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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT
LF 2999

19 – 22 July 1999

PERSONNEL

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

OBJECTIVES

i. To deploy an an additional instrumemted mooring close to coastal station 47.

ii. To acquire CTD, light and fluorescence data for calibration of moored instrumentation.

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

.CRUISE NARRATIVE

Monday 19 July 1999

In preparation for the cruise, all DANI scientific crew were onboard by 2000 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 2130 hrs and sailed overnight in a fresh westerly wind to the to the proposed mooring site, station 47A.

Tuesday 20 July 1999

The vessel arrived on the proposed mooring site at 0600 hrs. The weather was dry and bright with a light westerly breeze when work for the day commenced at 0800 hrs. Final preparations were made before the CTD/ fluorimeter/ light sensor instrumentation package was deployed at 12 metre depth on a U-type mooring at 0915 hrs on position 53^0 43^1.507N 06^0 05^1.131W. With the weather forcasted to deteriorate, the vessel immediately sailed to station 38A where the instrumentation mooring with two water samplers, was successfully recovered to shipdeck at 1100 hrs. With mooring components and water samplers serviced, the mooring was then successfully redeployed at 1245 hrs on position 53^0 46^1.961N 05^0 38^1.096W.

Following deployment of the rosette water sampler, sediment corer and zooplankton net, the ship sailed to coastal mooring site station 47A where a CTD profile, water samples and zooplankton net hauls were taken at 1600 hrs. Profiles were continued at hourly intervals until 2100 hrs. The vessel anchored overnight close to station 47A

Wednesday 21 July 1999

Work for the day commenced on station 47A at 0800 hrs with CTD/light/fluorescence profiles at hourly intervals. Profiling concluded at 1800 hrs when the vessel sailed to dock in Belfast at 0130 hrs.

Thursday 22 July 1999

Work for the day commenced at 0800 hrs when scientific crew removed samples, scientific instruments and mooring equipment from the ship. All scientific crew disembarked at 1100 hrs.

PARAMETERS MONITORED

The CTD/rosette water sampler was deployed at stations 38A and 47A to acquire nutrient, chlorophyll *a*, temperature and salinity data from the depth profile.
The Bowers and Connelly sediment 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 & 47A.
Multiple CTD profiles were taken at station 47A for calibration of moored instrumentation.

McLane moored water sampler
There was evidence from nutrient data from the June cruise that biofouling on the moored sampler was contaminating samples with phosphate and ammonia during transfer from sampler syringes to storage vials.
The components on the sampler deployed during this cruise were treated with a thin film of silicone grease to deter biofouling and connections between the sample syringe and filter unit were sealed to prevent ingress of biofoulant. In future samples will remain in the sampler until return to the laboratory where the complete unit will be washed with freshwater to remove any biofouling residue.

SUMMARY OF RESULTS

CTD data from station 38A shows a well established thermocline at 20 metres with surface and bottom temperature and salinity 14.9 °C / 34.0 psu and 11.0 °C / 34.1 psu respectively (Fig. 1). Recorded temperatures are approximately 2 °C above the June cruise values and illustrate continued warming throughout the profile.
Nutrient values above the thermocline remain depleted with inorganic nitrogen typically 0.03 – 0.16 micromoles N l^{-1} (Table 1). These results are consistent with

nutrient data acquired from daily samples taken and preserved *in situ* by the moored sampler at depth 20 (Fig.3).

In Dundalk Bay at Station 47 the water column was also stratified with a thermocline at 16 metres. Surface and bottom temperatures were 14.7 °C and 11.3 °C respectively with salinity, 33.9 ppt, fairly constant throughout the profile. (Fig. 2). A high fluorescence signal above the thermocline indicated major plankton activity in the upper layer of the water column. Trace levels of inorganic nitrogen (0.2 - 0.6 micromoles $N\ l^{-1}$) and almost zero silica concentration suggested substantial nutrient uptake by both dinoflagellates and diatoms (Table 1).

HOTEL REPORT & OPERATIONAL ASPECTS OF THE SHIP

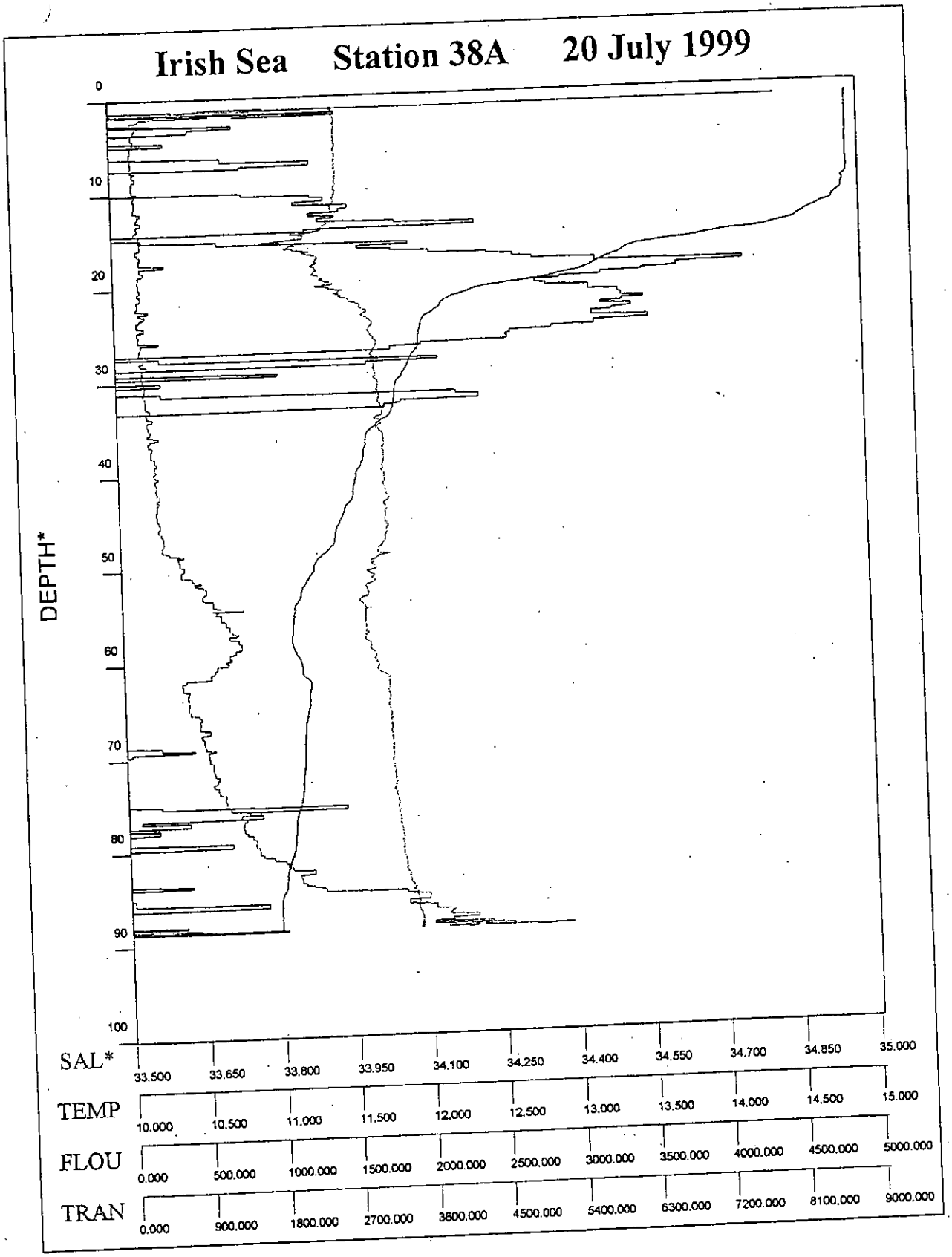
During the cruise the A-frame, main trawl winches, both hydrographic winches and the ship's clean sea-water supply were used. No problems were encountered with any of the ship's equipment nor indeed with any of the scientific equipment. The hotel and catering service was of the usual high standard and 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

25 August 1999


Irish Sea Station 38A 20 July 1999
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
10.000
10.500
11.000
11.500
12.000
12.500
13.000
13.500
14.000
14.500
15.000
FLOU
0.000
500.000
1000.000
1500.000
2000.000
2500.000
3000.000
3500.000
4000.000
4500.000
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TRAN
0.000
900.000
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6300.000
7200.000
8100.000
9000.000

Figure 1

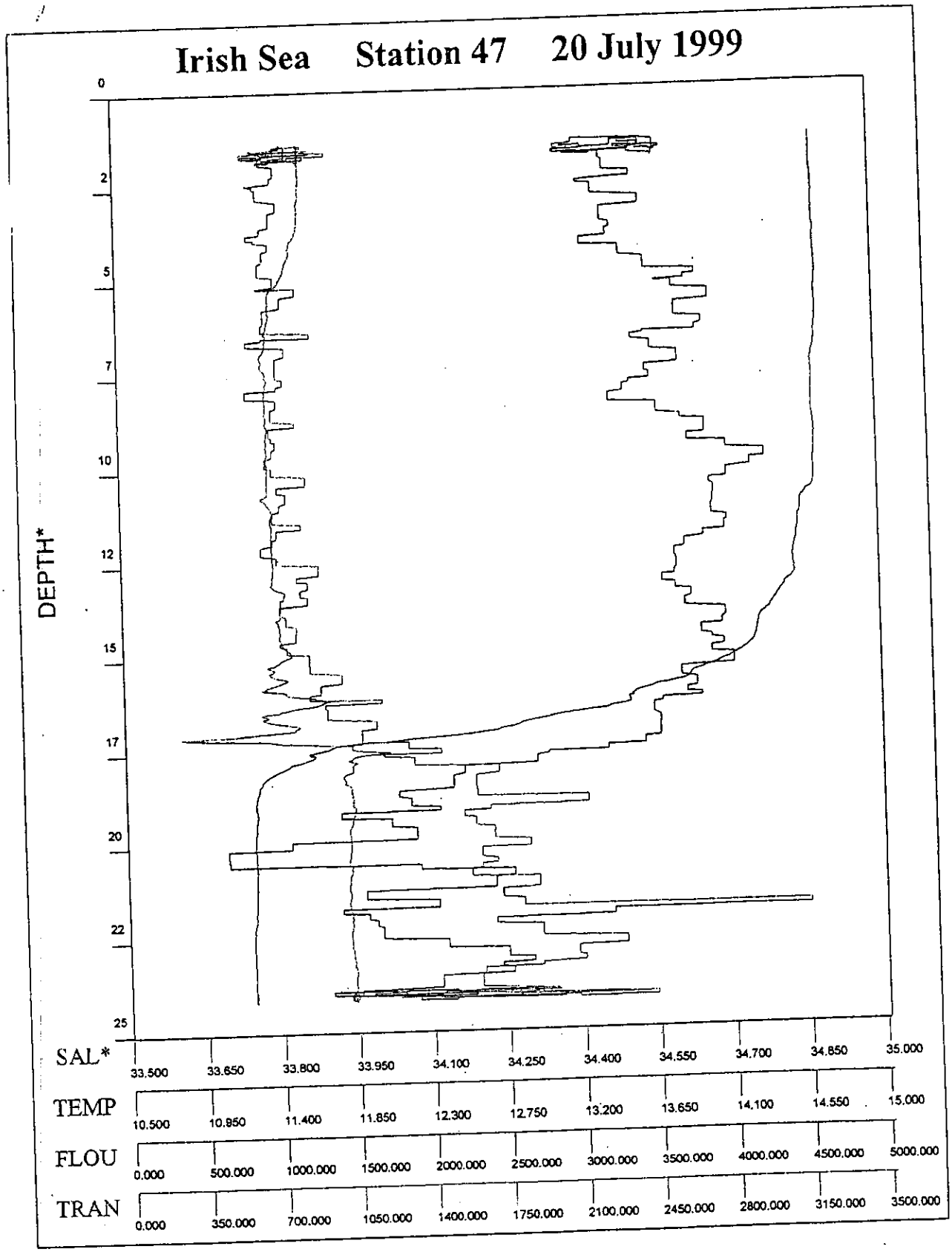
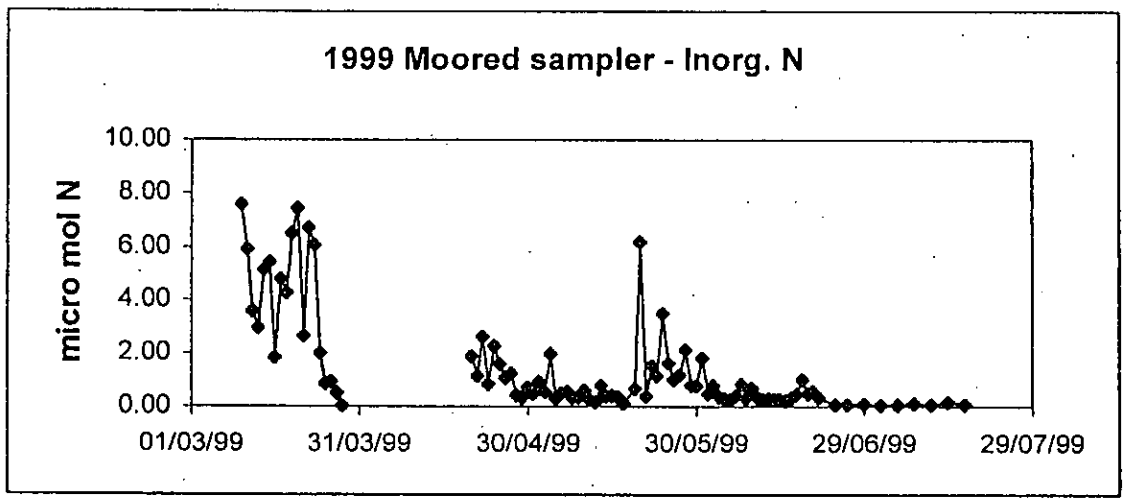

Irish Sea Station 47 20 July 1999
DEPTH*
0
2
5
7
10
12
15
17
20
22
25
SAL*
33.500 33.650 33.800 33.950 34.100 34.250 34.400 34.550 34.700 34.850 35.000
TEMP
10.500 10.950 11.400 11.850 12.300 12.750 13.200 13.650 14.100 14.550 15.000
FLOU
0.000 500.000 1000.000 1500.000 2000.000 2500.000 3000.000 3500.000 4000.000 4500.000 5000.000
TRAN
0.000 350.000 700.000 1050.000 1400.000 1750.000 2100.000 2450.000 2800.000 3150.000 3500.000

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
29/07/99

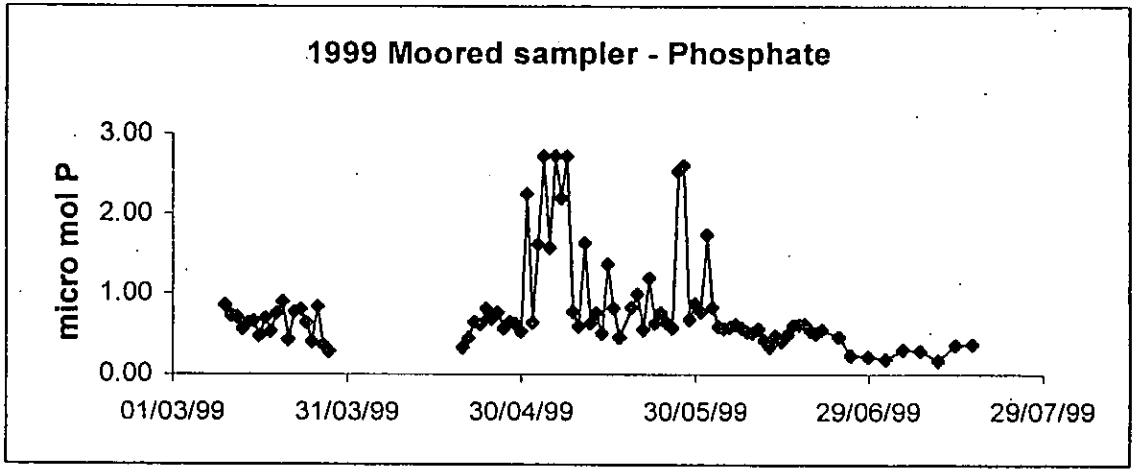

1999 Moored sampler - Phosphate
micro mol P
3.00
2.00
1.00
0.00
01/03/99
31/03/99
30/04/99
30/05/99
29/06/99
29/07/99

Figure 3

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Depth profile samples (20 July 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 20/07/99	1.3	1.06	0.17	0.03	0.28	0.00
	10.1	0.63	0.17	0.16	0.35	0.00
	21.5	0.78	0.35	1.78	2.13	0.22
	30.9	0.61	0.43	4.53	1.92	0.30
	40.5	0.71	0.47	5.20	2.28	0.28
	50.2	0.63	0.55	6.00	2.87	0.42
	60.8	0.60	0.58	6.29	3.15	0.20
	70.9	0.67	0.58	6.59	3.21	0.23
	89.5	0.86	0.62	7.09	3.94	0.22
STATION 47 20/07/99	2.5	1.52	0.39	0.66	0.66	0.03
	11.2	0.90	0.33	0.20	0.76	0.01
	24.2	2.39	0.60	2.22	3.44	0.23

Table 1.