

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE,  
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 OHT, UK

1999 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 12/99

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DURATION: 29 October – 9 November

LOCALITY: North Sea (IVb)

AIMS:

The general aim of the cruise was to identify species that are vulnerable to beam trawling disturbance and describe the structural and trophic changes that take place in benthic communities when vulnerable species are lost. The main objectives of the cruise were:

1. To complete a sidescan and Questor Tangent survey in 3 boxes (each 2 x 1 nautical miles) to the south-east of the Dogger Bank, before and after experimental beam trawling.
2. To sample the benthic invertebrate and fish community with corers, grabs, dredges and beam trawls before and after experimental beam trawling.
3. To collect sediment cores, before and after experimental trawling, to assess changes in sediment quality and nutrient fluxes.
4. To collect fish stomachs for dietary analysis and invertebrate and fish tissue for stable isotope analysis.

NARRATIVE: (all times are GMT)

Corystes sailed from Newcastle at 1000h on 29 October. She proceeded overnight to a site in the Western Mud Hole (a box of 1 nm E-W and 2 nm N-S with NW corner at 53°37'N, 03°23'E). The entire box was due to be side-scanned to select an experimental site, but the acquisition software failed and only three 1 nm E-W lines were side-scanned (250m apart N-S). An area suitable for the experimental work was chosen from the paper trace. Two sites, designated A and B and defined by 50m radius circles with centres 200m apart, were selected for study.

On Saturday 30 October, 6 NIOZ cores were collected from site A and 6 from site B for the study of meiofauna, oxygen and nutrient fluxes. These were followed by 3 samples of epibenthic macrofauna and fish from A, and 3 from B, collected using the 2m beam trawl. Sorting of samples was completed at 2100h. By this time, the weather was deteriorating with gale force winds from the SE. The ship dodged, and work could not be resumed until 1800h on Sunday 31 October. Six collection tows were made with a 2m beam trawl, but conditions deteriorated again and the vessel dodged.

Weather conditions had improved slightly on the morning of Monday 1 November, and we attempted to fish the 2m beam trawl at 0630h. However, the ship could not be controlled in the strong winds and swell and the attempt was aborted. Winds increased again and the vessel dodged for the remainder of that day.

The wind and swell eased by midday on Tuesday 2 November. Four successful collection tows were completed with the 4m beam trawl, followed by 4 successful drops of the day grab and anchor dredge at site A and 4 at site B. Sea conditions continued to improve with winds abating to force 5.

On Wednesday 3 November we commenced 4m beam trawling to create an impact at site A. 25 tows were completed through the site, and the presence of an impact confirmed with a side-scan sonar image. We proceeded to collect 6 post impact NIOZ cores at site A and 6 at B, followed by three 2-m beam tows at A and three at B. Forecasts suggested that the weather would deteriorate further within two days, and we decided to begin work at the Hospital Ground rather than repeat the anchor dredge and day grab drops that had shown infauna to be remarkably scarce at this site.

Corystes sailed to the Hospital Ground and arrived at 0800h on Thursday 4 November. A box of 1 nm E-W and 2 nm N-S with NW corner at 54°30'N, 02°50'E was side-scanned and two study sites (A and B) were selected. We began NIOZ coring at 0945h, with the intention of collecting three cores at site A and three at site B. However, after collecting the second good sample at site B, the arm of the corer was damaged and the corer ceased to function. Coring work had to be abandoned. While we attempted to fix the corer, three 2-m beam trawl samples were taken from site A and three from B. We then made five collections tows with the 2-m beam for specimen collections, and made four day grab drops at A and four day grab drops at B to collect samples for PSA and meiofaunal analysis now that the NIOZ had failed. As predicted, the weather was deteriorating fast, and a southerly gale developed.

Corystes dodged throughout Friday 5 November, heading for the safety of deeper water to the south of the Dogger Bank. The centre of the low passed on the morning of Saturday 6 November, and since the wind was predicted to veer north-westerly force 8-10, Corystes sailed SE so that she could dodge to the NW when the wind strength increased. Corystes turned NW into the approaching gale at 1100h on Saturday 6 November and dodged for the remainder of the day.

On Sunday 7 November, winds had decreased to W force 5 and work resumed on the Hospital Ground at 0630h. Twenty-five tows were completed with the 4-m beam and the area was side scanned to confirm that the impacted area included site A. Four day grab drops were completed at A and four day grab drops at B, followed by three 2-m beam tows at A and three at B.

When the work on Hospital Ground was complete Corystes steamed to the South Rough in an attempt to catch 150 live plaice and 30 live sole for Sandy Scott's group and a CEFAS external contract. After two tows, Corystes proceeded overnight to the Botney Cut to make five collection tows with the 2-m beam trawl. Corystes then steamed to Markhams Hole and started to fish for plaice and sole with the 4-m beam. Fishing continued until 2200h when Corystes sailed for Lowestoft. She docked in Lowestoft at 0930h on Tuesday 9 November.

## RESULTS

The aims of this cruise could not be met in full due to the consistently poor weather, but we made excellent progress when the weather improved. Reduced studies were completed successfully at two sites and live plaice and sole were collected following a request from Sandy Scott. The vessel dodged for more than 100 hours during the cruise, and even during brief breaks in the weather the residual swell slowed the deployment of gears, or made it difficult for the ship to remain on station. The breakage of the NIOZ corer curtailed the meiofaunal and nutrient flux studies.

1. To complete a sidescan and Questor Tangent survey in three boxes (each 2 x 1 nautical miles) to the south-east of the Dogger Bank, before and after experimental beam trawling.

The complete boxes were not surveyed, but we sidescanned all areas used for the experimental work before and after beam trawling.

2. To sample the benthic invertebrate and fish community with corers, grabs, dredges and beam trawls before and after experimental beam trawling.

This objective was met, although the scale of the experimental design had to be reduced given the adverse weather conditions.

3. To collect sediment cores, before and after experimental trawling, to assess changes in sediment quality and nutrient fluxes.


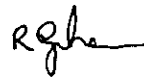
This objective was met successfully at the Western Mud Hole, although the breakage of the NIOZ corer limited our work at the Hospital Ground site.

4. To collect fish stomachs for dietary analysis and invertebrate and fish tissue for stable isotope analysis.

These objectives were completed successfully.

It is not possible to speculate on the results of this work until the samples have been processed in the laboratory and the data have been analysed.

Simon Jennings  
Scientist in Charge  
11 November 1999

SEEN IN DRAFT: R. Williams (Master)   
R. Graham (Senior Fishing Mate) 

INITIALLED:



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