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

1991 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 8a
(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF: D S Woodhead
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A Reeve
D Bucke)
) 1-5 October only
J F Knowles)

DURATION: 25 September-9 October 1991

LOCATION: Southern North Sea, Humber Estuary and Wash

AIMS:

1. To identify and quantify the fate of river-borne nutrients entering the Wash and Humber Estuary, examining nutrient distributions and critical processes from the river inputs in the sub-tidal sediments and the overlying waters.

2. To measure factors affecting benthic nutrient cycling in subtidal sediments along transects across the North Sea, in collaboration with the Netherlands "Benthic Links and Sinks" programme.

3. To examine dab collected off Flamborough Head and on the Dogger Bank for disease prevalence.

NARRATIVE:

CIROLANA left Lowestoft at 0925h on 25 September. The first sediment sampling site was at 53°00'N and 03°30'E (BELS3) surface water samples were collected every 10' of longitude en route. On 26 September the Reineck box cores were collected, and a CTD station was completed at BELS3 before the ship continued towards the Dutch coast collecting surface water samples on the way. Twelve miles off Texel CIROLANA set course for 53°30'N, 03°10'E (BELS18), again collecting water samples en route. The sediment sampling and CTD station at BELS18 were completed on the morning of 27 September and CIROLANA proceeded towards the Wash, collecting water samples as before. On 28 September a series of CTD stations was worked between the Wash and the mouth of the Humber estuary, including a transect between the Inner Dowsing light and the Lincolnshire coast. Strong northeasterly winds prevented any work on 29 September. On 30 September CIROLANA anchored off Spurn Head and completed a 13h CTD station and a CTD transect between Spurn Head and Haile Sand using the searider. In the evening, CIROLANA proceeded up-river to the anchorage off Killingholme. Weather conditions on 1 October were such that, although the two additional staff could be embarked using the searider, the cross-river CTD transect could not be attempted (winds to 40 knots). In addition, the CTD station was extended to 25h. The wind moderated on 2 October and CIROLANA proceeded to the first fishing station off Flamborough Head where two hauls were successfully completed with the Granton trawl. Fishing continued in good weather between Flamnborough Head and

the Dogger Bank on 3 October and the morning of the 4 October; in the afternoon it was necessary to return to the Humber estuary to put the cook ashore at Grimsby. Although the afternoon's fishing was lost, the opportunity was taken to complete the CTD stations off the mouth of the Humber lost to bad weather the previous Sunday. On completion, CIROLANA set a course for the Wash to commence sediment sampling and a 13h CTD station on 5 October. In the afternoon, two scientific staff were put ashore at King's Lynn. On 6 October a series of 7 CTD transects was worked in the Wash (32 stations), and on completion CIROLANA set course for the Thames Estuary. CTD transects and a 13h anchor station (off the Isle of Sheppey) were worked on 7-8 October. On the evening of 8 October CIROLANA set course for Lowestoft and docked at 1030h on 9 October.

RESULTS:

Apart from the transect across the Humber at Killingholme essentially all the projected work in pursuit of aims 1-3 was completed.

At the four sediment sites (BELS3 and 18, HSP2 in the Humber and WSS8 in the Wash) sub-sampled cores from the Reineck box cores were used to investigate nutrient fluxes at the sediment-water interface and the oxygen uptake. Preliminary analysis of the results shows a generally low oxygen demand at all four sites. Similarly, nutrient fluxes into the overlying water were low although those for silicate were significantly higher than those for nitrate and phosphate. Interstitial pore waters were obtained at 3 of the sites (BELS3 being the exception) and analysed for Fe^{2+}, Mu^{2+} and nutrients. Additional sub-samples were retained for further study in the laboratory including those for the investigation of denitrification processes. At each site X-radiographs were obtained to determine the surface sediment structure and 7 Day grab samples sieved to give a semi-quantitative description of the in-fauna.

The surface water samples and surface and bottom water samples obtained from CTD casts were analysed on board for nutrients. Fig 1 shows the variation of nitrate concentration in surface and bottom water over a tidal cycle determined for the anchor station off Spurn Head in the Humber Estuary. At all stations seawater samples were retained for salinity determinations in the laboratory. Complete analysis of the CTD profiles (data on tape and disc) will also be made in the laboratory.

The prevalence of fish diseases in dabs was determined at four sites (duplicate samples). Preliminary results are given in Table 1. In addition samples of 25 dab livers, whole dab, plaice, whiting and crab were collected at each station and frozen for chemical analysis in the laboratory.

D S Woodhead
11 October 1991

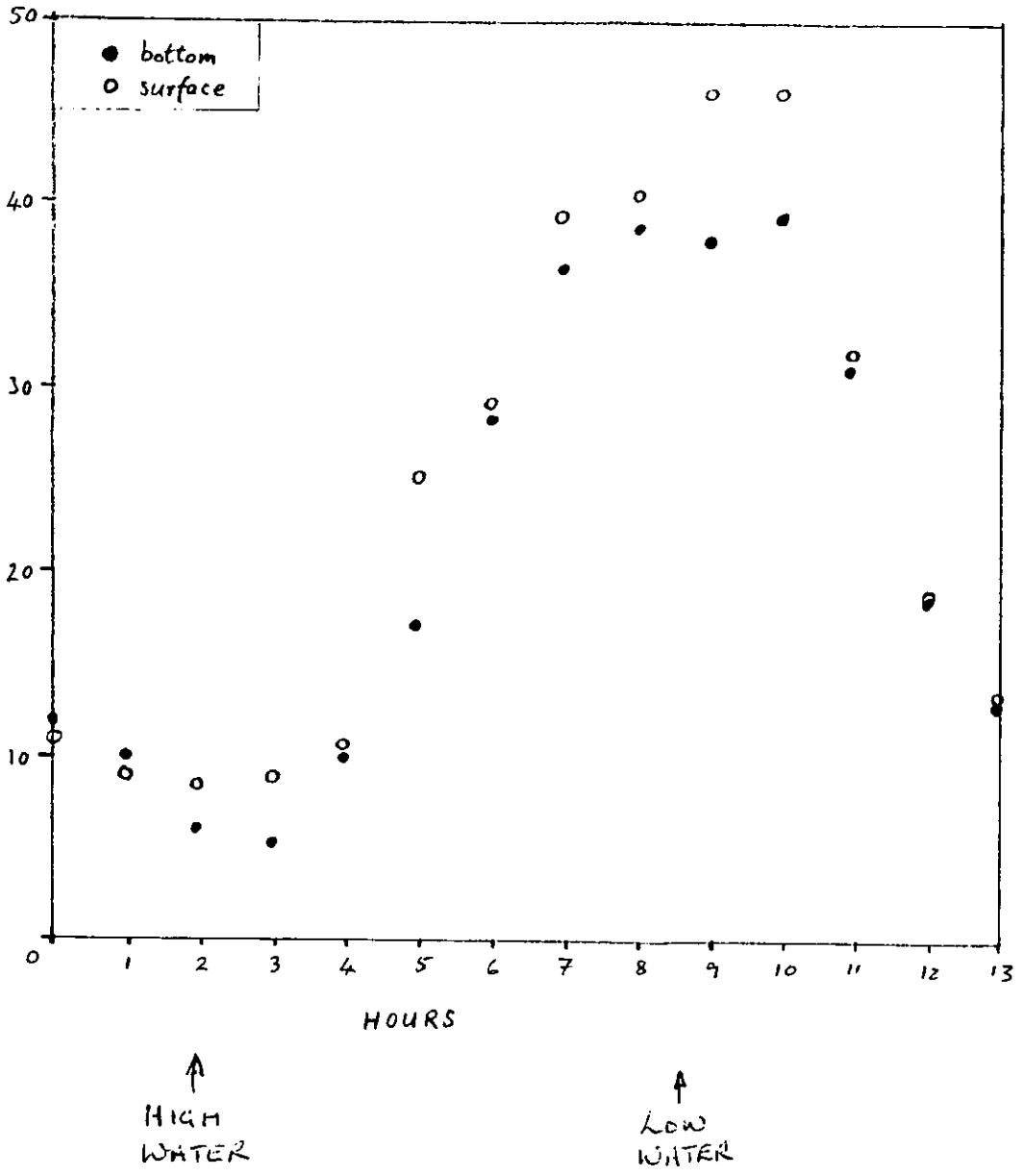
INITIALLED:

SEEN IN DRAFT: Captain B Chapman - Master
Mr J B W Harper - Senior Fishing Mate

DISTRIBUTION:

Basic List +
D S Woodhead
D S Kirkwood
J M Rees
D C Denoon
D B Sivyer
N Faber
A Poole
A Reeve
D Bucke
J F Knowles

ANCHOR STATION [illegible] POINT 30 59 91



Nitrate Concentration (μmol/L)

DISEASE PREVALENCE FOR DAB CIR/8a/

% values (PROVISIONAL) for all size groups except liver when 25 fish ≥ 20cm examined.

STATION	N examined	Lymphocystis	Papilloma	Ulcer acute / healed		Melanoma	N examined liver nodules	
174	(138)	3·6	0	3·6	5·7	10·1	(25)	12·0
175	(134)	5·9	0·7	0	2·9	6·7	(25)	8·0
176	(215)	4·1	2·3	0	2·3	4·1	(25)	16·0
177	(181)	2·2	1·6	2·7	2·7	3·8	(25)	8·0
178	(121)	5·7	0·8	2·4	7·4	0	(25)	12·0
179	(110)	3·6	0	2·7	3·6	0·9	(19)	5·2
180	(124)	5·6	2·4	0	5·6	0·6	(25)	4·0
181	(164)	5·4	0	1·2	6·0	1·2	(25)	8·0