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MRV *Alba na Mara*

## Survey 0715A

### PROGRAMME

08 – 15 May 2015

### Ports

**Loading:** Fraserburgh, 05 May 2015

**Unloading:** Fraserburgh, 15 May 2015

In setting the survey 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 survey with staff on-board before work is commenced.

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

### Personnel

K. Summerbell (SIC)

C. Hall

R. M. Eustace                      National Oceanography Centre (Visitor)

**Costs to Project:** 8 days – FIS project (no code as yet)

### Equipment:

- BIGG sledge (Benthic Interactions with Ground Gear)
- Ground gear elements and weights
- Rubber matting
- Load cells
- Sequoia LISST 100X particle size analyser
- Aquatec 210TY turbidity meter
- Video Cameras and Flashback recorders
- Scanmar units
- Flowmeters
- Water sampler
- Day grab (including table)

### Objectives

- To estimate horizontal drag forces (hydrodynamic and geotechnical drag) for ground gear shaped objects towed on the sea bed, with different vertical loads.
- To measure the quantity of sediment remobilised by ground gear shaped objects.
- To obtain water samples from the sediment plume to examine the relationship between suspended sediment load and nutrient concentration.

## **Protocols:**

*Alba na Mara* will leave Fraserburgh on 8 May and steam towards the work site ENE of Tarbat Ness (Fig 1). Fifteen sediment samples will be taken with the day grab at the work site. The rest of the survey will be dedicated to sledge sampling experiments. *Alba na Mara* will return to Fraserburgh on the 14 May, and the scientific personnel and equipment will be unloaded on the 15 May.

## **The BIGG Sledge and Ground Gear Components:**

The BIGG sledge has been designed to allow the horizontal drag of the ground gear (hydrodynamic and geotechnical drag) to be measured via load cells mounted within the framework. The vertical force applied to the gear shapes can be altered via weights (0 to 120kg) mounted in the side frame.

There are three ground gear shapes to be tested on the sledge (200, 300 and 400 mm diameter discs). These will be arranged into three configurations during the cruise (6 objects "spaced", 6 objects together in a "block", 12 objects in a "long block"). Three flat rectangular shapes measuring 600mm wide and 200, 300 and 400mm high will also be tested. All the shapes are made out of high density polyethylene (HDPE).

The sledge will have a LISST 100X mounted 1.9m behind the ground gear and 0.35m above the seabed. This will enable particle size and quantity to be measured within the sediment plume created by the gear shapes. The Aquatec 210TY turbidity sensor will also be fitted 0.35m above the seabed close to the LISST, to allow a comparison of the two methods of measuring the plume. A programmable water sampler will be mounted adjacent to the LISST. This will attempt to take five water samples in each tow. Four in the plume at heights of 0.2, 0.35, 0.55 and 0.75m above the seabed and one outside the plume for a control sample approximately 0.75m above the seabed. Two video cameras will be mounted on the framework of the sledge, one will be angled to verify the ground gear is in contact with the seabed, and the other will show if the LISST, turbidity meter and water sampler is within the sediment plume.

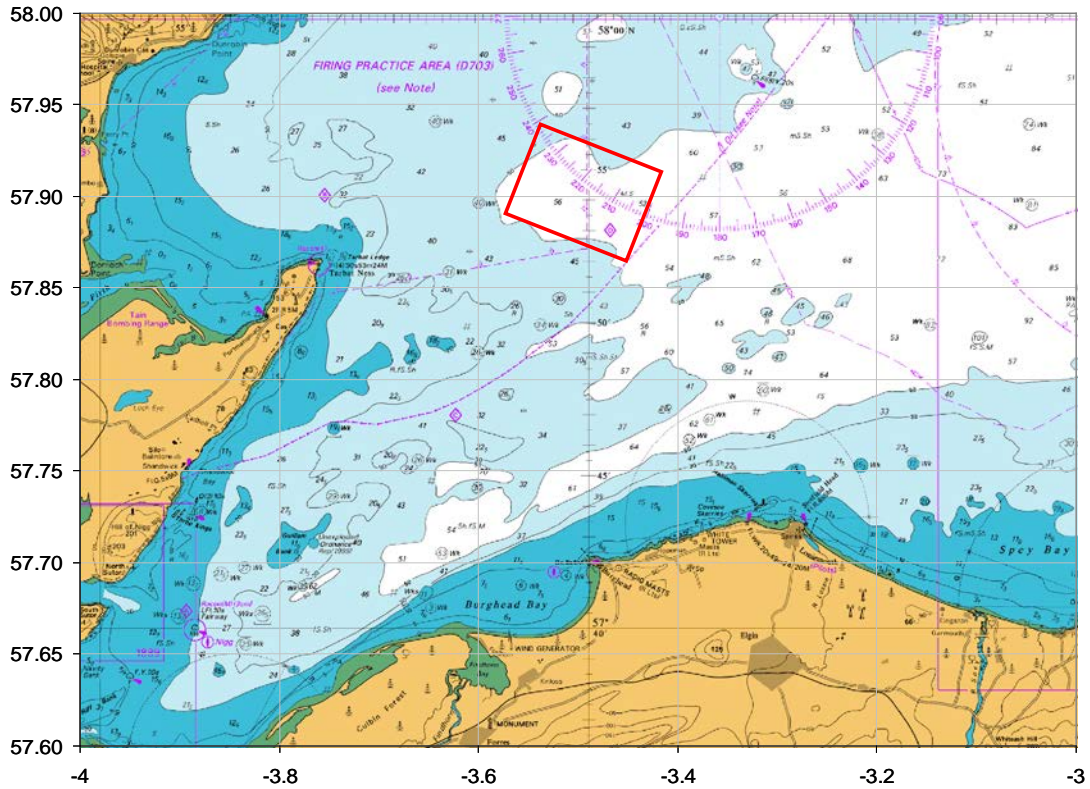
## **Sledge Sampling:**

The sledge will be towed off the central warp, with a wire bridle (Fig 2). A dyneema rope will lift the sledge in and out of the water by the deck winch through a block on the gamma frame. Each tow will last 30-40 min. During the tow the speed will be altered at 10 minute intervals (2.5, 3.0 and 3.5 knots). Once the sledge is back aboard, the ground gear and/or weights will be altered. Samples will be taken from the water bottles before being reset for the next deployment. The turnaround time between hauls will be approximately 15-20min. The hauls will be conducted >150m apart in parallel so that clean ground and water are sampled.

Normal contacts will be maintained with the laboratory.

Submitted:  
*K Summerbell*  
7 April 2015

Approved:  
I. Gibb  
30 April 2015



**Figure 1:** Chart of the Moray Firth, with the sampling site indicated by the red box.



**Figure 2:** The Bigg sledge with towing bridle and lifting line attached, the ground gear being tested is 400mm discs in the “spaced” arrangement.