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CSO

1 H 64 5/5

This 2 part cruise has accomplished most objectives save ACDP & some light measurements. The equipment faults are being investigated.

RECEIVED  
02 MAY 1995  
A. E. S. D.

**BIOLOGICAL OCEANOGRAPHY CRUISE REPORT**

The deployment of the automated water sampler to the best of my knowledge represents a 'first' for coastal oceanography & should eventually give better time series data using less ship time  
I am Henry J/S

LF 0795  
Date 27 - 31 March 1995

**PERSONNEL**

B Stewart	(SIC), SSO, DANI
P Elliott	SO, DANI
S Bloomfield	ASO, DANI
R Anderson	Student, Coventry University
L Blee	Student, University of Ulster

**CRUISE OBJECTIVE**

- i. To assess temperature, salinity and nutrient distributions in the north western Irish Sea.
- ii. To monitor water current movement with depth, over selected areas of the cruise track, using the ship's acoustic doppler current profiling system.

**CRUISE NARRATIVE**

Sunday 26 March 1995

In preparation for the cruise all scientific crew were onboard by 2000 hrs when equipment and instrumentation was checked and confirmed to be functioning properly.

Monday 27 March 1995

The RV Lough Foyle departed Belfast 0700 hrs and sailed to arrive at station 14 off the County Down coast (see attached sampling grid) at 1050 hrs. The weather was dry and bright with a strong force 5-6 south westerly wind. As a result of the strong wind the rosette/CTD was not deployed, although samples were taken via the ship's clean seawater supply. The vessel continued south along a coastal grid of sampling stations to arrive on station 36 at 1705 hrs. With decreasing winds the rosette/CTD was deployed at all stations on the coastal grid. Open sea station 46 was then sampled and work finished for the day on station 49 at 2000 hrs.

Tuesday 28 March 1995

Work commenced on station 47 at 0730 hrs and continued along a coastal grid through station 48 to arrive on station 59 at 1035 hrs. In rapidly deteriorating weather conditions, the ship dropped anchor at Howth off the Dublin coast, where work was completed for the day at 1200hrs.

Wed. 29 March 1995

The ship lifted anchor at 0500 hrs and sailed south easterly to arrive on station 62 at 0705 hrs. The weather was dry and bright with only light winds. Work continued along a northerly grid of open sea sampling stations (57, 45, 38, 26, 21, 16, 6) to station 4 at 1830 hrs, where the Biological Oceanography survey work was completed. The vessel sailed to dock in Belfast at 2030 hrs.

#### PARAMETERS MONITORED

At stations 15, 22, 24, 33, 36, 46, 49, 47, 48, 59, 62, 57, 45, 38, 26, 21, 16, 6 and 4 on the sampling grid the CTD/rosette water sampler was deployed to acquire nutrient, chlorophyll *a*, temperature, salinity, oxygen and fluorescence data from the depth profile. At station 14, due to strong winds, water samples were taken for chlorophyll *a* and nutrient analysis from the ship's clean seawater supply. Daylight permitting Secchi disc readings were taken at all stations. Underwater light measurements were made using a multi spectral light meter at stations 15, 24, 36, 59, 45 & 21. Algal samples were taken at all stations and stored frozen for carbon/nitrogen analysis. The Bowers & Connelly sediment corer was successfully deployed at stations 47 & 38 where sediment samples were acquired and stored for C/N and chlorophyll *a* analysis. For calibration purposes, samples were taken for the determination of oxygen by the Winkler method, at stations 22, 24, 33, 46, 48, 59, 62, 57 & 45. The ship's ADCP was prepared and initiated in Belfast and set to monitor along the cruise track.

#### SUMMARY OF RESULTS

Nutrient and CTD profile data for coastal stations 14, 15, 22, 24, 33, 36, 47, 48 & 59 showed the water column to be mixed with typical temperature and salinity 7.3 °C and 33.80 ppt respectively; typical inorganic nitrogen values ranged 9.0 - 11.0 micromoles  $N l^{-1}$  with a lower value of 8 micromoles  $N l^{-1}$  observed only at station 47 in Dundalk Bay.

Southern open sea stations 62 and 57 were mixed and showed high salinity values of 34.3 ppt and a typical temperature of 7.9 °C. Open sea stations 45 & 38 directly north of this region, exhibited stratification where approx 50 m of cooler less saline water (typically 7.5 °C and 33.9 ppt) formed a distinct layer above 50 m of water typically 8.2 °C and 34.4 ppt. At station 26 immediately north of station 38, a 20 m band of the warmer more saline water could only be detected at 80 m depth, while further north again at station 21 this band of water was absent with the profile totally mixed (typically 7.4 °C and 33.8 ppt). With these observations it would appear that the warmer more saline water, possibly from the Atlantic and now present in the southern open sea area is moving northwards at depth producing a wedge of increased salinity water in the central Irish Sea. Typical inorganic nitrogen values for all the open sea samples ranged 10.0 - 11.0 micromoles  $N l^{-1}$  with little change between surface and bottom concentrations.

## PROBLEMS ENCOUNTERED

### Light Meter

Depth sensor on the light meter was not reading correctly as surface was displaying depths of 6 - 7 metres. W Clarke to investigate the fault.

### Acoustic Doppler Current Profiler

Major problems with the gyroscope component of the ship's navigation system prevented the use of the ADCP during the cruise.

## ACKNOWLEDGEMENTS

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



BM STEWART

2 May 1995

BIOLOGICAL OCEANOGRAPHY CRUISE LF 7/95, 27 - 31 March 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.
38	53 51	05 34	CTD, Secchi, light, corer + sediment C/N & Chl a.
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 stations  
for Biological Oceanography cruise 27-31 Mar

