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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT
LF 3599

30 August – 3 September 1999

PERSONNEL

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OBJECTIVES

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

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

iii. To service moored water samplers at station 38a.

iv. To undertake a series of CTD profiles over tidal cycles at mooring station 47.

v. To recover moored instrumentation from station 47.

CRUISE NARRATIVE

Sunday 29 August 1999

In preparation for the cruise, all DANI scientific crew were onboard by 2000 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 the mooring site at station 38A.

Monday 30 August 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 two water samplers attached, was successfully recovered to shipdeck at 0820 hrs. The "biological" water sampler was removed from the mooring configuration and the "nutrient" water sampler replaced by an identical model pre-programmed 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 successfully redeployed at 1030 hrs on position 53^0 46^1.894N 05^0 38^1.004W. The guard buoy and anchor was then recovered to shipdeck at 1115 hrs. The mooring was serviced and redeployed at 1320 hrs on position 53^0 47^1.008N 5^0 37^1.970W.
Following deployment of the rosette water sampler, sediment corer and zooplankton net, the ship sailed to coastal mooring site station 47A. On arrival the instrument mooring was found 2000 m from the position of deployment, with the trawl float recovery line missing from the guard buoy. It is probable that the buoy was struck by a vessel and dragged to its current position, before becoming released. The guard buoy and instrument line was recovered to shipdeck, for inspection, at 1700 hrs. All instrumentation was free from damage and mooring wires were intact. However the instrument package was heavily biofouled, in particular the light sensors and fluorimeter. Time was spent cleaning the optics of the fluorimeter and light sensors, before the mooring was redeployed at 1900 hrs. The vessel anchored close to the mooring and a CTD profile, water samples and zooplankton net hauls were taken before work for the day finished 2030 hrs.

Tuesday 31 August 1999

Work for the day commenced on station 47A at 0800 hrs with CTD/light/fluorescence profiles at hourly intervals. Profiling concluded at 2000 hrs with the vessel at anchor close to the instrument mooring.

Wednesday 1 September 1999

Work for the day commenced on station 47A at 0800 hrs with CTD/light/fluorescence profiles at hourly intervals. Profiling concluded at 1500 hrs when the guard buoy and instrument package was recovered to ship deck. The instrument package and ground line was removed from the mooring configuration and the guard buoy redeployed at 1545 hrs on position 53^0 43^1.437N 6^0 04^1.052W. The vessel then sailed to dock in Belfast at 2300 hrs.

Thursday 2 September 1999

Work for the day commenced at 0800 hrs when scientific crew removed samples, scientific instruments and mooring equipment from the ship. 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 *a*, total carbon and total nitrogen analysis.
Three zooplankton net hauls were taken at both stations 38A & 47A.
Multiple CTD profiles were taken at station 47A for calibration of moored instrumentation.

McLane moored water sampler

The sampler, which had been covered with a film of silicone grease, was recovered free from biofoulant. Twenty samples had been taken as programmed. In the continued effort to deter biofouling, the sampler was programmed to acid wash the sample intake line prior to sampling. Before sampling, the excess acid was flushed from the system with 50 ml of seawater. Results from the sampler are shown in Figure 1.

SUMMARY OF RESULTS

CTD data from station 38A showed a strong thermocline established at 40 metres. With continued surface warming, the thermocline is now 20 metres deeper than observed during the July cruise. Typical surface temperature was 15.9 °C, almost 1 °C above the July value. Bottom temperatures were 3 °C higher than the July value, demonstrating that some mixing does occur across the thermocline (Fig. 2). Nutrients were almost depleted above the thermocline and typically 1 – 2 micromoles inorg N l^{-1}. Whereas at depth, the nutrient pool was close to winter levels and typically 6 – 9 micromoles inorg N l^{-1} (Table 1).

In Dundalk Bay, Station 47A exhibited stratification at 10 metres with upper and lower level temperatures 15.9 °C and 14.2 °C respectively (Fig. 3). Again the nutrient depleted upper layer was associated with a high fluorescence signal, indicating major activity from both dinoflagellates and diatoms.

HOTEL REPORT & OPERATIONAL ASPECTS OF THE SHIP

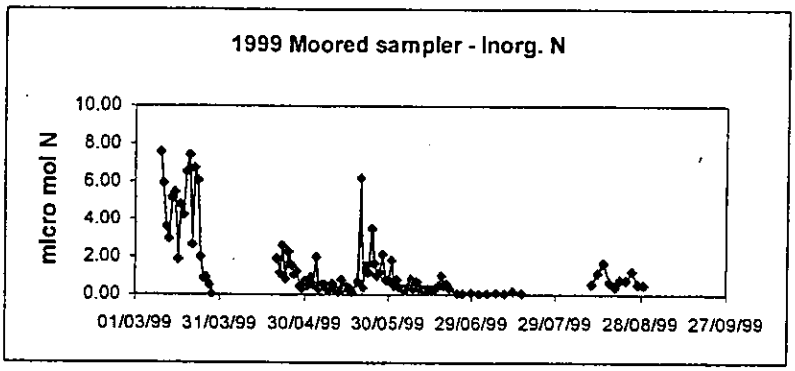
During the cruise the A-frame, main trawl winches, both hydrographic winches and the ship's clean sea-water supply were used. No problems were encountered with any of the ship's equipment nor indeed with any of the scientific equipment. The hotel and catering service was of the usual high standard and 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 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

14 September 1999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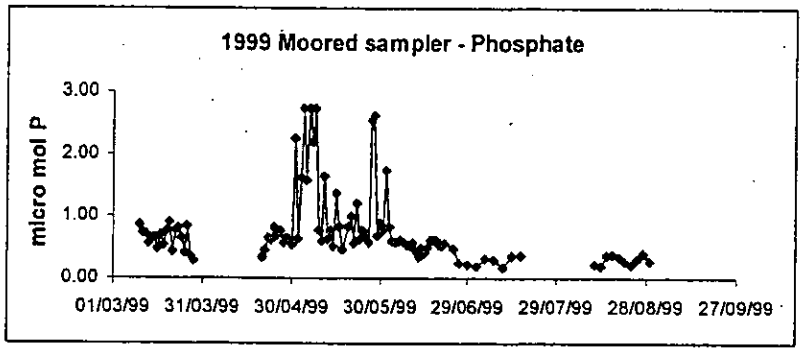
micro mol N
10.00
8.00
6.00
4.00
2.00
0.00
01/03/99 31/03/99 30/04/99 30/05/99 29/06/99 29/07/99 28/08/99 27/09/99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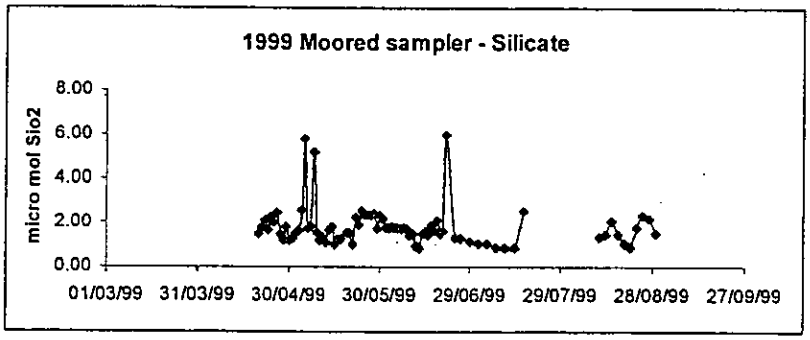
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micro mol Sio2
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01/03/99 31/03/99 30/04/99 30/05/99 29/06/99 29/07/99 28/08/99 27/09/99

Figure 1.

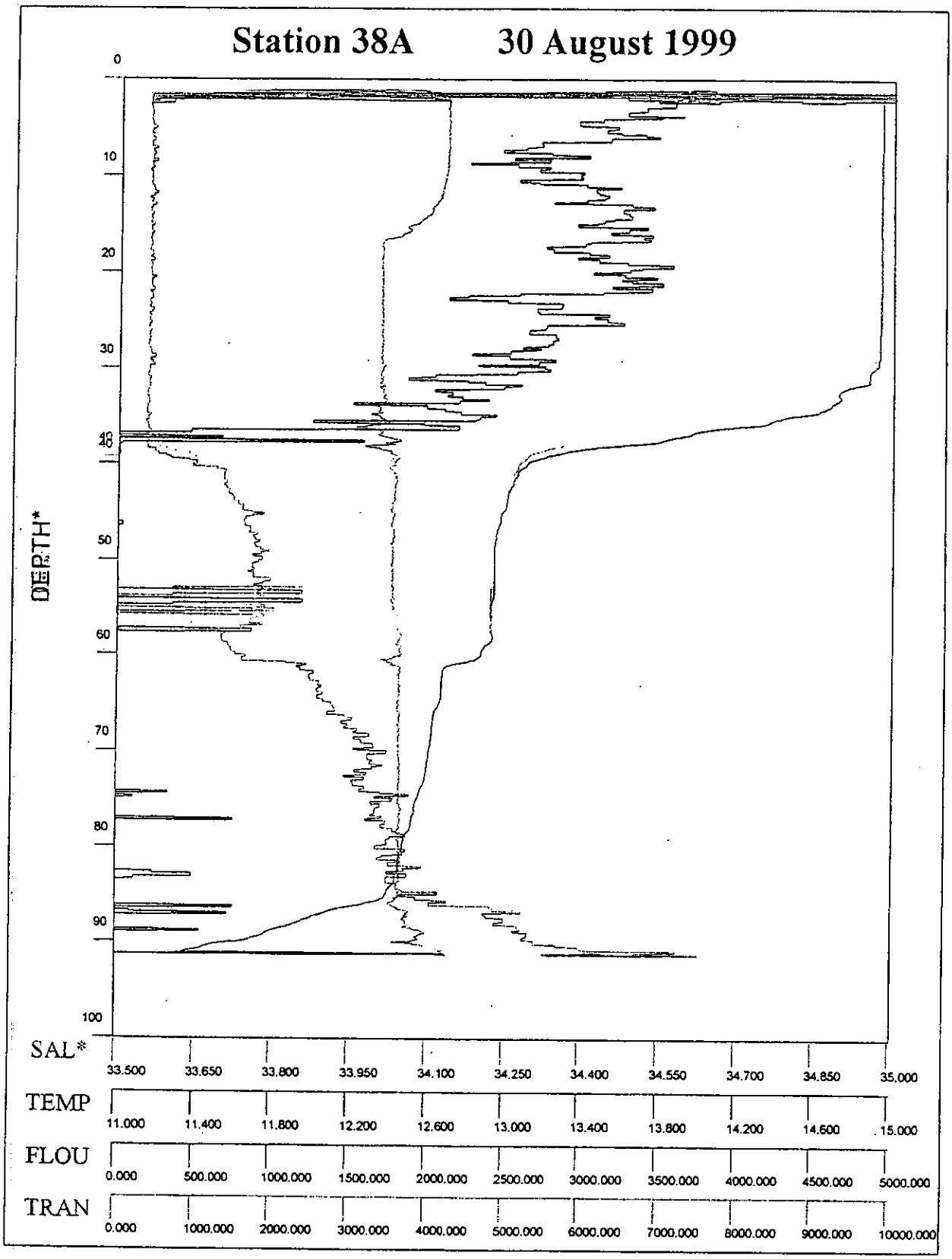
Station 38A 30 August 1999
DEPTH*
0
10
20
30
40
50
60
70
80
90
100
SAL*
33.500 33.650 33.800 33.950 34.100 34.250 34.400 34.550 34.700 34.850 35.000
TEMP
11.000 11.400 11.800 12.200 12.600 13.000 13.400 13.800 14.200 14.600 15.000
FLOU
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000
TRAN
0.000 1000.000 2000.000 3000.000 4000.000 5000.000 6000.000 7000.000 8000.000 9000.000 10000.000

Figure 2.

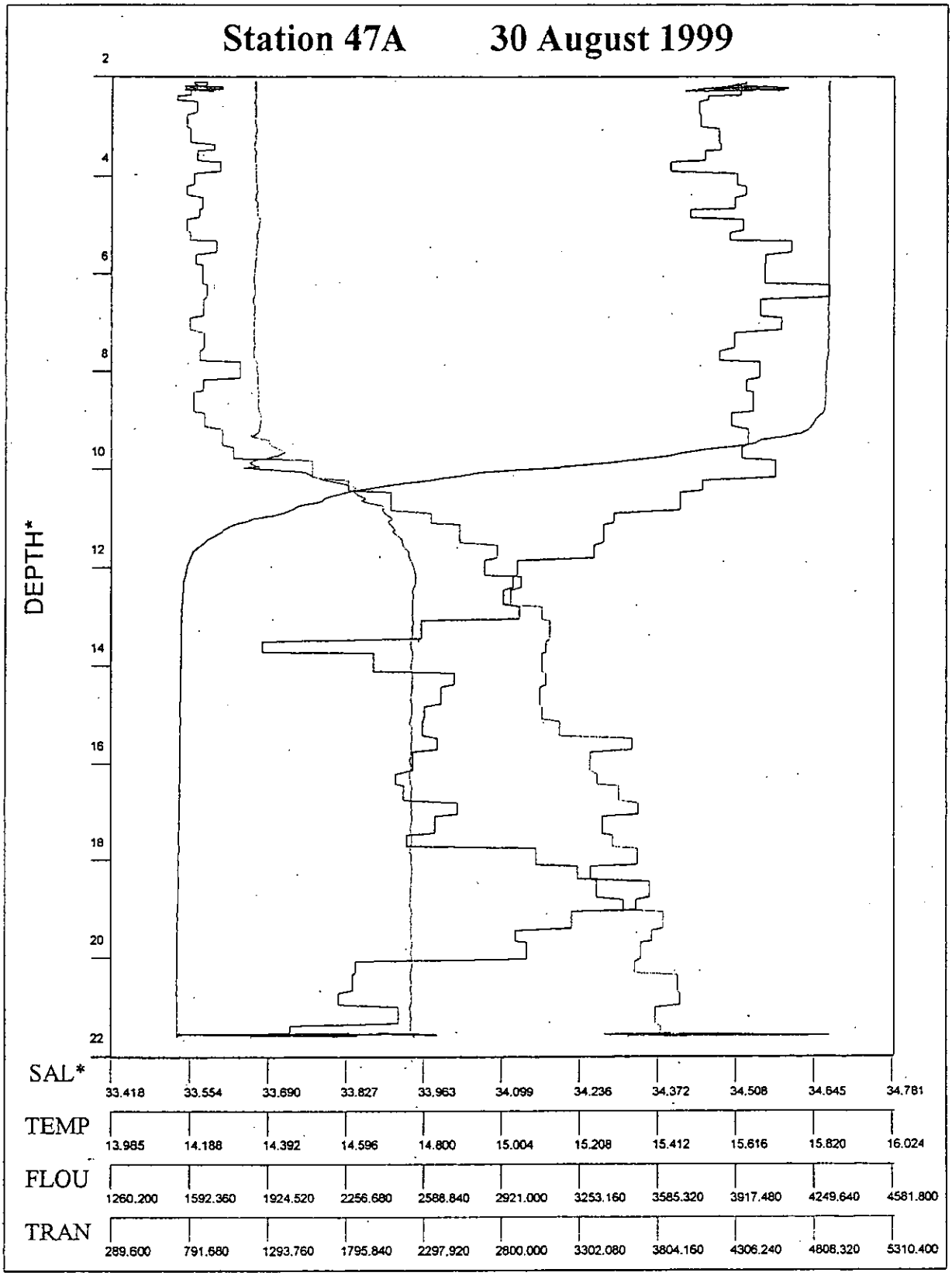
Station 47A 30 August 1999
DEPTH*
2
4
6
8
10
12
14
16
18
20
22
SAL*
33.418 33.554 33.690 33.827 33.963 34.099 34.236 34.372 34.508 34.645 34.781
TEMP
13.985 14.188 14.392 14.596 14.800 15.004 15.208 15.412 15.616 15.820 16.024
FLOU
1260.200 1592.360 1924.520 2256.680 2588.840 2921.000 3253.160 3585.320 3917.480 4249.640 4581.800
TRAN
289.600 791.680 1293.760 1795.840 2297.920 2800.000 3302.080 3804.160 4306.240 4808.320 5310.400

Figure 3.

IRISH SEA OCEANOGRAPHY 1999

Depth profile samples (30 August 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	3.4	1.16	0.21	1.34	0.89	0.02
30/08/99	10.1	0.94	0.20	1.39	0.95	0.01
	20.1	1.10	0.22	1.23	1.03	0.07
	30.2	0.98	0.57	5.88	4.12	0.09
	40.1	0.99	0.61	6.24	4.88	0.10
	50.0	1.20	0.62	6.41	5.41	0.09
	60.3	1.03	0.68	6.96	5.85	0.09
	70.7	1.04	0.69	7.11	6.23	0.08
	80.6	0.85	0.72	7.22	6.54	0.06
	91.0	1.12	0.79	8.87	7.76	0.08
STATION 47 A	2.6	0.88	0.24	1.10	1.83	0.03
30/08/99	10.7	1.50	0.55	2.47	6.42	0.71
	22.1	2.01	0.75	2.79	7.34	1.03

Table 1.