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

1976 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 8

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

STAFF

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DURATION

Sailed 2100 h 27 May 1976
Docked 6 June 1976

(All times are British Summer Time)

LOCALITY

West Central North Sea - North Norfolk Coast to 56°N.

AIMS

1. Investigate the distribution and abundance of planktonic fish eggs and larvae, zooplankton predators and competitors and the phytoplankton using the Lowestoft Multi-purpose plankton sampler. Including replicate hauls for variance estimates.

2. Monitor sub-surface water continuously along the ship's 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 contribution to chlorophyll 'a' fluorescence, including the preparation of slides for electron microscope examination of the micro flagellates.

4. Carry out hauls with the 2 sq m Lowestoft frame trawl to sample young fish.

5. Use the changing net sampler to investigate the vertical distribution of fish larvae and other zooplankton, alternating with water bottle casts for phytoplankton, chlorophyll 'a' and phaeophytin in relation to temperature and light penetration in the water column over a 26-hour period.

6. Collect samples of fish for stomach content analysis, using the young gadoid midwater trawl.

7. To continue estimating sampling variation by carrying out replicate hauls and replicate grids with the multi-purpose plankton sampler.

8. Collect live plankton as required.

9. Collect fish samples (frozen) for metal analysis.

NARRATIVE

RV CORELLA sailed at 2100 h 27 May, having been prevented from sailing on the a.m. tide by mechanical problems with the Lowestoft Bridge. The sub-surface sea water monitoring systems were switched on once clear of the harbour, and carried out continuous recording for the remainder of the cruise. The 30" multiple plankton sampler was calibrated and the new staff trained in its operation on the way to the first survey station. The survey began at 0200 h 28 May and proceeded uninterrupted until its completion at 2240 h 2 June.

Course was then set for an area of high plaice larval concentration some 8 mls east of Seaham in Tees Bay. Here the 30" multiple plankton sampler was used to collect late stage cod and plaice larvae for genotyping, and to make ten replicate hauls for the analysis of sampling variance, before it was recalibrated. The multiple layer plankton sampler was then rigged and used at 4 hourly intervals over a 26 h period, to sample the vertical distribution of plankton. During this series, water bottle casts at 5 m depth intervals and two profiles with the spectralradiometer down to 60 metres were made. Plankton sampling was completed at 1745 h 4 June when RV CORELLA was rigged for midwater trawling. Four hauls were made with the young gadoid trawl in the same area of Tees Bay between 1830 h 4 June and 1500 h 5 June. Pelagic fish sampling ended at 1645 h 5 June upon completion of a further haul 4 mls off Hartlepool.

Having been blessed with 10 consectutive days of exceptionally good weather all aims were completed by 1700 h 5 June when RV CORELLA set course for Lowestoft docking at h 6 June.

RESULTS

Preliminary examination of the 93 stations on the plankton survey grid shows very thick crustacean zooplankton over most of the area sampled, with hauls north of the Tyne being particularly productive. Fish larvae are still numerous in the samples with whitings, sandeels and dabs dominant. The only samples containing larval plaice were from a small area to the north and east of Tees Bay close to the coast. These larvae were all in advanced development stages and were present with larvae of the long rough dab and cod. Subsequent hauls in this area with the multiple layer plankton sampler and with the young gadoid trawl, confirmed an abundance of these larvae just 8 mls off the coast, together with young whiting, sprats, sandeels and some '0' group cod.

Temperature patterns in the area are notable for the big differences in sub-surface and bottom temperatures north of Flamboro' Head (Fig.1). The differences show up as a marked thermocline at between 15 and 30 metres depth on the temperature depth profiles obtained from the plankton sampler.

12 hauls were made during the survey grid with the 2 sq m Lowestoft frame trawl. Catches in this net, fitted with a fine meshed liner, were very poor particularly off shore where frequently nothing was caught. The only haul which contained metamorphosing flatfish larvae was one made off Druridge Bay and contained 3 plaice and 1 long rough dab.

At four selected points inshore and offshore on the survey grid depth profile light measurements were made with the spectral radiometer. Two further series of observations were made in Tees Bay.

Vertical distribution of plankton sampling was almost thwarted by a major failure in the electronic package on the first haul. This resulted in the loss of the net indicator and depth gauge. Sampling proceeded after calibration of sampler depth against warp out using Kelvin Tubes, and by timing the net sequence. Catches of metamorphosing plaice larvae together with long rough dab, sandeel and cod larvae were good throughout this series.

Four hauls with the young gadoid midwater trawl yielded good catches of young whiting and some other pelagic fish, for stomach content analysis. Many of the young whiting caught were observed to be feeding on the fish larvae, abundant in the area. One sample of whiting was taken for the monitoring programme (pollutants) and a further haul closer inshore yielded a small sample of sprats, weavers and a gurnard for this programme.

The continuous monitoring systems recorded temperature, salinity, pH, dissolved oxygen, turbidity and total chlorophyll 'a' fluorescence throughout the cruise. At each survey station discreet samples were analysed for total chlorophyll 'a' and phaeophytins (Fig. 1) and samples collected for salinity and nutrient salt analysis. The phytoplankton monitoring programme also included two integrated depth samples taken with the high speed water sampler at each survey station, and fixed in formalin and Lugol's iodine. In addition samples were taken with the water bottles from 5 m depth intervals, at one station off Tees Bay for phytoplankton, chlorophyll 'a', phaeophytin, salinity and nutrient salt analysis.

Water bottle casts were made at the position of the Tyne Buoy $55^{\circ}04.45'N$, $01^{\circ}15.7'W$ and 100 sea bed drifters released.

700 sea bed drifters were released in batches of 50 at selected stations over the survey grid including one in the Humber sludge dumping area.

8 cod larvae and 22 metamorphosing plaice were collected and deep frozen for genotyping. During midwater trawling a further 24 '0' group cod were collected for these studies.

24 x 1 kilo bags of small whiting were collected for the fish food production unit.

During the survey grid on 30 May the position of J.O.N.S.I.S. 2 moored current meter rig was approached. The rig was not in position and a short search of the immediate area failed to find any trace. The loss was reported to the laboratory.

J H Nichols
16 June 1976

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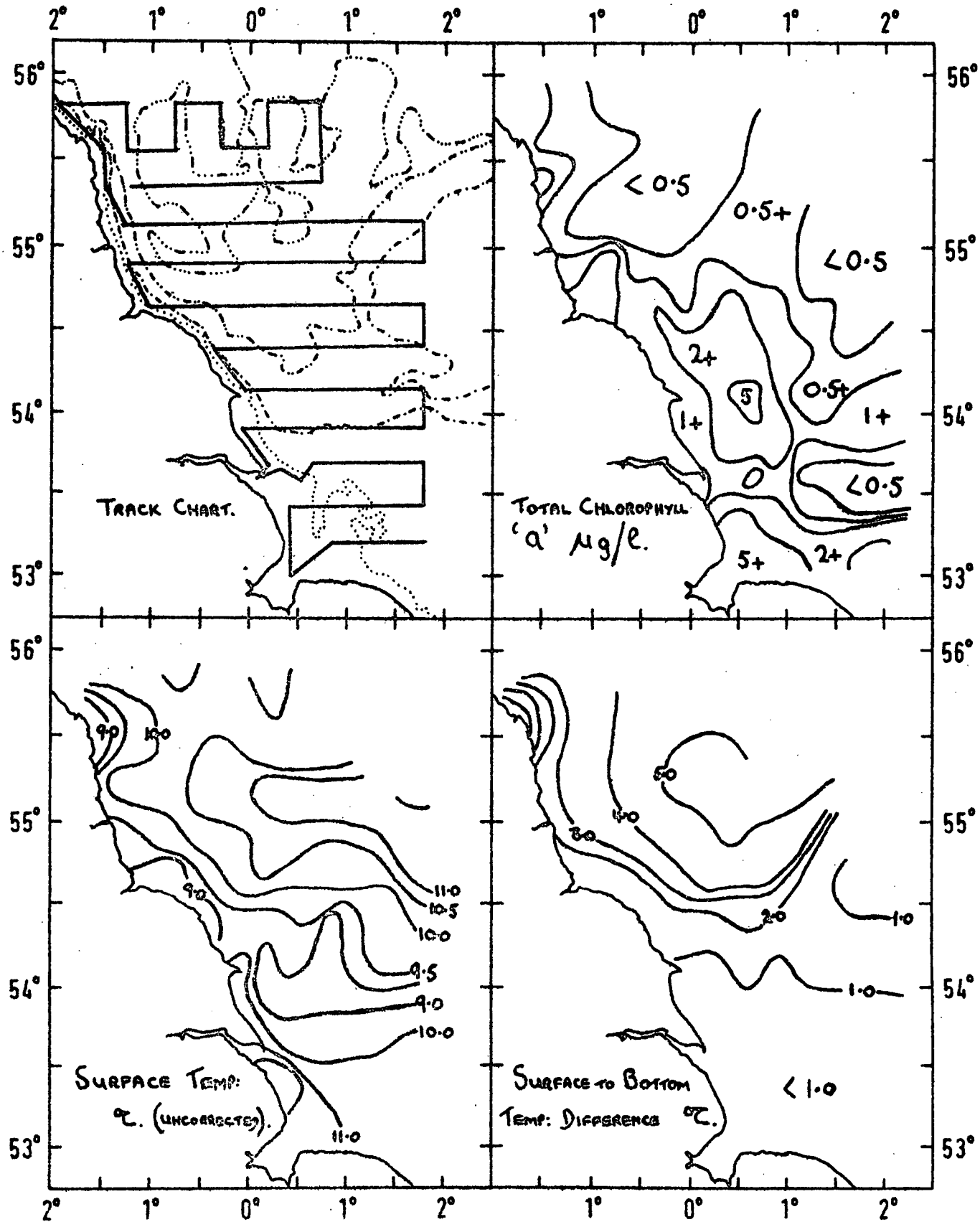
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1+
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5+
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SURFACE-TO-BOTTOM TEMP: DIFFERENCE °C.
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