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

MRV *Alba na Mara*

Survey 1114A

PROGRAMME

27 June – 4 July 2014

Ports

Loading: Fraserburgh, 24 June 2014
Unloading: Fraserburgh, 4 July 2014

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	(SIC)
C Hall	
A R Eryasar	Mersin University (Visitor)

Costs to Project: 8 days – 20119

Equipment:

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

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.

- Test new water sampling equipment to determine if it will be possible to obtain samples from the sediment plume generated by the ground gear shaped objects.

Protocols

Alba na Mara will leave Fraserburgh on 27 June and steam towards the work site between Nairn and Burghead (Figure 1). 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 3 July and the scientific personnel and equipment will be unloaded on the 4 July.

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 vertical force applied to the gear shapes can be altered via weights (0 to 120 kg) mounted in the side frame.

There are four ground gear shapes to be tested on the sledge (200, 300, 400 mm diameter discs and NACA0025 ("Hydro-Hopper")). These will be arranged into three configurations during the survey (six objects "spaced", six objects together in a "block", 12 objects in a "long block"). Three flat rectangular shapes measuring 600 mm wide and 200, 300 and 400 mm high will also be tested. All the shapes are made out of high density polyethylene (HDPE).

The sledge will have a LISST 100X mounted 1.9 m behind the ground gear. This will enable particle size and quantity to be measured within the sediment plume created by the gear shapes. A programmable water sampler will be mounted alongside the LISST for some of the tows. This will attempt to take six water samples during each tow, three within the plume and three outside the plume/control samples. 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 and water sampler are within the sediment plume.

Sledge Sampling

The sledge will be towed off the central warp, with a wire bridle (Figure 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 minutes, during the tow the speed will be altered at 10 minute intervals (2.5, 3.0 and 3.5 knots - dependent on tide, swell and windage). Once the sledge is back aboard, a quick alteration to either the ground gear or weights will be carried out, before redeploying.

Normal contacts will be maintained with the laboratory.

Submitted:
K Summerbell
19 June 2014

Approved:
I Gibb
20 June 2014

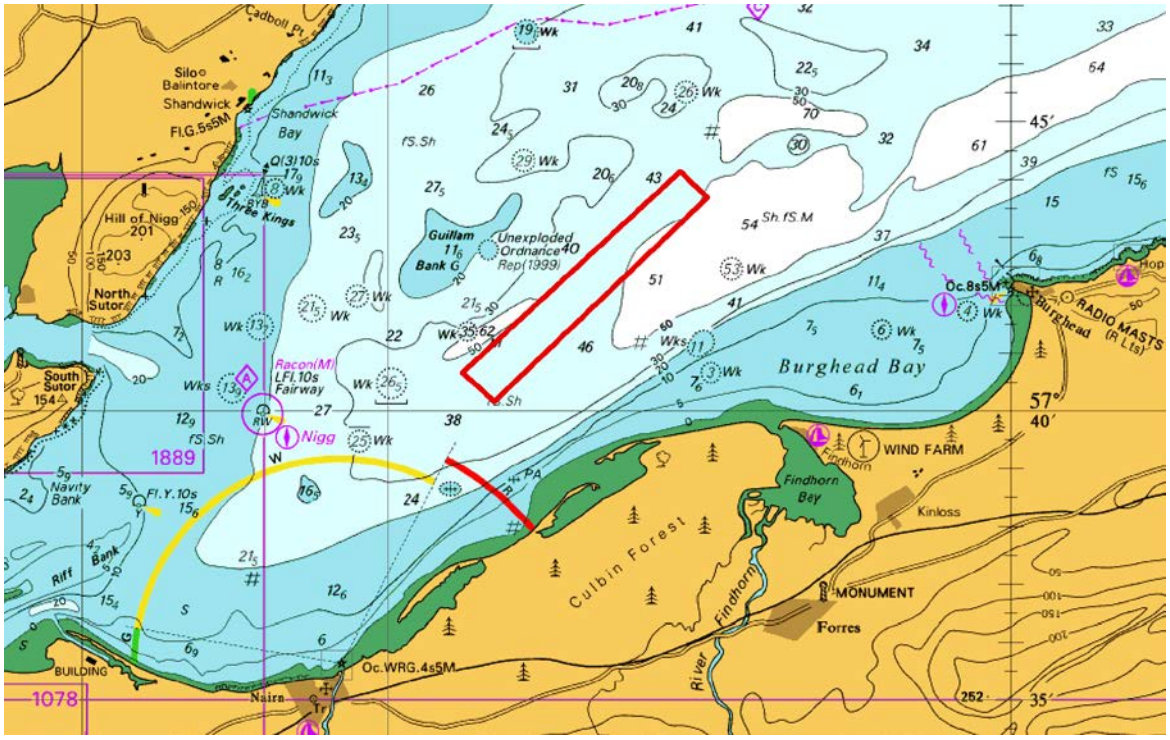

Figure 1: Chart of the Moray Firth, with the sampling site indicated by the red box.

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