

CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE SCIENCE,
LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK, NR33 0HT, UK

2000 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 14/00

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DURATION: 21 November- 4 December

LOCALITY: North Sea (IVb and IVc)

AIMS:

The work will 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 sample infaunal invertebrates at a series of sites in the Silver Pit that have been subject to different levels of trawling disturbance.
2. To survey sites in the Silver Pit with side-scan sonar in an attempt to locate trawl tracks, and to correlate the presence of these tracks with records of trawling activity from other sources (satellite and overflight data).
3. To sample epifaunal and infaunal invertebrate species that have been categorised as vulnerable in the Silver Pit and Botney Cut, at sites subject to different levels of trawling disturbance.
4. To sample meiofaunal communities at experimentally trawled sites in the Western Mud Hole and Botney Cut (sites were trawled on Corystes 12/99 and 14/99).

NARRATIVE: (all times are GMT)

Corystes sailed from Lowestoft at 1630h on 21 November. She proceeded overnight to a box of 2 nm (N-S) by 1 nm (E-W) in the Botney Cut (NW corner at 53°55' N, 03°03'E) to take NIOZ cores from experimental control and impact sites (previously studied on Corystes 12/99 and 14/99). Corystes was on station at 0600h on 22 November, but the weather was too poor to work and Corystes dodged for the remainder of the day. Weather conditions had improved slightly by 0400 on 23 November, but were still too poor to allow accurate positioning of the ship at the experimental sites. Corystes steamed north-west to a grid of 27 sites in the Silver Pit. Five replicate NIOZ cores had to be taken from each of these sites, but the sites were sufficiently large (1 * 1 nm²) that Corystes could work effectively in the prevailing sea conditions. The first NIOZ core was taken at 0630h on 23 November, and coring was completed at six sites by 1630h on the same day.

Sea conditions improved considerably during 23 November and once the NIOZ coring had been completed at the six sites, Corystes returned to the experimental control and impact sites in Botney Cut. From 1730h to 1845h, four NIOZ cores were taken from two sites, designated A and B. Site A had been impacted by trawling on Corystes 12/99.

Corystes then proceeded to the first of seven side-scan grids in the Silver Pit. Two grids were side-scanned overnight, before coring at the Silver Pit sites resumed at 0600h on 24 November. Cores were collected from three sites, and this work was completed by 1830h. Two more of the seven side-scan grids were completed during the evening of 24 November, but at 0130h, and with Force 9 SE gales forecast, the decision was made to sail to the north Norfolk coast to seek shelter. Corystes anchored off Wells on the morning of Saturday 25 November. The predicted gales, gusting to 45 knots, blew during the afternoon of Saturday 25 November and morning of Sunday 26 December. By the late afternoon of 26 December however, winds had eased, and Corystes sailed for the Silver Pit at 2200h.

Corystes arrived at the next NIOZ coring site by 0720 on 27 November. Coring was completed at five sites by 1500h, when the winch used to deploy the NIOZ corer failed. A temporary repair was made, and this allowed three more cores to be collected, but the winch suffered complete failure at 1645h. The decision was made to start side-scanning while alternative options for the deployment of the corer were considered. Three sites were side-scanned from 1815h on 27 November to 0700h on 28 November, but the work was delayed because the fin on the side-scan broke and had to be repaired.

The fishing skipper considered a number of options for deploying the NIOZ corer following the failure of the winch, and decided to deploy it over the stern using the Gilson. Coring began again at 0755h on 28 November, and the Silver Pit NIOZ grid was completed by 1540h. The anchor dredge was then deployed at five sites in the western Silver Pit. At 1800h, Corystes sailed west to the Skate Hole. Four NIOZ cores were collected from a box of latitude 54° 06' N to 54° 08' N and longitude 01° 34.5' E to 01° 37.5' E. The box was then surveyed overnight with side-scan sonar and QTC to investigate topography and bottom type of an area where spawning edible crabs are thought to aggregate. The survey at Skate Hole was completed at 0430 on 29 November.

Corystes returned to the Silver Pit, and from 0600 to 1400h on 29 November, six 4m beam trawl tows were conducted at stations in the Silver Pit to collect vulnerable epibenthic species, material for stable isotope analysis and plaice otoliths. The final tow was completed in the eastern Silver Pit, and Corystes proceeded to Botney Cut. Three tows were made with the 2m beam trawl from 1500h to 1615h, in order to collect vulnerable species of infauna.

Seas were relatively slight on 29 November, and Corystes sailed for 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). Four NIOZ cores were taken from two sites, designated A and B. Site A had been impacted by trawling on Corystes 12/99. Coring was completed at 2115h, and Corystes steamed west to the Hills region.

On 30 November, six 4m beam trawl tows were conducted at stations in the Hills to collect vulnerable epibenthic species, material for stable isotope analysis and plaice otoliths. The final tow was completed at 1715h. On 1 December, a grid of 12 stations was sampled with the 2m beam trawl in the Hills region. The work began at 0600h and ended at 2300h. Overnight, winds unexpectedly increased to 30-45 knots SSW. On 2 December, an anchor dredge grid in the Hills area was started at first light, but in deteriorating sea conditions, work was abandoned at 0820h. Corystes dodged in the Hills area until 1300h on 2 December, when mean wind speed still exceeded 30 knots. At 1300h we decided that, even if conditions improved rapidly, it would not be possible to complete the anchor dredge grid before the end of the cruise. Corystes sailed for Lowestoft at 1330h. In view of further bad weather that was forecast for Monday 4 December, the Master decided to dock in Lowestoft at 1330h on Sunday 3 December.

The following progress was made in relation to the stated objectives (page 1) of the cruise:

Objective 1. To sample infaunal invertebrates at a series of sites in the Silver Pit that are subject to different levels of trawling disturbance.

Infaunal invertebrates were sampled with a NIOZ corer at 27 sites. Five replicate cores were taken at each site and sieved through 1mm mesh. All infauna were preserved for laboratory analysis.

Objective 2. To survey sites in the Silver Pit with side-scan sonar in an attempt to locate trawl tracks, and to correlate the presence of these tracks with records of trawling activity from other sources (satellite and overflight data).

Seven sites in the Silver Pit were surveyed with side-scan sonar. Many trawl tracks were visible and our measurements suggested that most tracks were made by fishing vessels that towed twin 12m beams. Beam trawlers were working in the Silver Pit during the cruise and we were able to compare recent trawl tracks with those made at other times.

Objective 3. To sample epifaunal and infaunal invertebrate species that have been categorised as vulnerable in the Silver Pit and Botney Cut, at sites subject to different levels of trawling disturbance.

Vulnerable infaunal species were sampled with the NIOZ corer and anchor dredge at the least intensively fished sites in the Botney Cut and western Silver Pit. Epifauna were not sampled

in the Silver Pit because cruise time was lost to poor weather. As an alternative, a reduced programme of epifaunal studies was conducted with the 2m beam trawl in the Hills area.

Objective 4. To sample meiofaunal communities at experimentally trawled sites in the Western Mud Hole and Botney Cut (sites were trawled on Corystes 12/99 and 14/99).

Meiofauna were successfully sampled with a NIOZ corer and sub-cores at the control and impact sites in both the Western Mud Hole and Botney Cut. This completed the experimental study of the effects of fishing on meiofauna that began in 1999.

Meiofauna sub-cores were also collected from all 135 NIOZ corer deployments in the Silver Pit. These samples may allow us to assess the effects of trawling disturbance in a real fishery on meiofaunal communities.

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.

MISCELLANEOUS:


1. Otoliths were taken from 67 male and 93 female plaice caught in rectangles 37F0-37F2 (John Dann).
2. *Arctica islandica* shells were collected in the Silver Pit (Chris Richardson, University of Wales, Bangor).
3. A small sample of surface sediment (15cm³) was taken from each of the 135 Silver Pit NIOZ cores. The samples will be used to assess the abundance of over-wintering copepod eggs (Alistair Lindley, SAHFOS, Plymouth).
4. An edible crab spawning area in the Skate Hole was surveyed with side-scan sonar and sampled with the NIOZ corer to investigate the topography and sediment type (Derek Eaton)

Simon Jennings
Scientist in Charge
4 December 2000

SEEN IN DRAFT: R. McCurry (Master)
B. Salter (Senior Fishing Mate)

INITIALLED:

RM
BS


SAH - FB 5/12/00

DISTRIBUTION:

Basic List +

T Dinmore

D Eaton

C Firmin

A Hewer

P Hudson

M Schratzberger

SIGS

Fishing skipper: Corystes

FCO (for Netherlands)

Eastern SFC

North Eastern SFC