

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT,
ENGLAND

1990 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 4

STAFF

E M Gmitrowicz
N D Pearson
K J Medler
D J Allington (16-21 March)
A K Young (16-21 March)
R J Chapman
N J Faber (8-16 March)
M O Green (University of Cambridge)
J K Atherton (University of Cambridge)

DURATION

Departed Lowestoft 1000 8 March 1990
Arrived Lowestoft 0400 21 March 1990
All times Greenwich Mean Time

LOCALITY

North East Coast of England

AIM

1. To recover a line of four current meter moorings offshore of Marsden Bay.
2. To deploy the tetrapod for zero offset deployments and for 12 and 24 hour anchor stations, depending on the weather conditions. Most deployments will be in and around the Marsden Bay and Alnmouth Bay areas.
3. To try out the Cambridge University Colnbrook current meters and to perform tests on the acoustic backscatter monitor (ABM).
4. To undertake grab sample, side-scan sonar surveys and CTD surveys of the area as necessary.
5. To complete a 24 hour combined tetrapod/²³⁴TH geochemistry anchor station.
6. To run an offshore ²³⁴TH geochemistry section at a suitable location between Marsden and Alnmouth Bays.

NARRATIVE

RV CORYSTES sailed from Lowestoft on the morning tide of Thursday 8 March, and steamed to the line of four current meter moorings deployed south of the River Tyne (off Marsden Bay) during CIROLANA 1/90. On arrival the following morning the ship surveyed the line of moorings and found A and B to be on position. Mooring C was 1.2 miles off position and mooring D was

missing (see Fig. 1). All moorings found were recovered in strong westerly winds but four attempts to recover the missing mooring by dragging proved fruitless. Moorings A and B were intact on recovery but the meter wire of mooring C had been cleanly cut. A line of eight CTD stations was worked along the current meter section.

At 1800 that evening the ship anchored at the tetrapod site in Marsden Bay ready for a tetrapod deployment the following morning, 10 March. On readying the tetrapod we discovered that all four of the leg brackets had been left at Lowestoft, but these were brought to the ship by 1300 that day.

Prior to collecting the brackets and during the subsequent construction of the tetrapod, a 23-station, closely-spaced grab survey of Marsden Bay was completed to identify spatial trends in sediment type. The tetrapod was ready for deployment at 1830 that evening and was deployed for a zero-offset test. During the short 45 minute deployment the tetrapod remained tethered to the ship but was recovered prematurely when the tetrapod was pulled onto its side by the ship swinging. No damage was caused by this incident, though unrelated problems included an intermittent fault on one of the current meters and the flooding of the electronics cylinder of the miniature optical backscatter sensors (MOBS) due to an ill-seated O-ring. The latter eliminated the MOBS from any further use and the former necessitated a further short overnight deployment.

The tetrapod was recovered successfully before breakfast on 11 March with all data logged and a longer deployment was made to sample during any rough weather. During this deployment hourly CTD stations were worked at anchor to collect water samples for suspended load and particle size over a 25 hour period from 1330 on 11 March to 1430 on the 12th. QUISSET measurements were also made to give a distribution of settling velocities.

Calm weather on the 12th coupled with evidence from the previous overnight deployment that the new Colnbrook current meters were suffering from electronic interference, forced the decision to recover the tetrapod and redeploy it for short instrument tests. This also provided the opportunity to search for a noise source in the ABM which had been discovered on previous cruises and during lab. experiments. Two test dips were sufficient to solve the problems with both instruments. The first of these was from 2149 on 12 March to 0718 on the 13th and the second was from 1120 to 1518 on the 13th. While the tetrapod was deployed for these tests further QUISSET stations were worked and water samples were taken for triplicate suspended load analysis to determine the error on the method.

The results of the tests gave us confidence to deploy the tetrapod over the longer period from 2128 on 13 March to 0718 on the 16th. Another 25 hour anchor station, identical to that described above, was worked during this deployment.

After breakfast on the 16 March there was a change of personnel by "Searider" to and from the North Shields fish quay. N. Faber left the ship and D. Allington and A. Young embarked. The opportunity was also taken to collect two current meters off mooring D which had been handed to the D.I. at North Shields. The ship then steamed to Alnmouth Bay to undertake a 25 hour anchor station, this time in conjunction with ²³⁴TH/²³⁸U determinations, beginning at 0930 on 17 March, and preceded by an overnight deployment of the

tetrapod. On completion of the anchor station three guard buoys were positioned around the tetrapod and the ship undertook a side-scan survey of Alnmouth Bay, followed by an eight-station offshore CTD/grab section. The ship then steamed back to Marsden Bay (leaving the tetrapod deployed at Alnmouth) to be in position to start a five station ²³⁴Th/²³⁸U geochemistry section at 0630 on 19 March. On completion of the section at 1300 the ship returned to Alnmouth Bay to retrieve the guard buoys and to carry out a very successful TV camera survey of the seabed.

The tetrapod was recovered for the final time at 0715 on 20 March and the ship then steamed for home with all aims complete thanks to the hard work and skill of the ship and scientific staff alike. The ship arrived at Lowestoft at 0400 on 21 March.

RESULTS

1. The five current meters recovered all returned full, good records. Of the two current meters retrieved from the D.I. at North Shields, one had ceased recording after only one day while the other recorded 30 days of good data before being trawled on 17 February.
2. The temperature channel on the CTD was very noisy, reducing the resolution of the instrument to less than a tenth of that expected. Something may be retrieved from this data but it will take considerable time and will not be suitable for archiving.
3. The noisy signals on the ABM were tracked down to the cable connecting the transducers to the electronics case. Although the effect cannot yet be explained, it's discovery allowed good data to be recorded for the majority of the cruise, though on one frequency only.
4. In total there were eight separate tetrapod deployments during the cruise. Good data was recorded on the Marsh-McBirney current meters throughout that time and the series of short deployments allowed almost all the problems with the Colnbrook current meters to be solved within days of the first deployment. The particular configuration in which the Colnbrooks were deployed means that for the first time the three-dimensional structure of the turbulence field near the sea bed has been measured from the tetrapod.
5. The very clear TV pictures of the sea bed has allowed an estimate of the bed roughness at the tetrapod site in Alnmouth Bay to be made. Some inference on the structure of the turbulence field under small amplitude tidal flows can also be drawn.
6. Surface salinity was logged continuously throughout.

E M Gmitrowicz
(Scientist-in-Charge)
28 March 1990

Seen in draft JF (Master)
MGCR (Fishing Skipper)

Initialled CEP

DISTRIBUTION

Basic List +

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Figure 1

CORYSTES 4/90 STATION POSITIONS

