Not to be cited without prior reference to Marine Scotland, Marine Laboratory, Aberdeen.

FRV *Alba na Mara*

Cruise 1411A

PROGRAMME

4-13 October 2011

Ports

Loading: 30 September, Fraserburgh
Unloading: 13 October, Fraserburgh

In setting the cruise programme and specific objectives, etc the Scientist-in-Charge needs to be aware of the restrictions on working hours and the need to build in adequate rest days and rest breaks as set out in Marine Scotland's Working Time Policy (Lab Notice 34/03). In addition, the Scientist-in-Charge must formally review the risk assessments for the cruise with staff on-board before work is commenced.

In the interest of efficient data management it is now mandatory to return the Cruise Report, to I Gibb and the Cruise Summary Report (old ROSCOP form) to M Geldart, within four weeks of a cruise ending. In the case of the Cruise Summary Report a nil return is required, if appropriate.

Personnel:
K Summerbell
B O'Neill
J Hunter

Costs to Project: 10 days – 10873

Equipment:

- BIGG sledge (Benthic Interactions with Ground Gear);
- Ground gear elements and weights;
- Rubber matting;
- Load cells;
- LISST 100X;
- Day grab (including table);
- Video Cameras;
- Flashback recorders and housings;
- Scanmar (height and depth);
- Modified TV sledge;
- Modified trawl door.

Objectives

- To estimate horizontal drag forces (hydrodynamic and pelodynamic drag) for ground gear shaped objects towed on the sea bed, at different towing angles and vertical loads.

- To measure the quantity of sediment remobilised by ground gear shaped objects.

Protocols:

Alba na Mara will leave Fraserburgh on 4 October and steam towards Lossiemouth. Tows will be carried out on clean sandy ground between Lossiemouth and Burghead (Figure 1), to test the new BIGG sledge to ensure its stable during deployment, and allow the crew to practice handling the sledge on deck. Sediment samples will be taken with the day grab at both the "Lossiemouth" and "Nairn" sites. The rest of the cruise will be dedicated to sledge sampling experiments. *Alba na Mara* will return to Fraserburgh on the 12 October, and the scientific personnel and equipment will be unloaded on the 13 October.

The BIGG sledge and ground gear components:

The BIGG sledge has been designed to allow the horizontal drag of the ground gear (hydrodynamic and pelodynamic drag) to be measured via load cells mounted within the framework. The sledge allows the ground gear to be angled at 90, 60 or 30 degrees to the towing direction; and weights from 0 -120kg can be applied to the ground gear - altering the vertical force.

There are three model ground gear object shapes (8 inch disc, 16 inch disc and NACA0025 ("Hydro-Hopper")) to be tested on the sledge. Each object is made out of 2 inch thick high density polyethylene (HDPE). Six identical model shapes will be spaced 3 inches apart; or joined together to form one continuous object (12 inches thick); and fitted to a bar on the sledge. Therefore, six ground gear arrangements, plus the bar on its own (as a control) are to be tested.

The sledge will have a LISST 100X mounted 1.4m behind the ground gear. This will enable particle size and quantity to be measured within the sediment plume created by the ground gear. A video camera will be mounted on the framework of the sledge. It will be angled to verify the ground gear is in contact with the seabed, and the LISST is within the sediment plume.

Sledge sampling:

The muddy sand site at Nairn is the principal site. Single ~25 minute tows will be conducted with as many permutations of ground gear, tow angle and weight as possible. It might be necessary to allow the Nairn site to settle periodically, as the fine sediment mobilised by prolonged towing may start to contaminate the LISST sampling. If this occurs, sampling will be moved to the Lossiemouth site for up to 24 hours. This will also enable additional data from a different sediment type (sandy mud) to be obtained.

Normal contacts will be maintained with the laboratory.

Submitted:
K Summerbell
26 August 2011

Approved:
I Gibb
06 September 2011

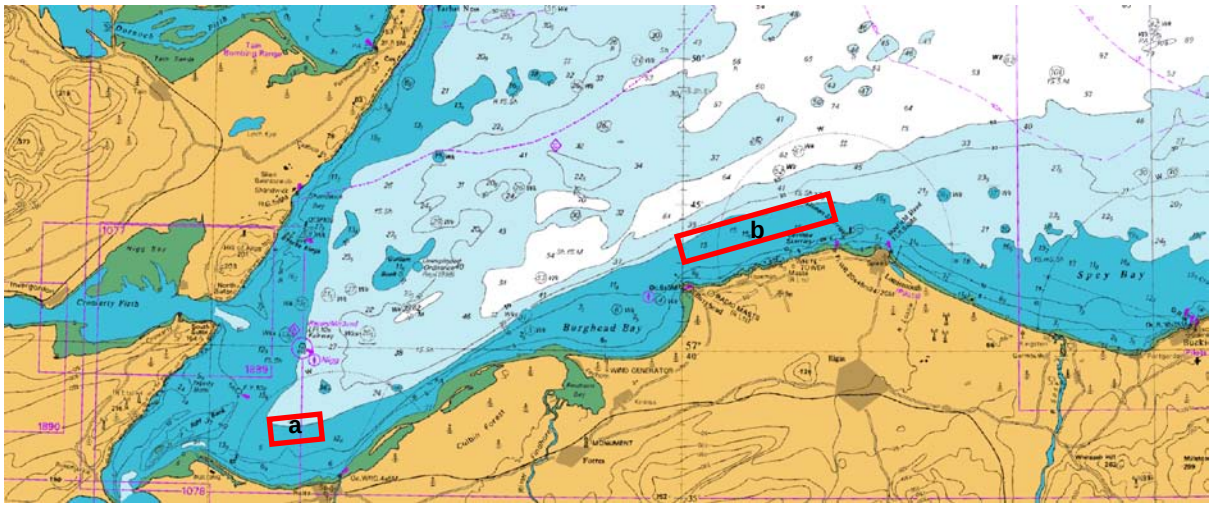

Figure 1: Chart of the Moray Firth, with sampling sites at a) Nairn and b) Lossiemouth indicated.