

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

1982 RESEARCH VESSEL PROGRAMME

REPORT: RV CLIONE: CRUISE 4

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF:

M S Rolfe (SIC)
 S M Rowlett (until 24 March)
 P Hudson
 R J Law (until 16 March)
 C D Byrne (Until 16 March)
 P Vessey (Chelsea Env. Inst. Ltd) (until 16 March)
 A Franklin (from 16 March)
 P A Ayres (from 16 March)
 Nicola Shakspeare (from 16 March)

DURATION:

Left Lowestoft 1016 h, 11 March
 Arrived Lowestoft 1002 h, 25 March

LOCATION:

North-east coast, Humber and Dover Straits

AIMS:

1. To conduct a survey over the disposal ground off Blyth to monitor industrial waste levels in seawater over an extensive period using a towed 'Aquatracka' fluorimeter.
2. To collect fish by trawling off Blyth and R Tyne for a) phenol residue analysis and b) metals and o/c analysis.
3. To conduct an 'intensive' monitoring survey of the Tyne sewage sludge dumping ground by grabbing for sediments for physical, chemical, biological and bacteriological analysis.
4. To conduct side scanning sonar surveys of (a) the colliery waste disposal grounds off R Wear and Souter Point, (b) the Cleveland Potash pipeline discharge area off Boulby, (c) New Sand Hole off R Humber.
5. To collect benthos for chemical analysis from the Inner Tees dumping ground by repeated grabbing.
6. To conduct sea trials of a Sea Sediments suspended sediment trap off the Tyne and/or off Boulby.
7. To conduct a 'routine' monitoring survey of the Humber sewage sludge dumping ground by grabbing for sediments for physical and chemical analysis.
8. Addition aim (not on programme):
 To conduct a post-dumping survey of the South Falls spoil dumping ground using side-scanning sonar.

NARRATIVE:

CLIONE left Lowestoft at 1016 h 11 March but bad weather hampered her progress northwards and Aim 1 was not commenced until 1249 h 13 March when CLIONE rendezvoused with the dumping vessel KEILDER off the R Tyne and then followed in her wake using the towed Aquatracka mounted on a TTN to monitor phenol present in the industrial waste discharged from the KEILDER. As no industrial discharge took place on 14 March, Aim 2 was carried out on that day. Three Granton trawl stations were worked off the Tyne followed by three Agassiz trawl stations (to collect Calocaris for chemical analysis); in addition, four outlying grab stations were worked (see Aim 3) and further testing of the Aquatracka was undertaken in the evening in readiness for further monitoring. The KEILDER discharged again on 15 March and CLIONE followed in her wake as on 13 March. At 1410 h, a survey was made over the industrial waste disposal ground with the Aquatracka but over a limited area in view of the relatively low readings obtained in the wake of the KEILDER. This was followed, at 1935 h, by a side scanning sonar survey, Aim 4(a), which continued until 1320 h 16 March. During this time a large sea area covering a number of current and disused spoil grounds between Blyth and Sunderland was surveyed.

CLIONE berthed at Blyth at 1409 h, 16 March where Messrs Law, Byrne and Vessey went ashore and were replaced by Dr Ayres, Mr Franklin and Miss Shakspeare. CLIONE sailed again at 0748 h 17 March and completed the side scanning survey concentrating on the dumping grounds off Souter Point and R Wear. At 0700 h 18 March Aim 3 was commenced and a grid of 57 stations was worked with a 0.14 m² Day grab. Five stations were re-visited and replicate samples taken at each for sediments and benthos for chemical analysis. The latter were cleansed in aerated seawater for 24 h before deep freezing. Grabbing was completed by 2018 h 19 March.

Sufficient programme time was available to resurvey part of the Tyne dumping ground to examine any changes in faecal bacteria distribution but this could not be done on 20 March as the bacteriological samples from the previous two days grabbing were still incubating. Consequently 20 March was spent on Aim 4(b) off Boulby, an area which could not be completely surveyed because of the presence of crab pots and trammel nets. Aim 4(b) was terminated at 1156 h and CLIONE returned to the Tyne area and between 1556 h and 1935 h carried out a side scan survey of the shoreward approaches to the Tyne sewage dumping ground to delimit the rough ground and provide data to assist in the interpretation of the sediment samples collected previously on 18 and 19 March. The repeat grabbing survey was commenced at 0700 h 21 March, the 28 stations worked being concentrated to the south and south-west of the dumping ground where the highest bacterial counts had been made previously. Five replicate samples were taken at four of the stations for statistical purposes. Grabbing was completed at 1621 h 21 March when CLIONE steamed to the Humber area.

Aim 7 was commenced at 0914 h 22 March; however it was decided to discontinue the grabbing survey (no undisturbed sediment samples could be obtained from the stony ground) in favour of collecting Modiolus modiolus and other fauna for chemical analysis using a Forster Anchor dredge at selected stations. Replicate samples were recovered from four stations and the fauna were cleansed and deep frozen. At 0638 h 23 March Aim 4(c) was commenced in the vicinity of a designated short-term spoil ground near New Sand Hole. On completion of the scanning grid at 1811 h, the West Sole-Easington gas pipeline was briefly inspected by side scanning after which sediments were collected from four stations by grabbing from the vicinity of the New Sand Hole for the verification of the earlier side scan record.

CLIONE left the Humber area at 2053 h 23 March and steamed south, stopping briefly at South Quay, Lowestoft for Dr Rowlatt to disembark (0650-0714 h, 24 March). CLIONE arrived in the South Falls area at 1338 h and commenced a side scan sonar survey (Aim 8) over and shorewards of a short term spoil ground. This was followed by a short grab survey which was completed at 0114 h 25 March. CLIONE then returned to Lowestoft and berthed at 1002 h 25 March.

RESULTS:

Aim 1: The CEI Aquatracka registered levels of approximately 100 ppb phenol in the slick behind the dumping vessel KEILDER but would have been more successfully deployed away from CLIONE'S own wake. Using the Aquatracka in CLIONE'S sea water supply via the stainless steel pump proved unsatisfactory due to the presence of small bubbles in the system which artificially elevated the readings. Alternative methods of monitoring the dispersal of liquids in the sea have their own problems and limitations and it would seem well worthwhile conducting further monitoring with the CEI Aquatracka either from a midships boom or from a smaller vessel; both methods would require good weather conditions.

Levels identified using the Aquatracka will need confirmation by laboratory analysis before an estimate of dispersion throughout the area of discharge can be obtained.

Aim 2: Samples of cod, Nephrops and Pandalus borealis were collected for metals and o/c analysis but none was collected for phenol analysis because of the low water concentrations found.

Aim 3: The grabbing survey over the Tyne sewage sludge dumping ground was successfully completed. Coliform, E. coli and faecal streptococci all showed high counts and a distribution indicating a southerly and southwesterly movement of material away from the dumping ground. Clostridium perfringens levels were high over most of the area surveyed. The follow-up survey was successfully carried out but bacteriological results were not available at the time of writing.

Aim 4: (a) Side scanning of all dumping grounds receiving solid wastes was completed. Time did not permit much on-board analysis of the record.

(b) The presence of pots prevented scanning over the shorewards margins of the area of interest near the end of the discharge pipe but most of the 'Boulby Sand patch' (where solids from the effluent might accumulate) was satisfactorily delimited. Anxious fishermen were re-assured by CLIONE'S pre-survey search for dahns in the vicinity. No fishing gear was struck.

(c) The designated spoil ground near New Sand Hole and its northward approaches were successfully surveyed although a number of tankers anchored in the area necessitated some alterations of course on some of the scanning legs.

Aim 5: This aim was transferred to the Tyne area and combined with the collection of fauna for chemical analysis during Aim 3. No ubiquitous species were found but samples of Turritella communis, Dosinia exoleta and other species were recovered from multiple and single dips at a number of stations.

Aim 6: This aim was cancelled before the cruise (it is now proposed to test the sediment trap at the Nab current meter station during other MAFF cruises in 1982).

Aim 7: Samples of Modiolus and Buccinum were recovered from four anchor stations but the grabbing survey was abandoned.

Aim 8: A spoil ground to the east of South Falls and its westward approaches were side-scanned but no clear signs of spoil were seen. Fifteen grab stations were worked over the survey area; mud balls were present at some but it was not clear whether or not these were derived from dumped spoil.

M S Rolfe
1 April 1982

SEEN IN DRAFT:

G R O
G F L

INITIALLED:

H W H

DISTRIBUTION:

Basic List +

M S Rolfe

S M Rowlatt

P Hudson

R J Law

C D Byrne

P Vessey

A Franklin

P A Ayres

Nicola Shakspeare