R1/12

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Cruise 0804S

REPORT

12–30 May 2004

Loading: Aberdeen
Unloading: Aberdeen
Half Landing: Stornoway (21 May)

Personnel

W Turrell	
G Slesser	
J Beaton	
D Lichtman	
M Rose	
C Johnson	SAMS PhD Student
C Embling	Aberdeen University
S Mendes	Aberdeen University
Toby Sherwin	Visitor (SAMS)

Gear

CTD, ADCP and current meter moorings, towed hydrophone, thermosalinograph

Objectives

1. To perform hydrographic surveys along the JONSIS standard section in the northern North Sea.

2. To perform hydrographic surveys along the standard Rockall section.

3. To perform a survey of the Wyville-Thomson Ridge.

4. To perform hydrographic surveys along the standard Faroe Shetland Channel sections.

5. To service two ADCP moorings.

6. To attempt to recover two current meter moorings.

7. To perform eddy surveys in the Faroe Shetland Channel

8. To perform ad-hoc towed array acoustic recordings for cetaceans.

Narrative

After an initial delay owing to repairs to a fault in the CTD sea cable, *Scotia* sailed at 1800 (Note – all times BST) on Wednesday 12 May. She proceeded to the start of the JONSIS standard section, and work along this line commenced at 0830 Thursday 13 May. Twenty carboys were filled with surface water at station JO10 at the start of this line. The survey along the JONSIS

line was completed by 2130, with continual problems with the control of the CTD winch. Eventually manual control was established to avoid damage to equipment.

Scotia then proceeded to the location of the ADCP mooring D (60° 27.20'N 4° 22.65'W), arriving at 0600 on Friday 14 May. The mooring was successfully recovered by 0700 and Scotia then proceeded to mooring E, which was recovered by 0830 (60° 16.57'N, 4° 20.10'W).

Scotia then sailed to the start of the Fair Isle Munken section, where work started at 1100 and was completed the following day at 0730 Saturday 15 May. *Scotia* then proceeded to the start of the Nolso Flugga Section, which was started at 1140 on the 15 May, and was completed by 1300 Sunday 16 May. By the end of these sections the CTD winch was back under control remotely from the winch cabin.

Scotia then proceeded to the start of Section T, along the 600 m contour north of the Wyville-Thomson Ridge (WTR). Work along this section commenced at 0900 on Monday 17 May and was completed by 1430 the following day. Section C, leaving Faroe Bank southwards and crossing the deep gully entering the Cirolana Deep, was started at 1720 on Tuesday 18 May and completed by 0730 the following day, when *Scotia* started a survey along Section D, crossing the gully further south. This line was completed by 1530 on Wednesday 19 May. A section crossing from the Faroe Bank, through the Cirolana Deep and up onto the Bill Bailey Bank extension, Section KE then commenced at 1555 later that day, and was completed by 0501 the following day, Thursday 20 May. Although *Scotia* then commenced a further line, Section L, crossing from the Bill Bailey Bank extension back to the Ymir Ridge, only one station, L1, was completed before *Scotia* had to proceed to the location of mooring WT 02b in order to carry out mooring work in day light. Prior to mooring work commencing a CTD cast was performed alongside the WTR Deep mooring (Station WTR).

Mooring WT 02b was successfully deployed by 1200 20 May (60˚14.74'N 8˚59.65'W), and mooring WT 01b deployed by 1400 (60˚16.24'N 9˚00.80'W). Mooring WTR Deep was then recovered. *Scotia* then proceeded to the half landing in Stornoway. On the way a single cast was performed at the northern end of the eastern Rockall Trough (Station NRT). *Scotia* entered Stornoway at 0800 Friday 21 May. ADCP batteries were delivered to the vessel, and instrument set up took place until noon that day.

Scotia sailed from Stornoway at noon Saturday 22 May. Two hours were spent outside Stornoway completing ADCP set-up procedures. *Scotia* then proceeded directly to a section running across the Rockall Trough, over the Rosemary Bank, Bill Bailey's Bank, Faroe Bank and ending back in the Faroe Shetland Channel. Work along this long section commenced at 0000 Sunday 23 May and was completed by midnight on Tuesday 25 May. *Scotia* then performed a single deep cast in the centre of the Faroe-Shetland Channel, and then the T section was re-surveyed, prior to the WTR-Shallow mooring being recovered by 1600 Wednesday 26 May.

There then followed a final section back to Rosemary Bank, and returning to the WTR, which was completed by 1500 Friday 28 May. *Scotia* then returned to the location of the Foinavan moorings. Mooring NWSD was deployed by 0400 Saturday 29 May, and mooring NWSE by 0600. However, a mistake with acoustic release commands resulted in mooring NWSE re-surfacing. As no further anchor weights were available, this mooring was not deployed.

Throughout the trip, a towed hydrophone was deployed between stations and on passage, and continuously pumped surface water was sampled for temperature, salinity and flurescence.

Results

The cruise had excellent weather throughout. Apart from the failed mooring at NWSE, all

objectives were achieved.

1. Hydrographic Surveys Along the JONSIS and Faroe-Shetland Channel Standard Sections

In all 181 CTD stations were performed. The table below gives details of the sections worked. A full data report has been prepared and will be published in the FRS Collaborative Report series.

Sect Name	Start				End				N Stns
	Latitude	Longitude	Time GMT	Date	Latitude	Longitude	Time GMT	Date	
FSC Background Survey									
FIM	60º 10.13'N	3º 44.43'W	0957	14/05/2004	61º 12.06'N	6º 21.42'W	0601	15/05/2004	14
NOL	61º 59.44'N	6º 11.74'W	1038	15/05/2004	60º 55.97'N	1º 00.38'W	1131	16/05/2004	16
WTR 2004 Survey Part 1 (17-20 May 2004)									
T(1)	59º 51.12'N	6º 04.66'W	0801	17/05/2004	60º 56.00'N	7º 50.80'W	1254	18/05/2004	16
C	60º 48.70'N	8º 50.54'W	1620	18/05/2004	60º 10.65'N	8º 55.13'W	0555	19/05/2004	13
D	60º 10.65'N	8º 55.13'W	0555	19/05/2004	60º 18.84'N	9º 01.82'W	1404	19/05/2004	8
KE	60º 18.84'N	9º 01.82'W	1404	19/05/2004	60º 08.69'N	9º 41.50'W	0401	20/05/2004	10
L	60º 10.59'N	9º 27.70'W	0509	20/05/2004	N/A				1
Station WTR					60º 14.49'N	8º 51.78'W	0752	20/05/2004	N/A
Station NRT					59º 27.34'N	7º 32.90'W	2052	20/05/2004	N/A
WTR 2004 Survey Part 2 (17-20 May 2004)									
RB1	58º 17.65'N	8º 59.86'W	2353	22/05/2004	59º 15.01'N	10º 02.72'W	1833	23/05/2004	13
RB2	59º 18.93'N	10º 00.04'W	1927	23/05/2004	60º 10.13'N	09º 36.00'W	1352	24/05/2004	14
BB	60º 10.13'N	09º 36.00'W	1352	24/05/2004	60º 37.18'N	10º 18.62'W	0313	25/05/2004	11
FB	60º 37.18'N	10º 18.62'W	0313	25/05/2004	60º 39.79'N	8º 28.04'W	2248	25/05/2004	19
Station FSC					60º 39.79'N	8º 28.04'W	2248	25/05/2004	N/A
T(2)	60º 25.27'N	8º 29.08'W	0435	26/05/2004	60º 09.59'N	7º 23.31'W	1301	26/05/2004	6
NRT1	59º 59.45'N	8º 18.00'W	1820	26/05/2004	59º 14.86'N	10º 02.97'W	1013	27/05/2004	11
NRT2	59º 14.86'N	10º 02.97'W	1013	27/05/2004	59º 06.99'N	7º 23.48'W	0347	28/05/2004	12
NRT3	59º 06.99'N	7º 23.48'W	0347	28/05/2004	59º 59.00'N	7º 44.04'W	1412	28/05/2004	8

2. Moorings

Mooring activities were:

Mooring	Activity	Location	Depth	Time / Date	Comments
NWS D	Recover	60° 27.20'N 4° 22.65'W		0615 14/05/2004	NWOCE ADCP
NWS E	Recover	60° 16.57'N, 4° 20.10'W		0740 14/05/2004	NWOCE ADCP
WT 02b	Deploy	60˚ 14.74'N 8˚ 59.65'W	1264	1043 20/05/2004	MOEN – 2 Aanderaas, Microcat, 10 Miniloggers. 290m long.
WT 01b	Deploy	60˚ 16.24'N 9˚ 00.80'W	986	1228 20/05/2004	MOEN – 3 Aanderaas, Microcat, 10 Miniloggers. 310m long.
WTR Deep	Recover	60º 14.35 N, 8º 52.10'W	1200	1434 GMT 21 May 2004	SAMS ADCP, 1 Aanderaa, 1 Microcat, 13 miniloggers
WTR Shallow	Recover	60º 10.98 N, 7º 44.03'W	643	0900 GMT 01Aug 2003	SAMS ADCP, 1 Aanderaa, 1 Microcat, 13 miniloggers
NWS D	Deploy	60° 27.20'N 4° 22.65'W			
NWS E	Deploy	No deployment occured			

3. To Perform Ad-hoc Towed Array Acoustic Recordings for Cetaceans

Passive acoustic surveys for cetaceans were carried out in the Faroe-Shetland Channel from the FRV *Scotia* between 12 and 30 May 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 lines as well as in the area of the Wyville Thompson Ridge, Faroe Bank, Rosemary Bank and north end of the Rockall Trough, where travel times between stations exceeded 1 hour. In several occasions the FRV *Scotia* steaming speed between hydrographic stations was reduced to allow enough time to tow the hydrophone. This provided data from areas previously unsurveyed. Towed array surveys were also carried out during transits between moorings deployment and recovery sites. Around 115.6 hours of acoustic monitoring effort were carried out which corresponds to around 2200 km. Two-minute listening stations were carried out each 15 minutes. In total, 490 listening stations were made. Sperm whales were detected in 25.3% of all stations and dolphin species were detected in 20.6% of all stations. There were also 2 sightings, one of a group of pilot whales and unidentified dolphin species and another of a group of unidentified dolphin species. 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. The FRV *Scotia* noise characteristics have changed since the last cruise, now including a high frequency hum. This might have been due to a recent polishing and fixing of the propeller as confirmed by the engineer on board.

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 300 m. 41 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.

4. Sampling for Heavy Metals

Three hundred and thirty five water samples were collected for analysis of aluminium content at 18 stations in the Faroe Shetland Channel, Faroe Bank Channel, Wyville-Thomson Ridge and northern Rockall Trough. Two samples were collected for every depth at each station: one straight from the rosette, and the second via a filtering system connected directly to the rosette bottle which passed the water through a 0.4 µm filter. This gives reactive and dissolved aluminium data respectively. Samples were kept in the dark until the addition of reagents and on-board analysis using a Perkin Elmer LS-5B luminescence spectrometer. The addition of reagents took place under 5days after sample collection and analysis 12-24 hours after. Problems were encountered with contamination of dissolved samples, although blanks for the filtering apparatus were under 0.8 nM. One possibility is from the filter papers used which gave variable blanks between 0.9-5 nM. Thirty three water samples were also collected at four stations in the Faroe Shetland Channel, Wyville-Thomson Ridge and northern Rockall Trough for general trace metal content. These were acidified and stored in the dark for later shore-based analysis.

W R Turrell
30 June 2004

Seen in Draft: Captain Peter Barratt, 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	**Non-lab staff**
~~Mr J T M Hunter~~	~~Island Cmdr Faroes (Faroes only)~~
~~Mr T Reid~~	~~Flag Officer, Denmark (Danish part of N Sea only)~~
~~Mr P J Copland~~	~~Coastguard~~
~~Mr J Dunn~~	~~Dr J Baxter~~
~~Mr A Beaton~~	
~~Mr G Howard~~	
~~Security~~	

PROGRAMMES AND REPORTS

Lab staff	**Non-lab staff**
Mr J A Morrison	~~Library, Danmarks Fisk (reports only)~~
Capt R Denholm	~~Mr J Mortensen (Faroes only)~~
Mr R S T Ferro) Fish Man team	Mr A Souplet (Fishing Cruises only)
Mr C Hall) progs only	~~Dr S Ehrich (Entering German Waters) (reports only)~~
Dr R M Stagg	
Dr C Moffat	W J McCurdy, Belfast
Mr M R Heath	Technical Director, SFIA (J E Tumilty)
Mr A Macdonald	Dr L Rickards
D Lichtman (+ additional copy of track chart of reports only)	Dr I Joint
	Director – Havfor Inst, Norway
Mrs E Morrison	Dr S Ehrich
CO/OIC of Vessel (*Scotia*) (to be faxed)	Monsieur le Chef du dépt, Nantes
Library (2)	Mr J C Brabant
File	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		**Fishery Officers at**
W Turrell	M Rose	Aberdeen
G Slesser	C Johnson	
J Beaton	C Embling	
D Lichtman	S Mendes	
	Toby Sherwin	