5738

BIOLOGICAL OCEANOGRAPHY CRUISE REPORT
LF 25/99

17 – 25 June 1999

PERSONNEL

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OBJECTIVES

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

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

ii. To assess the McLane water sampler as "buoy mounted" sub surface sampling device.

CRUISE NARRATIVE

Monday 21 June 1999

In preparation for the cruise, all DANI scientific staff were onboard by 2030 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 2155 hrs and sailed overnight in a light breeze to the mooring site.

Tuesday 22 June 1999

The vessel arrived on the mooring site at 0600 hrs. The weather was dry and overcast with a light easterly breeze when work for the day commenced at 0800 hrs. The instrument mooring was successfully recovered to ship deck at 0830 hrs. The mooring components were inspected for corrosion and replaced where necessary. The nutrient water sampler adjacent to the sub surface buoy was removed, serviced and reprogrammed before reattachment to the mooring wire. A second nutrient water sampler, incorporated into the steel structure below the guard buoy was removed and stored for transportation back to Belfast. The biological water sampler was confirmed working and reattached to the mooring wire to continue sampling as pre-programmed. Thermistors were removed, data down loaded, reprogrammed and then reattached to

their original positions on the mooring wire. The mooring complete with the two McLane water samplers was successfully redeployed at 1330 hrs on position $53^0\ 46^l.907N \quad 5^0\ 38^l.125W$.
The guard buoy and mooring was then successfully recovered to ship deck at 1400 hrs. The mooring components were inspected for corrosion and replaced where necessary. The serviced mooring was successfully redeployed at 1500 hrs on position $53^0\ 47^l.080N \quad 5^0\ 38^l.067W$.
Following deployment of the rosette water sampler, zooplankton net and sediment corer, the ship sailed to coastal station 47 in Dundalk Bay where water samples and zooplankton net hauls were also taken. Work on the station was completed at 1930 hrs and the vessel sailed to dock in Belfast on Wednesday at 0830 hrs.

Wednesday 23 June 1999

Work commenced at 0800 hrs with scientific crew removing samples, scientific instruments and mooring equipment from the vessel to AESD.

MOORING REDESIGN – Buoy mounted McLane water sampler

The McLane water sampler which was deployed attached to the steel structure below the guard buoy had failed to sample. First indications suggest a problem with the pump. The sampler has been returned to the laboratory for a thorough inspection and repair.

PARAMETERS MONITORED

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

SUMMARY OF RESULTS

The CTD profile from station 38A shows a typical well defined thermocline at 20 metres with surface and bottom temperature and salinity 12.5 °C / 34.1 psu and 9.8 °C / 34.3 psu respectively (Figure 1). Recorded temperatures are similar to the same period last year although current salinity values are consistently lower by 0.5 psu. Inorganic nitrogen values were depleted to 0.45 – 2.22 micromoles N l^{-1} above the thermocline although the inorganic nitrogen content of the deeper water has increased significantly from 5 to almost 9 micromoles N l^{-1} since the May cruise (Table 1). The near surface results are consistent with nutrient data acquired from daily samples taken and preserved *in situ* by the moored sampler at depth 12 metres (Figure 3).
In Dundalk Bay at Station 47 the profile was fairly well mixed with temperature and salinity 12.6 °C and 33.9 psu respectively but high fluorescence values indicated major plankton activity throughout the water column. (Fig. 2.), while trace levels of

inorganic nitrogen (0.5 - 0.8 micromoles N l^{-1}) suggest substantial nutrient uptake by dinoflagellates.

McLane water sampler

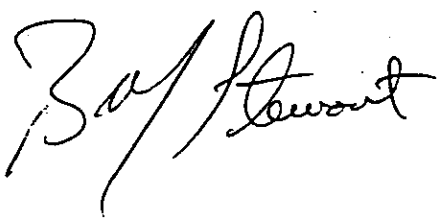
The McLane "large volume" water sampler continues to operate successfully having taken 17 samples since deployment on 16 May 1999. The sampler was redeployed to continue with its pre programmed sampling schedule. The "small volume" water sampler also operated successfully by sampling daily during the period 19 May – 21 June 1999. The 34 samples preserved *in-situ* with mercuric chloride solution were removed and stored for nutrient analysis.
Figure 3. shows inorganic N analysis of samples taken by the McLane sampler.

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 ship's officer delivered a comprehensive and detailed safety briefing 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
25 June 1999

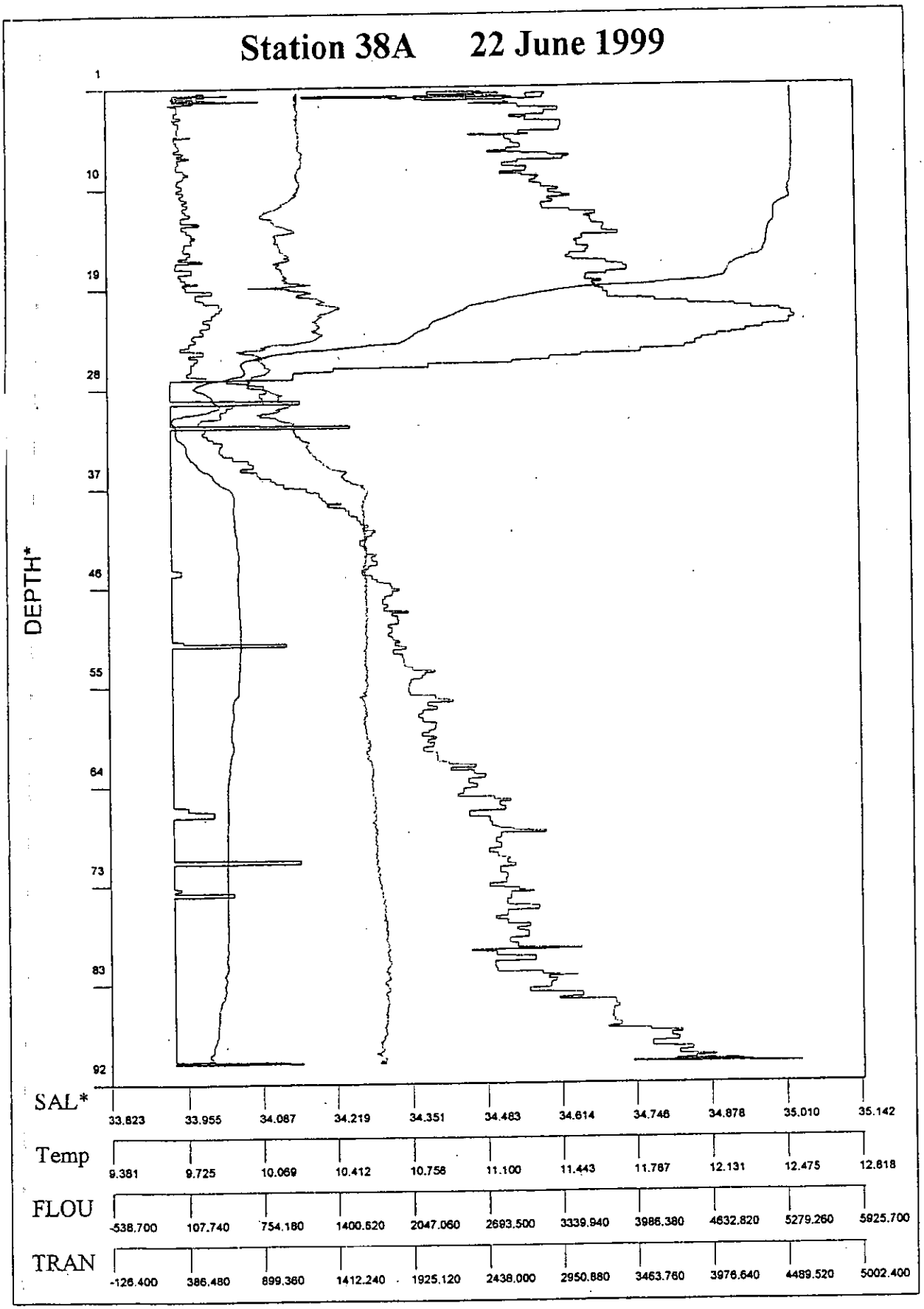

Station 38A 22 June 1999
DEPTH*
1
10
19
28
37
46
55
64
73
83
92
SAL*
33.823 33.955 34.087 34.219 34.351 34.483 34.614 34.746 34.878 35.010 35.142
Temp
9.381 9.725 10.069 10.412 10.756 11.100 11.443 11.787 12.131 12.475 12.818
FLOU
-538.700 107.740 754.180 1400.620 2047.060 2693.500 3339.940 3986.380 4632.820 5279.260 5925.700
TRAN
-126.400 386.480 899.360 1412.240 1925.120 2438.000 2950.880 3463.760 3976.640 4489.520 5002.400

Figure 1.

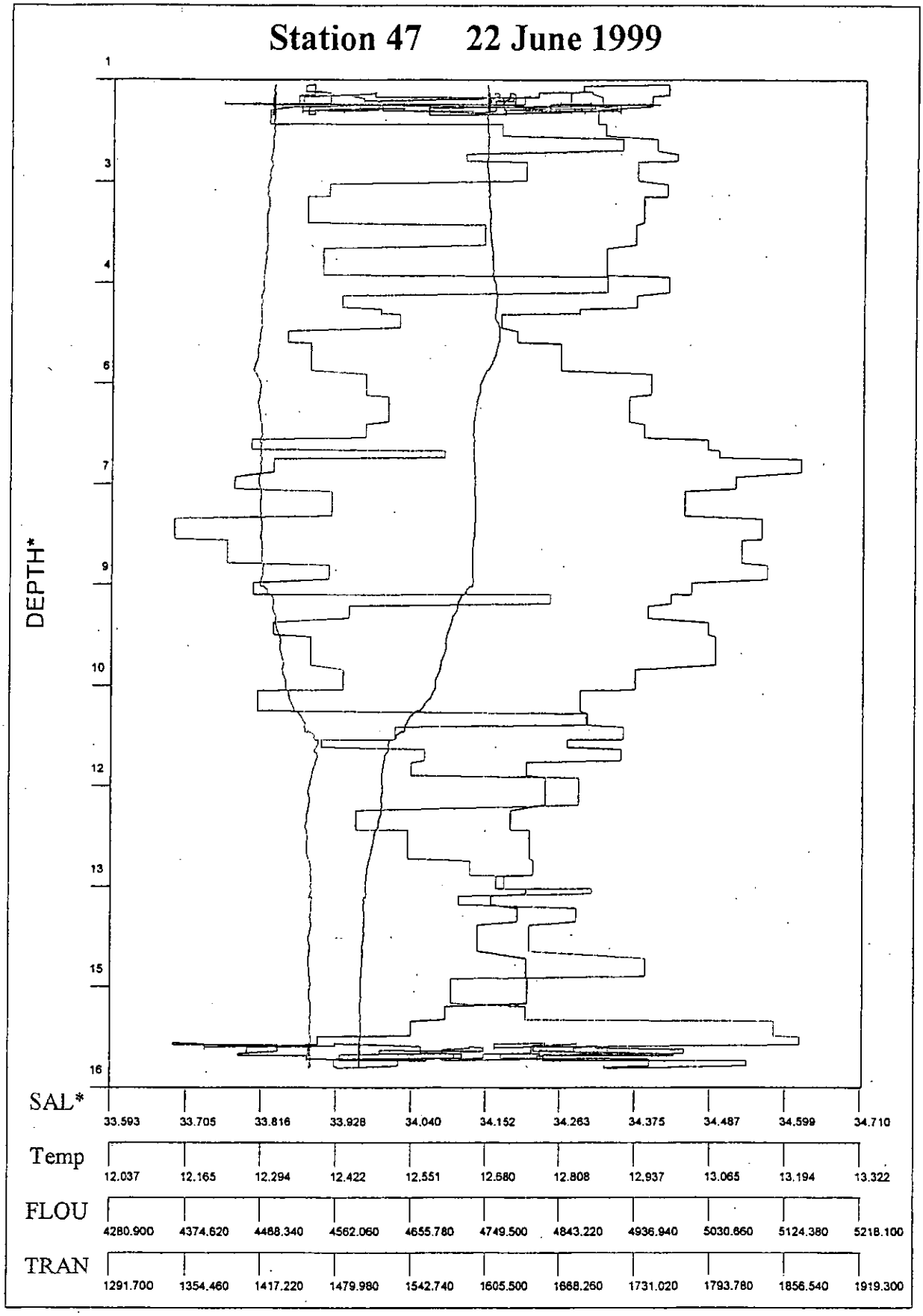

Station 47 22 June 1999
DEPTH*
1
3
4
6
7
9
10
12
13
15
16
SAL*
33.593 33.705 33.816 33.928 34.040 34.152 34.263 34.375 34.487 34.599 34.710
Temp
12.037 12.165 12.294 12.422 12.551 12.680 12.808 12.937 13.065 13.194 13.322
FLOU
4280.900 4374.620 4468.340 4562.060 4655.780 4749.500 4843.220 4936.940 5030.660 5124.380 5218.100
TRAN
1291.700 1354.460 1417.220 1479.980 1542.740 1605.500 1668.260 1731.020 1793.780 1856.540 1919.300

Figure 2.

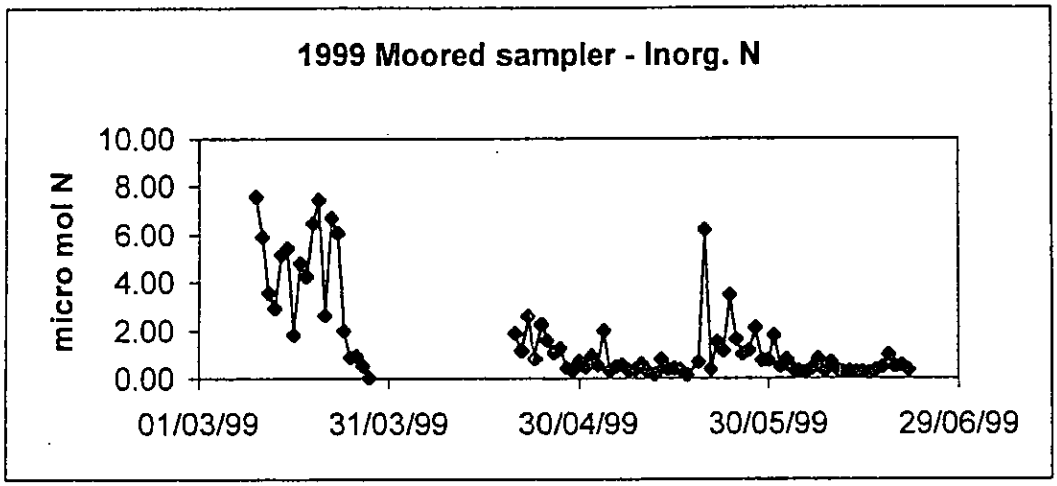

1999 Moored sampler - Inorg. N
micro mol N
10.00
8.00
6.00
4.00
2.00
0.00
01/03/99
31/03/99
30/04/99
30/05/99
29/06/99

Figure 3

IRISH SEA OCEANOGRAPHY 1999

Depth profile samples (22 June 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 22/06/99	2.2	1.66	0.25	0.45	0.37	0.00
	10.7	1.64	0.32	0.51	0.22	0.02
	20.8	1.67	0.57	2.22	1.57	0.18
	30.4	2.32	0.81	7.72	6.58	0.36
	50.3	1.62	0.77	8.24	4.36	0.45
	60.3	1.63	0.77	8.35	4.59	0.42
	70.8	1.64	0.69	8.37	4.56	0.40
	80.5	1.59	0.71	8.85	4.77	0.39
	90.2	2.46	0.84	8.88	4.85	0.35
STATION 47 22/06/99	1.7	1.66	0.48	0.78	3.84	0.01
	7.8	1.48	0.40	0.62	3.07	0.02
	16	1.67	0.44	0.55	4.17	0.02

Table 1.