

R1/3

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

*MV Lowland Searcher*

Cruise 0996H

## REPORT

17 June - 1 July 1996

### Personnel

R M Stagg	PSO (in charge)
C D Hall	SSO
A McIntosh	HSO
P Gillibrand	HSO
M Bailey	Res Assist
L Hou	Res Student
R Milne	RGU - Visitor
I Campbell	RGU - Visitor

### Objectives

1. Validation of modelling work on hydrocarbon distributions.
2. To collect samples of larval fish species for evidence of exposure to hydrocarbon contamination.
3. To collect water samples to characterise the nature of hydrocarbon contamination.
4. To collect plankton of characterisation of the species present and to measure bioaccumulation of PAH.
5. To obtain sediment cores from deep sedimentary basins.

**Out-turn days per project:** 15 days, BIG1

### Narrative

Loading took all day on 17 June requiring the installation of two container laboratories and the fixing of an echosounder and scanmar unit to a pole mounted in a moon pool at the front of the ship. The ship departed Aberdeen at 0100 hours on 18 June 1996 and made passage for the first station in the Moray Firth. In all 72 stations were occupied but the cruise was split into two parts.

### 18-24 June 1996

For the first 37 stations (Fig. 1) a metered Methot net with three plankton pods and an instrument frame was deployed on oblique surface to bottom tows at four knots. The

following data were recorded: depth, temperature, salinity, chlorophyll fluorescence, hydrocarbon fluorescence (Ex 240 nm, Em 410 nm), and duration and position of the haul. Fish larvae and plankton were caught in a live bucket. The fish larvae were picked from the sample, identified, a sub sample measured for length and cryopreserved in liquid nitrogen. The remainder of the sample was preserved in formalin. Plankton samples were obtained from two 95 µm mesh was sieved, wrapped in foil and frozen for subsequent measurement of bioaccumulated PAH. The remainder were preserved in formalin for subsequent enumeration and identification. At the beginning of each haul a water sample was taken from a pumped supply for the calibration of salinity and chlorophyll. The chlorophyll sample was filtered and the filter paper stored in the dark at -20°C. At the end of each haul duplicate 2.5 l water samples were taken from 20 m depths in glass winchesters using a sampling device designed to open under water. The samples were opened in a positive pressure container laboratory and extracted two times in 50 ml dichloromethane, reduced in volume to 10 ml by rotary evaporation. The hydrocarbon fluorescence was determined a fixed excitation/emission wavelengths of 310/360 and 240/350 nm and a synchronous fluorescence spectra determined between 250 and 400 nm at 25 nm intervals. The samples were then kept at -20°C for subsequent analysis of aliphatic and aromatic hydrocarbons by GC and GC-MS respectively.

### **25 June - 1 July 1996**

On 25 June Chelsea instruments indicated that they had supplied an incorrectly configured fluorimeter therefore replacement filters were collected from Lerwick on 26 June 1996 by a small boat. These were fitted to the Chelsea Aquatraka fluorimeter so that it read hydrocarbon fluorescence at Ex 240 nm and Em 350 nm. Thirty-three stations were then revisited (Fig. 2) and at each a CTD frame was deployed to measure depth, salinity, temperature and hydrocarbon fluorescence (240/310), water samples were taken simultaneously for salinity, chlorophyll and hydrocarbon analysis as described above.

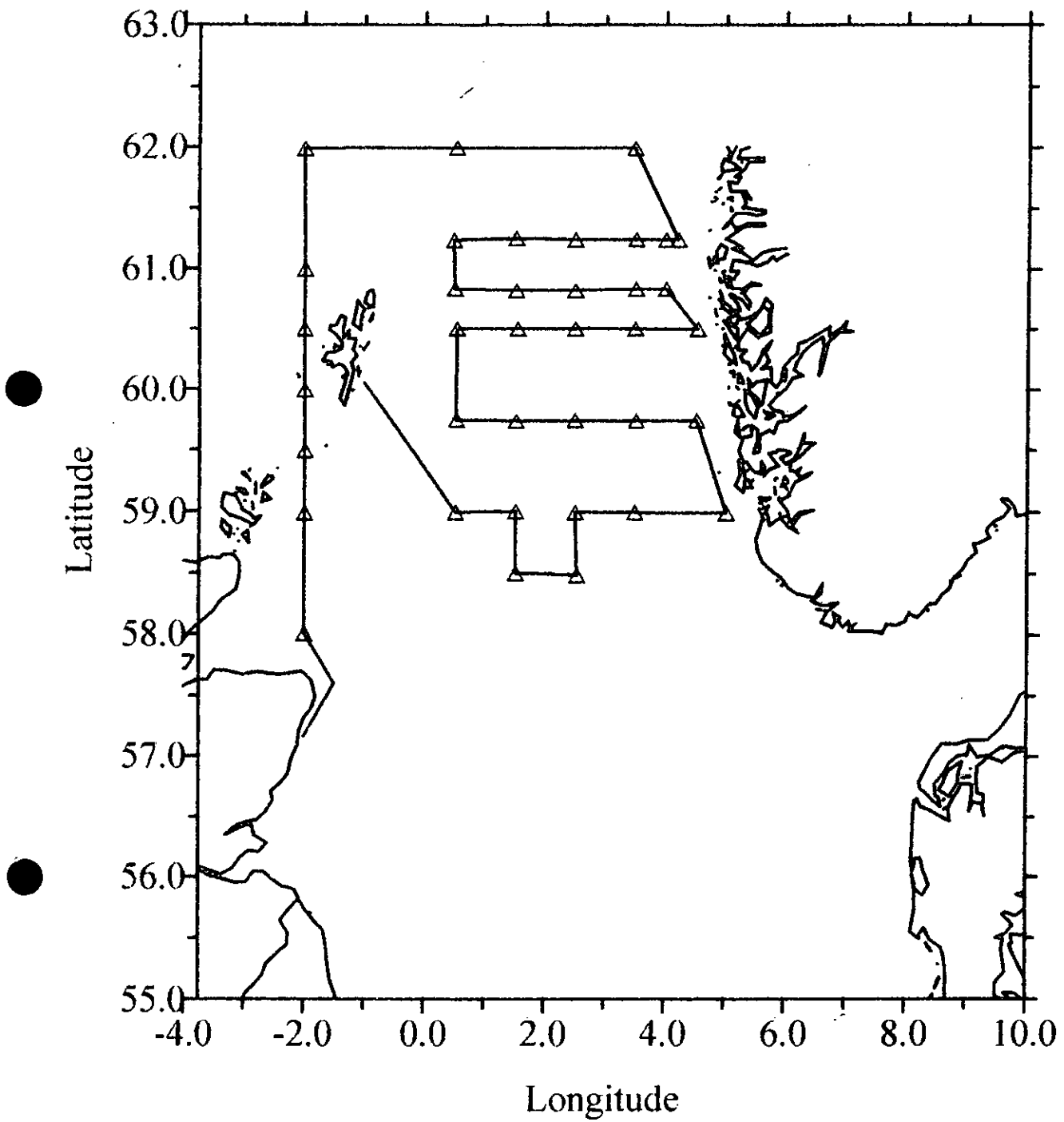
At two stations in the Norwegian trench at Scholkovitz corer was deployed and the cores sectioned at 1 cm intervals, stored in glass jars and frozen at -20°C for subsequent barium analysis.

Throughout the cruise experiments were carried out with an optical fibre hydrocarbon sensor and a laser powered device to measure hydrocarbon fluorescence at the sea surface.

The ship returned to Aberdeen at 1300 hours on Monday 1 July 1996 and all gear was unloaded.

R M Stagg  
9 July 1996

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