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FRV *Alba na Mara*

Cruise 0209A

REPORT

30 January – 10 February 2009

Loading: Fraserburgh, 28 January

Unloading: Fraserburgh, 10 February

Personnel

M Gubbins (In charge)

M Geldart

Y Santana

Project codes: AE11s (12 days out-turn)

Equipment

Proteus workboat and 100 L unleaded fuel

Sealogger CTD/Rosette

Day grab / wooden table

Objectives

- 1) To collect water column hydrographic data from approximately 20 sea lochs in the North Minch and Voes in Shetland to provide validation / forcing data for models of fish farming carrying capacity.
- 2) To continuously monitor T&S and chlorophyll a in surface waters and surface irradiance during the cruise.
- 3) To service meteorological buoy in Loch Shildaig.
- 4) To sample surface sediments at varying distances from the fish farm in Loch Duich.

Narrative

Due to poor weather (strong South Easterlies) departure from Fraserburgh was delayed and scientific staff boarded the vessel at 18:00 on 30 January. The first available weather window for Northerly passage was on the morning of 1 February and the *Alba na Mara* made passage for the West coast, arriving in the Edrachillis Bay area and anchoring in shelter North of Kinlochbervie early in the morning of 2 February. Because of the weather delay (and because weather delays during 1308A had restricted work to East coast of Shetland) it was decided to focus the remainder of the cruise on the West coast and Western Isles.

Survey work commenced with hydrographic sampling by CTD/rosette at stations outside Loch Inchar, and at 2 stations inside the loch. Data concerning salinity, fluorescence / chlorophyll, irradiance, transmission and dissolved oxygen were recorded and water samples for calibration purposes and analysis for SPM, CDOM and nutrients were taken from multiple depths at every station in the survey.

This survey strategy was repeated at 3 stations in Loch Laxford and Badcall Bay and further sampling was conducted in stations within the Chairnbhairn system at Loch Chairnbhairn, Loch Glen Coull and Loch Glendhu under the Kylesku bridge. *Alba na Mara* then steamed to a sheltered anchorage for the night just south of the Edrachillis Bay area.

On 3 February, *Alba na Mara* steamed to Little Loch Broom to complete hydrographic survey work at 3 stations and then to Loch Torridon. At the time of arrival in Loch Torridon, strong winds prevented launching of the Proteus workboat to access the meteorological buoy in Loch Shieldaig, so *Alba na Mara* was anchored overnight at the top of the upper basin. Hydrographic work in the upper loch and Loch Shieldaig was completed the following morning and with improved weather, the Proteus was launched in Loch Shieldaig. Scientific staff removed the instruments from the head of the met buoy and recovered them to *Alba na Mara* for servicing and subsequent replacement. A third hydrographic station was sampled on the way out of the Torridon system en route to Loch Ainort.

Three station surveys were completed in Lochs Ainort and Kishorn before *Alba na Mara* moored at Kyle of Lochalsh overnight. Sampling work recommenced in Loch Alsh/Duich with 3 hydrographic stations by CTD/rosette and the Proteus workboat was launched for grab sampling work adjacent to the fish farm in Loch Duich. Six grab samples were taken by hand held Van Veen grab from the Proteus along a transect starting adjacent to cages and moving into deeper water of the central loch. A final 3 grabs were taken by Day grab from *Alba na Mara* in the deep water of the central loch.

A further hydrographic survey was completed in Loch Hourn before *Alba na Mara* anchored overnight in the Sound of Sleat. On 6 February further hydrographic work was completed in Loch Nevis and outside Loch Ailort from the *Alba na Mara*, before the Proteus workboat was launched to access the upper reaches of Loch Ailort and complete hydrographic work using reversing bottles and thermometers. Following recovery of the Proteus, passage was made to Loch Brittle on Skye for overnight anchorage.

Hydrographic survey was conducted in Loch Bracadale / Harport on 7 February followed by crossing the Minch to Loch Boisdale on South Uist. Three further CTD/rosette sampling stations were conducted in Loch Boisdale and Loch Skipport before *Alba na Mara* steamed to Loch Maddy for a secure overnight anchorage sheltered from a Northerly swell.

On 8 February, Hydrographic surveys were conducted in Lochs Maddy, East Loch Tarbert and Loch Shell before crossing the Minch to Loch Eriboll on the North coast. *Alba na Mara* arrived in Loch Eriboll at midnight and anchored overnight before completing hydrographic work in the loch the following morning then making passage for the Pentland Firth and testing vibration on the drop keel.

Alba na Mara returned to Fraserburgh, arriving early in the morning on 10 Feb, before unloading equipment and scientific staff.

Results

Full surveys by CTD were conducted in 19 lochs as shown in the table below.

Loch	Date	Hydro-stations	Sediment samples
Inchard	02/02/09	3	-
Laxford	02/02/09	3	-
Badcall Bay	02/02/09	3	-
Cairnbhain	02/02/09	4	-
Little Broom	03/02/09	3	-
Torridon	04/02/09	3	-
Ainort	04/02/09	3	-
Kishorn	04/02/09	3	-
Duich	05/02/09	3	9
Hourn	05/02/09	3	-
Nevis	06/02/09	3	-
Ailort	06/02/09	3	-
Harport	07/02/09	3	-
Boisdale	07/02/09	3	-
Skipport	07/02/09	3	-
Maddy	08/02/09	3	-
East Tarbert	08/02/09	3	-
Shell	08/02/09	3	0
Eriboll	09/02/09	3	0

Continuous logging of surface salinity and chlorophyll during the cruise from the on-board TSG and fluorometer was successful and will provide additional regional background data for modelling purposes.

In addition, nine sediment samples were obtained at fixed distances from the fish farm in Loch Duich and preserved by a variety of methods. These will be sent to the University of Leeds for investigation of the effects of the fish farm on nutrient cycling in sediments.

Samples collected during this cruise will be analysed and data will be made available in due course. It is anticipated that nutrient analyses from this cruise along with 1308A will form the basis of a submission to OSPAR to provide evidence that Northern coastal and offshore regions

of Scottish waters can be exempt from specific eutrophication assessment under the Comprehensive Procedure.

M Gubbins
3 March 2009