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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 20/96

13 - 15 May 1996

PERSONNEL

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OBJECTIVES

- i. To assess temperature, salinity and nutrient distributions over a grid of stations in the north western Irish Sea.
- ii. To recover, service and redploy existing mooring and instrumentation located at station 45 on the sampling grid.
- iii. To redeploy mooring with water samplers, previously recovered 7 May 1996, adjacent to existing mooring at station 45 on the sampling grid.

CRUISE NARRATIVE

Sunday 12 May 1996

In preparation for the cruise, all DANI scientific crew were onboard by 1800 hrs when mooring instrumentation and monitoring equipment was programmed, tested and confirmed to be functioning properly. Following a talk on ship safety and a demonstration of life saving equipment, the RV Lough Foyle departed Belfast at 2200 hrs and sailed overnight in calm seas to station 45 (see attached sampling grid).

Monday 13 May 1996

The ship arrived on station 45 at 0745 hrs. The weather was dry and bright with only a light wind. Work commenced at 0800 hrs on the shipboard mooring and water samplers, when final preparations were made for deployment. The mooring was attached to buoy id. No. 3 and successfully deployed at 1030 hrs on position $53^{\circ} 43' .09N$ $05^{\circ} 32' .00W$.
DANI mooring (buoy id. No 2) with MAFF instrumentation attached (2 current meters, a fluorimeter and transmissometer) was recovered to the ship deck at 1130 hrs. More time than anticipated was required to download and reprogramme the unfamiliar instrumentation. However the mooring was eventually redeployed at 1725 hrs on position $53^{\circ} 43' .41N$ $05^{\circ} 32' .07W$. The Irish Marine Emergency Service was informed of the change in position of the moorings and requested to modify their navigation warning broadcasts accordingly.
Following the successful deployment of the rosette water sampler and sediment corer at station 45, the vessel sailed in a southerly direction to arrive on station 50 where

work for the day was completed at 2130 hrs. Overnight the vessel sailed slowly towards station 38.

Tuesday 14 May 1996

Work commenced on station 38 at 0800 hrs and continued in a southerly direction to station 45. The weather was dry and bright with a light breeze. A grid of 5 "inter stations" was then monitored between station 45 and 47. The survey continued in a northerly direction from station 47 at 1300 hrs along a grid of stations 36, 33, 24, 26, 22 & 21 to station 16 where work finished for the day at 2215 hrs. Overnight the vessel sailed slowly towards station 15.

Wednesday 15 May 1996

Work commenced on station 15 at 0730 hrs and continued in a northerly direction along a grid of stations 14 and 6 to finish on station 4 at 1115 hrs. The vessel sailed to dock in Belfast at 1315 hrs when scientific and mooring equipment was prepared for unloading. The scientific crew disembarked at 1345 hrs.

Thursday 16 May 1996

Unloading of scientific and mooring equipment commenced at 0930 hrs and was completed at 1230 hrs.

PARAMETERS MONITORED

The CTD/rosette water sampler was deployed at all stations on the sampling grid to acquire nutrient, chlorophyll *a*, temperature and salinity data from the depth profile. Samples were taken every 10 metres over the depth profile at stations 38, 45 and 50. Daylight permitting, Secchi disc readings were also taken at each station. The Bowers & Connelly mini-corer was deployed at stations 45 and 47 where sediment samples were subsampled for C/N and chlorophyll *a* analysis. At station 38, 45 and 50, samples were taken every 10 metres for the determination of oxygen by the Winkler method. Additional stations located at five equidistant positions between stations 45 and 47 were sampled at the point of fluorescence maximum on the depth profile.

SUMMARY OF RESULTS

From the acquired nutrient and CTD profile data, the salinity stratification observed at open sea stations 38, 45 and 50 during the April cruise was no longer present. Salinity values throughout the depth profile at these stations were fairly constant and typically 34.75 ppt. Also, the surface layer which was observed depleted in nutrients during the April cruise, had now returned to winter levels with typical nitrate concentration 9-10 micromoles N l⁻¹. With surface warming, a weak thermocline was beginning to form at 20 metres, with surface and mid depth temperatures typically 9.5 and 8.5 °C respectively.

Stronger temperature gradients were observed at the shallower coastal stations 47, 36, 33, 24, 26 and 22, with surface and mid depth temperatures typically 10.5 and 8.2 °C respectively. All stations exhibited nutrient depletion with typical nitrate concentration 0.5 - 2.0 micromoles N l⁻¹. With the influence of freshwater at these stations, salinity values were generally lower than open sea stations but constant throughout the profile, typically, 34.2 ppt.

The strong tidal influence on coastal stations 14 and 15 produced a well mixed depth profile with temperature and salinity similar to adjacent stations 21, 16 and stations 4 and 6 in the North Channel, where recorded values were typically 8.7 °C and 34.5 ppt respectively. Partial nutrient depletion was observed at these stations with typical nitrate concentration 4 - 7 micromoles N l⁻¹.

Samples taken from at the depth of "fluorescence maximum" at the five "inter" stations between open sea station 45 and coastal station 47, showed gradual nutrient depletion from 9.0 to 0.3 micromoles N l⁻¹ on approaching the coast.

Moored McLane water sampler

Shortly after deployment on the April cruise, the mooring containing the water samplers was supposedly trawled and found deposited approximately seven miles south of the original location. The mooring was successfully recovered on 7 May 1996, with only slight damage to the toroidal surface buoy. For this reason, no samples were taken since the previous cruise.

The McLane samplers were programmed to sample every other day at the time of slack tide, and redeployed at 1030 hrs on 12 May 1996.

ACKNOWLEDGEMENTS

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



B M STEWART

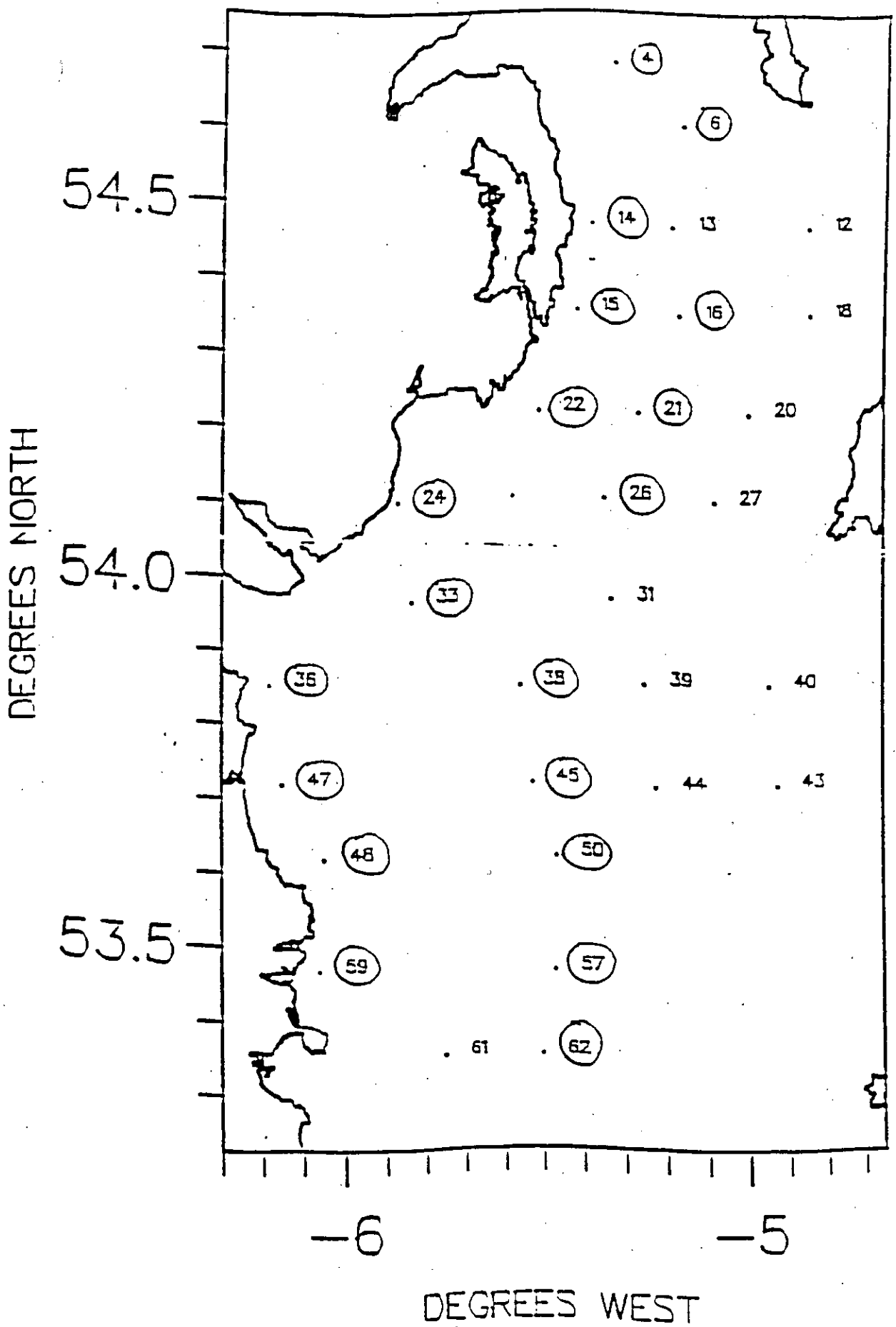
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PROPOSED WORK SCHEDULE

STATION	Lat.	Long.	Activity
36	53 51	06 11	CTD, Secchi
47	53 43	06 09	CTD, Secchi, corer + sediment C/N & Chl <i>a</i> .
48	53 37	06 03	CTD, Secchi.
59	53 28	06 03	CTD, Secchi
62	53 21	05 30	CTD, Secchi
57	53 28	05 28	CTD, Secchi
45	53 43	05 32	CTD, Secchi, corer + sediment C/N & Chl <i>a</i> , & mooring service (C/N & Oxygen @ 10 m intervals)
50	53 37	05 28	CTD, Secchi (C/N & Oxygen @ 10 m intervals)
38	53 51	05 34	CTD, Secchi (C/N & Oxygen @ 10 m intervals)
4	54 41	05 20	CTD, Secchi
6	54 36	05 10	CTD, Secchi
16	54 21	05 10	CTD, Secchi
21	54 13	05 16	CTD, Secchi.
26	54 06	05 21	CTD, Secchi
33	53 58	05 50	CTD, Secchi
24	54 06	05 52	CTD, Secchi
22	54 13	05 31	CTD, Secchi
15	54 21	05 25	CTD, Secchi
14	54 28	05 23	CTD, Secchi



SAMPLING SCHEDULE

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DATE 13-17 May 1996 279