

5735

BIOLOGICAL OCEANOGRAPHY CRUISE REPORT

LF 14/99

7 - 10 April 1999

PERSONNEL

B Stewart	(SIC), SSO, DANI.
P Elliott	SO, DANI.
S Bloomfield	ASO, DANI
J McNally	SO, DANI.

OBJECTIVES

- i. To deploy an additional automated water sampler and service existing moored instrumentation at station 38A
- ii. To assess temperature, salinity and nutrient distributions over depth at stations 38A and 47.

CRUISE NARRATIVE

Tuesday 6 April 1999

In preparation for the cruise, all DANI scientific crew were onboard by 2000 hrs when moorings and instrumentation was 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 2200 hrs and sailed overnight in a fresh westerly wind to the mooring site.

Wednesday 7 April 1999

The vessel arrived on the mooring site before dawn at 0600 hrs and confirmed that the warning beacons on both buoys were functioning satisfactorily. The weather was dry and bright with a fresh westerly breeze when work for the day commenced at 0800 hrs. The guard buoy and anchor was successfully recovered to shipdeck, serviced and redeployed at 0920 hrs on position $53^{\circ} 47' .011N$ $5^{\circ} 37' .940W$. The instrument mooring, which contained the water sampler incorporated into the steel structure of the buoy was then successfully recovered to shipdeck at 1015 hrs. Severe wave action had damaged the plastic protective sheeting on the sampler and as a result

some fragile components on the sampler suffered minor damage. The sampler was removed from the mooring and a close inspection indicated that the sampler was still functioning. The mooring components were inspected for corrosion and replaced where necessary. The biological water sampler and a replacement nutrient water sampler was attached to the mooring adjacent to the sub surface buoy. It was obvious that a more robust protective shield was required for the nutrient water sampler before it could be considered for redeployment within the steel structure below the buoy. The mooring complete with McLane water samplers was successfully redeployed at 1315 hrs on position $53^{\circ} 46' .84N$ $5^{\circ} 38' .09W$. 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 taken. Work on the station was completed at 1830 hrs and the vessel sailed to dock in Belfast at 0200 hrs.

Thursday 8 April 1999

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

MOORING REDESIGN

In an attempt to offer the McLane nutrient sampler better protection from collision damage and also to acquire samples close to the surface, the mooring guard buoy was redesigned to incorporate the sampler into the steel structure below the buoy.

On recovery of the mooring it was immediately obvious that the clear plastic material which partially encased the sampler was not sufficiently robust to prevent damage by wave action to the sampler.

An additional sampler was positioned below the sub surface buoy and redeployed at depth 14m on an anchored wire.

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, but despite many sampling attempts a strong tidal current prevented successful sampling of the sea bed. Three zooplankton net hauls were taken at both stations 38A & 47.

SUMMARY OF RESULTS

CTD data from station 38A shows the initial onset of thermal stratification (Fig. 1). Surface warming with some mixing has progressively increased the temperature of the upper 50m layer, with surface values almost $0.5^{\circ}C$ above values from lower depths. A high fluorescence signal associated with this warmer upper layer is the main indicator that the annual cycle of primary production has commenced.

Below depth 50m the fluorescence signal becomes minimal, temperature and salinity values become constant at 8.0 °C and 34.4 psu respectively. In addition, this stable portion of the profile retains particulate material below the 50m interface as shown by the signal from the transmissometer.

With the onset of the spring bloom, nutrient concentrations in the top 40m have become depleted ranging 0.5 – 1.1 micromoles inorg N Γ^1 (Table 1).

In Dundalk Bay, Station 47 the profile is mixed with temperature and salinity 8.7 °C and 33.90 psu respectively (Fig. 2). With a 2 °C increase in water temperature since the middle of March and a high fluorescence signal throughout the water column, all signs indicate that primary production is progressing.

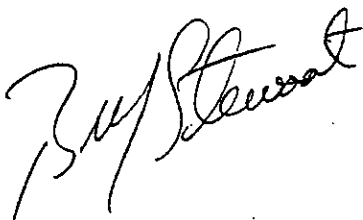
Again nutrient concentrations throughout the profile at this shallow station have become depleted and range 0.5 – 0.7 micromoles inorg N Γ^1 (Table 1).

HOTEL REPORT & OPERATIONAL ASPECTS OF THE SHIP

During the cruise the A-frame, main trawl winches, both hydrographic winches and the ship's clean 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

28 May 1999

Station 38A 7 April 1999

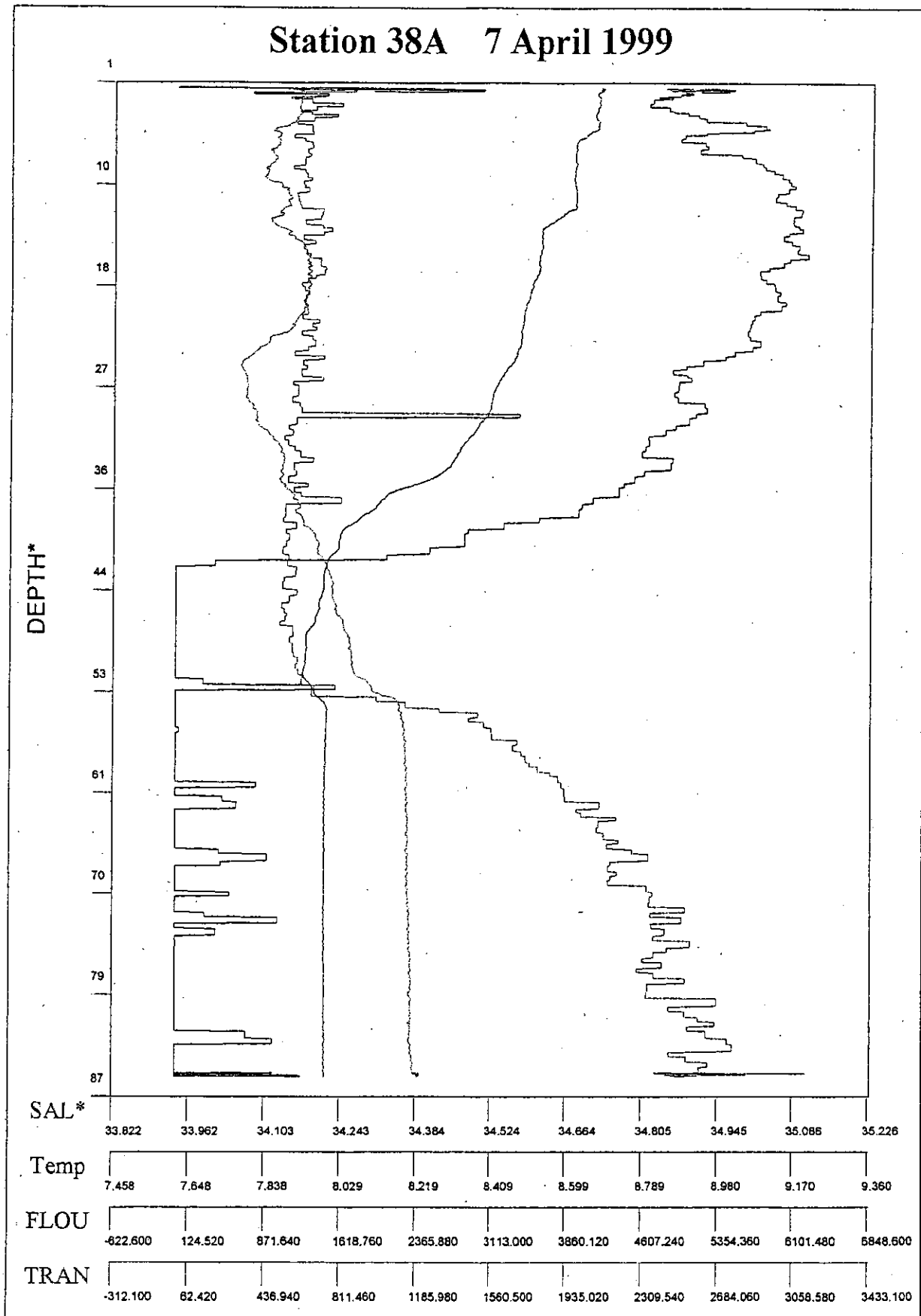


Fig. 1.

Station 47 7 April 1999

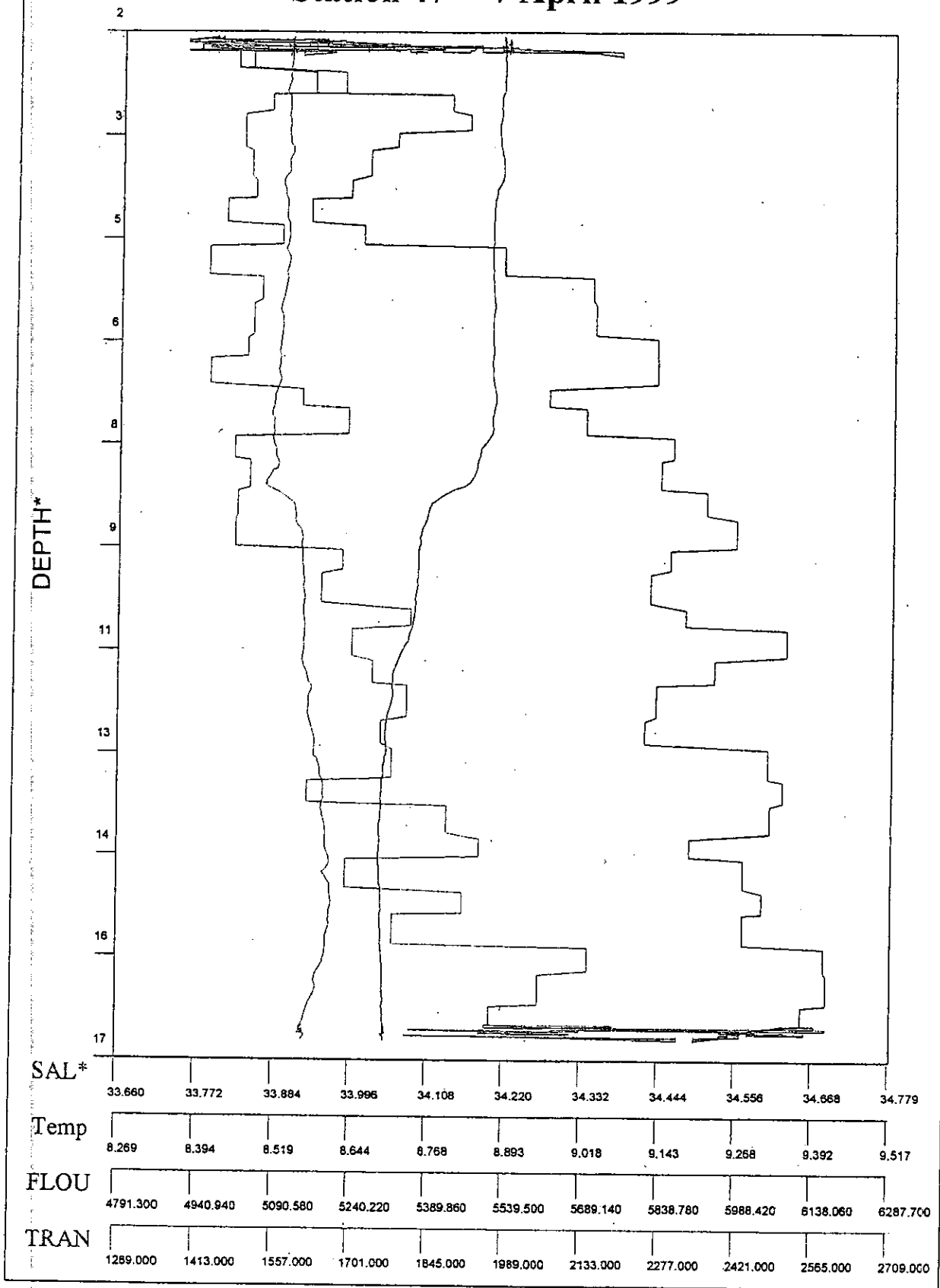


Fig 2.

IRISH SEA OCEANOGRAPHY 1999

Depth profile samples (7 April 1999)

	DEPTH M	AMMONIA $\mu\text{m N } \Gamma^1$	PHOSPHATE $\mu\text{m P } \Gamma^1$	INORG N $\mu\text{m N } \Gamma^1$	SILICA $\mu\text{m SiO}_2 \Gamma^1$
STATION 38A	2.1	2.64	0.15	0.58	0.66
07/04/99	10.7	1.44	0.15	0.59	0.72
	20.7	1.55	0.21	0.86	0.70
	30.7	1.51	0.23	1.14	0.91
	40.4	1.49	0.63	6.88	5.05
	50.5	1.39	0.81	8.59	7.01
	60.7	1.58	0.77	7.83	6.38
	71.6	1.47	0.77	7.86	6.59
	86.6	1.54	0.90	8.71	7.12
STATION 47	2.5	1.68	0.26	0.55	0.32
07/04/99	5.1	1.44	0.22	0.67	0.39
	10.5	1.76	0.22	0.67	0.38
	17.6	1.48	0.21	0.58	0.53

427

Table 1