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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 47 2000

19 – 20 November 2000

PERSONNEL

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OBJECTIVES

i. To maintain a nutrient monitoring programme at station 38A.

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

CRUISE NARRATIVE

Sunday 19 November 2000

In preparation for the cruise, all DANI scientific crew were onboard by 2000 hrs when mooring components and the automated sampler 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 2120 hrs and sailed overnight in a fresh north westerly wind to the mooring site at station 38A.

Monday 4 September 2000

The vessel arrived on the mooring site at 0700 hrs. The weather was dry and bright with a moderate to fresh northwesterly wind. Work for the day commenced after breakfast at 0800 hrs with the recovery of the instrument mooring. The mooring components were inspected for corrosion and replaced where necessary. The thermistor chain was removed from the mooring wire and temperature data downloaded. The automated water sampler was removed and replaced with a similar pre programmed unit. The mooring components and thermistors were then reassembled, the satellite tracking system was confirmed working and the mooring was successfully redeployed at 1035 hrs on position $53^0\ 46^1.95N\quad 5^0\ 38^1.02W$. Following the deployment of the rosette water sampler, the sediment corer and 3 zooplankton net hauls, the vessel sailed to coastal station 47 close to the Drogheda fore shore where water samples and

zooplankton net hauls were taken. Work on the station was completed at 1430 hrs and the vessel sailed to dock in Belfast at 2230 hrs.

Tuesday 21 November 2000

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

McLane moored water sampler

The McLane automated water sampler recovered from the Irish Sea had operated as programmed. The sampler was removed and replaced by an identical unit previously programmed to sample every second day during the next period of deployment. Recent values from this year's data (Fig. 3) show the annual replenishment of nutrients beginning in mid-September.

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 was subsampled for chlorophyll, total carbon and total nitrogen analysis.
Three zooplankton net hauls were taken at both stations 38A & 47.

SUMMARY OF RESULTS

The CTD profile at station 38A clearly shows surface cooling since the previous cruise in early November, with temperatures in the upper layer reduced by almost 2 °C (Fig.1). Temperatures at the lower layer below 55 metres have remained similar to the earlier cruise. This has resulted in a thermocline, which is inverse to that recorded during the spring, and summer months and is a transitional state to typical cooler and mixed winter profile. While surface salinity has remained constant, salinity values of the deeper layer have increased by 0.5 psu indicating ingress of Atlantic water to the northwestern Irish Sea. Nutrient values above the thermocline have remained constant and typically 4 -5 micromole inorg N l^{-1}, whereas at depth, the nutrient pool has increased and typically 7 – 8 micromoles inorg N l^{-1} (Table 1).
In Dundalk Bay at Station 47 the CTD profile is mixed from surface to bottom (Fig. 2). Temperature and salinity values typically 16.3 °C and 33.4 psu are significantly less than recorded in early November. This coupled with further nutrient enrichment, now typically 10 micromoles inorg N l^{-1} (Table 2), demonstrate the freshwater effect of the Boyne river on this area of the Irish Sea.

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 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

30 November 2000

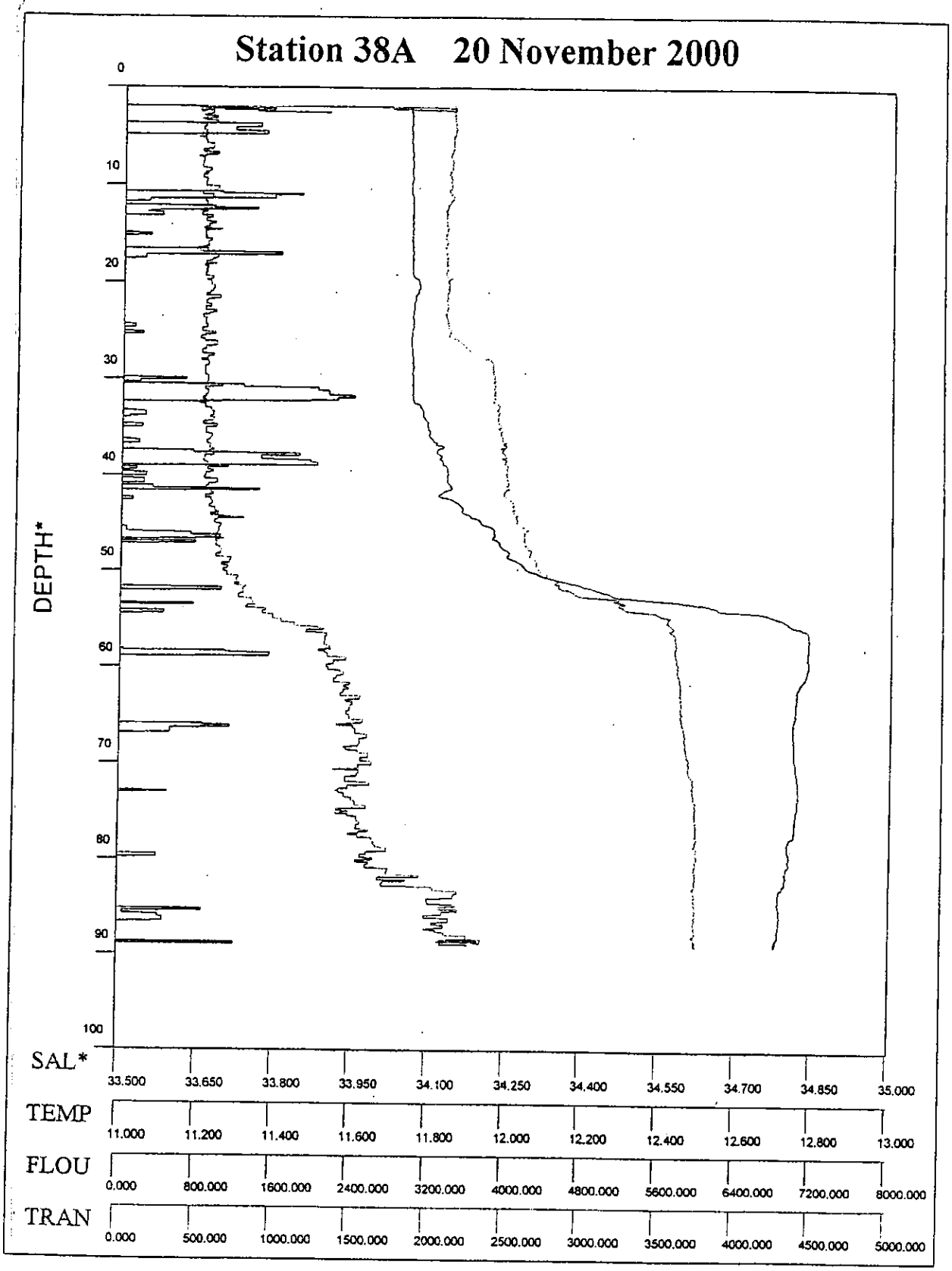

Station 38A 20 November 2000
DEPTH*
0
10
20
30
40
50
60
70
80
90
100
SAL*
33.500 33.650 33.800 33.950 34.100 34.250 34.400 34.550 34.700 34.850 35.000
TEMP
11.000 11.200 11.400 11.600 11.800 12.000 12.200 12.400 12.600 12.800 13.000
FLOU
0.000 800.000 1600.000 2400.000 3200.000 4000.000 4800.000 5600.000 6400.000 7200.000 8000.000
TRAN
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000

Figure 1.

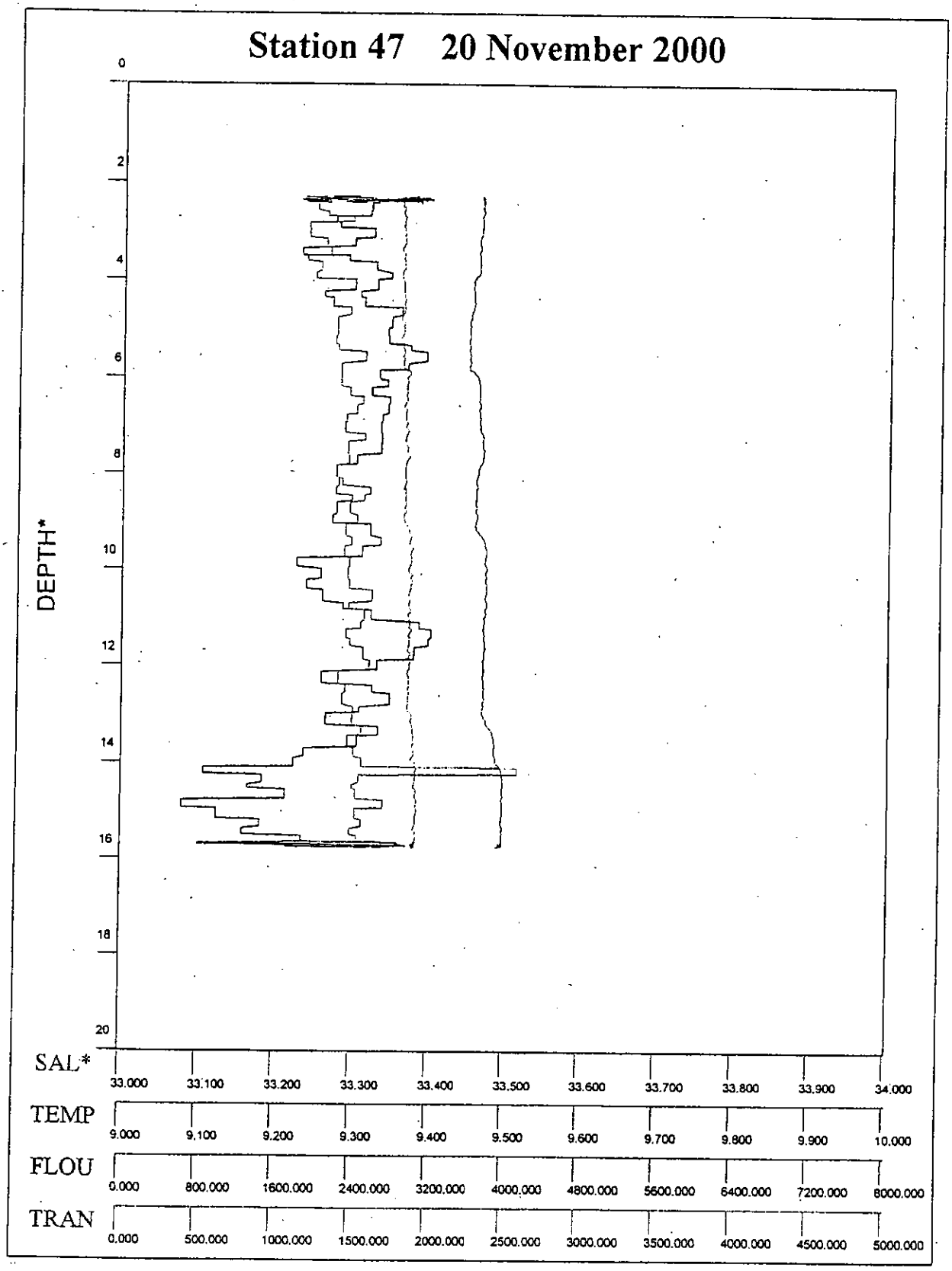
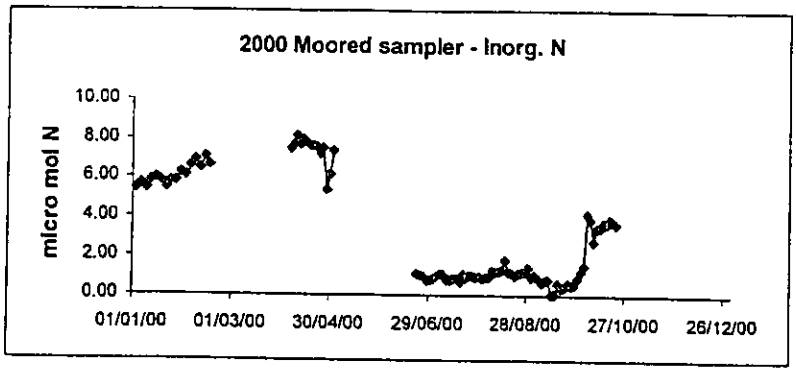
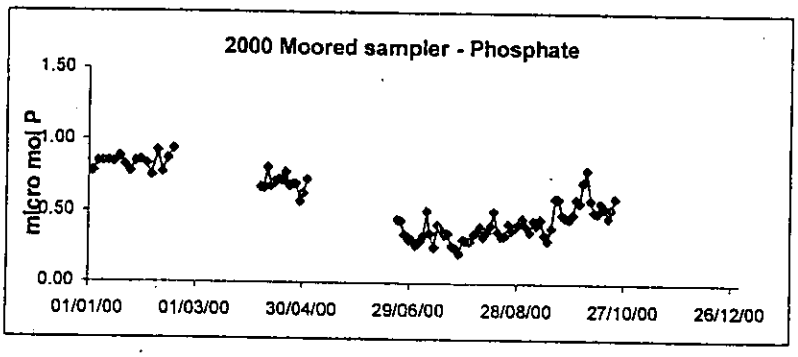

Station 47 20 November 2000
DEPTH*
0
2
4
6
8
10
12
14
16
18
20
SAL*
33.000
33.100
33.200
33.300
33.400
33.500
33.600
33.700
33.800
33.900
34.000
TEMP
9.000
9.100
9.200
9.300
9.400
9.500
9.600
9.700
9.800
9.900
10.000
FLOU
0.000
800.000
1600.000
2400.000
3200.000
4000.000
4800.000
5600.000
6400.000
7200.000
8000.000
TRAN
0.000
500.000
1000.000
1500.000
2000.000
2500.000
3000.000
3500.000
4000.000
4500.000
5000.000

Figure 2.


2000 Moored sampler - Inorg. N
micro mol N
10.00
8.00
6.00
4.00
2.00
0.00
01/01/00
01/03/00
30/04/00
29/06/00
28/08/00
27/10/00
26/12/00


2000 Moored sampler - Phosphate
micro mol P
1.50
1.00
0.50
0.00
01/01/00
01/03/00
30/04/00
29/06/00
28/08/00
27/10/00
26/12/00

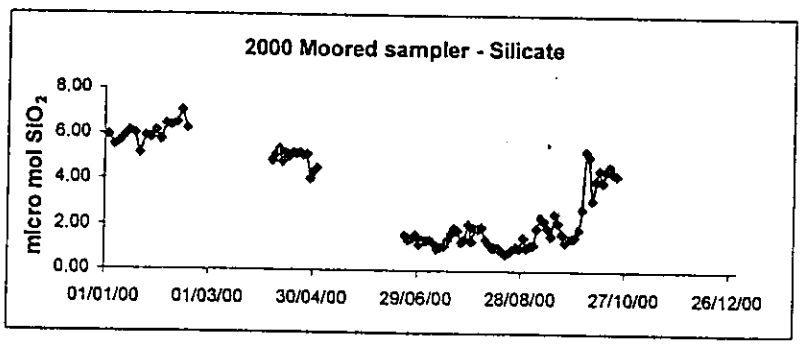

2000 Moored sampler - Silicate
micro mol SiO2
8.00
6.00
4.00
2.00
0.00
01/01/00
01/03/00
30/04/00
29/06/00
28/08/00
27/10/00
26/12/00

Figure 3.

IRISH SEA OCEANOGRAPHY 2000

Depth profile samples (20 November 2000)

STATION	DATE	DEPTH M	AMMONIA µm N l^{-1}	PHOSPHATE µm P l^{-1}	INORG N µm N l^{-1}	SILICA µm SiO_2 l^{-1}	UREA µm N l^{-1}	NITRITE µm N l^{-1}	CHL	PHAEO	ACID RATIO
38A	20/11/00	2.1	0.77	0.56	4.68	4.19		0.05	0.52	0.11	1.80
38A	20/11/00	10.0	0.75	0.54	4.70	4.14		0.04	0.60	0.08	1.86
38A	20/11/00	19.9	0.76	0.55	4.70	4.19		0.05	0.55	0.11	1.81
38A	20/11/00	30.0	0.77	0.55	4.65	4.18		0.04	0.56	0.06	1.88
38A	20/11/00	40.4	0.80	0.56	5.50	4.27		0.04	0.56	0.06	1.88
38A	20/11/00	51.5	0.86	0.51	7.07	4.35		0.07	0.33	0.07	1.79
38A	20/11/00	61.2	1.01	0.54	7.59	4.90		0.08	0.32	0.07	1.79
38A	20/11/00	71.1	1.00	0.54	8.83	4.52		0.08	0.33	0.07	1.79
38A	20/11/00	88.8	1.09	0.55	5.67	4.67		0.11	0.37	0.10	1.77

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Table 1.

IRISH SEA OCEANOGRAPHY 2000

Depth profile samples (20 November 2000)

STATION	DATE	DEPTH M	AMMONIA $\mu m\ N\ l^{-1}$	PHOSPHATE $\mu m\ P\ l^{-1}$	INORG N $\mu m\ N\ l^{-1}$	SILICA $\mu m\ SiO_2\ l^{-1}$	UREA $\mu m\ N\ l^{-1}$	NITRITE $\mu m\ N\ l^{-1}$	CHL	PHAEO	ACID RATIO
47	20/11/00	2.4	1.81	0.77	9.67	7.52		0.27	1.32	0.15	1.87
47	20/11/00	7.2	1.92	0.78	10.29	7.65		0.27	1.16	0.20	1.83
47	20/11/00	12.3	2.06	0.81	9.86	7.70		0.28	1.26	0.18	1.85
47	20/11/00	15.7	1.42	0.87	10.04	7.56		0.28	1.26	0.14	1.88

Table 2.