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

1978 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 1

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

STAFF:

P G W Jones
J W R Dutton
J A Talbot
C W Baker
B R Harvey
D J Allington
T C Doddington
S J Gerrell
A K Young
J Lees (Part time)

DURATION:

Left Grimsby 1215h, 4 January

Arrived Grimsby 1500 h, 20 January

LOCALITY:

Irish Sea, English Channel, North Sea

AIMS:

1. Radionuclide studies in the Irish Sea. Samples to be taken of the sea bed (including interstitial water), particulate suspended material and water. Special emphasis to be placed on samples from near the sea bed/water interface. Particulate size distribution, suspended loads and radionuclides will be measured as appropriate. At selected positions, near the Windscale outflow velocity measurements to be made at three levels using recording current meters. Sea-bed drifters to be released at selected localities.

2. To measure the distribution of dissolved and particulate trace metals in the water over the Liverpool Bay sludge dumping ground and off the Marchon chemical works sea discharge pipeline. Surface sea bed samples to be collected at the latter locality.

   A trace metal survey to be made of other regions of the Irish Sea as time permits.

3. To recover and relay the Humber and JONSIS current meter rigs.

4. To collect water samples for the measurement of radioactive caesium on passage to and returning from the Irish Sea.

NARRATIVE

After sailing from Grimsby, CIROLANA proceeded to the Humber Dumping ground where the current meter rig was successfully recovered and relaid between

1415 h and 1600 h the same day. The vessel then continued on to the area of the JONSIS rigs but SW gales prevented any recovery work during the following day. On the morning of the 6 January JONSIS 1 was successfully recovered and relaid between 0815 h and 1000 h. The vessel then had to return to the Bull Anchorage to land a member of the scientific staff via the Grimsby pilot owing to a family bereavement. CIROLANA returned to the JONSIS 2 station but was unable to locate the current meter rig by acoustic, visual or grapnel searches. A new rig was laid between 1300-1330 h 7 January and the vessel then proceeded to the Irish Sea via the English Channel taking surface caesium samples on passage.

The main survey area was reached at 1700 h, 9 January off Wexford Bay. A series of sediment/water sampling stations were worked off the Irish coast throughout a period of strong westerly winds. During the early morning of 11 January the vessel took a series of water samples off Dundalk Bay to evaluate the reproducibility of the caesium and trace metal analysis. CIROLANA departed from the area at 0800 h and proceeded to Luce Bay where a sediment/water sampling station was worked during the early afternoon. With deteriorating weather conditions the vessel ran south to a position between the Isle of Man and the Cumbrian coast and then dodged throughout the night in a northerly force 9-10 gale. By the morning of 12 January the wind had commenced to moderate and the vessel returned north to work a hydrographic section across the mouth of the Solway Firth between 1300 and 1700 h. A water/sediment sampling survey in the region of St Bees Head was commenced at 2100 h 12 January to examine the distribution of trace metals discharged from the Marchon chemical works and was completed by 1300 h the following day during excellent weather conditions. Advantage of the settled weather was then taken to lay current meter rigs off the BNFL Windscale works during the afternoon of the same day. A water sampling programme was worked near the rig over a 12½ hour tidal cycle the following day. The meter rigs were recovered between 0830 h and 0900 h on 15 January. CIROLANA commenced the trace metal survey of the Liverpool Bay sludge dumping area at 1300 h the same day and the grid was completed at 1400 h the following day. Thereafter the remaining time was devoted to completing the hydrographic sections and working most of the miscellaneous water/sediment sampling stations. The sections worked were Ardglass Head to Peel, North Channel, Burrow Head to Point of Aire, Castletown Bay to Anglesey and Holyhead to Dublin. The last station was worked off Dublin at 0800 h on 18 January. CIROLANA then commenced the homeward passage via the English Channel. Southwest gales delayed progress somewhat during the night of 18/19 January. On the morning of 20 January a series of surface water samples were taken for mercury analysis on the approach from the Norfolk Banks to Spurn Head. The vessel reached Grimsby at 1500 h on 20 January.

RESULTS

1. Most of the work relating to radionuclide studies was completed but as a result of bad weather early in the cruise it was possible to work only one tidal station near the Windscale outflow. A large number of seabed samples were obtained using the Day Grab, Reineck corer and Gravity corer, including 16 cores of length up to 86 cms. On the basis of generally accepted sedimentation rates the longer cores must have penitrated material laid down well before the Windscale plant was operational. A number of the cores were from the large mud patch on the bed of the Western Irish Sea and the limits of this patch have been reasonably well defined. Interstitial water samples were obtained from one core to a depth of 76 cms.

The new near bed water sampler was used at the tidal station and appeared to work well, producing samples from within a few cms of the sea bed. The underwater camera was used only once because the frame to attach this to the

sampler proved to need stiffening.

Five sections were worked for particle size distribution, chlorophyll, suspended load, salinity, temperature and radionuclide level. Four of these being at the boundaries of the Western Irish Sea. Seabed drifters were released at 9 stations in this area to supplement the work.

Routine samples for the analysis of radioactive caesium were taken at several stations over the survey area and also on passage to the Irish Sea. No samples were collected during the homeward passage since the vessel did not return via the northern route.

2. Mercury was analysed at the time of collection on most trace metal water samples. Levels were found to be relatively high in Liverpool Bay but the full significance of these data will not be apparent until the amounts of suspended material have been determined. Remaining metals will be analysed ashore for both "soluble" and particulate fractions. Surface sediment samples were taken for metal analysis off the Marchon works by means of a cone dredge. Nutrient salts will also be analysed in the water from the Marchon survey.

When all the analyses have been completed it is hoped that the data will indicate if the sludge dumping in Liverpool Bay is raising the dissolved and particulate metal concentrations above background levels and similarly if the discharge from the Marchon chemical works (particularly in respect of cadmium) can be detected within the area surveyed.

P G W Jones
26 January 1978

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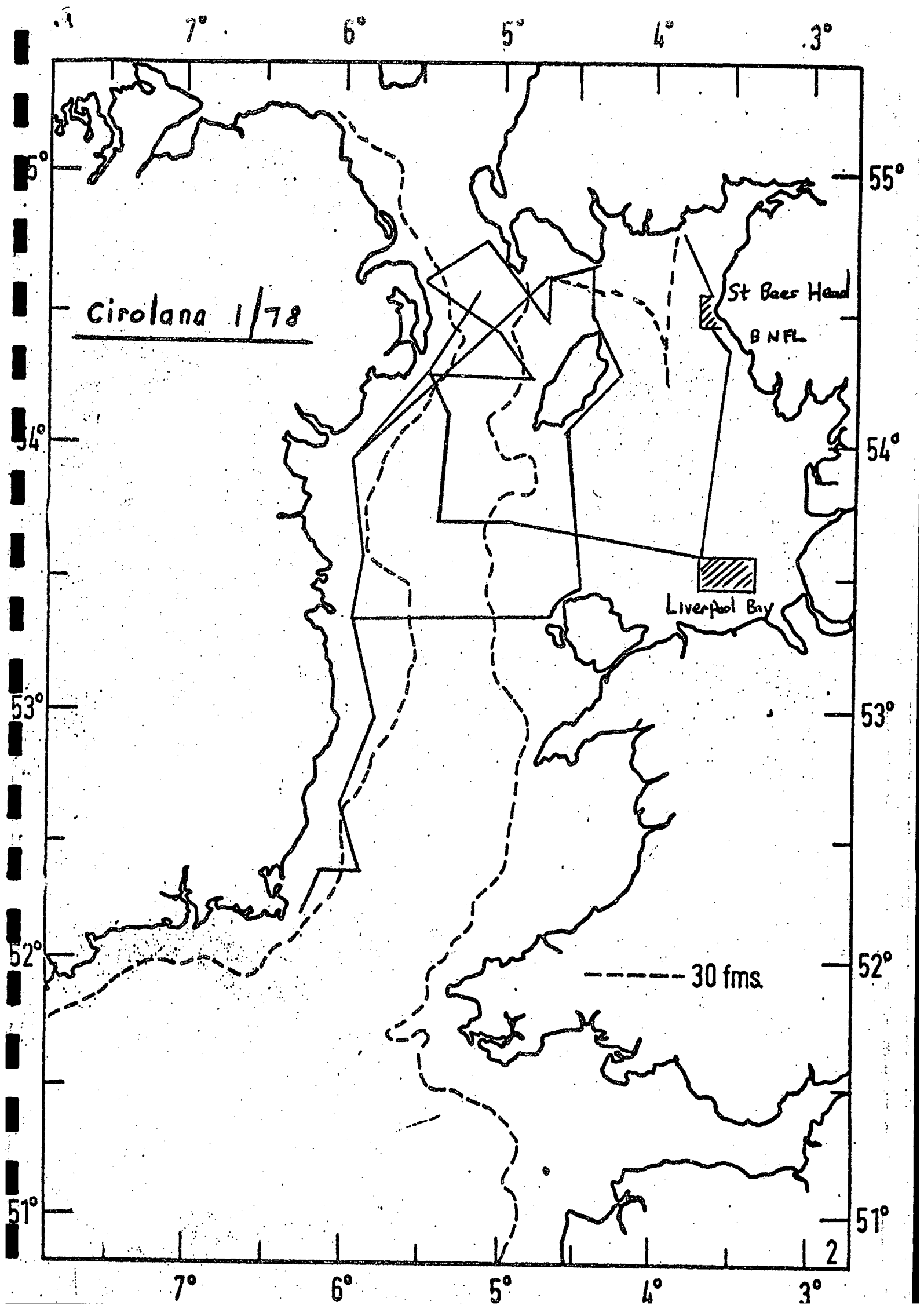
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