

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

1976 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 10

STAFF

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J Last

DURATION

Left Lowestoft 1400h, 6 July

Arrived Lowestoft 0030h, 18 July

All times are Greenwich Mean Time

LOCALITY

West Central North Sea (N.E. Coast Survey)

AIMS

1. Investigate distribution and abundance of planktonic fish eggs and larvae, zooplankton predators and competitors and the phytoplankton using the Lowestoft multipurpose sampler. Including replicate hauls for variance estimates.
2. Monitor sub surface water continuously along the ships track for temperature, salinity, transparency and chlorophyll 'a'.
3. Collect water samples from the pump for salinity and nutrient analyses, calibrate the fluorometer with chlorophyll 'a' extracts, measure phaeophytin and identify the phytoplankton contributing to this fluorescence, including the preparation of slides for electron microscope analysis.
4. Carry out hauls with the 2 sq metre frame trawl for young fish over the same grid.
5. At selected stations sample the water very near the surface with a neuston net for lobster larvae.
6. Use the changing net sampler to investigate the vertical distribution of fish larvae and other zooplankton, alternating with water bottle casts for phytoplankton, chlorophyll and phaeophytin in relation to temperature and light penetration into the water column over a 26 hour period.
7. Collect samples of fish for stomach content analysis using the young gadoid trawl.
8. Collect samples of fish for heavy metal analysis.
9. Collect live plankton as required.

10. Service the 6 JONSIS current meter stations. At the Tyne station carry out a vertical series for temperature and salinity using standard water bottles and release 100 sea bed drifters.

11. Release 700 sea bed drifters at the 14 standard release points on the grid.

12. Collect a series of water samples off the Tees in the vicinity of the proposed I.C.I. dumping ground for M.E.P.2.

NARRATIVE

CORELLA sailed from Lowestoft at 1400h 6 July. All instruments were calibrated in Yarmouth Roads as the ship proceeded to the first current meter station off the North Norfolk coast. This meter was recovered and a new meter rigged and laid by 2120h. The plankton sampler was then calibrated and sampling on the standard grid commenced at 0057h 7 July. During this cruise hauls were also made with the 2 metre frame net (a modified Boothbay net) and a neuston net or ring net at the sea surface at selected stations. The bulk of the samples collected with these nets were taken from inshore waters but stations were worked as far east as the Dogger Bank and over deep water in the north east corner of the grid. The chart (Fig 1) shows the cruise track and stations worked on this cruise.

Work proceeded uninterrupted by weather or equipment faults, although the cruise track was adjusted to reach the five remaining current meter stations in daylight. All but one rig was recovered intact and new meters laid without mishap.

The ship paused briefly on 11 July to put Skipper Bridges onshore at Newcastle by Pilot Boat. Then sea bed drifters were released and a series of water samples collected at the position of the Tyne current meter station before continuing work on the plankton grid. The last plankton station on this grid was sampled at 1634h 13 July and the final current meter station relaid by 2000h the same day.

CORELLA then ran in to Sunderland for water and to allow time for the plankton samples to be examined before choosing the working area for vertical distribution sampling and fishing.

Between 0700 and 0940h 14 July water samples were collected from nine stations in Tees Bay on the site of the proposed I.C.I. dumping ground. This was followed by a series of replicate hauls with the multi-purpose plankton sampler at $54^{\circ}37.5'N$ $00^{\circ}36.5'W$ and the sampler was then recalibrated at 4, 5 and 6 knots en route for the area selected for the vertical distribution sampling and fishing, about 20 miles east of Flamborough Head.

Problems with the electronics of the vertical distribution sampler meant that the work could not start immediately and the ship was, therefore, rigged for trawling. Three hauls were made at dusk, dawn and in daylight, followed by casts with water bottles for temperature, salinity, chlorophyll and nutrient measurements and by in depth light measurements with the spectral radiometer. The ship was then re-rigged for tow netting and the work with the changing net sampler started at 2343h 16 July. Only one series of hauls was made as further faults developed with the electronic and mechanical parts of the sampler. This work was therefore abandoned after several hours trying to correct the

faults. CORELLA sailed for the Dowsing Bank at 0700h and at 0930h hauls were made with the standard plankton sampler on the west side of the bank, in the location where adult lobsters have been located releasing their larvae. A phytoplankton sample was also collected here for Dr Dodge.

CORELLA steamed for Lowestoft at 1100h 17 July and reached Yarmouth Roads at 1730h. The tow net was then recalibrated at 4, 5 and 6 knots, with and against the tide, on the measured mile. This work was concluded at 2000h. The ship docked at Lowestoft at 0030h 18 July.

RESULTS

All the aims listed were achieved except Nos 6 and 8. The vertical distribution sampler developed faults which could not be corrected at sea and too few fish were obtained in the Humber to make up an adequate sample for metal analysis.

100 plankton stations were sampled on this cruise using the multi purpose sampler and 26 samples of neuston collected with a 1 metre neuston net or 1 metre ring net. Larval plaice were not very abundant, but larval dabs were found in fairly large numbers east of Flamborough Head along with the larvae of sand eels, sprats and gadoids. The neuston nets took samples of 0-group gadoids and sprats, but no lobster larvae were seen in these samples.

The frame trawl caught small numbers of young gadoids close inshore just north and east of Flamborough Head and again near the Farne Islands.

The environmental package worked well throughout and showed a warm tongue of water with temperatures in excess of 19°C at 4 metres extending from 1° East to the coast near Tees Bay (Figure 2) and cold water close inshore at Filey Bay and near the Farne Islands. The bottom water was much colder; as low as 5°C in the deep water to the north east; and extended in a tongue of cold water under the warm surface water from $56^{\circ}00'\text{N}$ at $0^{\circ}00'$ eastwards to $54^{\circ}30'\text{N}$ at $2^{\circ}00'\text{E}$ (Fig 3). Strong thermoclines were found to the north of the grid between these two water masses, but in the south the thermoclines were less well defined and the water more thoroughly mixed. Chlorophyll 'a' measurements showed that most of the production is confined to the mixed water south of the line extending from Tees Bay to $54^{\circ}00'\text{N}$ $02^{\circ}00'\text{E}$ (Fig 4).

Routine releases of sea bed drifters were also made at 14 standard stations; live plankton collected for Mrs Thompson and a sample collected for Dr Dodge.

D Harding
2 August 1976

SEEN IN DRAFT: JEMB

INITIALLED: AJL

DISTRIBUTION: Basic list +

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