CRUISE: CORY 3/01

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DURATION: 5 April to 18 April 2001

LOCALITY: North Sea (IVb and IVc)

AIMS:

The aims of this cruise were (1) to identify species that are vulnerable to beam trawling disturbance, (2) to describe the impacts of trawling disturbance on the structure and productivity of benthic communities and (3) to examine links between the frequency of trawl tracks in the Silver Pit and satellite and overflight records of trawling activity.

The specific objectives of the cruise were:

1. To sample infaunal invertebrates at a series of sites in the Silver Pit that are 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 assess the persistence of trawl tracks on the seabed (subject to beam trawlers working in the Silver Pit area at the time of the cruise).

4. To sample epifauna and fish in the Silver Pit and Hills regions with the 2m beam trawl.

5. To sample epifauna and fish in the Silver Pit and Hills regions with the 4m beam trawl.

6. To collect fish and benthic invertebrate species for stable isotope analysis

7. To collect zooplankton for stable isotope analysis

8. To collect dabs for bass feeding experiments (C. Sweeting)

NARRATIVE: (all times are GMT)

Corystes sailed from Lowestoft at 1815h on 5 April. She proceeded overnight to the western Silver Pit to begin a NIOZ coring grid of 135 stations at 27 sites. NIOZ coring continued from 0445h - 1730h on Friday 6 April, 0500h - 1730h on Saturday 7 April and 0500h - 1400h on

Sunday 8 April, when the grid was completed. Weather conditions were favourable for coring throughout. During the evenings and nights of 6- 8 April, six 1 * 1 nm boxes in the Silver Pit were side-scanned to locate beam trawl tracks.

Corystes sailed from the Silver Pit to the Hills area on Monday 9 April, to begin 4-m beam trawling. *En route*, a single 1 * 1 nm box at the extreme western end of the Silver Pit was side-scanned. The first 4-m beam trawl tow began at 0830h, and the sixth and final tow was completed at 0430h on Tuesday 10 April. Corystes then fished a grid of 12 2-m beam trawl stations in the Hills area. The grid was completed at 1900h on Tuesday 10 April and Corystes sailed overnight to begin a grid of 60 NIOZ core stations and 36 anchor dredge stations at 12 sites in the Hills. Coring and anchor dredging commenced at 0500h on Wednesday 11 April. Only nineteen successful cores had been collected by 1740h, because the shoes of the corer were bent and did not allow the rubber base plate to seal the core tube when working on sand. Coring was abandoned at 1740h, so that the problem with the core shoes could be investigated. However, the collection of anchor dredge samples continued until 2000h.

On Thursday 12 April, anchor dredging continued in the Hills. Dredging began at 0330h and the grid was completed at 1530h. At 2000h on the same day, we began plankton collections with a ring net. There were insufficient large zooplankton to meet our requirements and we abandoned the plankton collection at 2100h. Corystes steamed to the Silver Pit overnight. We started fishing a grid of six 4-m beam trawl stations at 0400h on Friday 13 April and completed the grid by 1330h. Once trawling was complete, Corystes steamed to the first of two 1 * 1 nm boxes at the western end of the Silver Pit. These boxes were side-scanned from 1500h to 2030h.

On Saturday 14 April, seven 2-m beam stations were fished in the Silver Pit. Trawling began at 0400h and was completed by 1400h. We stopped fishing for one hour at 0800h, in order to test the NIOZ corer that had been repaired by the ship's engineers. The engineers had straightened the shoes and welded additional supporting braces beneath them. The repaired corer worked successfully on 4 trial drops.

At 1430h on 14 April, Corystes sailed for the eastern Hills. She arrived on station at 1700h and six 4-m beam tows were completed by 2100h. Corystes then steamed to the western Hills, and further 4-m beam collection tows were made from 0400h on Saturday 15 April. After 6 tows, sufficient samples for stable isotope analysis had been collected, and Corystes resumed the NIOZ core grid that was abandoned on 11 April following damage to the corer. Twenty cores were successfully collected from 4 sites between 0930h and 1600h, but at 1700h, with windspeed increasing to c30 knots NW and sea conditions deteriorating, coring had to be abandoned. Corystes remained on station to await improvement in the weather.

Sea conditions remained unfavourable for coring on Monday 16 April, and Corystes dodged until 0400h on Tuesday 17 April when windspeed had dropped to c15 knots and the swell had decreased. NIOZ coring resumed at 0430h on 17 April. The remaining 20 NIOZ cores were collected by 1050h, and with insufficient cruise time remaining to complete the anchor dredge grid in the Silver Pit or to track beam trawlers, Corystes sailed for Lowestoft at 1100h.

Corystes docked in Lowestoft at 0630h on Wednesday 18 April.

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 and anchor dredge at 27 sites in the Silver Pit and 12 sites in the Hills. 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.

Objective 3. To assess the persistence of trawl tracks on the seabed (subject to beam trawlers working in the Silver Pit area at the time of the cruise).

We did not meet this objective as there were very few beam trawlers working in the Silver Pit on the days when Corystes was there.

Objective 4. To sample epifauna and fish in the Silver Pit and Hills regions with the 2m beam trawl.

Epifauna and fish were sampled at 7 sites in the Silver Pit and 12 sites in the Hills.

Objective 5. To sample epifauna and fish in the Silver Pit and Hills regions with the 4m beam trawl.

Epifauna and fish were sampled at 6 sites in the Silver Pit and 6 sites in the Hills.

Objective 6. To collect fish and benthic invertebrate species for stable isotope analysis

Individuals from a range of species were collected for stable isotope analysis.

Objective 7. To collect zooplankton for stable isotope analysis

Water clarity was very high throughout the cruise and zooplankton were scarce. We did not collect sufficient zooplankton for stable isotope analysis.

Objective 8. To collect dabs for bass feeding experiments (C. Sweeting)

Dabs were retained on all collection tows. They were filleted and diced to use in bass feeding experiments.

It is not possible to speculate on the results of the work on Corystes 3/01 until the samples have been processed in the laboratory and the data have been analysed.

MISCELLANEOUS:

1. *Arctica islandica* shells were collected in the Silver Pit (Chris Richardson, University of Wales, Bangor).

2. Whelks *Buccinum undatum* were collected in the Hills region (University of Hull).

Simon Jennings
Scientist in Charge
18 April 2001

SEEN IN DRAFT: R. McCurry (Master)
A. Lincoln (Senior Fishing Mate)