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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 36 2000

03 – 5 September 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 3 September 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 2100 hrs and sailed overnight in a light easterly 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 light easterly breeze. 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 1045 hrs on position $53^{\circ} 46' .92N$ $5^{\circ} 38' .03W$. Following the deployment of the rosette water sampler, the sediment corer and 3 zooplankton net hauls, the vessel sailed to coastal station 47 in Dundalk Bay 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 5 September 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. Figure 1 shows nutrient data obtained this year from the sampler.

An updated comparison between samples taken by the rosette water sampler and the nearest available event from the autosampler is shown in Figure 2. Unfortunately the correspondence between the two sets of samples was never exact with samples taken up to a day apart and several metres apart in depth. A paper detailing the problems and progress of the McLane autosampler for nutrient monitoring is currently in press.

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

With the continuation of mild weather and calm conditions, the profile at station 38A remains thermally stratified (Fig. 3). Typical surface temperature was 15.6 °C, almost 2 °C above the previous oceanography cruise in late June. The depth of the thermocline has also increased from 8 to 16 metres since the last cruise. Bottom temperatures were 2 °C higher than the June value, demonstrating mixing across the thermocline. Nutrients were almost depleted above the thermocline and typically less than 1 micromole inorg N l⁻¹. Whereas at depth, the nutrient pool was typically 5 – 6 micromoles inorg N l⁻¹ (Table 1). The nutrient depleted upper layer was associated with a high fluorescence signal, indicating activity from both dinoflagellates and diatoms.

In Dundalk Bay, Station 47 exhibited stratification at 10 metres with upper and lower level temperatures 16.3 °C and 14.4 °C respectively (Fig. 4). Nutrients throughout the water column were typically 1 – 2 micromoles inorg N l⁻¹ (Table 2). Chlorophyll

values ranged 1 - 4 μg chlorophyll l^{-1} and together with a strong fluorescence signal indicated significant biological activity throughout the water column (Table 2).

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.

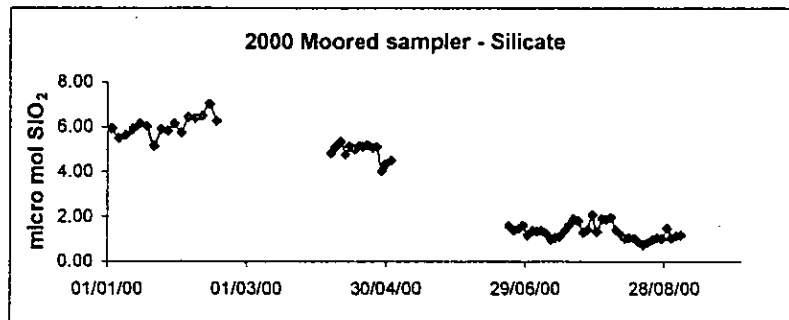
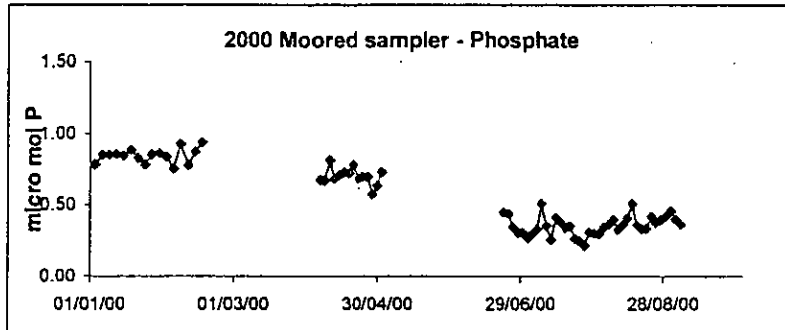
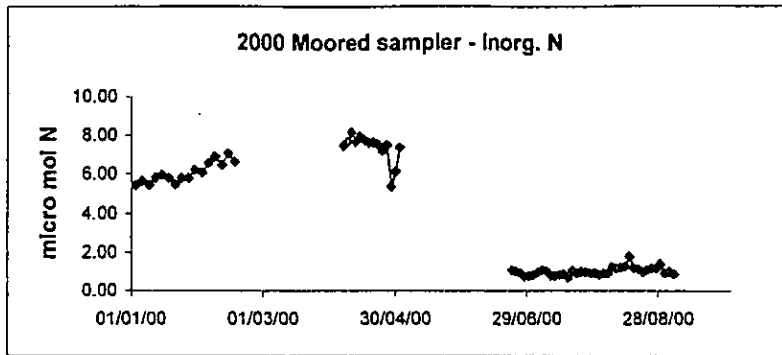
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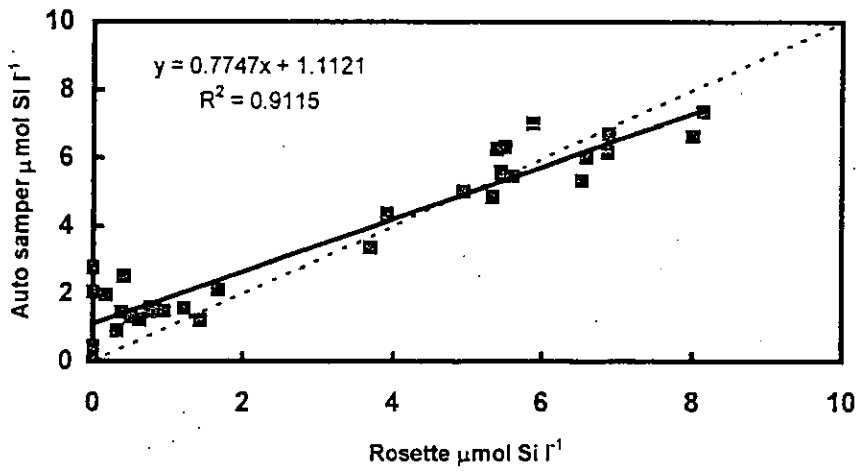
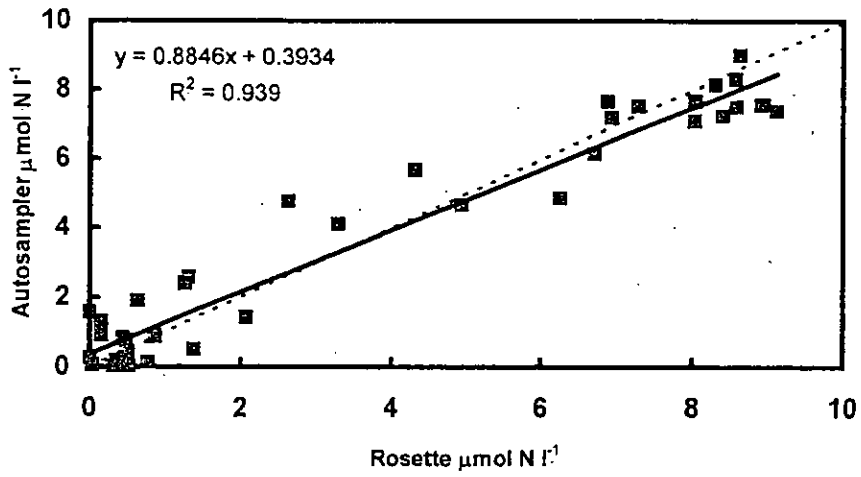
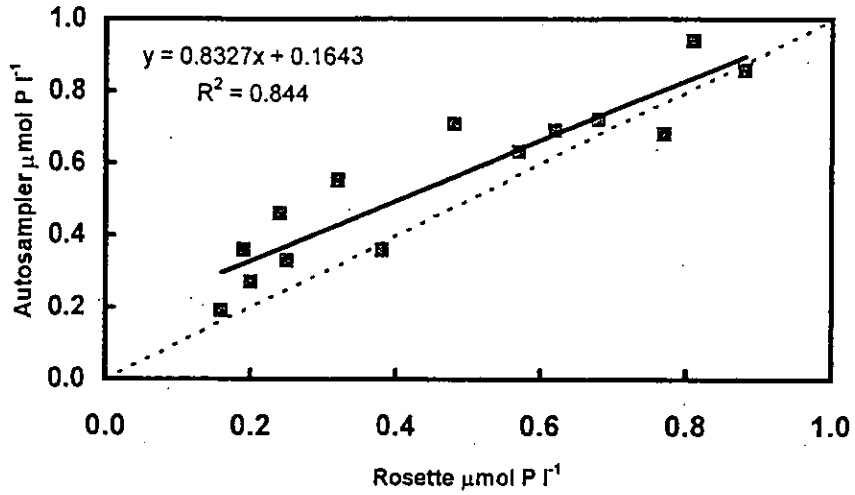
I am indebted the deck crew of the RV Lough Foyle for their co-operation and assistance during the mooring recovery and deployment operation. The ship's master, officers, engineers and catering staff are also thanked for their co-operation during this cruise.



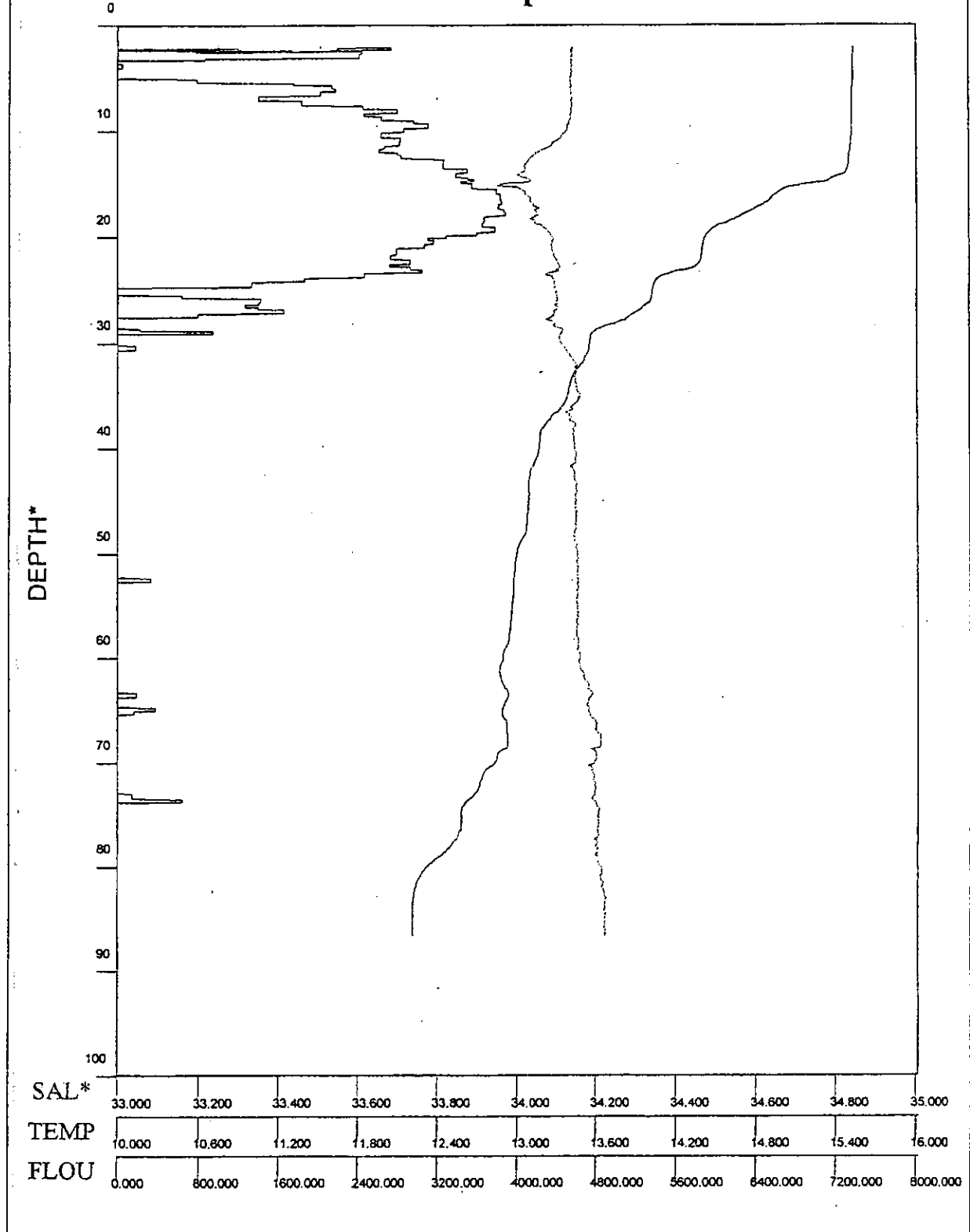
B M STEWART

11 September 2000





Station 38A 4 September 2000



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Figure 3.

Station 47 4 September 2000

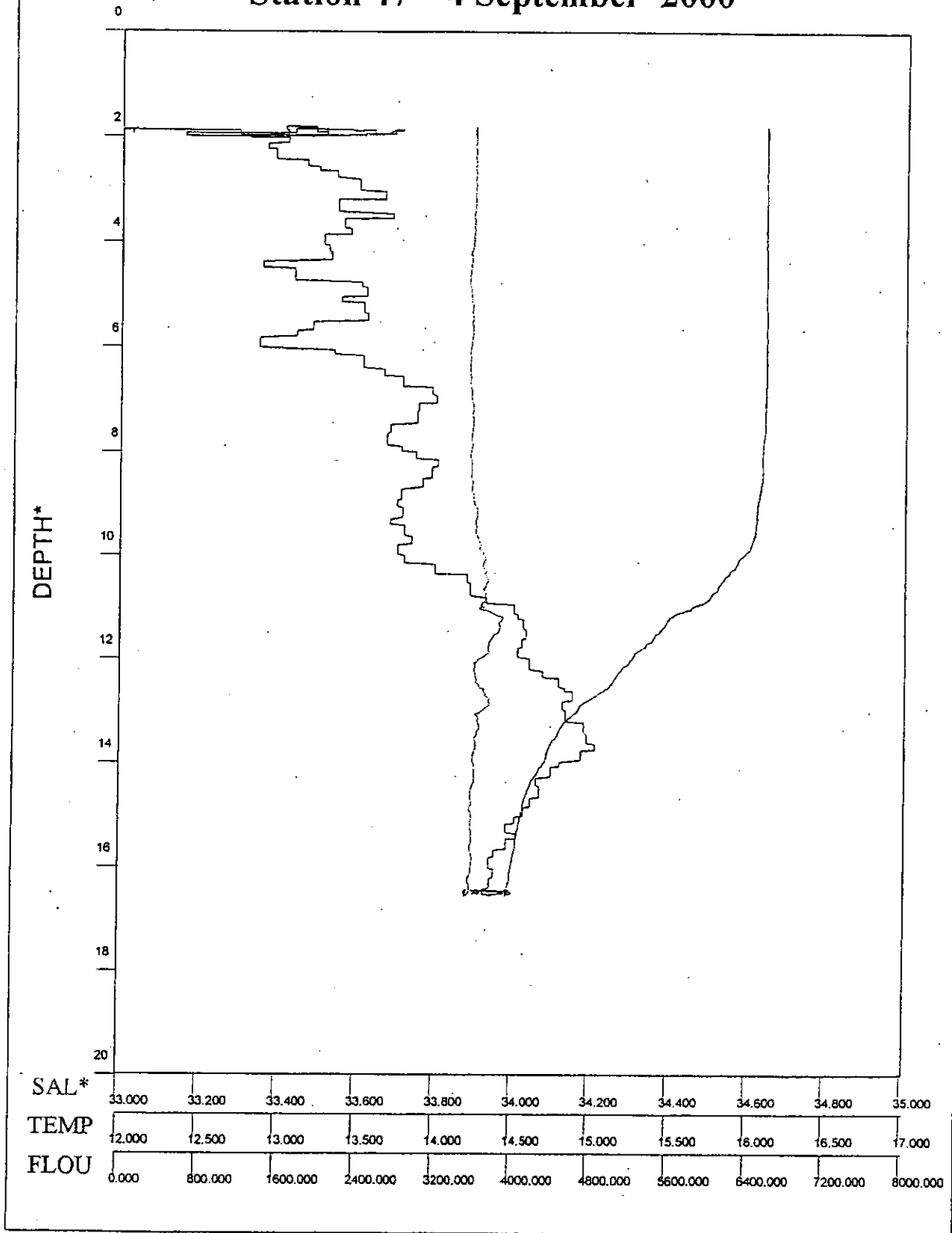


Figure 4

IRISH SEA OCEANOGRAPHY 2000

Depth profile samples (4 September 2000)

STATION	DATE	DEPTH M	AMMONIA $\mu\text{m N l}^{-1}$	PHOSPHATE $\mu\text{m P l}^{-1}$	INORG N $\mu\text{m N l}^{-1}$	SILICA $\mu\text{m SiO}_2 \text{ l}^{-1}$	UREA $\mu\text{m N l}^{-1}$	NITRITE $\mu\text{m N l}^{-1}$	CHL	PHAEO	ACID RATIO
38A	04/09/00	2.2	0.70	0.21	0.50	1.02	-1.00	0.09	1.19	0.06	1.92
38A	04/09/00	10.1	1.19	0.27	0.87	0.76	-1.00	0.09	1.15	0.09	1.90
38A	04/09/00	20.1	0.92	0.38	1.65	1.44	-1.00	0.21	1.89	0.22	1.87
38A	04/09/00	30.1	0.70	0.51	3.75	2.26	-1.00	0.12	0.09	0.02	1.81
38A	04/09/00	40.1	1.24	0.69	5.74	3.10	-1.00	0.50	0.13	0.09	1.57
38A	04/09/00	50.3	1.63	0.64	4.95	3.04	-1.00	0.09	0.10	0.10	1.48
38A	04/09/00	60.0	0.70	0.58	4.84	3.07	-1.00	0.10	0.11	0.10	1.51
38A	04/09/00	69.9	0.91	0.68	4.69	3.22	-1.00	0.12	0.10	0.10	1.47
38A	04/09/00	86.7	3.60	0.80	5.93	5.11	-1.00	0.53	0.09	0.14	1.38

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Table 1.

IRISH SEA OCEANOGRAPHY 2000

Depth profile samples (4 September, 2000)

STATION	DATE	DEPTH M	AMMONIA $\mu\text{m N l}^{-1}$	PHOSPHATE $\mu\text{m P l}^{-1}$	INORG N $\mu\text{m N l}^{-1}$	SILICA $\mu\text{m SiO}_2 \text{l}^{-1}$	UREA $\mu\text{m N l}^{-1}$	NITRITE $\mu\text{m N l}^{-1}$	CHL	PHAEO	ACID RATIO
47	04/09/00	2.4	1.12	0.33	2.05	0.93	-1.00	0.17	1.02	0.00	2.00
47	04/09/00	6.3	0.79	0.32	2.38	1.01	-1.00	0.08	1.38	0.02	1.96
47	04/09/00	11.6	0.95	0.58	1.05	4.07	-1.00	0.10	4.08	0.13	2.03
47	04/09/00	16.3	1.04	0.61	0.78	5.02	-1.00	0.15	3.42	0.44	1.94

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Table 2.