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FRV *Scotia*

Cruise 0605S

REPORT

25 April – 2 May

Personnel transfer: Peterhead (evening of 28 April)

Personnel

E Jones	(SIC)
R Kynoch	
N Collie	
I Penny	
M Stewart	
A McIntosh	
M Robertson	(Part 2)
L Robinson	(Part 2)
B Wigham	(Oceanlab, University of Aberdeen)
A Jamieson	(Part 1) (Oceanlab, University of Aberdeen)
S Davie	(MSc student, University of Aberdeen)
C Fletcher	(MSc student, University of Southampton)
A Guerin	(PhD student University of Southampton)
M Dennis	(Part 1) (student, University of Aberdeen)

Gear

BT 137 (GOV trawl) fitted with ground gear B and scanmar
FRS baited underwater camera (JULIET)
Oceanlab Lander (ROBIO)
Van Veen Grab
Day Grab
Box Core
Simrad EM 950 swathe bathymetry system

Objectives

To repeat the biological baseline survey of the Buzzard platform site and adjacent control area carried out in 2004. This will include:

- Baited time lapse camera deployments
- Sediment samples for biological analysis collected by Van Veen and box core
- GOV trawl samples
- A swathe bathymetry mapping exercise of the area.
- Sediment samples for chemical analysis and flatfish for biological effects and chemical analysis.

Narrative

Equipment was loaded on 21 and 22 April. Staff joined the vessel on the morning of Monday 25 April and *Scotia* left Aberdeen at 1100, arriving at the Buzzard site (57°48'N, 0°58'W) at 1530. Once on station baited camera work commenced with both ROBIO and JULIET being deployed at regular intervals over the next 3 days. In between deploying and retrieving landers, sediment sampling was carried out for both biological and chemical analysis. On the afternoon of Thursday 28 April, following the early retrieval of both landers due to poor weather, *Scotia* steamed to Fraserburgh to carry out a personnel transfer by pilot boat outside Fraserburgh harbour. Once this transfer was complete, *Scotia* returned to the Buzzard site although worsening weather prevented scientific work from being resumed until the following morning.

On Friday 29 April, an area delimited by the positions 57°50.132'N, 00°53.066'W, 57°547.047'N, 00°52.974'W and 57°47.062'N, 00°59.354'W, 57°50.137'N, 00°59.365'W, encompassing both the rig site and control area was surveyed using the Simrad EM950 swathe bathymetry system. A total of 10, 3 nautical mile long transects were completed with the ship taking approximately 1 hour for each leg. Following the bathymetry survey, conditions had improved sufficiently to allow the baited camera work to continue overnight before fishing commenced the following morning. A total of seven 30 min hauls were carried out over the next 2 days along a transect between the rig and the control site with additional ROBIO deployments being completed at the same time.

Following the completion of fishing activities on Sunday afternoon, box core sampling began at the rig and control site until weather worsened. The poor conditions also prevented further lander deployments and *Scotia* steamed back towards Aberdeen that evening. The vessel docked in Aberdeen at 1100 on Monday 2 May. Platform construction work began at the Buzzard site on the 2 May.

Results

ROBIO was deployed, as last year, in suspended mode (i.e. with the camera frame suspended 1.5 m above the bait and ballast by a 120 m mooring line). Although 4.5 h deployments were planned, the strong spring tides resulted in the surface marker buoy being dragged below the surface within 2 hr of the first deployment, making recovery impossible until the tide had slackened off. The photographs indicated that the water flow at the sea bed had tilted the frame up to 40°, resulting in the reference scale being in view for the first 1.5 h of the deployment only. As a consequence of these conditions ROBIO deployments were shortened and restricted to periods near slack tide. Even so, difficulties were still experienced at times in retrieving the lander. It is hoped that improvements to the rigging of the mooring line and some practice time set aside for the ship at the start of future cruises will minimise these problems. A total of 15 ROBIO deployments were accomplished. Of these, 10 were completed prior to any trawling activity (six within the future exclusion zone of the platform and four at the control site). A further five deployments were made once trawling had begun; two were dropped as close as possible to recent trawl tracks, one in the corridor region between the rig and manifold positions and two north of the control site. Deployment durations ranged from 45 min to 4 hours, depending on the strength of the current. A similar species composition was observed compared to last year with whiting, haddock, flatfish (mainly common dab) and hagfish being attracted to the bait. However, more flatfish were observed (over 50 in one deployment) and fewer haddock compared to last year along with more hermit crabs. These photos are being analysed as part of an MSc research project.

Seven deployments of the newly built FRS lander (JULIET) were accomplished during the cruise. JULIET was lowered directly onto the seafloor on its mooring line, which was then released with a surface marker buoy. During the first deployment, the lander frame was dragged over onto its side before the mooring line was released from the ship. A scanmar tilt sensor attached to the frame was subsequently used to monitor the angle of the lander during deployment. The frame tipped over on one more occasion, but five others were successful. Since this lander rested directly on the sea-floor, the camera view was unaffected by the tidal currents although the area photographed was smaller. Two short deployments were made to the west of the platform site, one without and one with bait, followed by three overnight baited deployments, one in the corridor between the future rig site and the adjacent water injection manifolds and one at each of the manifold sites. The same key species were observed but in lower numbers. It is intended to change the deployment technique of this lander for future cruises to allow free-fall descent of the frame. This should solve the problem of dragging the frame over whilst the mooring line is paid out.

Sediment samples were collected using a van Veen grab at the site of the platform (5) and at the control site (5). These samples were sieved at 250 µm and preserved in 4% formalin. Three box cores were collected at the rig site and two at the control site. These were then sub-sampled using 100 mm ID push cores which were sliced at pre-determined intervals and preserved in 4% formalin. These samples will be used to look at any vertical zonation patterns in the macrofauna. Analysis will be carried out at Aberdeen and Southampton Universities. A total of 16 sediment samples were taken by Day grab from the control site and around the rig site for contaminant analysis. Sediment will be analysed at FRS for organic carbon, particle size, PAH, CB and brominated flame retardants.

All seven trawl samples were worked up with the catch being sorted, weighed and either all or a sub-sample being measured for each species present. Biological data (sex, maturity and stomach samples) were collected for whiting (131) and haddock (165) over the full size range caught and for the three cod caught. Any intact invertebrates were also collected and preserved in 4% formalin. From these hauls, sufficient male common dab, and at the rig site trawling location, plaice, were processed for hepatic mixed function oxidase activity (by EROD determination), polycyclic aromatic hydrocarbon (PAH) bile metabolites, liver and muscle for PAH and chlorobiphenyl (CB) analysis. Length and weight were recorded and gonad weight taken for somatic index. The liver aliquot for EROD was homogenised and the protein fraction stored in liquid nitrogen. Stomach samples were also collected from the common dab. A total of 180 dab and 10 plaice comprised the samples taken.

The data from the swathe bathymetry survey were logged initially onto a SUN workstation and was then to be transferred to a PC loaded with the latest version of Quester Tangent's Multiview ground discrimination system. However, software compatibility problems prevented this from occurring during the time spent onboard *Scotia*. All software problems have now been resolved and simple maps of the survey area will be available soon. During this bathymetry survey, acoustic data was also logged from the EK 60 (18, 38, 120 and 200 kHz).

Despite difficult weather and tidal conditions, this survey was largely a success and the crew of FRV *Scotia* and scientific staff are thanked for their co-operation and hard work.

Emma Jones
1 August 2005

Seen in draft: Captain Peter Ramsay, OIC *Scotia*