

R1/12

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FRV *Scotia*

Cruise 0104S

**REPORT**

6-16 January 2004

**Ports**

Loading: Aberdeen  
Unloading: Aberdeen

**Personnel**

Alistair McIntosh      In charge  
Marie Russell  
Malcolm Rose  
Eric Dalgarno  
Gill Packer

**Fishing Gear:** BT 101

**Objectives**

- 1. To undertake water, sediment and biological sampling for the National Marine Monitoring Programme.
- 2. To collect water samples for hydrographic studies as part of the Scottish Coastal Eutrophication Assessment Survey (SCEAS).
- 3. To undertake water sampling in support of the *Jambo* monitoring programme.

**Out-turn Days Per Project:** 10 days 10124 (AE11p)

**Narrative**

All sampling and scientific equipment was loaded and secured before departure at 1100 on 6 January 2004. Passage was made for the Tay/Forth NMMP station where sampling of water, sediment and fish was carried out between 1500 and 1730. Passage was then made south to start the water sampling, in support of the Scottish Coastal Eutrophication Assessment Survey (SCEAS), off Berwick. Between 0130 on 7 January and 0345 on 8 January, 69 water samples were taken. As the centrifuge had developed a problem, a replacement was taken aboard as *Scotia* passed Aberdeen on passage north to the Moray Firth. The Intermediate Moray Firth NMMP (95) station was sampled between 0400 and 0930 on 8 January. SCEAS water sampling continued as passage was made north to the Outer Moray Firth NMMP (105) station which was occupied between 1300 and 1730. On completion of this sampling, passage was continued north and west to the NMMP fish sampling site in the north Minch which was occupied between 0930 and 1130 on 9 January after which passage was made to the water and sediment sampling site which was completed by 1500. Passage was then made to the Solway Firth NMMP (25) site, arriving at

1800 on 10 January. The sampling was completed by 2000 when passage was made to the Clyde NMMP (35) sampling site collecting water samples at regular intervals while on passage. The Clyde NMMP site sampling commenced at 0600 on 11 January. Due to worsening weather conditions with wind speed in excess of 40 knots, further attempts at collecting fish had to be abandoned. SCEAS water sampling was continued during passage north. Due to the prevailing adverse weather conditions, the water sampling on the west side of Islay and Mull was not attempted and passage continued through the Sound of Islay and the Sound of Mull. Water sampling was continued on passage north to Ullapool.

*Scotia* arrived off Ullapool at 0800 on 12 January where two scientific staff from SEPA joined the vessel to carry out water sampling at the Summer Isles in support of the *Jambo* environmental monitoring programme. At the seven stations occupied, water samples were taken from the surface, mid water and just off the bottom. This sampling was completed by 1400 when the SEPA staff disembarked and *Scotia* made passage north to continue the water sampling programme around Orkney.

Water sampling on the west coast of Orkney commenced at 2150 on 13 January covering 27 stations. Passage was then made to the south of the Shetland Islands and water sampling was conducted around the entire coast between 0800 and 2100 on Wednesday 14 January. Passage was then made south to pick up the sampling station on the west coast of Orkney which was completed by 0400 on 15 January. Passage was then made to Aberdeen where dock was completed by 0600 on Friday 16 January. All scientific gear and samples were transferred to the ML.

## Results

All Scottish NMMP offshore sites were occupied (Fig. 1). At all sites, water from 5 m from the surface and 5 m off the bottom, sediment for macrofaunal benthic analysis, total polycyclic aromatic hydrocarbon, chlorinated biphenyl, trace metals and particle size analyses and fish for chemistry and biological effects measurements were taken as per Table 1.

**Table 1**

NMMP site	Water samples Salinity Nitrate Ammonia	Sediment samples		Fish samples			
		Chemistry PAH CB Trace-metal	Macro Benthos	Chemistry PAH CB Trace-metal	Biological Effects		
					Hepatic EROD activity	PAH Bile metabolite analysis	Plasma samples
Tay/Forth (165)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	5 pools of 5 fish - flesh and liver	25 sample s	5 pools from 5 fish	10 from male fish
Moray Firth Intermediate (95)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	5 pools of 5 fish - flesh and liver	25 sample s	25 individual samples	10 from male fish
Moray Firth Outer (105)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	5 pools of 5 fish - flesh and liver	25 sample s	25 individual samples	10 from male fish
North Minch (85)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	5 pools of 5 fish - flesh and liver	25 sample s	25 individual samples	10 from male fish

Solway Firth (25)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	5 pools of 5 fish - flesh and liver	25 sample s	25 individual samples	10 from male fish
Clyde (35)	5 m from surface 5 m from bottom	5 replicates and 5 for wet sieving	5 x 1mm and 5 x 0.5 mm fractions	2 pools of 2 fish - flesh and liver	4 sample s	4 individual samples	4 from 2 male and 2 female fish

The water samples taken at the NMMP stations were analysed on board *Scotia* for nitrate, phosphate and silicate concentrations. Determination of ammonia and nitrite will be completed at the ML.

A total of 315 water samples were taken in support of the Scottish Coastal Eutrophication Assessment Survey, 217 around the Scottish mainland (Fig. 1), 43 around Orkney (Fig. 2) and 55 around Shetland (Fig. 3).

A total of 21 water samples were taken in the vicinity of the *Jambo* grounding. These will be analysed for zinc, cadmium and lead concentrations by SEPA.

A McIntosh SIC  
16 January 2004

Seen in draft: Captain Peter Barratt, OIC *Scotia*

Figure 1. Scottish NMMP Offshore Sites and Scottish Coastal Eutrophication Assessment Survey sampling sites (Scottish mainland)

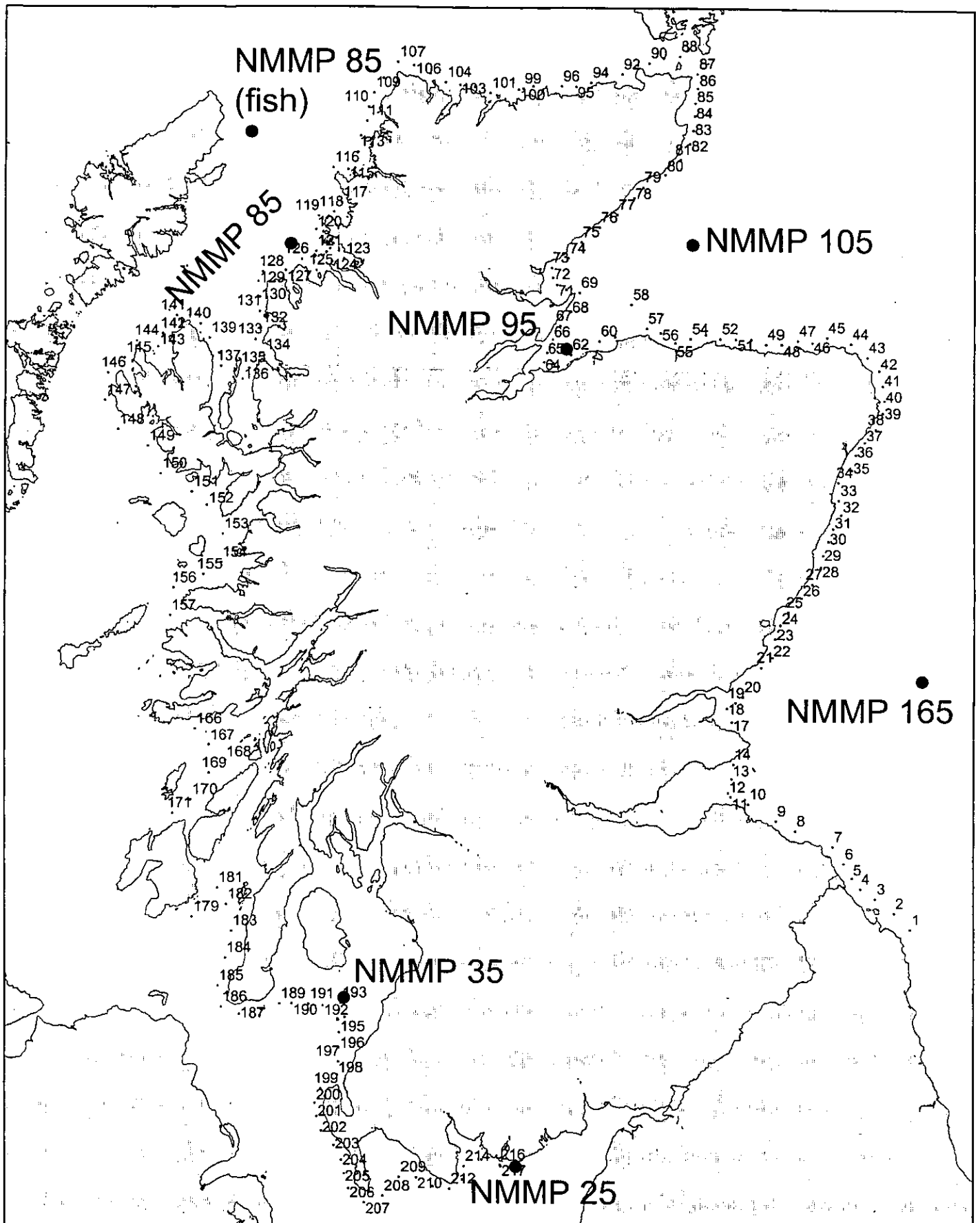


Figure 2. Scottish Coastal Eutrophication Assessment Survey sampling sites (Orkney)

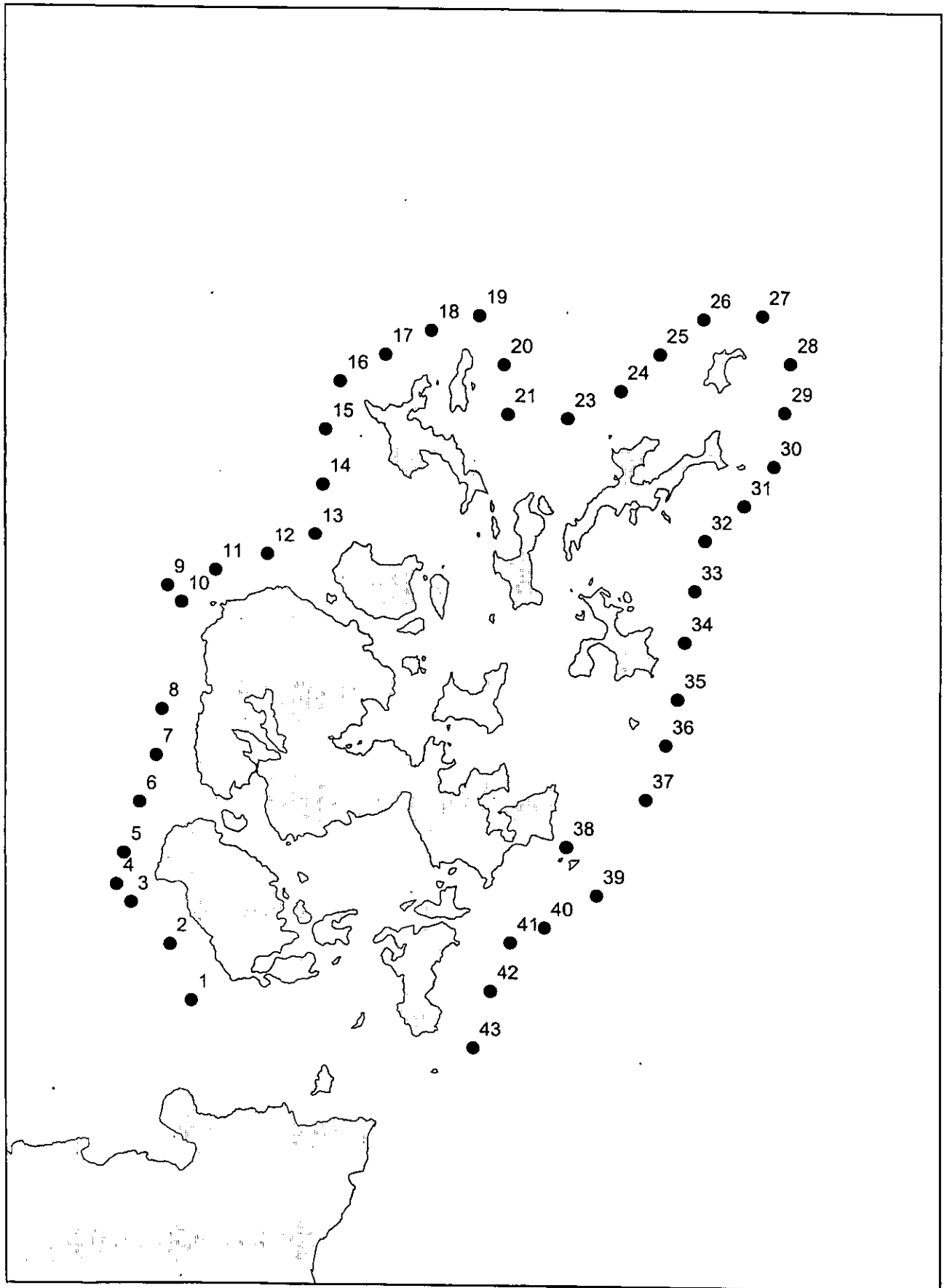


Figure 3. Scottish Coastal Eutrophication Assessment Survey sampling sites (Shetland)

