

R1/12

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FRV *Scotia*

Cruise 0506S

## REPORT

4-8 April 2006

### Personnel

J Dunn	(In Charge)	4-8 April
Martin Burns		4-8 April
Mike Stewart		4-8 April
Neil Collie		4-8 April
Jim Hunter		4-8 April
Eric Armstrong		4-8 April
Hongyue Sun	(Ms) (AU)	4-8 April
Nick Burns	(AU)	4-8 April
Charlotte Main	(Msc AU)	4-8 April
Nick Jacobs		4-5 April
Matt Geldart		5-8 April

**Project:** MF0454 – 1 days; MF01TA – 2 days; MF0662 – 2 days

### Fishing Gear

PT 160 with larger pelagic doors  
Multisampler frame, extension and codends  
GOV Trawl Ground gear C  
Methot net insert for multisampler

### Equipment

RCTV  
Dual Methot samplers  
ARIES  
Holographic camera  
Multisampler transducers (drop keel fitting prior to sailing)  
Self recording net mounted cameras  
Scanmar sensors  
Camera and light net frames

**Area:** Moray Firth, Southern deeps

### Objectives

1. To conduct tow trials of Acoustic platform
2. To test the function of two Dual Methot net frames
3. To test the function of the multi sampler frame and train scientific staff in it's use
4. RCTV trials
5. ARIES orientation trials and holographic camera trials

6. Trials of acoustic instrumentation for monitoring gear performance
7. Swath bathymetry survey and training
8. Monitoring performance of acoustic systems
9. Testing shipboard instrumentation

## Results

1. Tow trials of the acoustic platform were held up due to fine control problems with the hydro winches. The platform was successfully deployed and towed using the container crane and it's associated winch.
2. Two Dual Methot frames were successfully tested in shallow sheltered waters.
3. The multi sampler frame was tested on the Methot net winch.
4. RCTV trials were successfully conducted and new cameras were tested.
5. ARIES fitted the holographic camera, and OPC was deployed and towed five times in sheltered shallow waters. Due to poor weather a vertical dip test of ARIES on the plankton crane was used initially to test the holographic camera.
6. Acoustic instrumentation was successfully tested on the demersal trawl net and all data recorded for analysis back at the laboratory.
7. Swathe bathymetry trials and training in the operation of the system were conducted.
8. Acoustic systems, which were modified during refit were monitored and protocols drawn up, and tested by ships personnel. A remote switch was fitted in the Sonar container to control the EK60 transceivers, in the transducer connection room.
9. Certain shipboard instrumentation were monitored and tested during the cruise, including EK60 bridge repeater, SSU, Thermo salinograph and Zendiq interface.

## Narrative

*Scotia* sailed from Aberdeen at 0900 on Tuesday 4 April in blustery weather and heavy swell and made for deep water about two hours distant from Aberdeen where she commenced test deployment of the plankton winch system. Control problems with both the plankton and hydro winches were identified and the chief engineer decided that the plankton winch was too dangerous to use, due to the lack of fine control. Engineers in Norway were contacted to see if a solution could be found.

The problems with the Hydro winch meant the launching the acoustic platform was made a little more difficult, but it was eventually launched using the container crane and its integral winch. The platform was towed north at full ship's speed, without incident, in very poor conditions and was eventually recovered at 1800.

A swathe bathymetry grid was completed overnight and in the early hours of Wednesday morning. This allowed FRS staff to be trained in the use of the system - however problems in calibrating the computer meant that it was not entirely successful.

Test deployments were made with the new RCTV system on Wednesday morning and test data was acquired, before *Scotia* broke off at 1100 and made passage to Peterhead to drop off Nick Jacob and pick up Matt Geldart. The change over of staff was completed by 1520 and *Scotia* made for the Southern deeps to continue RCTV trials.

The potential of using a remote control box on the plankton winch to see if this offered an alternative way of using the winch safely failed, as the unit operated the brake, but not the winch.

On completion of the RCTV trials at 1940 the multi sampler had been rigged and was made ready for trials on a four - point bridle system to be towed on the Methot net winch. There were some problems with monitoring the amount of wire out on the winch, but a read out on the Scantrol system eventually allowed the trials to proceed.

The multi net system did not perform correctly and was recovered, reset and deployed again several times, but it still did not function correctly, so the system was recovered and the motor housings removed for investigation. Removal of the casings was very difficult due to corrosion and the job was not completed until 0330 Thursday.

The Methot net winch was considered as a means of deploying and test towing the dual Methot net frames, down the ramp, but rejected by FRS engineers as the potential for damage to the instrumentation at the bottom of the frames was quite high.

The pelagic doors were swapped with the demersal doors and moved on to the deck. The demersal GOV trawl was rigged with instrumentation at 1200 on Thursday in worsening wind and sea state.

The gear was eventually shot away in shallow water in 55 knt winds and a series of tests carried out successfully with all data from the instruments being recorded for analysis back at the laboratory.

With weather and sea conditions worsening Scotia sought shelter further to the west in the Moray Firth to allow tests of the plankton winch and repaired multi codend system. On reaching shelter, tests were carried out on the plankton winch which showed that modifications carried out to the hydraulic system by the chief engineer had been successful in allowing a measure of fine control in winch operation.

A vertical deployment of ARIES was carried out with the holographic camera operational. ARIES was lowered to ten meters off the seabed and hauled up in ten-metre intervals, stopping at each ten-metre increment for five minutes. The system was deployed in this manner for an hour, and after data were downloaded from the camera, a significant number of images had been collected. Instrumentation fixed to the sampler indicated that it had remained almost level while being deployed and recovered vertically. Flotation was then added to predetermined positions on the ARIES frame and it was then towed in 50 knt winds over a range of speed blocks to determine if the sampler was towing horizontally during normal operation, with the holographic camera fitted. Downloading the data indicated that the sampler was still towing nose down but not by as much before the floatation was fitted.

Following a short break in the early hours of Friday morning, in very poor weather, the Multi codend system was deployed on the Methot winch, but it failed to function properly and it was recovered at 0345.

ARIES was deployed after breakfast in strong winds and a choppy sea, with two more floats added at the front end of the sampler and the holographic camera. On recovery data indicated that the two extra floats had not made any difference to the attitude of the sampler under tow. The holographic camera had captured 36 Gigabytes of high quality images. Plankton samples from ARIES were preserved for future analysis.

The system was then deployed again in the same area with even more flotation fastened to the fore end of the sampler. Downloading the data on recovery however indicated no change in the attitude of the sampler under tow. The holographic camera had nevertheless again recorded some very interesting images.

Following lunch two Methot net frames were deployed in shallow sheltered waters and both functioned perfectly.

The Multi codend unit was deployed at 1500 on the Methot net winch with a mini camera system fitted to it to observe operation under water. The multi codend unit functioned perfectly and was recorded on tape.

Two more deployments of ARIES were successfully completed and valuable information was gained on the attitude of the sampler with added weight and less flotation. On completion of this work *Scotia* made passage for Aberdeen at 2100 on 7 April.

Weather conditions during the cruise ranged from poor to atrocious, which meant that some of the trials had to be conducted in sheltered but shallow water.

The fine control of certain winches did hamper the early part of the cruise, but the ship's chief engineer is to be commended on coming up with a temporary solution, which allowed equipment to be deployed safely on the plankton crane/winch.

I would like to thank the officers and crew for all their help in achieving as many of the outcomes as we did in difficult weather conditions

J Dunn  
19 April 2006

Seen in draft: A MacLeod, OIC *Scotia*