5733

# B LOGICAL OCEANOGRAPHY CRUISE REPORT

1 Prof Pearce
2 Prof McManus

This is the report of a short cruise to obtain winter information on physical & chemical variables. Winter data are very important & are indicating long-term changes in the Irish Sea. You will note the loss & remarkable recovery of some of our moored instrumentation. You might be interested to know that the US company that supplied our water sampler is refitting lost items free of charge.

Dan H 11/12

**LF 46/98**

**8 –11 November 1998**

**PERSONNEL**

| | |
|---|---|
| B Stewart | (SIC), SSO, DANI. |
| P Elliott | SO, DANI. |
| S Bloomfield | ASO, DANI |
| C Cochrane | Temp. LA, DANI |

**OBJECTIVES**

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

ii. To provide an assessment of a moored W.S Ocean automated water sampler.

iii. To service moored instrumentation at station 38A.

**CRUISE NARRATIVE**

Sunday 8 November 1998

In preparation for the cruise, all DANI scientific crew were onboard by 2000 hrs. With a gale force westerly wind which was forcast to continue for the next 24 hours, sailing was postponed until the next day.

Monday 9 November 1998

DANI scientific crew embarked at 1700 hrs and again because of strong westerly winds, sailing was postponed for a further 12 hours.

Tuesday 10 November 1998

Again DANI scientific crew embarked at 0945 hrs. The weather was dry and bright with a fresh westerly wind. Following a talk on ship's safety and a demonstration of personal life saving equipment, the RV Lough Foyle departed Belfast at 1000 hrs and sailed south to station 38A, the DANI mooring site. The vessel arrived on station at 1720 hrs when the rosette water sampler, sediment corer and zooplankton net were deployed. In the absence of daylight and with a strong westerly wind, the mooring

recovery operation was postponed. The vessel then sailed in a westerly direction to station 47 in Dundalk Bay where the rosette water sampler and zooplankton net were deployed. Work on the station was completed at 2115 hrs and the vessel anchored overnight in Dundalk Bay.

Wednesday 11 November 1998

Work for the day commenced at 0700 hrs when the vessel returned to the mooring site. The weather was dry and bright with a fresh westerly wind which was forcast to increase to gale force in the afternoon. The guard buoy (No. 1) was observed at position $53^0\ 47^1.82N$ & $5^0\ 37^1.83W$; almost one mile north of the position at which it was deployed in September. Attempts to recover the buoy, in order to return it to the original position, were frustrated by the fact that the recovery floats were missing. After several unsuccessful attempts and with increasing winds, the recovery was abandoned and attention switched to recover the instrument mooring before the weather further deteriorated. The instrument mooring was successfully recovered to ship deck at 0730 hrs. The mooring wire between the WS Ocean sampler and the McLane sampler had been severed resulting in the loss of the sub surface buoy and McLane sampler. Evidence from remaining thermistor/depth sensors indicate that the incident occurred between 0900 – 1200 hrs on 24 October '98.
The instrument leg and the ground line were removed from the mooring and the buoy and anchor only, were redeployed at 0930 hrs on position $53^0\ 46^1.92N$ & $5^0\ 38^1.16W$. The Irish Marine Emergency Service was informed of the change in position of the moorings and requested to modify their navigation warning broadcasts accordingly. With winds increasing to gale force the vessel sailed to dock in Belfast at 1630 hrs. All scientific crew had disembarked by 1700 hrs.

Thursday 12 November 1998

Scientific crew returned to the vessel at 0930 hrs to remove samples, scientific instruments and mooring equipment.

**PARAMETERS MONITORED**

The CTD/rosette water sampler was deployed at stations 38A and 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*.
The zooplankton net was deployed for 3 hauls at both stations 38A & 47.

**SUMMARY OF RESULTS**

With recent storms the CTD data from station 38A showed the profile to be mixed from surface to bottom with typical temperature and salinity 12.3 °C and 34.5 ppt respectively (Fig. 1). Nutrient concentrations throughout the profile were reasonably constant and typically 4 –5 micromoles N $l^{-1}$ (Table 1). Surface inorganic nitrogen

concentration had increased by almost 5 micromoles N $l^{-1}$ since the September cruise and this represents the beginning of a steady increase towards the normal winter maximum concentration of 9 –10 micromoles N $l^{-1}$. In Dundalk Bay at Station 47 again the profile was mixed with typical temperature and salinity 10.9 °C and 33.9 ppt respectively (Fig. 2). In comparison to station 38A in the central Irish Sea, the lower salinity and temperature values observed at station 47 demonstrate the freshwater influence of the River Boyne in this area.

**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.

**ADDENDUM**

The McLane water sampler and sub-surface buoy was subsequently reported floating in Heysham harbour by the local Port Officer. The equipment was recovered and returned to DANI Belfast on 28 November 1998. The instrument suffered minor damage and prior to redeployment, the mooring configuration will be redesigned to offer better protection to sampling equipment.

**B M STEWART**

10 December 1998

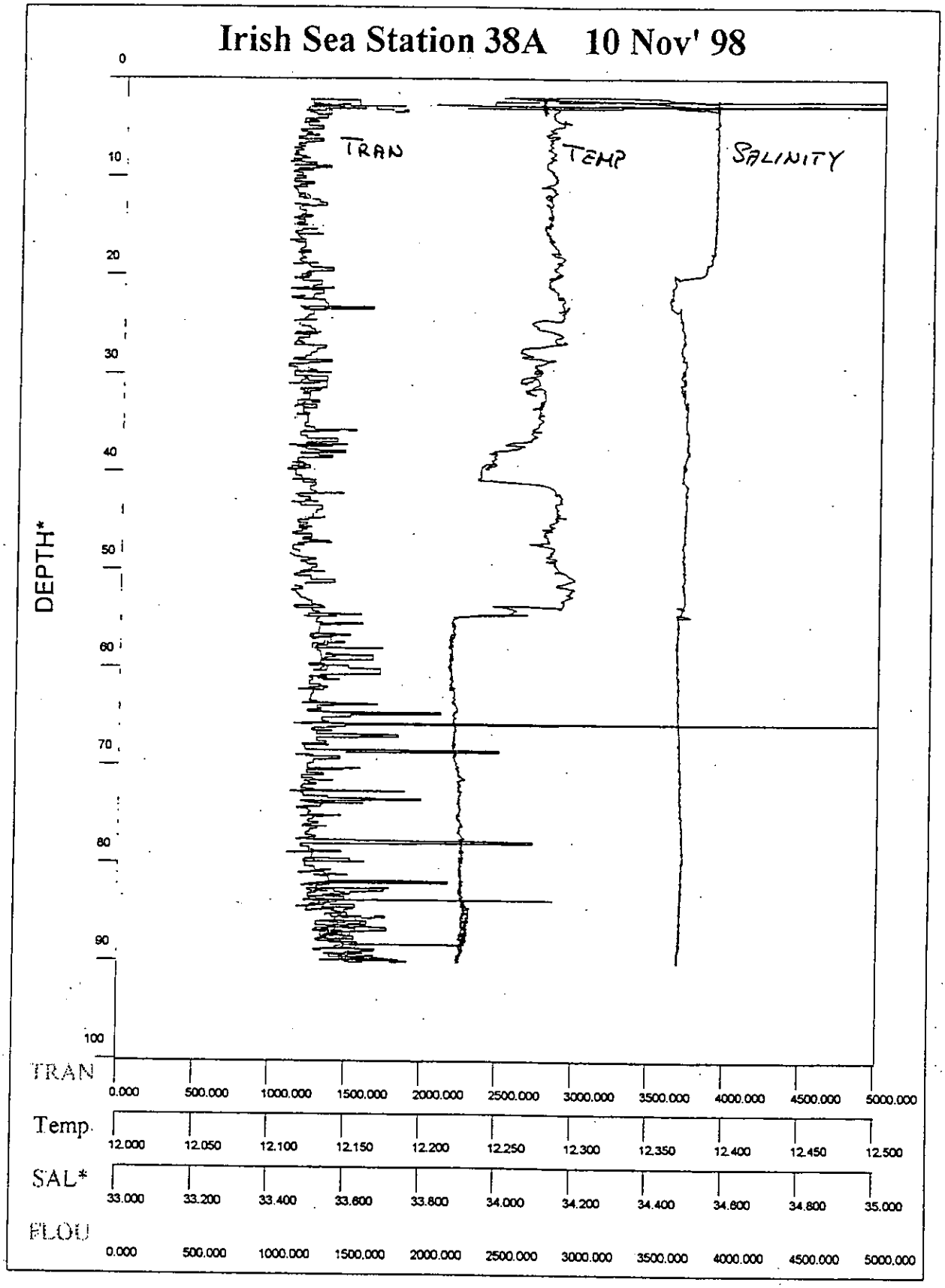
Irish Sea Station 38A 10 Nov' 98
TRAN
TEMP
SALINITY
DEPTH*
0
10
20
30
40
50
60
70
80
90
100
TRAN
0.000
500.000
1000.000
1500.000
2000.000
2500.000
3000.000
3500.000
4000.000
4500.000
5000.000
Temp
12.000
12.050
12.100
12.150
12.200
12.250
12.300
12.350
12.400
12.450
12.500
SAL*
33.000
33.200
33.400
33.600
33.800
34.000
34.200
34.400
34.600
34.800
35.000
FLOU
0.000
500.000
1000.000
1500.000
2000.000
2500.000
3000.000
3500.000
4000.000
4500.000
5000.000

Figure 1

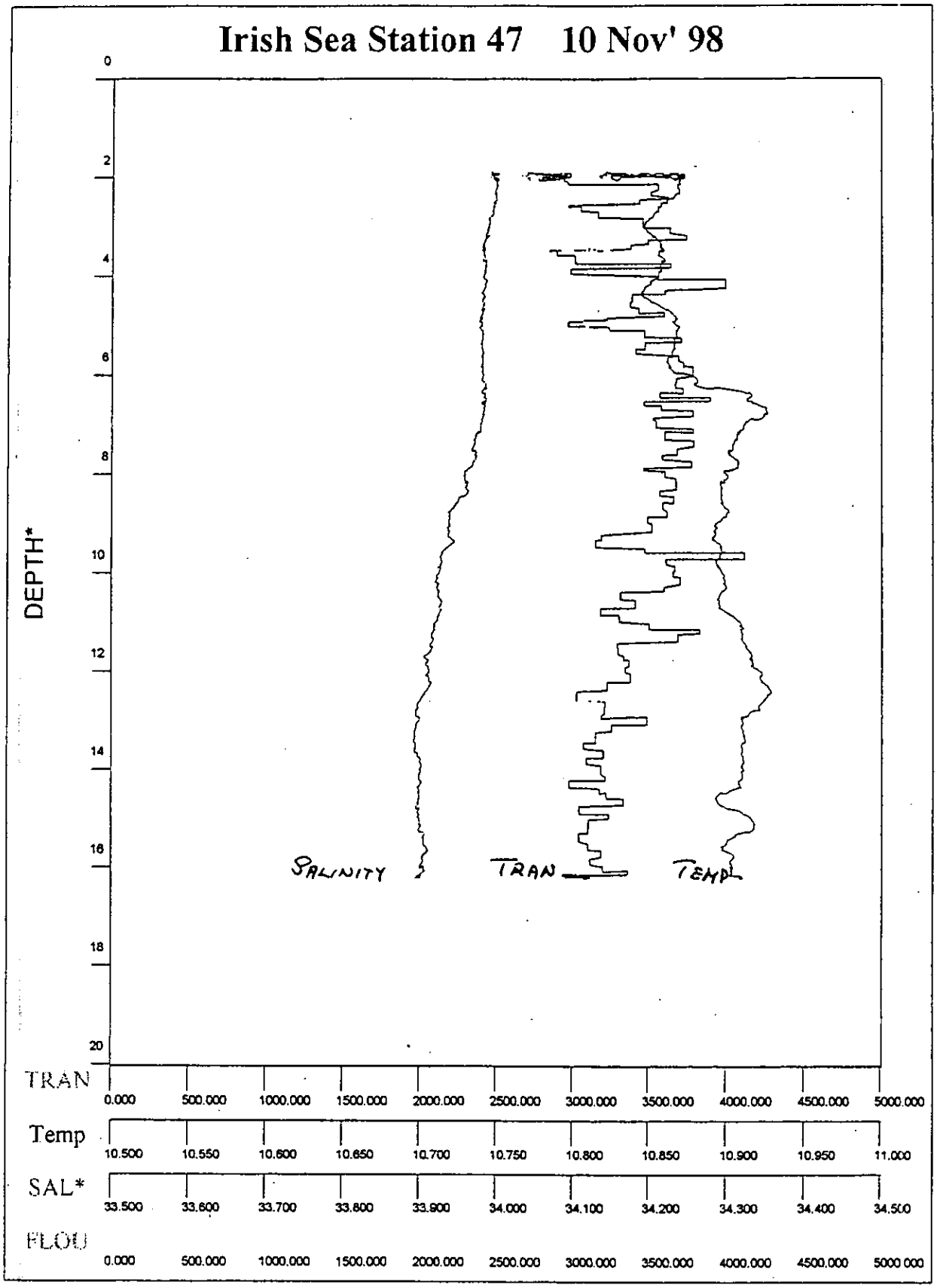
Irish Sea Station 47 10 Nov' 98
DEPTH*
0
2
4
6
8
10
12
14
16
18
20
SALINITY
TRAN
TEMP
TRAN
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000
Temp
10.500 10.550 10.600 10.650 10.700 10.750 10.800 10.850 10.900 10.950 11.000
SAL*
33.500 33.600 33.700 33.800 33.900 34.000 34.100 34.200 34.300 34.400 34.500
FLOU
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000

Figure 2.

IR' SEA OCEANOGRAPHY 1998

Depth profile samples (10 November 1998 )

| | DEPTH M | AMMONIA $\mu m\ N\ l^{-1}$ | PHOSPHATE $\mu m\ P\ l^{-1}$ | NITRATE $\mu m\ N\ l^{-1}$ | SILICA $\mu m\ SiO_2\ l^{-1}$ | UREA $\mu m\ N\ l^{-1}$ | NITRITE $\mu m\ N\ l^{-1}$ |
|---|---|---|---|---|---|---|---|
| STATION 38A | 3.0 | 1.49 | 0.56 | 5.10 | 3.99 | 1.20 | 0.03 |
| 10/11/98 | 9.6 | 1.42 | 0.51 | 3.75 | 2.09 | 1.17 | 0.97 |
| | 19.1 | 1.22 | 0.48 | 3.10 | 1.78 | 0.76 | 0.89 |
| | 40.2 | 1.83 | 0.58 | 5.18 | 4.11 | 1.23 | 0.02 |
| | 50.2 | 1.55 | 0.58 | 4.81 | 3.56 | 0.96 | 0.02 |
| | 60.1 | 1.16 | 0.49 | 3.08 | 1.57 | 0.93 | 0.84 |
| | 70.7 | 1.78 | 0.57 | 5.09 | 4.17 | 1.88 | 0.02 |
| | 80.2 | 1.63 | 0.66 | 5.84 | 4.26 | 0.91 | 0.01 |
| | 89.3 | 1.48 | 0.57 | 5.22 | 4.07 | 1.43 | 0.04 |
| STATION 47 | 2.6 | 2.86 | 0.74 | 7.75 | 4.66 | 1.41 | 1.08 |
| 10/11/98 | 5.2 | 2.62 | 0.63 | 4.65 | 4.84 | 1.36 | 0.88 |
| | 10.9 | 3.35 | 0.73 | 7.68 | 4.74 | 1.60 | 0.51 |
| | 16.8 | 3.36 | 0.77 | 8.15 | 4.73 | 1.49 | 0.53 |
| | 29.5 | 0.82 | 0.55 | 3.57 | 2.38 | 0.87 | 0.73 |



Table 1