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MRV *Alba na Mara*

Survey 0816A

## **PROGRAMME**

10-17 May 2016

### **Ports**

**Loading:** Fraserburgh, 07 May 2016

**Sailing:** Fraserburgh, 10 May 2016

**Unloading:** Fraserburgh, 17 May 2016

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)  
J Hunter

**Costs to Project:** 8 days – 20119

### **Equipment:**

BIGG sledge (Benthic Interactions with Ground Gear)  
Netting frames and netting samples  
Rubber matting  
Load cells  
Sequoia LISST 100X particle size analysers  
Aquatec 210TY turbidity meters  
Video Cameras and Flashback recorders  
Scanmar units  
Flowmeters  
Day grab (including table)

### **Objectives**

- To estimate hydrodynamic drag for netting samples towed close on the sea bed.
- To quantify sediment remobilised by the turbulence from the netting.

## **Procedure**

Equipment will be loaded onto MRV *Alba na Mara* at Fraserburgh on 7 May 2016, where the sledge will be connected with the towing bridle to the central warp. Instrumentation will be prepared ready for attachment to the sledge on the sailing day. *Alba* will leave Fraserburgh on 10 May and steam towards the work sites at the Hollows ground and Dornoch bay (Figure 1). Fifteen sediment samples will be taken with the day grab at each work site. The rest of the survey will be dedicated to sledge sampling experiments. *Alba* will return to Fraserburgh on 16 May, and the scientific personnel and equipment will be unloaded on the 17 May.

## **The BIGG Sledge and Netting Components**

The BIGG sledge was originally designed to measure the horizontal drag (hydrodynamic and geotechnical drag) of ground gear shapes via load cells mounted within the sledge. During this survey the sledge will have one of three different sized frames installed between the load cells. These frames will allow netting samples to be mounted so that hydrodynamic drag can be measured.

The three frames to be tested on the sledge are made from two triangular sheets of 25 mm thick HDPE measuring 400 mm high by 850, 650 and 450 mm long. These are held apart by three galvanised steel M20 threaded rods so that the internal width is 1326mm (Figure 2). The frames are bolted to brackets which attach to the load cells. The netting samples will all be 50 mm mesh (knot centres) made from 3 mm diameter double polyamide (nylon) twine. The netting will be mounted so that it forms a "V" shape on the frame, which will be towed with the opening facing forward. The netting samples will be changed so that 120, 100, 80, 60 and 40 meshes wide are tested on each frame (15 configurations overall). Each of the netting/frame configurations will be towed three times, once approximately 10 cm above the seabed to measure uninfluenced hydrodynamic drag, and once at each of the work sites as close to the seabed as possible without touching. These are to investigate if proximity to the seabed influences the hydrodynamic drag and whether sediment can be remobilised by the turbulence of the netting and the effect of sediment type.

The sledge will have two LISST 100X and two Aquatec 210TY turbidity sensors mounted 205 cm behind the leading edge of the netting frame. The LISST's will be at 20 and 75 cm above the seabed. These will enable particle size and quantity to be measured within the sediment plume and the background levels outside the plume respectively. The turbidity sensors will be at 20 and 35 cm above the seabed. These will be used to compare turbidity at different levels within the sediment plume. Two video cameras will be mounted on the framework of the sledge, one will be angled to verify the netting frame isn't in contact with the seabed, and the other will show if the LISST and turbidity meters are in the sediment plume.

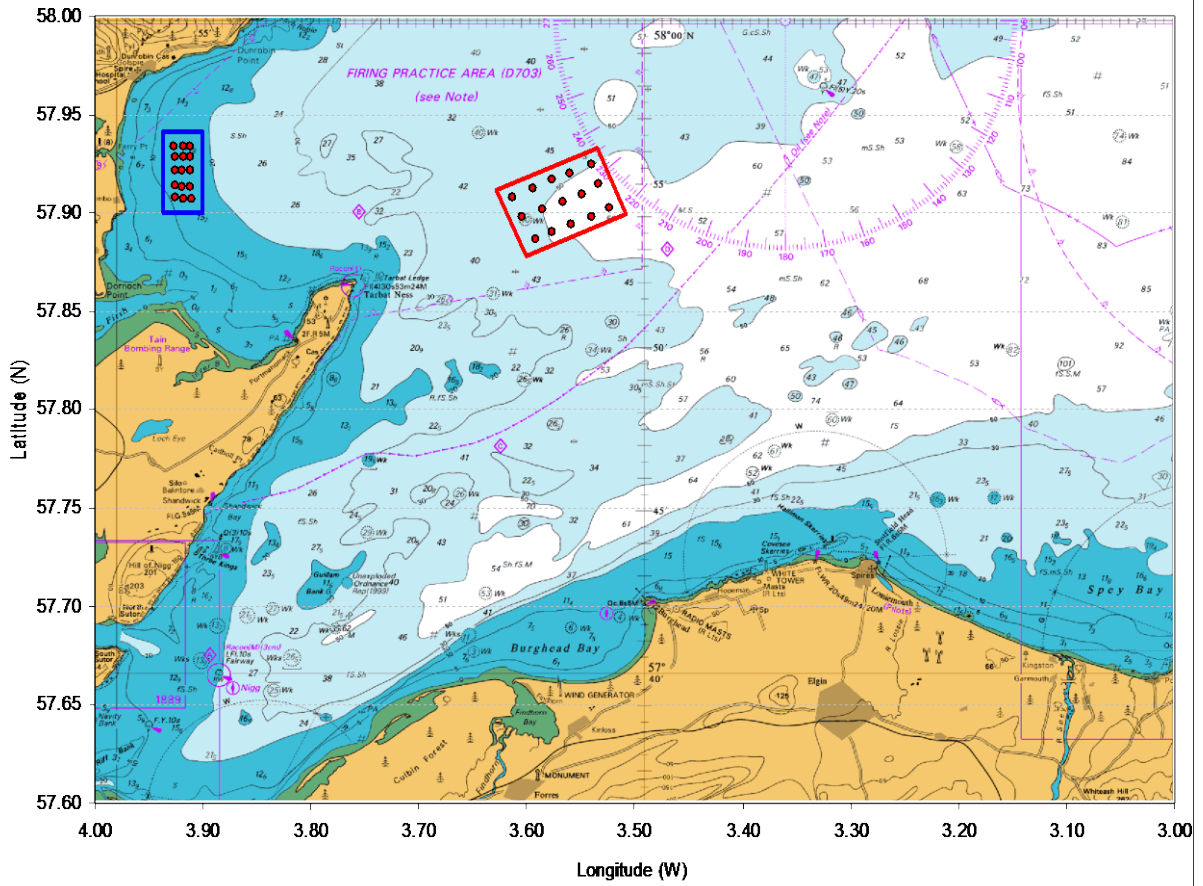
## **Sledge Sampling**

The sledge will be towed off the central warp, with a wire bridle. 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 ten minute intervals (2.5, 3.0 and 3.5 knots). Once the sledge is back aboard, the netting frame and/or height of the frame will be altered. The turnaround time between hauls will be approximately 10min. The hauls will be conducted >100 m apart in parallel so that clean ground and water are sampled.

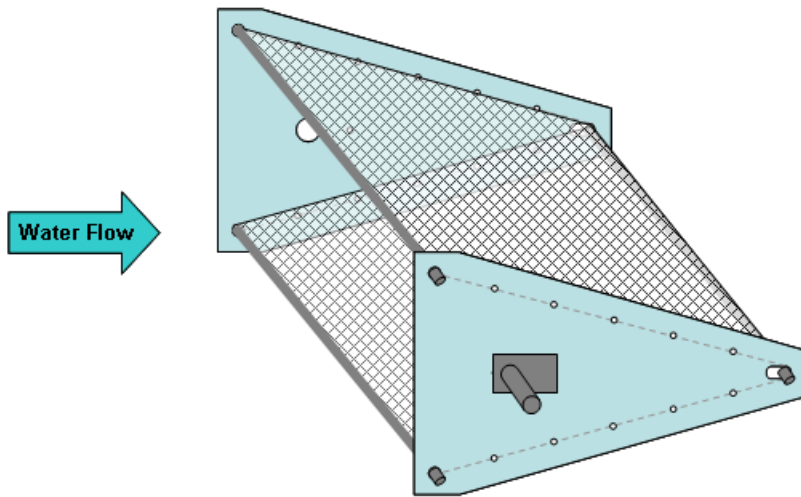
Normal contacts will be maintained with the laboratory.

Submitted:  
K Summerbell  
20 April 2016

Approved:  
I Gibb  
03 May 2016



**Figure 1:** Chart of the inner Moray Firth, with the “Hollows” sampling site indicated by the red box, and the “Dornoch” site indicated by the blue box.



**Figure 2:** Basic diagram of the netting frame.