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

1979 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 9

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

STAFF:

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DURATION:

Left Lowestoft 1500 hours 17 July
Arrived Lowestoft 1210 hours 30 July
All times are Greenwich Mean Time

LOCALITY:

Thames Estuary, Tees Bay, Flamborough (JONSIS Area).

AIMS:

1. To relay the current meter station at South Falls.

2. To track a dumped sludge patch in the Barrow Deep.

3. To map the front between Flamborough and Tees Bay.

4. To lay an array of current meter stations in the front area.

5. To carry out a water quality survey between Tees Bay and the methyl methacrylate dumping ground.

6. To recover and relay the permanent current meter stations off Tees Bay, JONSIS 1 and JONSIS 2.

NARRATIVE:

CORELLA sailed at 1500h 17 July and steamed to the South Falls. While on passage the current meter rig was assembled and made ready. The South Falls was reached at 2045h when it was decided to lay until the next morning. The current meter station was laid by 0625h 18 July and the ship then steamed to the Barrow Deep dumping ground. The first dumping ship, MV BEXLEY, arrived at 1300h and sampling began just after she had made her turn on the return journey to the Thames. Two other vessels, MV THAMES and MV SIR JOSEPH BAZALGETTE dumped a short time later. The main patch was followed and sampled until it moved over the Middle Sunk Sand. It was then decided to continue bottom sampling along the west side

of the Barrow Channel as far as No. 11 Buoy and then cross the channel and sample from No. 10 Buoy northwards to No. 4 Buoy. Sampling was terminated at 1820h and CORELLA then steamed for the Flamborough area.

By the afternoon of 19 July the ship had reached the Bridlington Bay area where the TTN/temperature/depth system was tested. A survey of surface and sub-surface temperature was made from Bridlington Bay 10 miles to seaward and then back into Filey Bay, after which CORELLA anchored for the night in Bridlington Bay. The temperature survey was begun again in Filey Bay on 20 July and continued to the Tees Bay area after which the ship anchored in Hartlepool Bay on 21 July. A line of 4 current meter stations was laid at 1½ mile intervals stretching to the west of the permanent Tees Bay station to cross the temperature front. The Tees Bay station was recovered and relaid. On the morning of 22 July a temperature survey was made in the front area and a further current meter station was laid to the north of the line laid on 21 July. A release of 15 gallons of Rhodamine was made during the afternoon of 22 July and tracked visually until dark when the ship laid a few miles from the patch.

By the morning of 23 July the Rhodamine patch was no longer visible but it was successfully tracked with the fluorometer. A water bottle cast in the late afternoon in the densest part of the patch showed that the Rhodamine had sunk to midwater and was heading into Tees Bay. No further tracking was done. In the evening of the 23 July a section was worked along the current meter line, with the temperature depth probe coupled to the Aquatracka to observe temperature structure and chlorophyll distribution, after which the ship laid for the night.

24 July was spent on the water quality survey of the Tees Bay area. Surface water was analysed for temperature, salinity, phosphate, nitrate, nitrite, ammonia and surface chlorophyll. In addition a lowering of the temperature-depths probe/Aquatracka package was made at each end of the survey legs. On completion of the survey CORELLA anchored off North Hartlepool.

Further temperature/chlorophyll profiles were made during Wednesday 25 July and the morning of 26 July after which CORELLA steamed for Sunderland where she docked at 1345h. After an overnight stay in Sunderland the ship sailed at 0800h and during the day the 5 short term current meter stations were recovered. The ship then steamed for the JONSIS 1 station which was checked to be on position for pick up on the next day. During the night passage was made to the JONSIS 2 station.

It was already known that the surface buoy at JONSIS 2 was missing and on arrival at 0600h 28 July a visual search of the area was made to locate the pellet line but this proved to be unsuccessful. A further survey with the acoustic release equipment also proved unsuccessful and no signals were heard. A final attempt with the grapnel brought no success and recovery attempts were abandoned. The station was relaid and the ship steamed to JONSIS 1. After the recovery of JONSIS 1 it was found that substantial damage had been sustained by the rig. The top meter frame was broken and the current meter was missing, the bottom meter had its fins broken off and its impeller and guard were missing also the acoustic release had received a heavy blow and the scroll was distorted. JONSIS 1 was relaid and CORELLA anchored overnight in Filey Bay.

On Sunday 29 July profiles of temperature and chlorophyll were made across the front east of Flamborough Head. CORELLA left the working area at 2100h and steamed for Lowestoft, where she docked at 1210h 30 July.

RESULTS

The front between Flamborough and the Tees Bay area was surveyed and was in good agreement with the infra-red satellite photographs obtained prior to the cruise. A feature of the temperature distribution was the occurrence of warm water along the coast in the Robin Hoods Bay-Whitby area. This could also be seen in 1976 and would seem to be due to the impinging of the warm offshore water into this area thereby bringing the front water onto the coast in two places. The new temperature/depth probe and the Aquatracka chlorophyll profiler worked extremely well and the information obtained from these instruments showed that maximum fluorescence in the water column was associated with the bottom of the mixed layer above the thermocline. An interesting feature of the temperature profiling on the Flamborough front was that JONSIS 1 station sits in the frontal zone and exhibits thermal stratification. In the calm weather that prevailed there were clear visual manifestations of frontal phenomena at the surface.

The Tees Bay water quality survey showed that offshore nutrient concentrations were very low but first indications are that water from the Tees covered a considerable part of the inshore area.

Results of the analysis of samples taken for metal content in the Barrow Deep dumping ground m are awaited before an assessment of the survey can be made.

A R Folkard
30 July 1979

SEEN IN DRAFT: GS, RCN

INITIALLED: AJL

DISTRIBUTION:

Basic list
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