

R1/6

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FRV CLUPEA

Cruise 5/89 Part 1

5pt1CR89

REPORT

17-29 April 1989

Personnel

Period I 17-19 April

J A Morrison	SSO (in charge)
P Rankine	HSO
F Burns	ASO

Period II 20-29 April

G K Clark	SO (in charge)
J C McKie	HSO
C W Glass	HSO
F Armstrong	SO
R D Adams	SO
M Costello	Visitor (pt)

Objectives

Period I (17-19 April)

To carry out a grab survey on Ballantrae Bank to check for herring eggs deposited subsequent to those observed on cruise C3/89 and C4/89.

Period II (20-29 April)

1. To commission the new cored cable/water sampling system.
2. To carry out dispersion studies at Garroch Head of the sewage plume in the water column, in order to investigate the movement and fate of trace metals in the sludge after dumping.
3. To obtain sediment samples at the Garroch Head dump site and surrounding areas for the analysis of bacterial spores.

Narrative

Period I

Scientific staff joined *Clupea* at Troon on the afternoon of 17 April. The ship immediately made for Ballantrae where a current meter deployed during cruise C3/89 was recovered prior to

proceeding to Cairnryan for the night. During 18 and 19 April *Clupea* completed a grid of grab stations on Ballantrae Bank, returning to Troon by 1730 on 19 April. Samples were unloaded and scientific staff left the boat later the same evening.

Period II

Scientific staff joined "Clupea" at Troon on 19 April at 1830. The cored cable sampling system was tested and surveys of the surface patch were carried out on 20 and 21 April. The cored cable sampling system was commissioned by 22 April.

At the weekend, 22-23 April, a sediment sampling programme was carried out around the sewage sludge dump site and in the deeper water of the Arran Trough. The control sampling and drogue tracking were carried out around the disposal area on 23 April.

Dispersion studies of the sludge in midwater were carried out for the remainder of the cruise (24-28 April; half-landing 25 April) using the acoustic measurements and instrument package.

Control stations were sampled on 29 April to provide salinity and temperature profiles.

Results

Period I

Two hundred and seventy "Day" grab stations were carried out on Ballantrae Bank. There was no evidence of new spawning subsequent to that observed in cruises C3/89 and C4/89. The entire area of the egg patch appeared, however, to be covered with a carpet of dead and decaying eggs.

Period II

The cored cable sampling system was found to be electronically fully operational on testing, but modifications had to be made to the water sampling system.

The majority of the water samples obtained during this cruise are awaiting analysis. However, results obtained at the time of the dispersion studies showed a surface patch which remained in the top 1-5 m of the water column for 4-5 hr post dumping. The rates of settlement found in these studies were similar to those reported for previous surveys.

Operation of the cored sampling cable provided samples of the midwater plume which will be analysed for trace metal concentration of the suspended solids.

Analysis of the bacterial spores (*Clostridium*) within the sediment showed an increasing number of spores towards the dump site. Comparisons will be made of the use of bacterial spores with other tracers for indicating the presence of sewage sludge.

J A Morrison
G K Clark
18 August 1989

Seen in Draft: W Smith

CRUISE 5/89 PART I, PERIOD I 17-19 APRIL 1989



