Scotia* then made to the Wyville-Thomson Ridge area to survey a series of CTD sections (Stns 494-533). This work commenced at 0219 on Sunday 11 October and was completed at 0651 on Wednesday 13 October. Two brief breaks were taken during the working of these sections to stop at the two current meter moorings deployed during *Scotia* Cruise 8 of this year. This allowed scientific staff to interrogate these moorings by hydrophone and verify that they were still on position.

Following the completion of these CTD sections *Scotia* proceeded to the position of the NWOCE mooring NWSD. This mooring (60º27.02'N 04º22.54'W) was successfully deployed at 1538 on Wednesday 13 October. This was followed by the deployment of the NWOCE mooring NWSE (60º16.61'N 04º20.02'W) at 1747.

Scotia then proceeded to the Butt of Lewis to start coastal CTD section work. This work commenced at 0530 on Thursday 14 October and continued throughout the next three days. During this time 50 CTD stations (Stns 534-583) were completed.

In the early hours of Sunday 17 October *Scotia* proceeded to Aberdeen, where she berthed at 0530 on Monday 18 October.

Results

The weather conditions throughout the trip were reasonably good throughout the cruise and no ship time was lost.

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. Due to a malfunction on the NWSD ADCP no data were recovered. The data from the NWSE ADCP was successfully down loaded. The NWSD malfunction

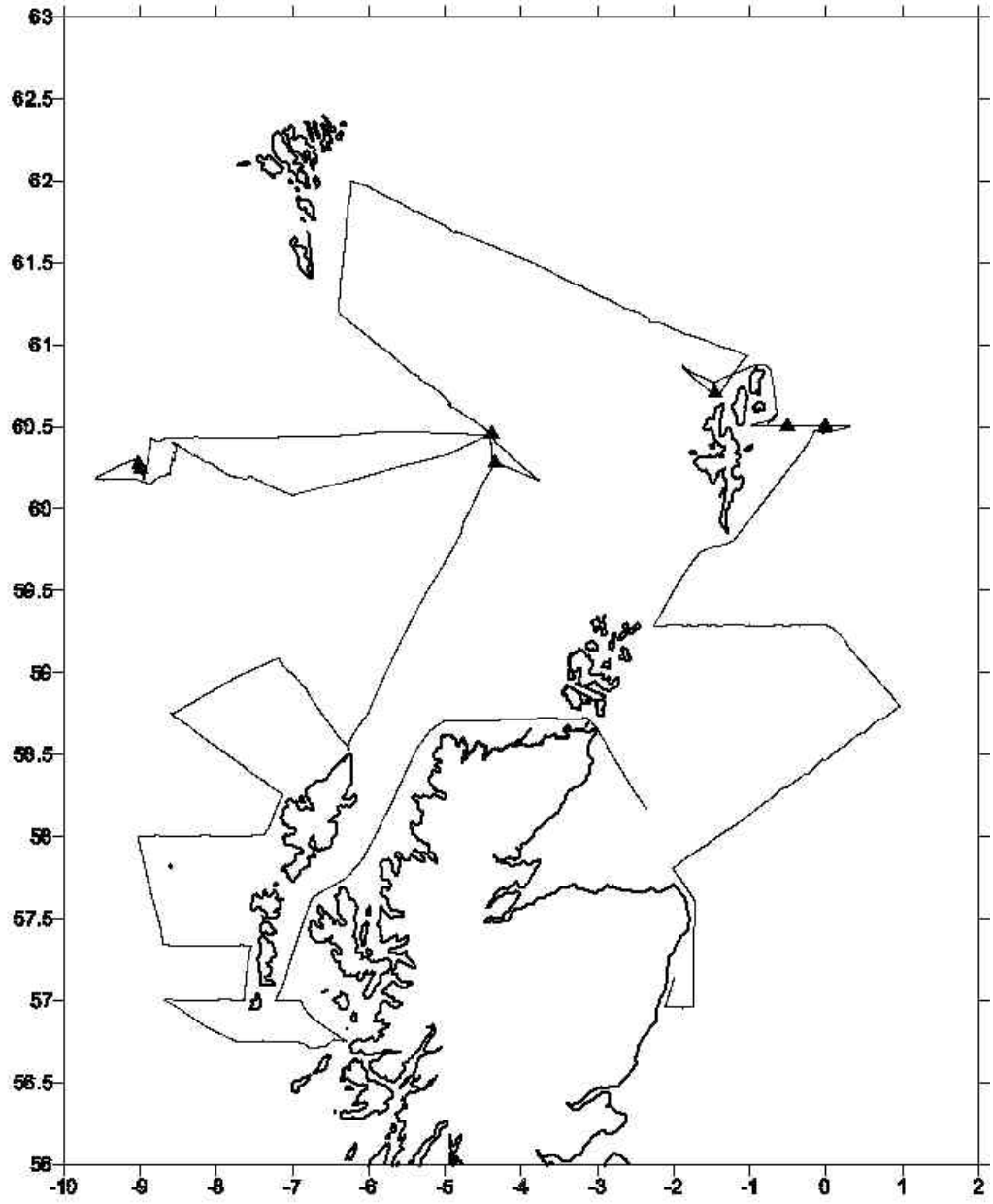

Figure 1. Cruise Track and Mooring Positions