

5,700

- ① Prof Garrett
- ② CSO

This outlines the results of another successful cruise. The Oceanography Centre. The new moored samplers are getting some unique data which requires further consideration & analysis. It will be more meaningful when the corresponding plankton samples are analysed in due course.

Don H  
26/9

# BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 19/95

Date 3 - 7 September 1995

## PERSONNEL

B Stewart	(SIC), SSO, DANI
R Hensley	HSO, DANI
P Elliott	SO, DANI
G McLaughlin	L. Attendant, DANI
J Taylor	Res. Assistant, QUB

## CRUISE OBJECTIVES

- i. To assess temperature, salinity and nutrient distributions in the north western Irish Sea.
- ii. To recover, service and redeploy moorings and instrumentation located at station 38 on the sampling grid.

## CRUISE NARRATIVE

### Sunday 3 September 1995

In preparation for the cruise, all scientific crew were onboard by 2000 hrs when equipment and instrumentation was tested and confirmed to be functioning properly. The RV Lough Foyle departed Belfast at 2200 hrs and sailed overnight in light winds to the mooring site at station 38 (see attached sampling grid).

### Monday 4 September 1995

Recovery of mooring (buoy id. No 3) with sediment traps and current meters attached, commenced at 0700 hrs and was successfully completed at 0730 hrs. Weather conditions were dry and bright with only a light breeze. The 3 sediment traps were removed and each individually replaced by an equivalent length of wire, to maintain the overall dimensions of the mooring. The current meters remained attached and were prepared for deployment, while mooring wires and couplings were examined for corrosion and replaced where necessary. The mooring was assembled and redeployed at 0930 hrs on position 53° 51' .04N 05° 33' .96W.

Recovery of the second mooring (buoy id. No 2) with 2 water samplers attached, commenced at 1000 hrs and was successfully completed at 1030 hrs. The large volume 'biological' water sampler was removed from the mooring and replaced by an equivalent length of wire. The 'nutrient' water sampler was serviced and mooring components inspected for corrosion before redeployment at 1605 hrs at position 53° 51' .00N 05° 34' .58W. Finally, water samples and a CTD depth profile were taken. The ship then sailed south to sample station 46 where work finished at 2000hrs. The vessel drifted overnight on a calm sea.

### Tuesday 5 September 1995

Work commenced on station 45 at 0710 hrs and continued in a southerly direction along a grid of stations 49, 50, 57, 62, 59, 48, 47, 36 to finish on 33 at 1910 hrs. Work for the day was completed at 2030 hrs and again the vessel drifted overnight in light winds.

### Wednesday 6 September 1995

Work commenced on station 24 at 0705 hrs and continued in a northerly direction along a grid of stations 26, 21, 22, 15, 16, 14, 6 to finish the sampling survey on station 4 in the North Channel at 1600 hrs. The vessel sailed to dock in Belfast at 1830 hrs where heavy mooring equipment was immediately unloaded to facilitate loading a large amount of fishing gear required on the next cruise. Work was completed at 2130 hrs.

### Thursday 7 September 1995

Unloading of scientific equipment continued from 0830 hrs and was completed at 0930 hrs. The scientific crew disembarked at 1000hrs.

### **PARAMETERS MONITORED**

The CTD/rosette water sampler was deployed at all stations on the sampling grid to acquire nutrient, chlorophyll *a*, temperature, salinity, oxygen and fluorescence data from the depth profile. Suspended solids were determined on a sub surface sample from each station. Daylight permitting, Secchi disc readings were also taken at all stations. Algal samples were taken at most stations and stored frozen for carbon/nitrogen analysis. Sediment cores were taken at stations 47 & 38 and subsampled for C/N and chlorophyll *a* analysis. Samples were taken for the determination of oxygen by the Winkler method at stations 38, 45 & 50.

### **SUMMARY OF RESULTS**

Nutrient and CTD profile data for southern coastal stations 33, 36, 47, 48 & 59 showed the water column to be mixed with typical temperature and salinity 15 °C and 33.80 ppt respectively; typical inorganic nitrogen values ranged 0.5 - 1.5 micromoles N l<sup>-1</sup>. The northern coastal stations 14, 15, 22 & 24 were also mixed but cooler with typical temperature and salinity 14.5 °C and 33.90 ppt respectively; typical inorganic nitrogen values ranged 4.0 - 7.0 micromoles N l<sup>-1</sup>. In the southern open sea area, only station 62 was totally mixed with top to bottom temperature and salinity 14.6 °C and 33.96 ppt respectively. Station 57, ten miles north was only weakly stratified, while further north again, stations 50, 49, 46, 45 & 38 in a slack tidal region exhibited major stratification with the thermocline depth varying from 20 - 25 m; surface temperatures were typically 15.0 °C, approximately 3 - 4 °C above the bottom temperature with

typical salinity 33.9 ppt ; typical surface inorganic nitrogen values ranged 0.5 - 3.5 micromoles N l<sup>-1</sup>. North of this stratified area, open sea stations 26, 21, 16, and stations 6 and 4 in the North Channel were mixed with typical temperature and salinity 12 °C and 33.9 ppt respectively; typical inorganic nitrogen values ranged 3.0 - 6.0 micromoles N l<sup>-1</sup>.

Generally, since the June '95 cruise, surface temperatures have increased by 4 - 5 °C to a summer maximum of about 15 °C. Typical salinity in the survey area was 33.8 - 33.9 ppt with no evidence of salinity stratification in the water column. The calm mild conditions that have persisted throughout the summer has allowed thermal stratification to intensify at stations 38 & 45 and to extend southwards to stations 50 & 57. High salinity water (typically 34.4 ppt) observed at the southern open sea stations during surveys earlier in the year, was not detected on this cruise.

#### Moored McLane water samplers

Following a successful season of several deployments, the large volume "biological" water sampler has now been removed from the mooring. Samples taken for species identification have been stored preserved for inspection at a later date. Field trials are continuing with the "nutrient" water sampler. Results from daily samples analysed for inorganic nitrogen and orthophosphate are shown in Figure 1.

#### Moored sediment traps

Sediment traps deployed in February this year and programmed to sample for periods of 6 days, were moored at depths 25, 50 and 75 metres in a depth of 105 metres. Following a season of several successful deployments the traps have been removed from the mooring. Preliminary results for the weight of sediment collected over 6 day periods at the three different depths are shown in Figure 2.

### PROBLEMS ENCOUNTERED

#### Hydro-Bios water sampler

Despite having new bottle closure mechanisms recently fitted, only five out of twelve sample bottles were functioning on the Hydro-Bios water sampler. Mr Clarke has contacted the Hydro-Bios UK agent who will attempt to resolve this problem.

### ACKNOWLEDGEMENTS

The ship's master, officers, engineers, catering staff and crew are thanked for their cooperation during this cruise.



B M STEWART

26 September 1995

BIOLOGICAL OCEANOGRAPHY CRUISE LF 19/95, 4 - 8 September 1995

PROPOSED WORK SCHEDULE

STATION	Lat.	Long.	Activity
36	53 51	06 11	CTD, Secchi, light, susp. solids & C/N
47	53 43	06 09	CTD, Secchi, light, C/N, corer + sediment C/N & Chl a.
48	53 37	06 03	CTD, Secchi & C/N.
59	53 28	06 03	CTD, Secchi & C/N.
62	53 21	05 30	CTD, Secchi, light, susp. solids & C/N.
57	53 28	05 28	CTD, Secchi & C/N.
49	53 37	05 45	CTD, Secchi & C/N.
46	53 43	05 50	CTD, Secchi & C/N.
45	53 43	05 32	CTD, Secchi, light, susp. solids & C/N.
50	53 37	05 28	CTD, Secchi, light, susp. solids & C/N.
38	53 51	05 34	CTD, Secchi, light, C/N, corer + sediment Chl a. & moorings.
4	54 41	05 20	CTD, Secchi, light, susp. solids & C/N.
6	54 36	05 10	CTD, Secchi & C/N.
16	54 21	05 10	CTD, Secchi & C/N.
21	54 13	05 16	CTD, Secchi & C/N.
26	54 06	05 21	CTD, Secchi & C/N.
33	53 58	05 50	CTD, Secchi & C/N.
24	54 06	05 52	CTD, Secchi, light, susp. solids & C/N.
22	54 13	05 31	CTD, Secchi & C/N.
15	54 21	05 25	CTD, Secchi, light, susp. solids & C/N.
14	54 28	05 23	CTD, Secchi & C/N.

Proposed  
Sampling  
Grid.

DEGREES NORTH

54.5

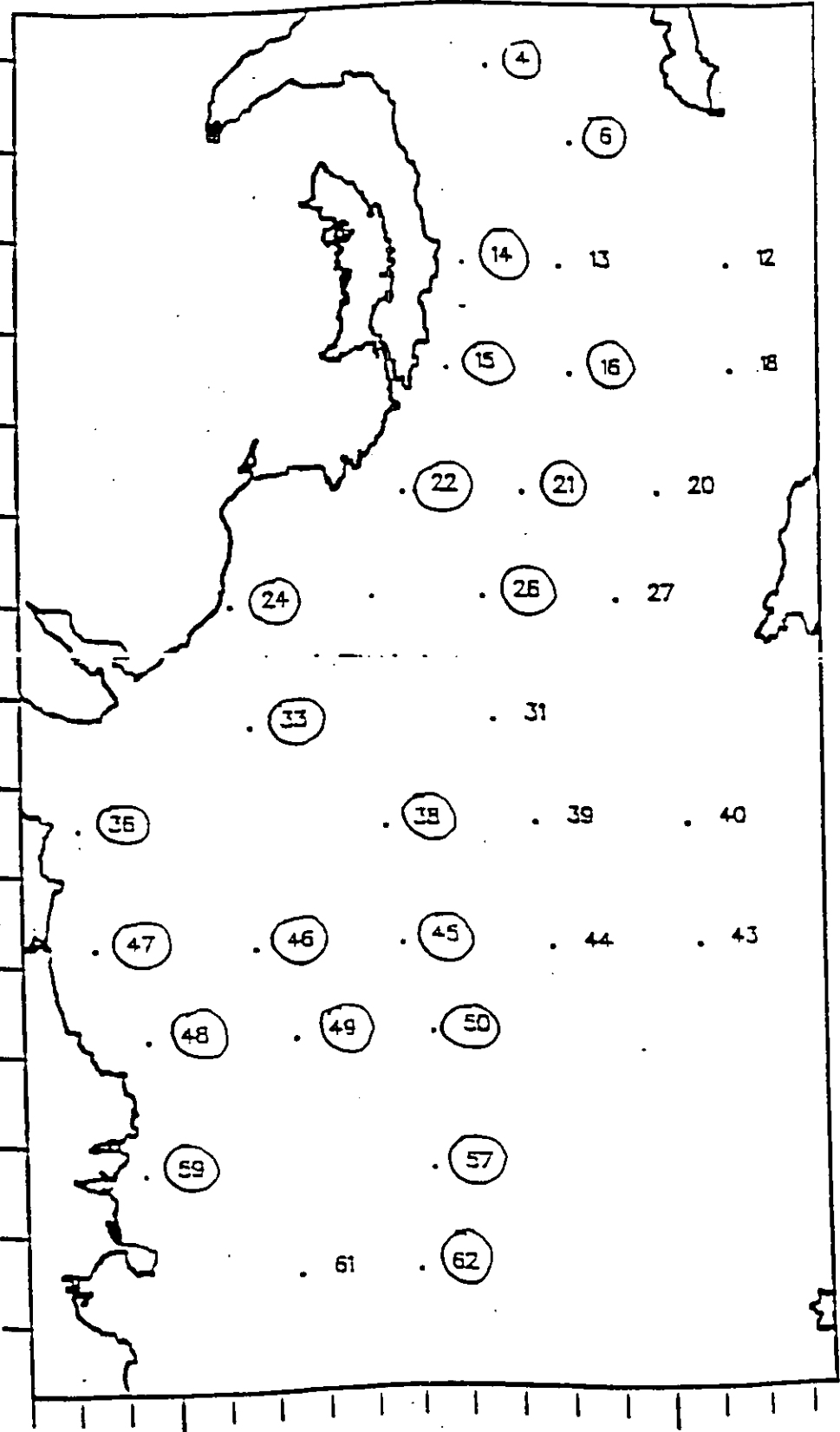
54.0

53.5

-6

-5

DEGREES WEST



It is proposed to sample and monitor at  
circled stations only.

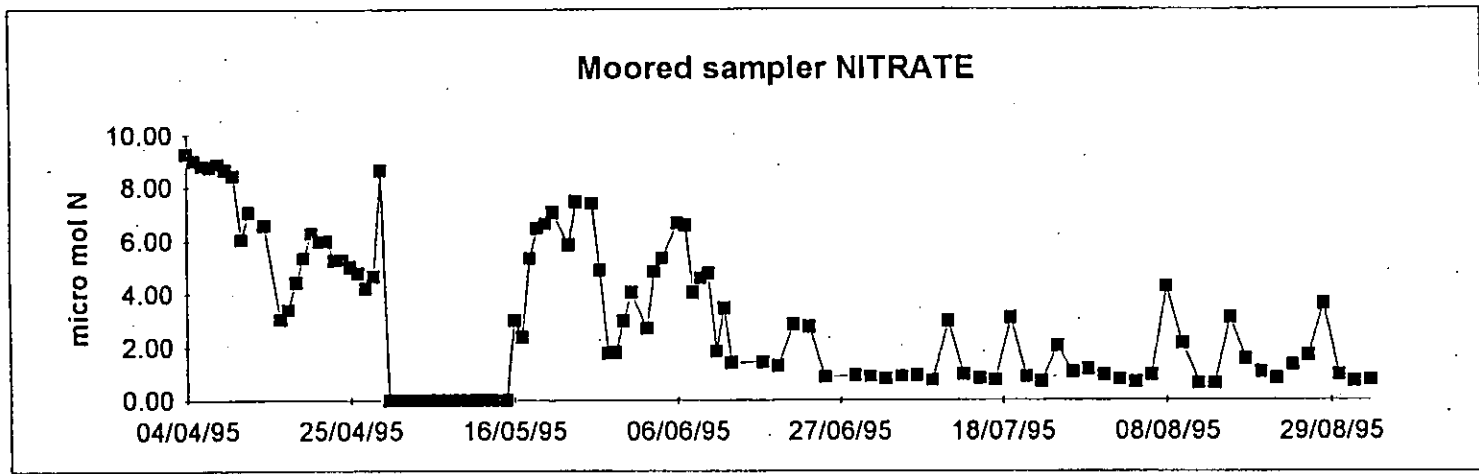
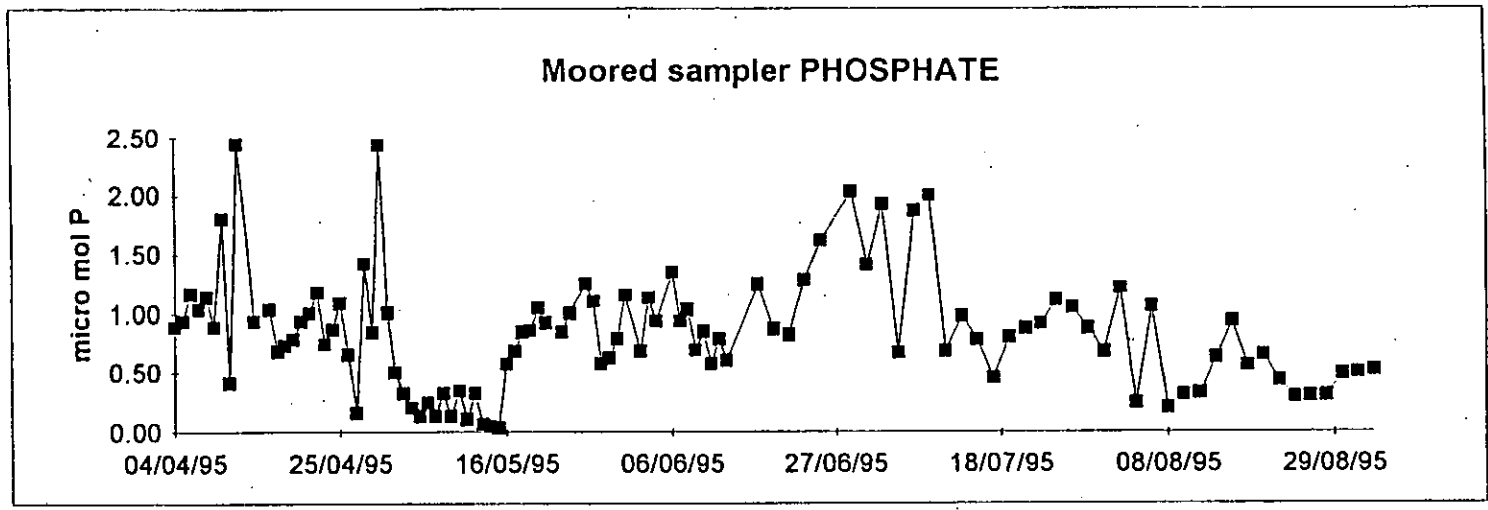


Figure 1

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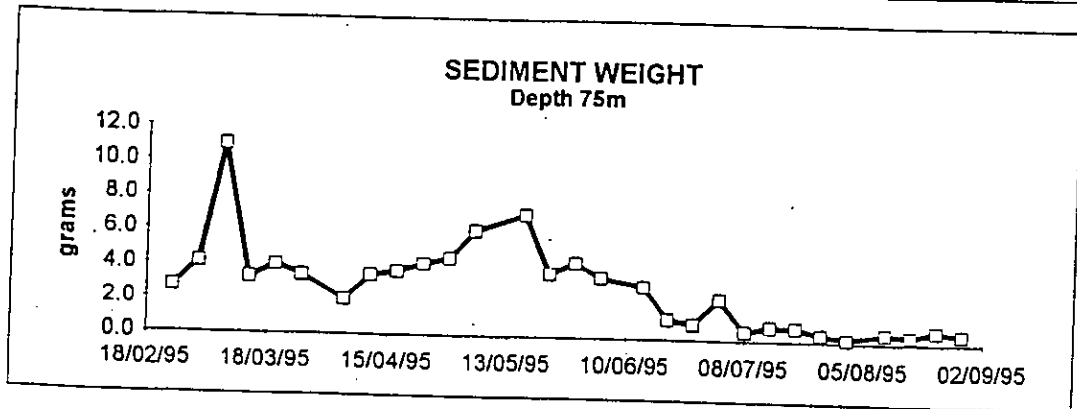
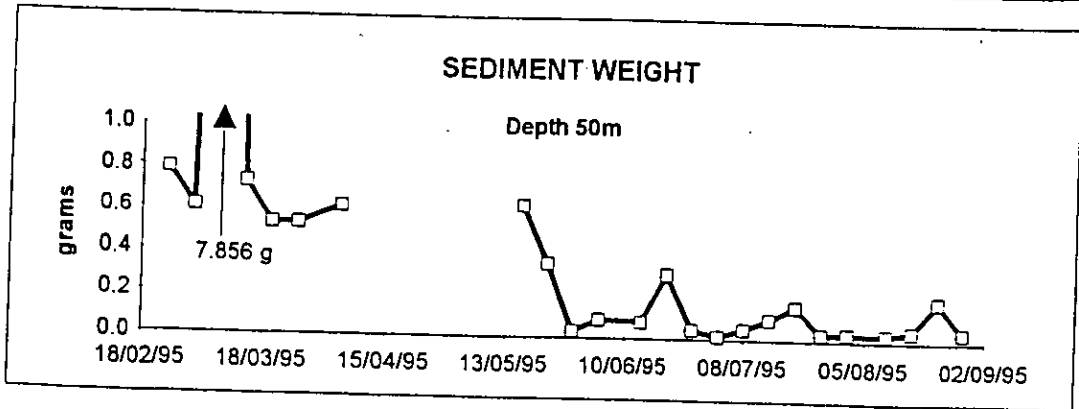
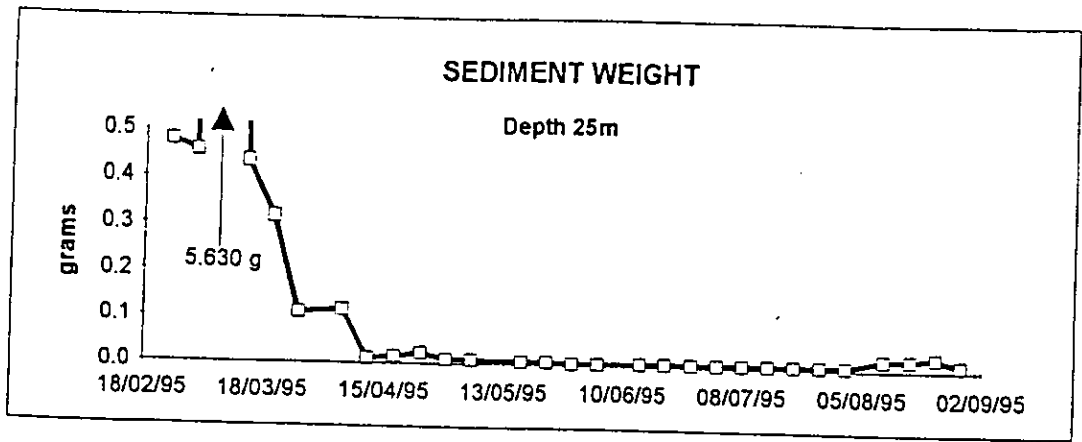


Figure 2