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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT
LF 4399

Sent to Prof Pearce/ CSO. 5.11.99.

24 - 26 October 1999

PERSONNEL

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OBJECTIVES

i. To assess zooplankton populations at stations 38A & 47A.

ii. To assess temperature, salinity and nutrient distributions over depth at stations 38A and 47A.

iii. To service moorings and instrumentation where appropriate at stations 38A and 47A.

CRUISE NARRATIVE

Sunday 24 October 1999

In preparation for the cruise, all DANI scientific crew were onboard by 2100 hrs when moorings and instrumentation were prepared for deployment. Following a talk on ship's safety and a demonstration of personal life saving equipment, the RV Lough Foyle departed Belfast at 2130 hrs and sailed overnight in light winds to mooring station 38A.

Monday 25 October 1999

The vessel arrived on the mooring site at 0730 hrs. The weather was dry and bright with a light breeze, when work for the day commenced at 0800 hrs. The instrumentation mooring, with a water sampler and a thermistor string attached, was successfully recovered to shipdeck at 0820 hrs. The water sampler was removed from the mooring configuration, samples removed to vials, then serviced and reprogrammed for operation. Thermistors were removed from the mooring wire and data downloaded. The sensors were reprogrammed and reattached to the mooring. After mooring components were inspected for corrosion and replaced where necessary, the mooring was then successfully redeployed at 1350 hrs on position 53^0 46^1.753N 05^0 38^1.084W. The guard buoy and anchor was then recovered to shipdeck at 1430

hrs. The mooring was serviced and redeployed at 1510 hrs on position 53^0 46^1.988N 5^0 38^1.111W.
Following deployment of the rosette water sampler, sediment corer and zooplankton net, the ship sailed to coastal mooring site station 47A. On arrival, a CTD profile, water samples and zooplankton net hauls were taken, before work for the day finished 2000 hrs. Over night the vessel anchored close to mooring station 47A.

Tuesday 26 October 1999

Work for the day commenced on station 47A at 0800 hrs when the mooring guard buoy was recovered to shipdeck at 0820 hrs. After mooring components were inspected for corrosion and replaced where necessary, the mooring was successfully redeployed at 0850 hrs on position 53^0 46^1.753N 05^0 38^1.084W.
The survey successfully completed the ship sailed to dock in Belfast at 1545hrs.
The scientific crew disembarked at 1615hrs

Wednesday 27 October 1999

Work for the day commenced at 0900 hrs when scientific crew returned to the ship and removed samples, scientific instruments and mooring equipment. All scientific crew disembarked at 1100 hrs.

PARAMETERS MONITORED

The CTD/rosette water sampler was deployed at stations 38A and 47A to acquire nutrient, chlorophyll *a*, temperature and salinity data from the depth profile.
The Bowers and Connelly sediment corer was deployed at station 38A where sediment was subsampled for chlorophyll, total carbon and total nitrogen analysis.
Three zooplankton net hauls were taken at both stations 38A & 47A.

McLane moored water sampler

The McLane water sampler recovered from the Irish Sea had operated successfully as programmed. Unfortunately the spare McLane water sampler was unavailable as a replacement for this cruise. The recovered sampler was serviced taking all available precautions to avoid sample contamination by biofoulant. The sampler was programmed to take duplicate samples on every third day during the next period of deployment. The nutrient data from the sampler is shown in Figure1.

SUMMARY OF RESULTS

CTD profile data from station 38A showed the recent storms had eroded the thermocline (Fig. 2). The profile showed 0.7 °C difference between surface and seabed temperatures with cooler water overlying the warmer water. The salinity

profile followed a similar pattern with bottom layer 0.2 psu above surface values. The signal from the transmissometer followed the same profile as temperature and salinity whilst a fluorescence signal could only be detected in the surface layer. Nutrient concentrations throughout the profile were reasonably constant and typically 4 –5 micromoles N l^{-1} (Table 1). Surface inorganic nitrogen concentration had increased by almost 4 micromoles N l^{-1} since the September cruise and this represents the beginning of a steady increase towards the normal winter maximum concentration of 9 –10 micromoles N l^{-1}. In Dundalk Bay at Station 47A, the profile was mixed with typical temperature and salinity 12.3 °C and 33.8 psu respectively (Fig. 3). In comparison to station 38A in the central Irish Sea, the lower salinity and temperature values observed at station 47 demonstrate the freshwater influence of the River Boyne in this area.

Nutrient concentrations, with the exception of ammonia, were generally similar to the open sea station. Enrichment from the river Boyne may explain why ammonia concentrations ranged typically 3 micromoles N l^{-1} above the open sea concentration (Table 1).

HOTEL REPORT & OPERATIONAL ASPECTS OF THE SHIP

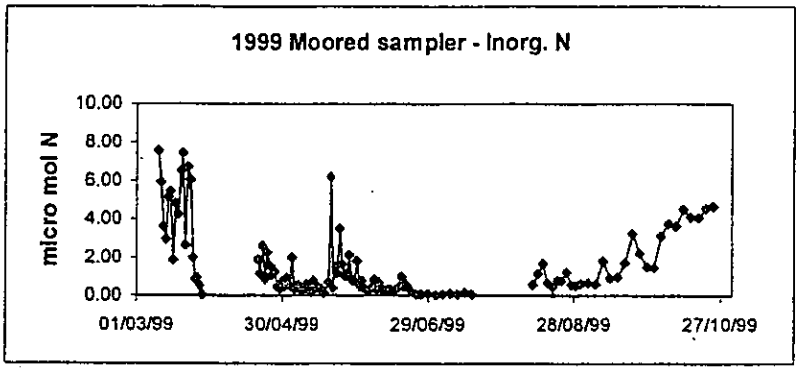
During the cruise the A-frame, main trawl winches, both hydrographic winches and the ship's clean seawater supply were used. No problems were encountered with any of the ship's equipment nor indeed with any of the scientific equipment. The hotel and catering service was of the usual high standard and there was a good working relationship between the scientists and the ship's crew. Prior to the ship departing Belfast a comprehensive and detailed safety briefing was delivered to the scientific crew.

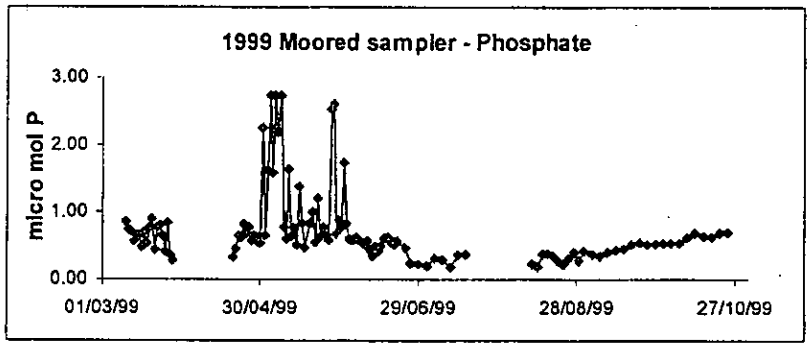
ACKNOWLEDGEMENTS

I am indebted the deck crew of the RV Lough Foyle for their co-operation and assistance particularly during the mooring recovery and deployment operation. The ship's master, officers, engineers and catering staff are also thanked for their co-operation during this cruise.

B M STEWART

4 November 1999


1999 Moored sampler - Inorg. N
micro mol N
10.00
8.00
6.00
4.00
2.00
0.00
01/03/99
30/04/99
29/06/99
28/08/99
27/10/99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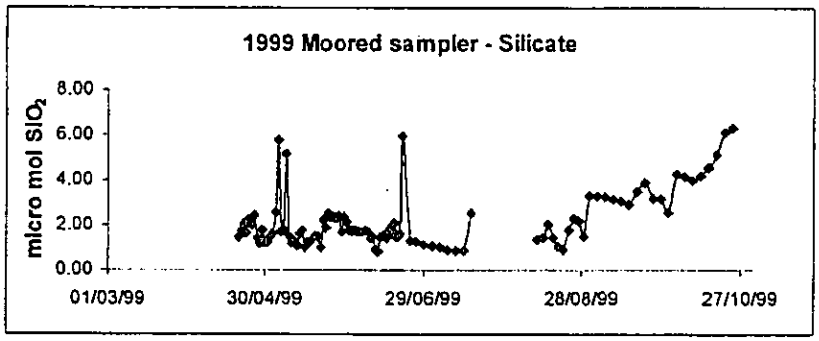
1.00
0.00
01/03/99
30/04/99
29/06/99
28/08/99
27/10/99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micro mol SiO2
8.00
6.00
4.00
2.00
0.00
01/03/99
30/04/99
29/06/99
28/08/99
27/10/99

Figure 1.

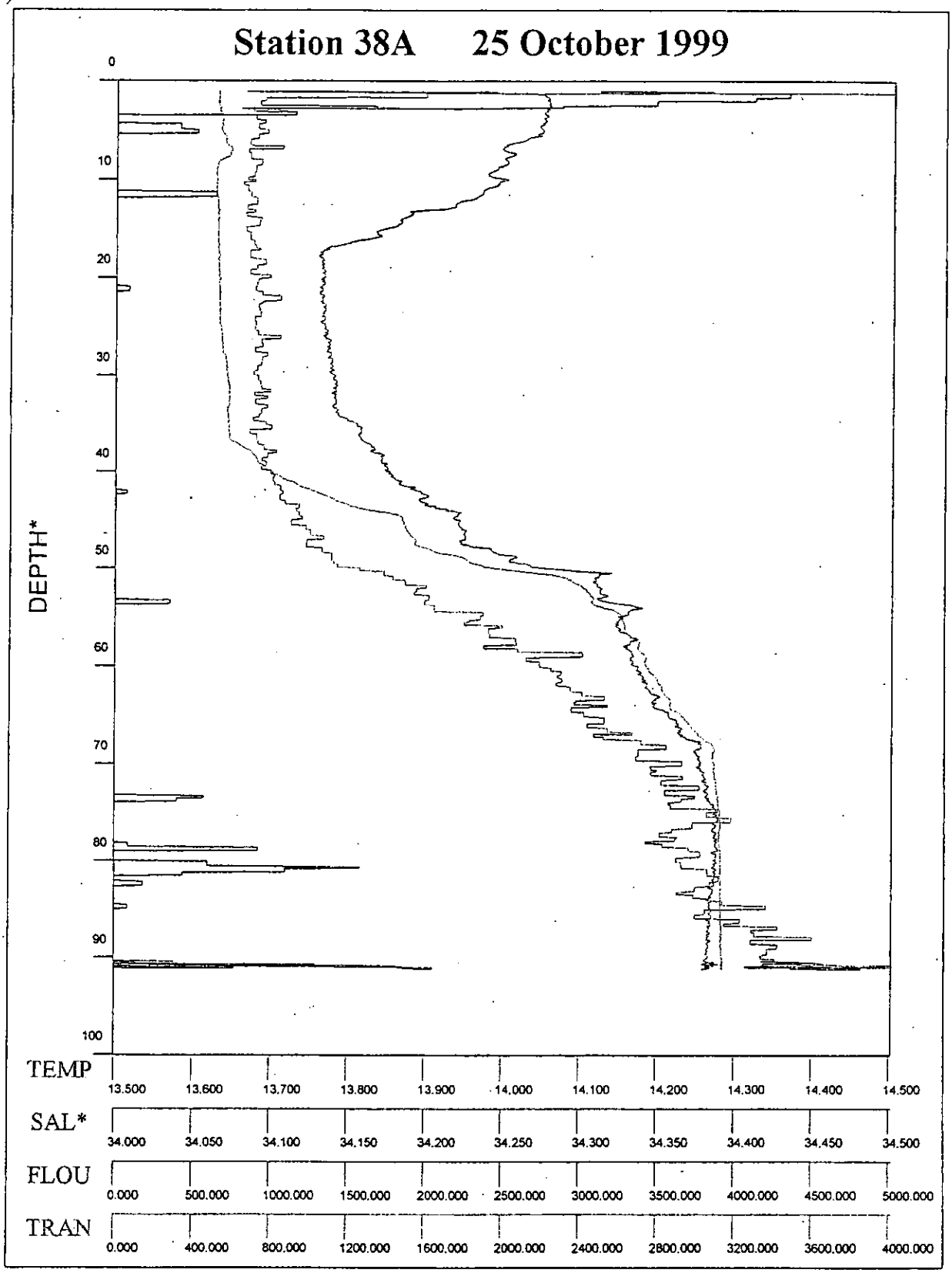
Station 38A 25 October 1999
DEPTH*
0
10
20
30
40
50
60
70
80
90
100
TEMP
13.500 13.600 13.700 13.800 13.900 14.000 14.100 14.200 14.300 14.400 14.500
SAL*
34.000 34.050 34.100 34.150 34.200 34.250 34.300 34.350 34.400 34.450 34.500
FLOU
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000
TRAN
0.000 400.000 800.000 1200.000 1600.000 2000.000 2400.000 2800.000 3200.000 3600.000 4000.000

Figure 2

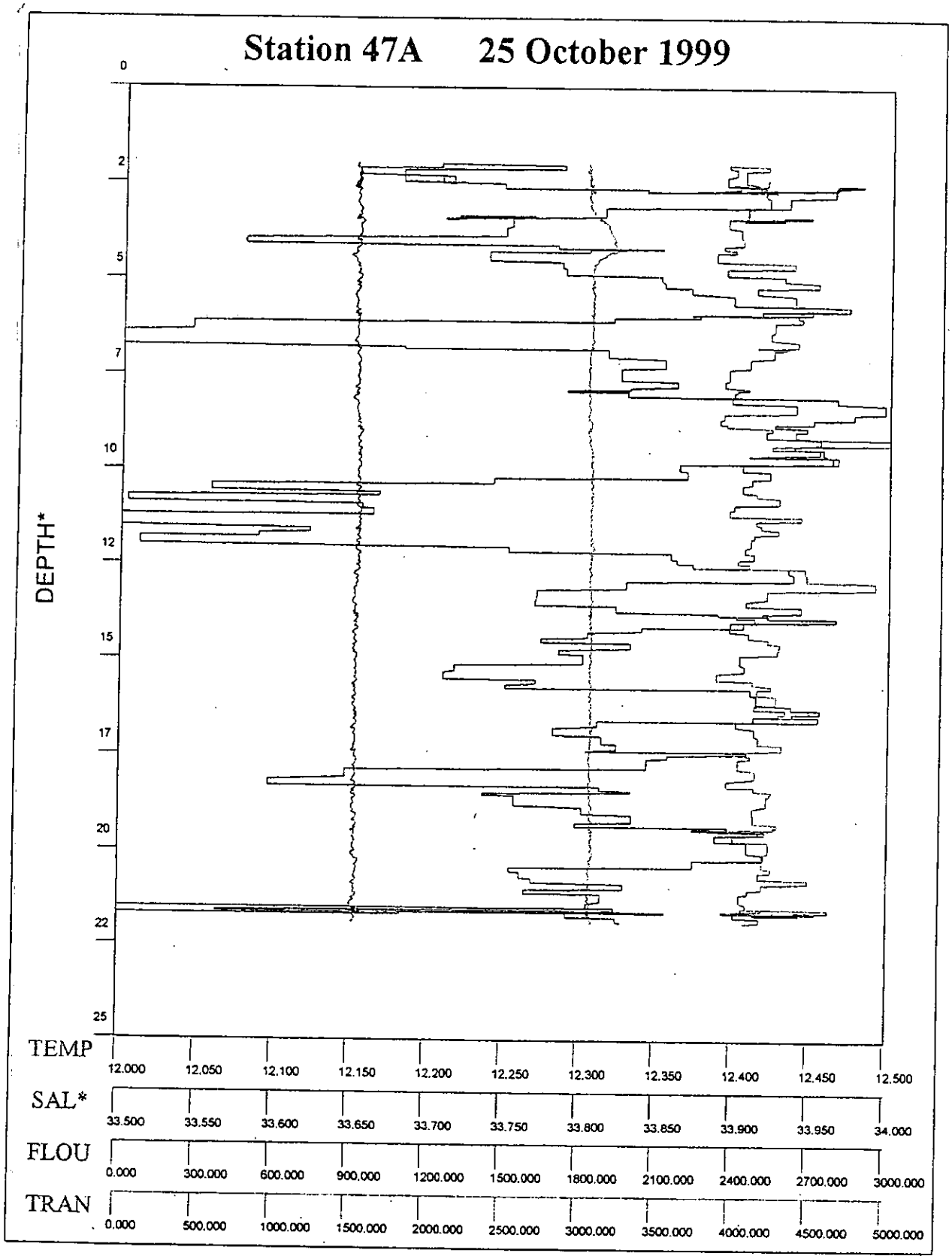
Station 47A 25 October 1999
DEPTH*
0
2
5
7
10
12
15
17
20
22
25
TEMP
12.000
12.050
12.100
12.150
12.200
12.250
12.300
12.350
12.400
12.450
12.500
SAL*
33.500
33.550
33.600
33.650
33.700
33.750
33.800
33.850
33.900
33.950
34.000
FLOU
0.000
300.000
600.000
900.000
1200.000
1500.000
1800.000
2100.000
2400.000
2700.000
3000.000
TRAN
0.000
500.000
1000.000
1500.000
2000.000
2500.000
3000.000
3500.000
4000.000
4500.000
5000.000

Figure 3.

IRISH SEA OCEANOGRAPHY 1999

Depth profile samples (25 October 1999)

	DEPTH M	AMMONIA µm N l^{-1}	PHOSPHATE µm P l^{-1}	INORG N µm N l^{-1}	SILICA µm SiO_2 l^{-1}	NITRITE µm N l^{-1}
STATION 38A	2.1	1.03	0.63	5.19	5.46	0.13
25/10/99	10.3	0.90	0.62	4.94	5.51	0.09
	20.5	1.03	0.64	4.99	5.42	0.08
	30.4	1.16	0.64	5.25	5.44	0.08
	40.3	0.97	0.58	4.79	5.27	0.07
	50.7	1.11	0.56	4.81	5.16	0.07
	60.7	1.02	0.52	4.56	4.90	0.04
	70.4	1.10	0.49	4.61	4.81	0.06
	78.9	1.13	0.50	4.71	5.00	0.05
	89.1	1.14	0.50	4.71	5.02	0.04
STATION 47 A	2.2	4.67	0.76	2.49	6.18	0.15
25/10/99	11.3	4.53	0.77	2.72	6.32	0.14
	21.7	4.71	0.83	3.07	6.58	0.15

Table 1.