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FRV *Scotia*

Cruise 1405S

REPORT

26 September – 10 October 2005

Loading: Aberdeen
Unloading: Aberdeen

Personnel

G Slesser	In charge
J Beaton	
D Lichtman	
N Collie	
M Rose	
L Stobo	
J P Lacaze	
T Gridley	University of Aberdeen
C Booth	University of St Andrews

Gear

SeaBird CTDs, ADCPs, SonoBuoys, Acoustic releases.

Objectives

1. To perform hydrographic surveys 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 east of the Shetland Islands.

5. To carry out CTD hydrographic surveys in the Wyville-Thomson Ridge and Rosemary Bank areas.

6. To recover a current meter mooring from Anton Dohrn Sea Mount.

7. To perform ad-hoc towed array acoustic recordings for cetaceans and deployment of sonobuoys.

Out-Turn Days per Project: 11 days: Ae11r0, 4 days: Ae1190.

Narrative

Scotia sailed from Aberdeen at 1000 hours (all times are GMT) on Monday 26 September for the start of the long term monitoring (LTM) JONSIS CTD/water line. En route a trial CTD deployment was carried out. On completion of this trial deteriorating weather conditions prevented passage to the first JONSIS line station and the *Scotia* remained in the Moray Firth overnight. The following morning *Scotia* proceeded to the start of the JONSIS line. Sampling commenced at 1556 hours on Tuesday 27 September. By time of the completion of the JONSIS 2 station at 1757 hours the weather conditions had deteriorated again and shelter was sought off the Orkney Islands. Slightly better conditions on Wednesday 28 September allowed work to recommence at 0825 hours. Two stations, JONSIS 3 and 4 were worked before weather conditions again called a halt to the sampling work at 1015 hours.

Due to the continuing bad weather conditions *Scotia* left the JONSIS line at 0630 hours on Thursday 29 September and made passage to the CTD line bisecting two FRS current mooring positions east of the Shetland Islands. Working this line commenced at 1730 hours on Thursday 29 September and was completed by 0230 hours on Friday 30 September. Once again due to the deteriorating weather conditions it was only able to confirm that both current meter moorings were on position by interrogating the acoustic release at each mooring position. Shelter was sought by *Scotia* off Fetlar. With improved weather conditions the following morning both current meter moorings were recovered at 0730 and 1005 hours on Saturday 1 October.

Scotia then made passage to the start of the LTM Nolso-Flugga CTD/water sampling line where two stations were completed before work again was brought to a halt by gale force weather conditions. Work recommenced at 0600 hours on Sunday 2 October. Slow progress was made along this LTM sampling line before it was finally completed at 1612 hours on Monday 3 October. Passage was then made to the start of the LTM Fair Isle - Munken CTD/water sampling line. En route, *Scotia* received a message that the Chief Engineers wife had been injured in a car accident. *Scotia* broke its passage to call in to Torshavn to allow the Chief Engineer to fly home. Once the Chief Engineer had departed *Scotia* set sail from Torshavn at 0700 hours on Tuesday 4 October for the start of the Fair Isle – Munken line. The line was worked till station 3a when *Scotia* broke off to recover the NWOCE ADCP moorings.

ADCP mooring NWSE (60 16.58'N 004 22.48'W) was recovered at 0755 hours on Wednesday 5 October followed by the recovery of ADCP mooring NWSD (60 26.99'N 004 22.48'W) at 0950 hours The remaining stations on the Fair Isle – Munken line were then worked and completed at 1404 hours. Scotia then made passage to the Anton Dohrn seamount to recover a current meter mooring deployed on the previous Scotia cruise. En route to the seamount the ADCP data was downloaded, batteries replaced and set up for redeployment.

The following morning, Thursday 6 October, an updated weather forecast for the following day showed that despite the forecast issued the previous day gale force 8 and 9 conditions were forecast for the seamount area. It was decided to abandon the recovery of this mooring and make a return passage to the NWOCE ADCP mooring position for deployment of the ADCP instruments the following morning. Information was made available to us that the *Charles Darwin* would be working the Anton Dohrn Seamount area sometime over the period 6-28 October. Contact was made with the *Charles Darwin* to ask whether she would be willing to recover the mooring during its cruise. Chief scientist, Dr Toby Sherwin, indicated that he would be happy to make an attempt to recover the mooring.

On the morning of Friday 7 October mooring NWSD (60 27.09'N 04 22.62'W) was successfully deployed at 0813 hours and mooring NWSE (60 16.91'N 04 19.25'W) at 1032 hours. Passage was then made to the start of the JONSIS line. En route deteriorating weather conditions prevented work starting on the line and Scotia sheltered overnight off the Orkney Islands

awaiting better conditions. However, given the forecast received later for the next 48 hours, it was decided to abandon working the JONSIS line. On Saturday 8 October time was spent carrying out a trial run of the ships ADCP into the Moray Firth followed by an ADCP survey over Moray Firth dump sites. Finally, on Sunday 9 October testing, running and drawing up a set of step by step instructions of the Windows version of the Sea-Bird 911 CTD software was carried out before returning to Aberdeen. The *Scotia* berthed at 2100 hours that evening.

Results

The weather conditions throughout the cruise were characterised by gales, resulting in considerable loss of time and the inability to undertake some of the objectives.

1. Only stations 1, 1a, 2, 3 and 4 of the JONSIS LTM line in the northern North Sea were surveyed.

2. Both the standard Faroe - Shetland Channel sections were surveyed.

3. The two Nordic WOCE ADCP moorings NWSD and NWSE were recovered successfully; data downloaded and re-deployed. The recovered ADCP data will be processed in the laboratory by in-house software.

4. The East of Shetland current meter moorings for this objective were successfully recovered and the data downloaded. The current meter data will be processed on return to the laboratory.

5. Due to the intermittent gale-force weather conditions throughout the cruise no work was carried out in the Wyville-Thomson Ridge and Rosemary Bank area as other objectives had a higher priority.

6. Again due to the weather conditions throughout the cruise the Anton Dohrn Seamount mooring was not recovered. As mentioned in the narrative it is hoped that this mooring will be recovered by the *Charles Darwin* some time over the next three weeks.

7. Passive acoustic surveys for cetaceans were carried out in the Faroe-Shetland Channel from the FRV *Scotia* between the 26 September and 10 October 2005. The surveys were conducted using a towed hydrophone array (0.2-150kHz). The hydrophone array was towed between standard hydrographic stations along the Fair Isle-Munken, Nolso-Flugga and East of Shetland standard hydrographic lines as well as in the North Sea, where travel time between stations exceeded 30 minutes. Towed array surveys were also carried out during transits between mooring retrieval and deployment and also whilst under passage.

Approximately 159 hours of acoustic monitoring effort were carried out; covering 2193.7 km. Two-minute listening stations were conducted every 15 minutes. In total, 434 listening stations were made. Sperm whales were detected in 2.3% of all stations (Fig. 1) and dolphin species were detected in 11.3% of all stations (Fig. 2). Recordings were automatically made for 30 seconds every 2 minutes together with long continuous recordings carried out in the presence of vocalizing whales or dolphins. There were also 5 sightings made by crew members on the bridge, though species identification was not possible.

The towed hydrophone array data will be analysed by Sónia Mendes (University of Aberdeen) and Clare Embling (Sea Mammal Research Unit, University of St. Andrews) independently as part of their PhD research projects.

Low frequency recordings (0.0001-0.2 kHz) were made using sonobuoys deployed at

hydrographic stations. Twenty seven sonobuoys were deployed throughout the cruise. Post processing of these recordings will be carried out by René Swift in order to detect vocalisations of baleen whales.

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. Clogging up of the pipe work of the thermosalinograph system throughout the cruise by mussels finding their way into the intake pipe has resulted in some of these data to be deemed unsafe. A decision on these data to be deleted from this data set will be taken in post processing at the laboratory.

Detailed results of the hydrographic data collected during the cruise will be made available as these data are worked up and interpreted in the laboratory. Calibrations samples were taken for both the thermosalinograph and CTD instruments. Due to the problems highlighted above no calibration was determined for the thermosalinograph. A conductivity calibration was determined for CTD and is shown in Figure 3.

No depths were displayed on the Zendiq display screens throughout the cruise. Checks carried out by the ships electrical officer and laboratory engineer showed that depth readings were being received from the EA500 by the communications serial cable to the point of connecting to the Zendiq DAS PC. It is thought that there maybe a fault in the multi port serial card on DAS1. On 1 October the date on the Zendiq displays was found not to have updated from the 30 September. The date was updated by altering the AWE PC clock to the correct date. This problem will also be investigated on return to Aberdeen.

G Slesser
17 October 2005

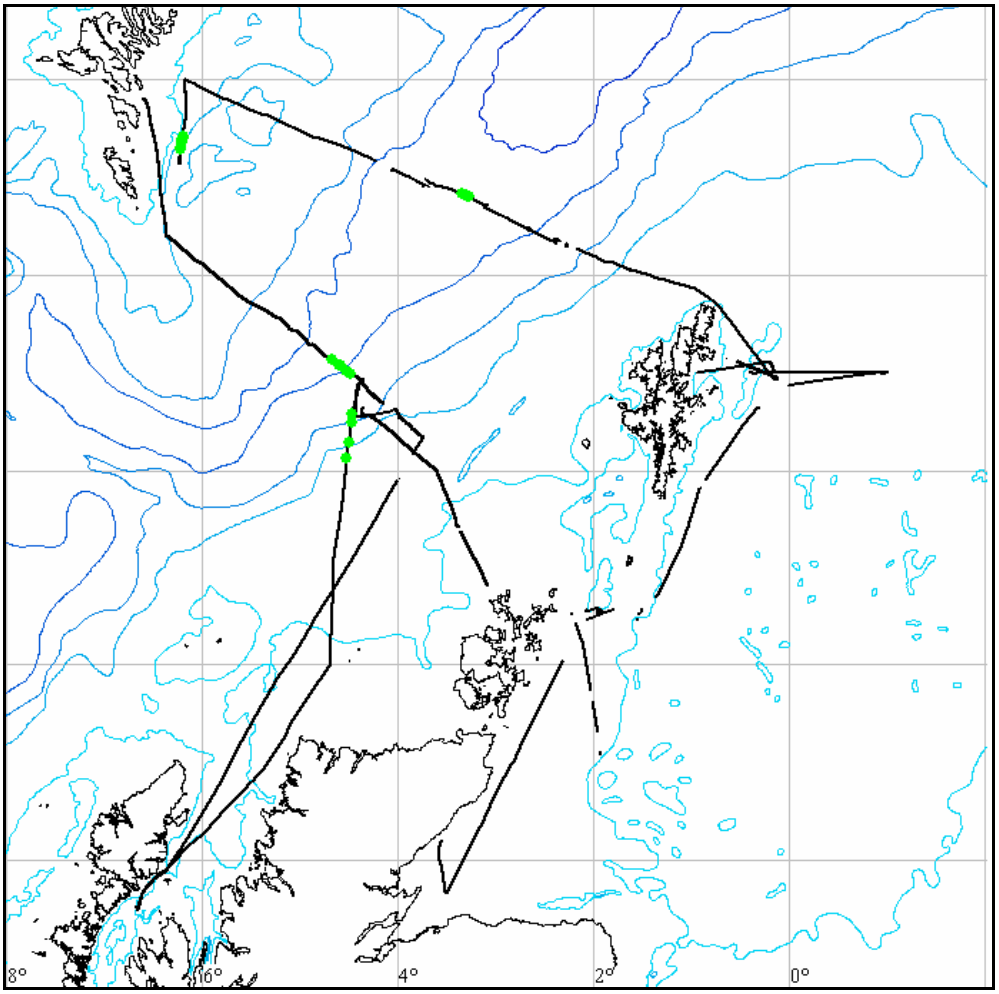

Figure 1 - **Sperm whale locations (circles) during the September/October 2005 Scotia survey**

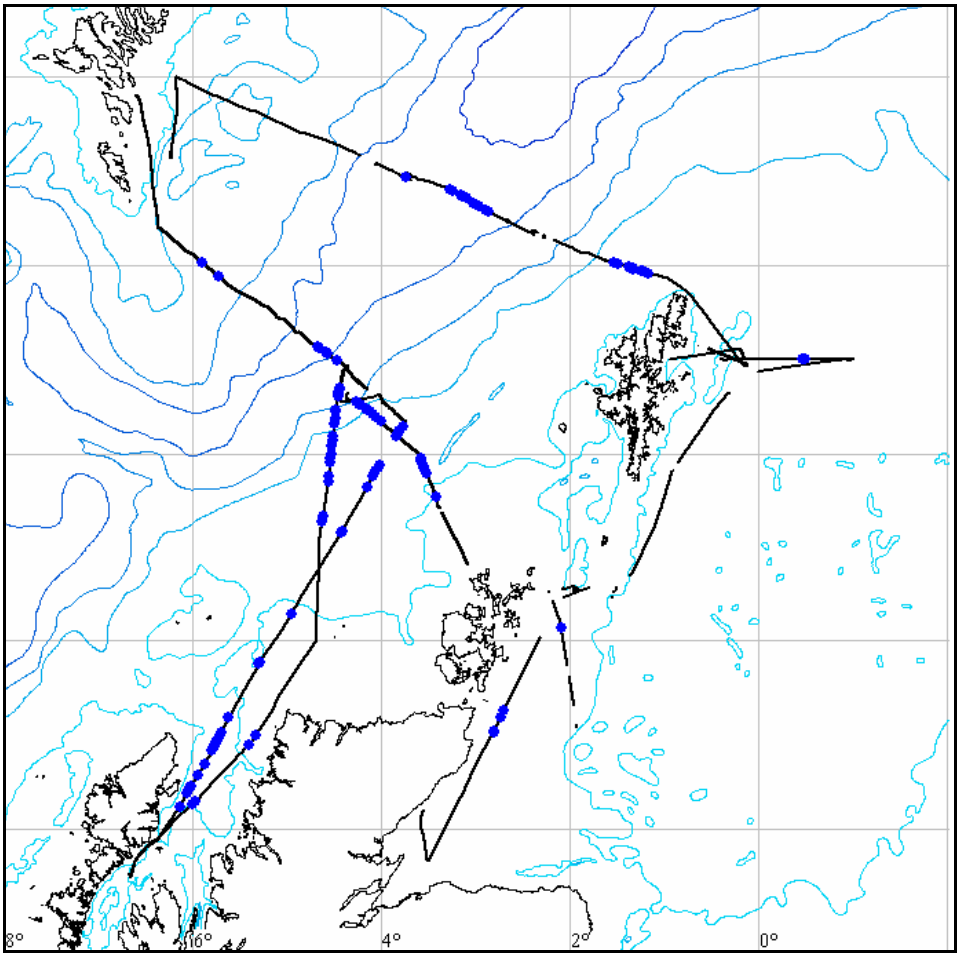

Figure 2 – Dolphin locations (circles) during the September/October 2005 Scotia survey

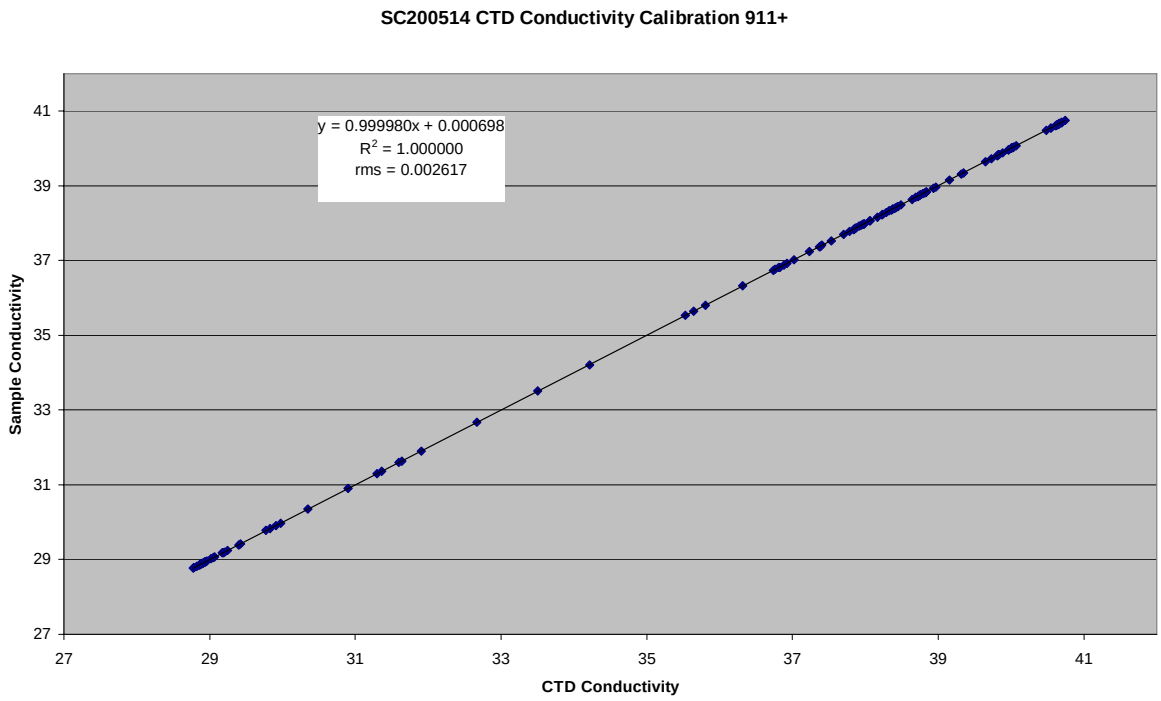

Figure 3 – CTD Calibration.

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~~
~~Handymen~~
~~Mr P J Copland~~
~~Mr J Dunn~~
~~Mr A Beaton~~
~~Mrs J Petrie~~
~~Security~~

Non-lab staff

~~Island Cmdr Faroes (Faroes only)~~
~~Flag Officer, Denmark (Danish part of N Sea only)~~
~~Coastguard~~
~~G Lees~~

PROGRAMMES AND REPORTS

Lab staff

Mr J A Morrison
Capt R Denholm
Mr C Hall - Fish Man team progs only
Dr R M Stagg
Dr C Moffat
Mr M R Heath
Mr A Macdonald
D Lichtman (+ additional copy of track chart of reports only)
Mrs E Morrison
C O/OIC of Vessel (*Scotia*) (to be faxed)
File

Non-lab staff

~~Library, Danmarks Fisk (reports only)~~
~~Mr J Mortensen (Faroes only)~~
~~Mr A Souplet (Fishing Cruises only)~~
~~Dr S Ehrich (Entering German Waters) (reports only)~~

W J McCurdy, Belfast
Technical Director, SFIA (J E Tumilty)
Dr L Rickards
Dr I Joint
Director – Havfor Inst, Norway
Dr S Ehrich
Monsieur le Chef du dépt, Nantes
Mr J C Brabant
Mrs van Duyvenvoorde
Dr J G Gordon
G Kane
R de Clerck
Mr B Stewart
Capt J Cannan (*Scotia* and *Clupea* only)
Controller Coastal Ops - A Stewart
Dr P Grieg-Smith
Mr H C Boyar
Dr R J A Atkinson
Mr H i Jákupsstovu
Mr C Bullimore (To be faxed: 01923 846392)

Laboratory Personnel on Vessel

*G Slesser
S Hughes
J Beaton
D Lichtman
N Collie

M Rose
C Embling
T Gridley

Fishery Officers at