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

FRV *Scotia*

Cruise 0110S

PROGRAMME

6-21 January 2010

Loading: Aberdeen

Unloading: Aberdeen

***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 and the Cruise Summary Report within four weeks of a cruise ending. In the case of the Cruise Summary Report a nil return is required if appropriate.

Personnel

M Russell (SIC)

A McIntosh

M McKenzie

E Dalgarno

G Packer

D Watson

P Stainer

G Slesser*

M Geldhart*

*will join in Aberdeen on 6 January if *Scotia* is heading straight for Shetland, otherwise will join at Lerwick at a suitable time.

Fishing gear: BT 101 with tickler chains; **Sediment Sampling:** Day grab and sieves

Objectives

1. To undertake water, sediment and biological sampling for the Clean Seas Environmental Monitoring Programme (CSEMP).
2. To collect water samples for nutrient studies as part of the Scottish Coastal Eutrophication Assessment Survey (SCEAS).
3. Collect sediment samples for SEPA from Shetland.

4. Undertake CSEMP sediment sampling in the Firth of Forth for SEPA.
5. Undertake additional sampling for integrated assessment ROAME.
6. Weather permitting, redeploy a current meter mooring East of Shetland (60 18.666°N, 000 41.775°W)

Estimated Days Per Project: 15 days AE11p, 1 day AE11101

Procedure

At the 4 CSEMP fixed sites (NMMP85, NMMP95, NMMP105, NMMP165) water, sediment (for chemistry only) and fish will be sampled.

Stratified random samples of sediment will be taken from one stratum on the East coast, four strata in the Fladen Ground, two strata in the Moray Firth, two strata in the North Minch and one stratum in the Sea of Hebrides (Table 1; Figure 1). Fish sampling will be carried out within these strata, except for the Sea of Hebrides (Table 1).

Water and sediments will be sampled for chemical analyses at all locations. Sediment will be sieved for macrobenthos analysis only at the stratified random sampling locations. Fish will be sampled for biological effects measurements and chemical analyses. Some biological effects measurements will be carried out during the cruise. Nutrient samples will be collected and appropriately stored throughout the cruise.

Additional sampling will be carried out at 5 sites in the Firth of Forth, in support of CSEMP sampling for SEPA (Table 2). Five sites off Lerwick will be sampled for SEPA, for benthos only (Table 2).

Surface water will be collected for hydrographic nutrient studies (SCEAS) from coastal regions around the east and west coast mainland and around Orkney and Shetland at fixed time intervals. Completion of this objective will be time and weather dependent.

In support of the Integrated Assessment ROAME both plaice and dab will be sampled, if present, in the Moray Firth (both strata), Shetland and the Fladen Ground.

G Slesser and M Geldhart will join (either at Aberdeen at the start of the trip or at Lerwick at a time to be arranged) to redeploy the mooring east of Shetland. This will be weather dependant and contact will be maintained with G Slesser.

General Arrangements

Liquid nitrogen and formaldehyde will be carried aboard for the preservation and storage of biological material.

Normal contacts will be maintained with the laboratory.

Submitted:
M Russell
16 December 2009

Approved
I Gibb
18 December 2009

Table 1: CSEMP sampling

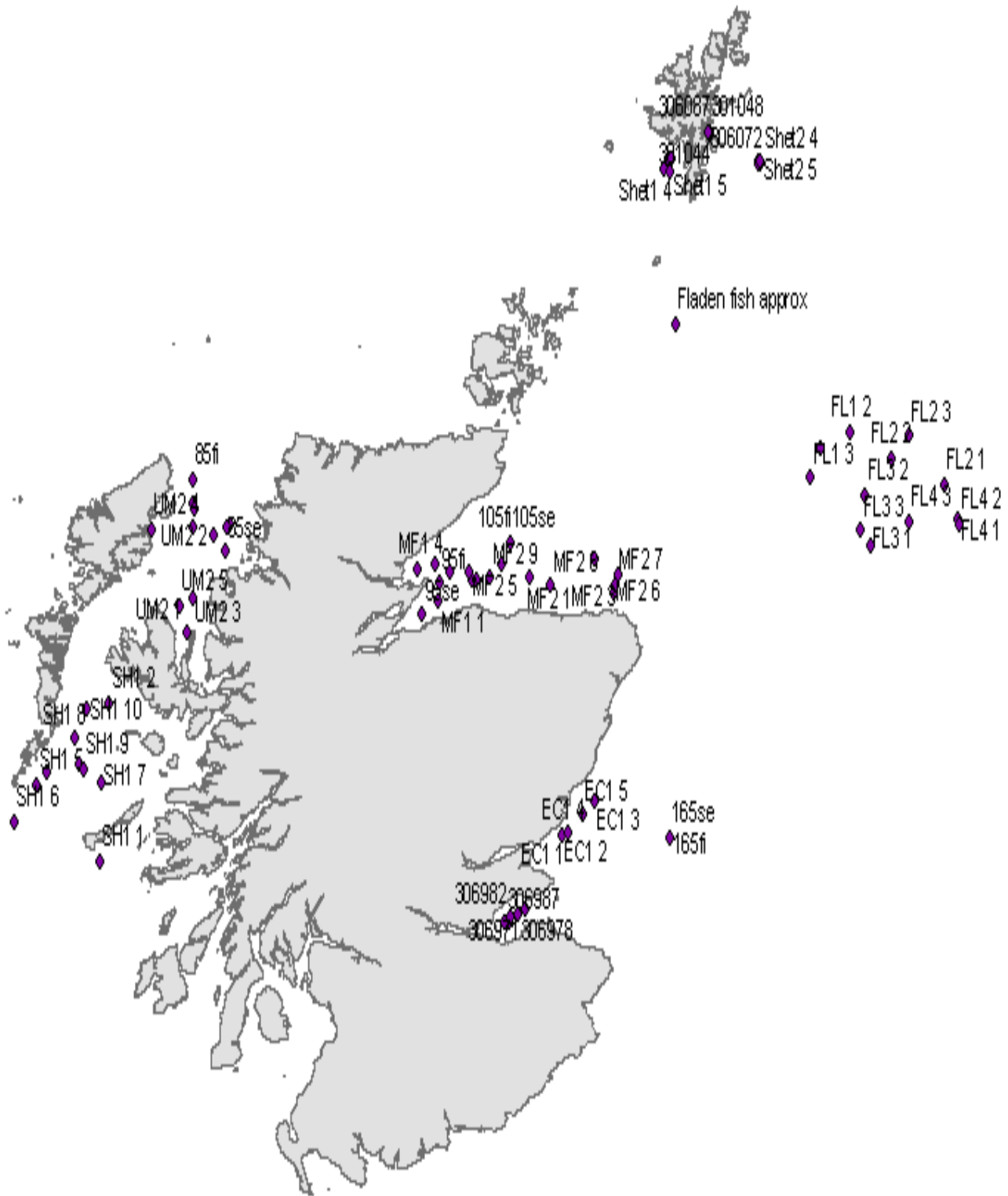
CSEMP Site	Water samples (nutrients TOxN, phosphate, silicate, nitrite and ammonia analyses)	Sediment Chemistry (PAH, CB, BFR, trace metals, PSA, TOC)	Macrobenthos (1mm sieved fraction)	Fish Chemistry Chemistry (PAH, CB, BFR, trace metals) and biological effects (EROD and PAH bile metabolites)
Continuous water sampling in support of SCEAS				
East Coast stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	5 samples	5 samples	-
NMMP 165 (Montrose Bank) 56°30.00'N 001°30.00'W	1 x 5 m from surface, 1 x 5 m from bottom	1 sample	-	5 pools of 5 plaice# 56°30.00'N 001°30.00'W
Fladen ground stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	3 samples from each of 4 strata	3 samples from each of 4 strata	5 pools of 5 fish# Approx fish site position 59 12.00'N 001°27.00'W
Moray Firth stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	5 samples from stratum 1, 10 from stratum 2	5 samples from stratum 1, 10 from stratum 2	-
NMMP 95 (Intermediate Moray Firth) 57°40.00'N 003°49.00'W	1 x 5 m from surface, 1 x 5 m from bottom	1 sample	-	5 pools of 5 plaice# Fishing site 57°53.00'N 003°39.48'W
NMMP 105 (Outer Moray Firth) 58°03.00'N 003°00.00'W	1 x 5 m from surface, 1 x 5 m from bottom	1 sample	-	5 pools of 5 fish# Fishing site 58°03.00'N 003°00.00'W
North Minch stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	5 samples from each of 2 strata	5 samples from each of 2 strata	5 pools of 5 plaice from stratum 2 only
NMMP 85 (North Minch) 58°00.00'N 005°40.00'W	1 x 5 m from surface, 1 x 5 m from bottom	1 sample	-	5 pools of 5 plaice Fishing site 58°23.00'N 005°58.00'W
Sea of Hebrides stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	10 samples	10 samples	
Shetland east coast stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	5 samples	5 samples	-
Shetland west coast stratified random	1 site per stratum: 1 x 5 m from surface, 1 x 5 m from bottom	5 samples	5 samples	-
Shetland northeast coast				5 pools of 5 plaice#

Etra fish sampling for dab at these sites for the integrated assessment ROAME

Table 2: Sampling for SEPA

Shetland Offshore (on behalf of SEPA)		
WFD Site	Benthos PSA	Macrobenthos (1mm sieved fraction)
Hawk's Ness	1 sample, PS only	1 sample
Lerwick UWWTD Site F	1 sample, PS only	1 sample
Lerwick Benthic sample site 2	1 sample, PS only	1 sample
Lerwick Benthic sample site 17	1 sample, PS only	1 sample
Lerwick UWWTD Site F	1 sample	1 sample
Firth of Forth on behalf of SEPA		
CSEMP Site	Sediment Chemistry (organics, metals, TOC and PS)	Macrobenthos (1mm sieved fraction)
Firth of Forth at Fairway Buoy	1 sample	1 sample
Firth of Forth Spatial Survey Station 49	1 sample	1 sample
Firth of Forth Spatial Survey Station 42	1 sample	1 sample
Firth of Forth Spatial Survey Station 38	1 sample	1 sample
Firth of Forth Spatial Survey Station 33	1 sample	1 sample

Figure1 :Proposed Sampling Locations



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PROGRAMME AMENDMENT

M Mackenzie will be replaced by A McIntosh during this cruise.

I Gibb

05 January 2010