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

1986 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 68/86
(PROGRAMME: not to be quoted without prior reference to the author)

STAFF:

R R Dickson (SIC)
A R Folkard
J W Read
E M Gmitrowicz
J Wooltorton
D J Ailington
M C Fulcher
P Holligan (MBA; part-time)
N D Pearson (part time)

DURATION:

3-21 July 1986

LOCALITY:

North East Atlantic and Irish Sea

AIMS:

1. To recover the 9-mooring current meter array around the NEADS 6 site on the continental rise at the mouth of the Rockall Channel (51° 50'N-52° 42'N, 17° 04'W-18° 10'W).

2. To relay the NEADS 6 mooring for its 10th deployment and to lay 4 moorings on the continental rise west of Porcupine Bank at positions:

50° 33.35'N	14° 41.36'W
50° 59.65'N	15° 05.57'W
51° 03.35'N	15° 10.17'W
51° 04.00'N	15° 14.07'W

3. To work CTD and rosette sampling for tritium at 19 sites in the East Atlantic centred on the NEA Dumpsite. At each station 10 samples will be taken in the bottom 1000m of the water column. At 3 of these sites an additional full-rosette sample at a height of 5m from the bed will be taken for Pu analysis and at one site further lowerings will provide the 1000 l necessary for a K_D estimate.

4. To take Reineck box cores and Kaston cores at a few locations at the head of the Porcupine Abyssal Plain to assess $\frac{239 + 240}{238}$Pu ratio in surficial sediments.

5. To deploy fish traps at the same sampling locations to assess Cs and Pu in fish.

6. To carry out full service of the Irish Sea moorings including recovery and redeployment of 7 current meter moorings, recovery and redeployment of the NBVR tetrapod, anchor station over one tidal cycle and the normal CTD stations.

7. XBTs and surface Cs samples will be taken on passage.

NARRATIVE:

(All times GMT.) Shortly after the embarkation of Part B staff, Cirolana sailed from Falmouth at 2130h 3 July and proceeded to the Porcupine Abyssal Plain, NE of the NEA dumpsite to resume the series of deep tritium stations begun on Part A. On leaving port, continuous monitoring of surface chlorophyll fluorescence, turbidity, nitrate and temperature was begun together with discrete plankton samples by Holligan, and this programme was continued throughout the cruise. From 0830 5 July to 0220h 8 July a further five tritium stations were worked northward up the Porcupine Abyssal Plain in moderate to poor weather conditions, with a further 30 l rosette cast to 5m above the seabed at one site for Pu analysis and acoustic release tests on the Gerard-Barrel cable on 7 July.

From 0900h 8 July hydrochemistry was suspended to begin recovery of the 9-mooring Rise Array around the NEADS-6 site. By 2121h 9 July, 8 out of 9 moorings had been successfully recovered and NEADS-6 had been relaunched, but no contact was made with mooring 85-01 despite an extensive search. Thereafter, from 2138h 9 July to 2345h 10 July, a successful launch and recovery of the fishtraps and a good box core via the Reineck completed the 3-part sampling for Pu in water, fish and sediment begun last year at this site, and a further station of the tritium grid was worked, but two attempts to obtain Kaston cores from the crest of Feni Ridge were unsuccessful. After a final search for Mooring 85-01 from 0244h-0400h 11 July, the lost mooring was abandoned and Cirolana continued southeastward to her second main working area on the continental rise west of Porcupine Bank.

From 1139h 11 July to 2013h 13 July, a series of two Reineck cores and one Kaston core (all successful) were worked up the Rise, four current meter moorings (including one full-depth) were laid after the necessary acoustic release tests, and a section of 4 CTD stations, with tritium sampling at the deepest, was worked through the current-meter array. At the deeper of the two Reineck sites, the opportunity was taken to add fish samples via a second fish-trap deployment, and a bulk 330 l water sample at a height of 5m above the bed, thus completing the 3-part sampling for Pu in fish, sediments and water at a further north-east Atlantic site. As with previous box-cores, the overlying water was drawn off to provide a K_D estimate for easily-suspended particulates. From 2015h 13 July, with the deep-ocean part of the programme completed, Cirolana steamed for Holyhead.

After working the first of the Irish Sea CTD stations in the Anglesey Deeps, Cirolana anchored 1239h 15 July to await the arrival of gear by tug. By 1440h the transfer was completed, with Pearson joining ship and Holligan leaving. Cirolana then proceeded northward to recover and relay all 7 current meter moorings and to work 3 CTD sections of 11 stations (total) from Anglesey to Isle of Man, Isle of Man to Burrow Head and Isle of Man to St Bees Head. At each CTD station, samples for salinity, nitrate, silicate, oxygen and caesium were taken via 1.8 or 30 l Niskins as appropriate, with surface samples by overside pump. This work was completed by 1118h 17 July and Cirolana continued to the NBVR site off the Solway Firth where a triangle of 3 guard toroids were moored before anchoring to lay the tetrapod. By 2041h 17 July after one misfire, the tetrapod was tested and laid and Cirolana dropped south to work an anchor station at the next planned tetrapod site off St Bees Head. From 0730h to 1630h 18 July, this station was worked with hourly sampling for suspended particulates throughout the water column, and with continuous monitoring of current speed and direction via the NBA current meter at mid depth and the new Anderaa with Sea Tech 25 cm transmissometer mounted in its fin monitoring conditions at 3-5 m above the seabed. Surface light transmission was also monitored throughout this period via both the Riches unit and a second 25 cm SeaTech unit mounted in a deck tank.

At 1645 18 July with the work programme completed the vessel steamed for the Isle of Wight where seabed drifters were dropped at 2 sites west of Selsey Bill. Cirolana then continued to Lowestoft docking at 0845h 21 July.

RESULTS:

1. Eight out of 9 of the deep sea moorings were successfully recovered. The 16 instruments all had full tapes and preliminary analysis shows good data on 15 of these; the remaining record (85-04 bottom) consisted of only ~1month of good data. Five moorings were laid including the 10th annual deployment of NEADS-6, and a CTD section was worked through the array off Porcupine Bank.

2. A total of 7 deep tritium stations were worked to add to the 11 stations worked during Part A. Thus 18 of the intended 19 stations were completed.

3. Full 30 l water samples were recovered for Pu analysis from a height of 5 m above the seabed at 2 sites.

4. Fish traps were successfully deployed at 2 sites, returning two Coryphenoides (101 and 65 cm) at the first and three (77, 76 and 67 cm) at the second. Samples of used and unused bait were frozen for Pu analysis to provide a check on decontamination procedures.

5. A total of 3 Reineck box-cores were recovered. Box-section subsamples were X-rayed and returned to Lowestoft for geochemical analysis, and the overlying water was drawn off to provide a K_D value for easily suspended material in each case. Of the 3 Kaston cores attempted, only one was successful. The 3-core section up the continental rise suggests less sedimentation there than expected. [The deepest Reineck core (3460 m) seems to have reached basement with a bottom layer of very hard tough dry clay; the shallower Reineck (3075 m) showed a layer of black coral stems at its base; the Kaston in 2550 m collected no core but a large siliceous sponge, shell and coral debris, gravel and four large stones.]

6. A full Irish Sea service-programme was successfully completed (current meters, tetrapod, anchor station and CTD sections). All 7 moorings were recovered and relaid. Of the 14 instruments, all had full tapes and only one of these proved to have partial data caused by loss of the rotor halfway through the deployment.

7. Dr Holligans plankton sampling appears to have been successful, though the "milky sea" coccolith bloom conditions found during Part A were not re-encountered.

8. The MAFF/U. Southampton study of circulation east of the Isle of Wight was continued with 2 seabed drifter drops.

9. Bulk water samples for Cs analysis were collected for Mr Jefferies, where requested.

Acknowledgement: It is a pleasure to acknowledge the contribution that was made to this successful cruise as a result of precise ship-handling over long working days by the ships officers and crew.

R R Dickson
22 July 1986

SEEN IN DRAFT:

M J Willcock	Master
E W Pearson	Fishing Skipper

INITIALLED:

H W H

DISTRIBUTION LIST:

Basic List +
All scientific staff on Cirolana 6/86
Dr P Holligan MBA Plymouth