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Department of Agriculture for Northern Ireland

Aquatic Sciences Research Division

Cruise Report: LF 14 94 Ichthyoplankton Survey of the Irish Sea

Vessel: R V *Lough Foyle*

Dates: 17 - 21 May 1994

Area of Operation: North Western Irish Sea; ICES Division VIIa

Type of Survey: Plankton sampling and oceanography

Personnel:

Mark Dickey-Collas	DANI	SIC (HSO)
Willie McCurdy	DANI	SSO
Michael McAliskey	DANI	SO
Gillian McCullough	DANI/QUB	student

Objectives

1. To sample the ichthyoplankton of the western Irish Sea, to determine species distributions and abundance's.
2. To collect samples for primary increment analysis of gadoids to investigate larval growth in the Irish Sea.
3. To test the new Pronet system and Lebus winch for real time monitoring of the high speed plankton sampler, and to test modifications to the MIK net.
4. To sample the zooplankton in areas of high fish larval density and collect data on the abundance of other important organisms in the western Irish Sea, such as euphausiids, arrow worms and *Nephrops* larvae.
5. To collect samples, with the PUP net for analysis of nauplii densities for the DANI/QUB MSc studentship.

6. To carry out a fixed 24 hour station to investigate the variation in catch data whilst sampling the same patch of water.
7. To collect samples for nutrient, chlorophyll, C and N analysis at 5 fixed stations.

Cruise Narrative

Monday 16 May 1994

The ship departed Belfast dock at 21:45, with all crew and scientists aboard.

Tuesday 17 May 1994

The ship arrived at station 3 (Figure 1) at 00:33 and the CTD and water bottle rosette were deployed. Then the high speed plankton sampler was deployed. However within the first 3 seconds of deployment, the signal from the sampler failed. The sampler was retrieved and all the connections were cleaned and checked. Still no signal passed through the winch to the monitoring system, so at 02:00 the ship began back to Belfast. The ship anchored off Bangor for two hours and docked in Belfast at 08:30.

Mr Bill Clarke was contacted with regards to the problem, and on his arrival he discovered that a fault in the slip-ring of the winch had lead to the signal failure. This was easily rectified, and the ship sailed at 10:00 with Mr Clarke onboard for a test run in Belfast Lough. The test ran successfully and the ship returned to dock. Mr Clarke disembarked at 14:00.

The ship then sailed for station 1 (Figure 1) and arrived at 16:00. Due to problems with the new winch cable, caused by lack of tension during the original spooling onto the drum, 650m of weighted cable was let out and successfully recoiled. One CTD deployment and three plankton sampler hauls were executed and the ship sailed for

The zooplankton was dominated by the copepods *Temora* and *Pseudocalanus*. Larger species such as *Acartia*, *Centropages* and *Metridia* were also common. Stations 41 and 45, at the very south east of the grid, gave very small catches and the copepods appeared very pale, (suggesting a different^t or lacking food source). As expected *Temora* were more common at the coastal stations (Figure 4) whereas *Pseudocalanus* were found throughout the region. The north channel had large numbers of *Metridia*, and the southern region (eg stations 37 and 45) seemed to rich in *Acartia*.

Chaetognaths (arrow worms) were common throughout the region (Figure 5) but were present in much higher densities to the south of the Isle of Man. *Nephrops* larvae were most abundant off the Mournes, 20 miles off Dublin and off Strangford Lough (Figure 6).

Larval fish growth, plankton analysis and PUP net (fine mesh) analysis will take place in the laboratory.

The 24 hour station showed that there is either a great deal of variation in the sampling technique, or in the marine ecosystem, or both (table 1). At station 18 the catch of fish larvae is within the same order of magnitude, but the *Nephrops* larvae and arrow worms data show a high degree of variation (two orders of magnitude).

Acknowledgements

The master, and his crew, must be praised for their^{ur} hard work, help and humour throughout the week. The cruise would not have been so successful but for their ardour and advice. The scientific staff were exceptional in their work, coping with difficult hours and conditions and learning new skills very quickly. Their work was thorough, efficient and very productive. Mr Bill Clarke must also be thanked for his constant help throughout the cruise, he was always present, either in body or on the end of a telephone.

Signed

SIC *M. Collins*

Date *23/5/94*

Master *[Signature]*

Date

Division Head *[Signature]*

Date *1/6/94*

Figure 1 Station positions during LF1494

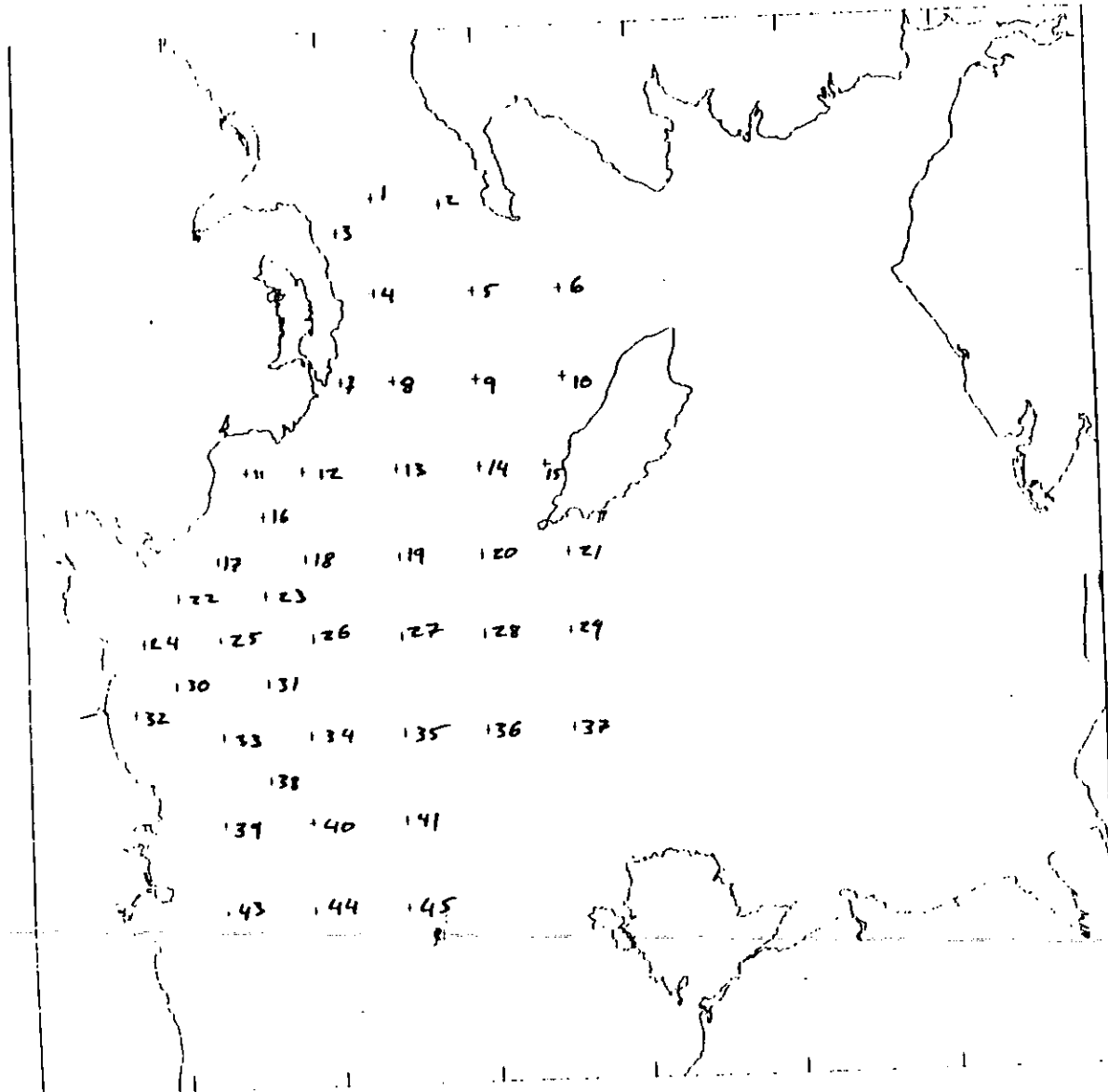
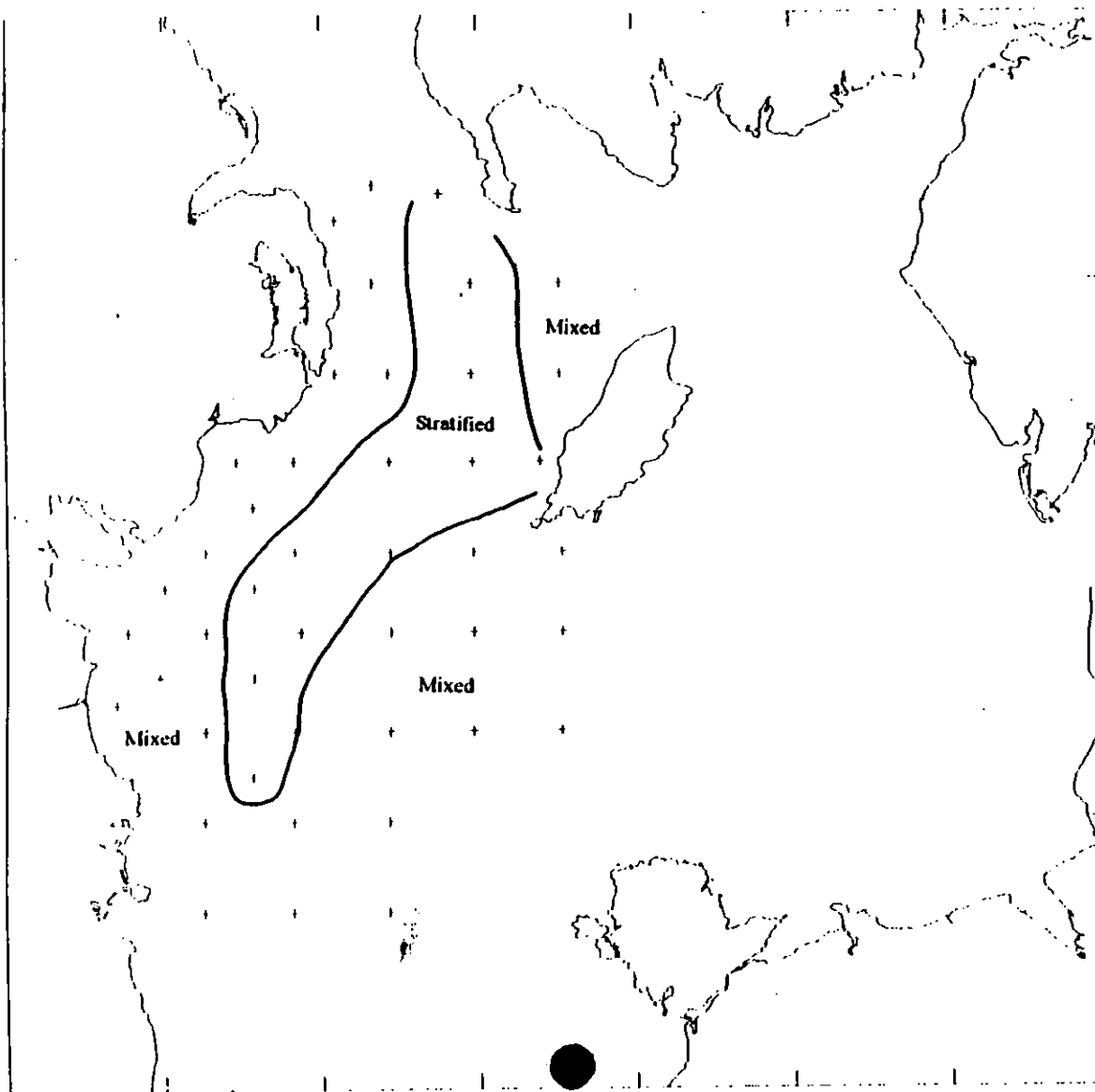


Figure 2

Region showing signs of water column stratification during the cruise LF1494, in May 1994.

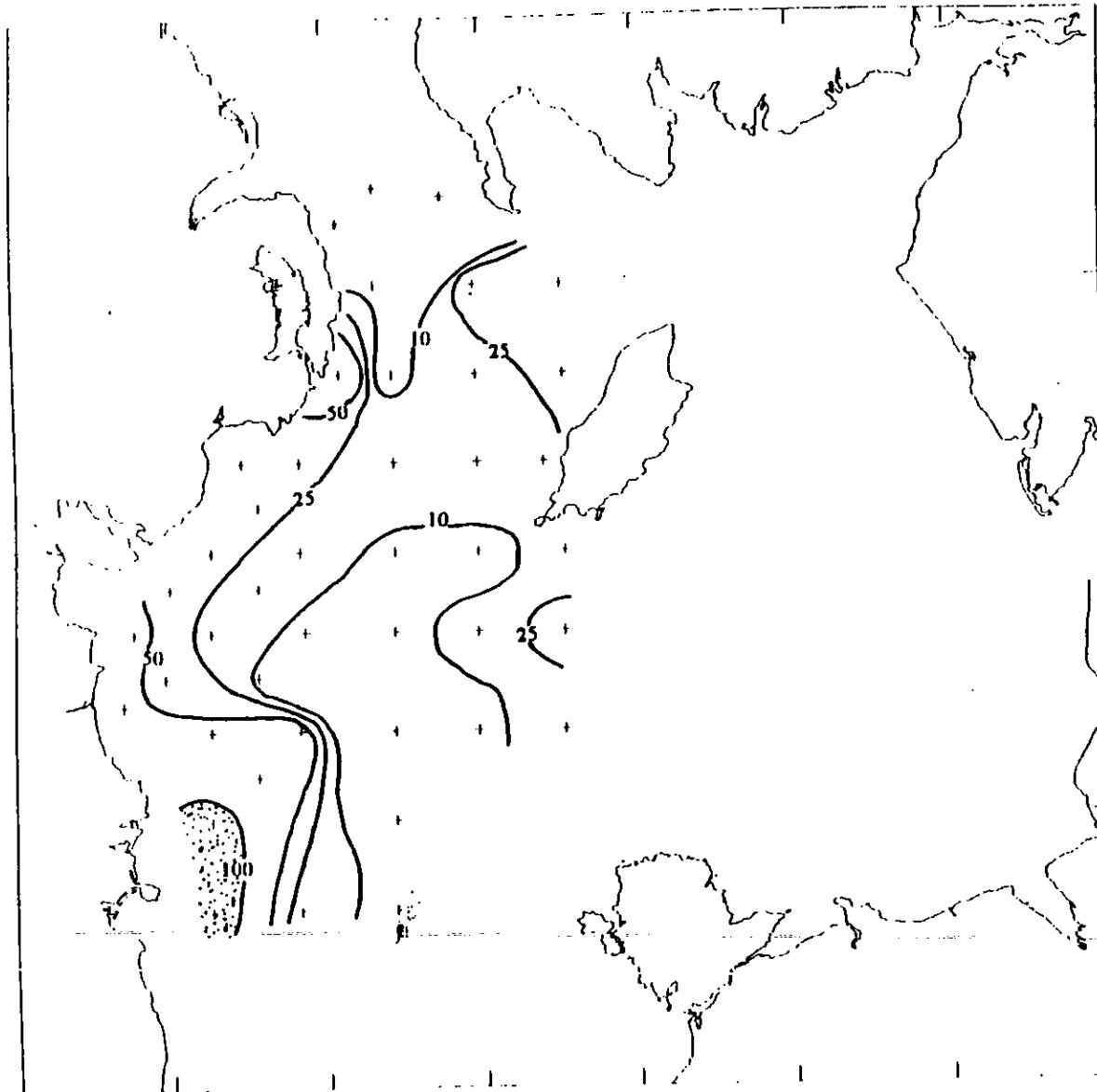


Based on the presence of a thermocline showing a greater than 1.5°C change in temperature.

198
369

Figure 3

Approximate numbers of fish larvae per m² caught on the cruise LF1494, May 1994



Maximum catches:
Strangford Lough 57 per m²
River Boyne to Skerries 69 per m²
Dublin 261 per m²

Figure 4 Dominant calanoid copepods at 6 stations of LF1494

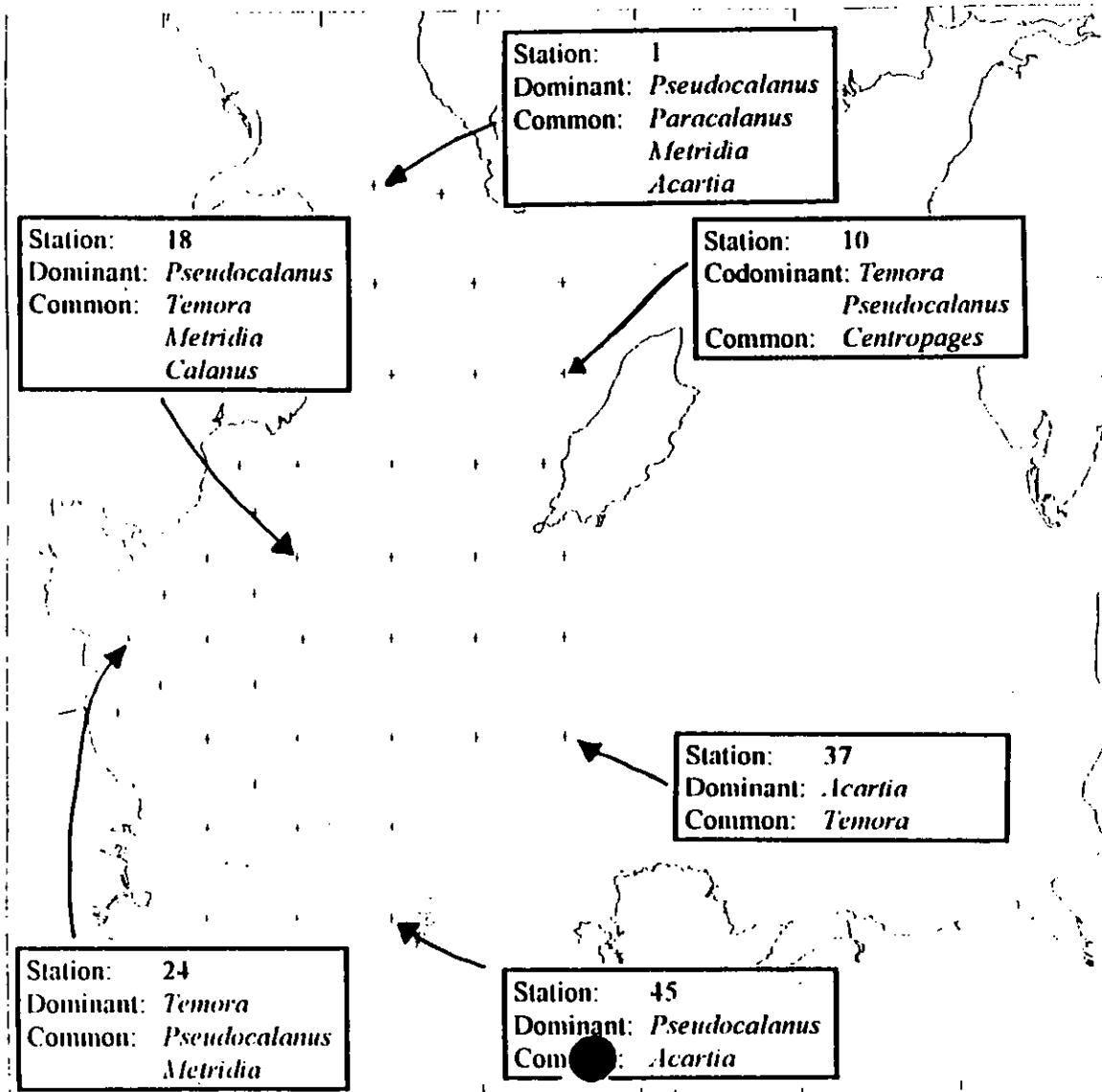
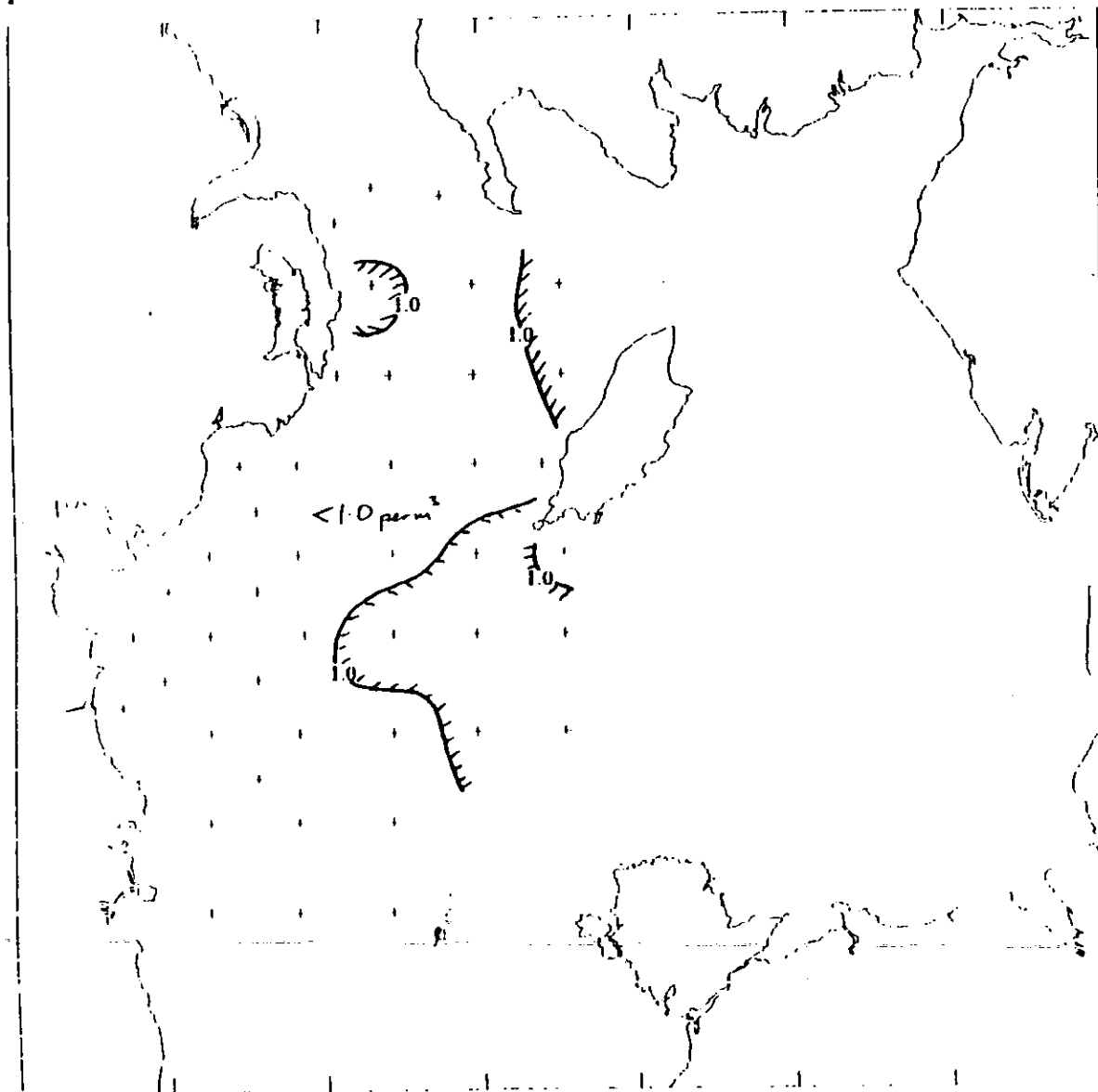


Figure 5

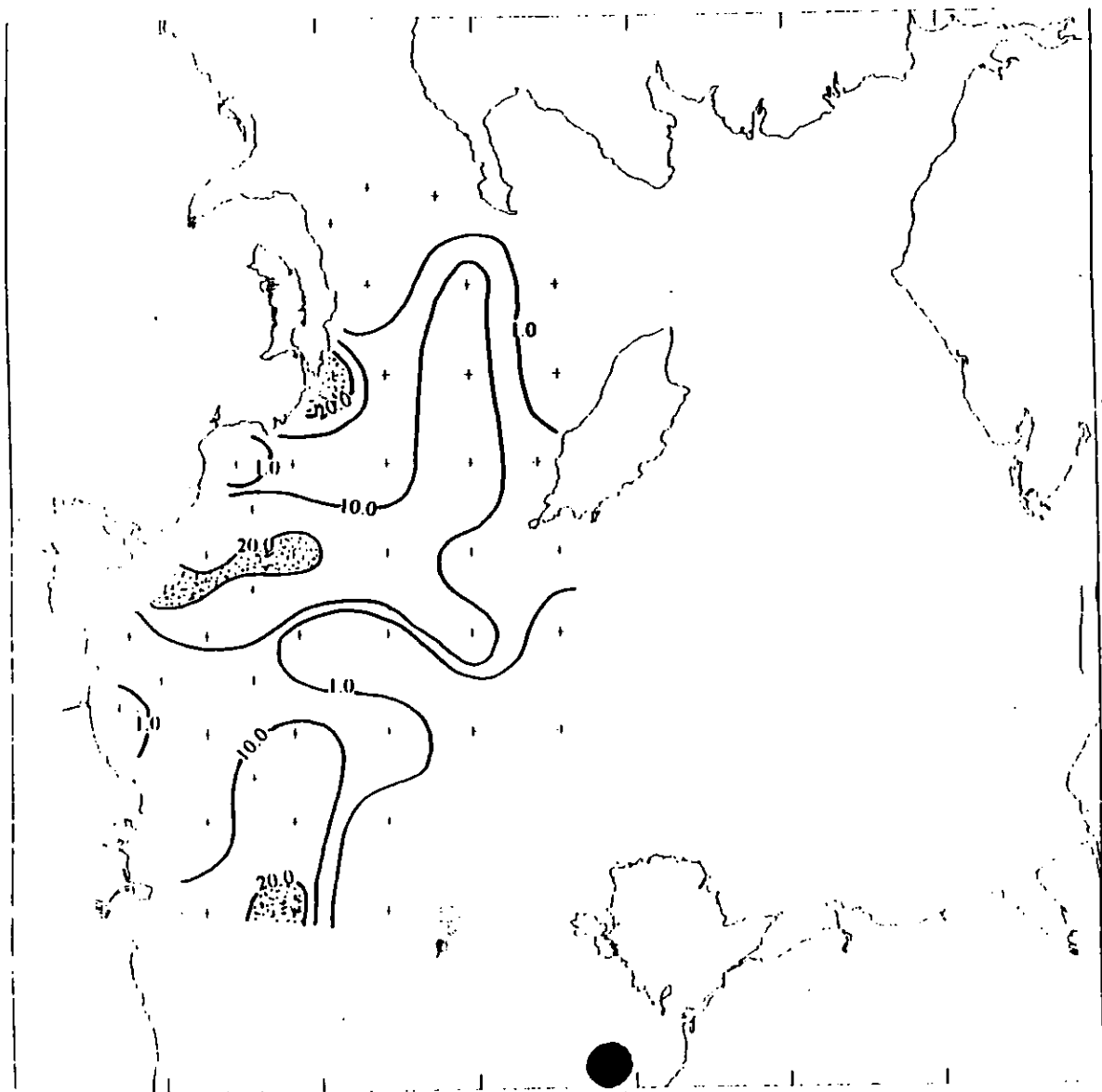
Approximate numbers of chaetognaths per m³ caught on the cruise LF1494, May 1994



372

Figure 6

Number of *Nephrops* larvae per m² caught on the cruise LF1494, May 1994



Maximum catches:

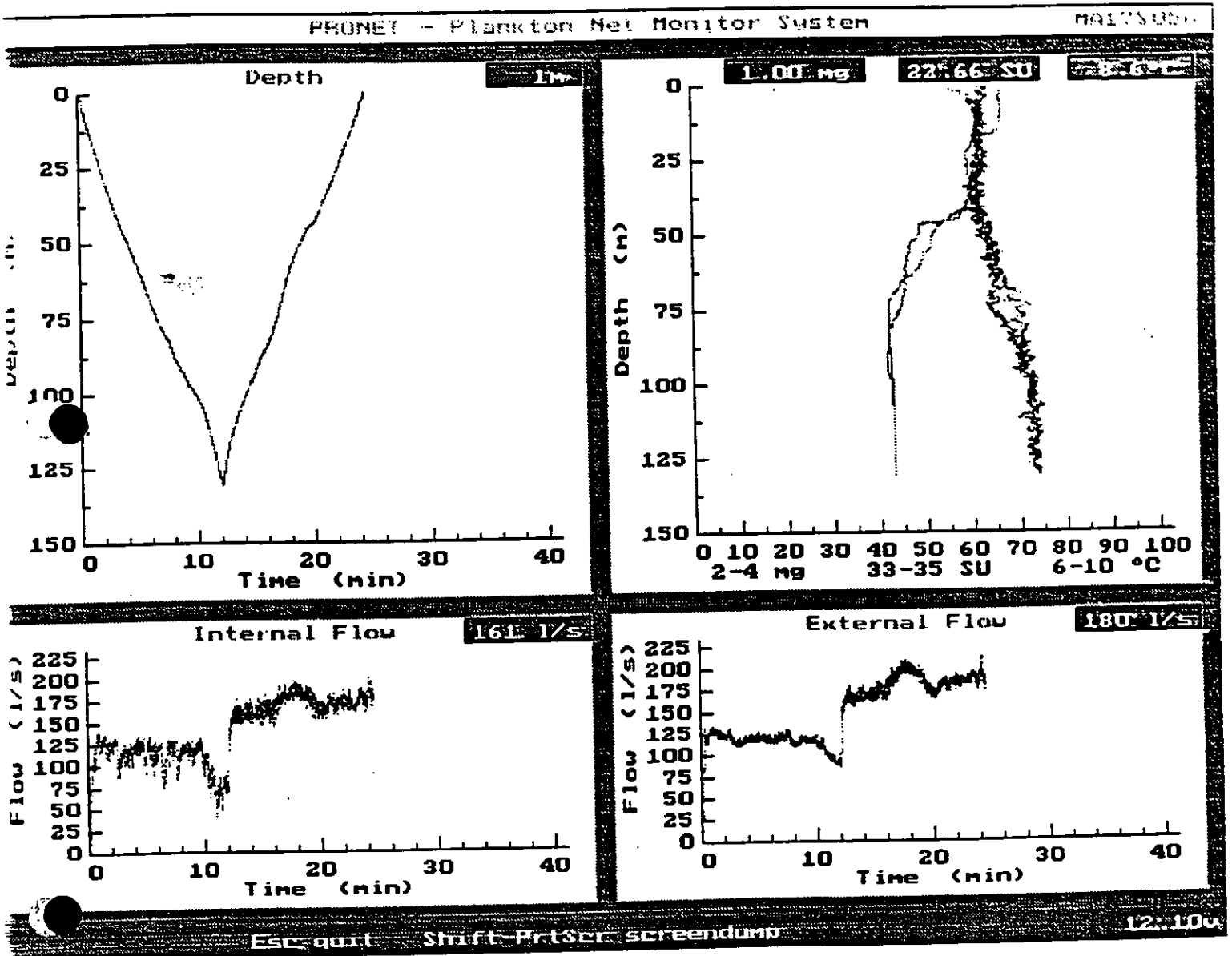
Strangford Lough 25 per m²

Mournes 44 per m²

Dublin 41 per m²

Table 1 Density of fish larvae, *Nephrops* larvae and arrow worms, taken over the 24 hour sampling cycle at station 18 during LF1494.

Time	fish larvae per m3	<i>Nephrops</i> larvae per m3	arrow worms per m3
22:30	0.129	0.027	0.354
00:00	0.424	0.064	0.184
01:30	0.355	0.063	0.278
03:00	0.553	0.073	0.430
04:30	0.342	0.221	1.340
06:00	0.457	0.496	1.341
07:30	0.251	0.182	0.559
09:00	0.214	0.156	0.817
10:30	0.224	0.200	0.648
12:00	0.339	0.216	1.170
13:30	0.407	0.168	1.291
15:00	0.406	0.150	0.556
16:30	0.173	0.110	0.189
18:00	0.311	0.211	1.380
19:30	0.282	0.231	0.603
21:00	0.199	0.182	0.658
mean	0.317	0.172	0.737
stand. dev	0.116	0.108	0.432
Coeff Var (%)	36.5	62.3	58.6



PRONET - TOTAL VOLUME FILTERED

File Name	MA17S05A
Internal (m3)	205.6
External (m3)	217.4
Int/Ext*100 (%)	94.6

	Int Flow (l/sec)		Ext Flow (l/sec)		Temperature (oC)		Salinity (PSU)		Chlorophyll (mg/m3)	
	Down	Up	Down	Up	Down	Up	Down	Up	Down	Up
8	176	13	183	8.46	8.63	16.37	24.66	1.0	1.0	
61	179	75	186	8.47	8.64	34.16	34.26	1.0	1.0	
70	178	87	194	8.47	8.65	34.15	34.23	1.0	1.0	
85	189	107	205	8.47	8.65	34.21	34.25	1.0	1.0	
91	195	116	204	8.47	8.64	34.21	34.25	1.0	1.0	
100	185	126	196	8.47	8.64	34.18	34.26	1.0	1.0	
105	174	123	186	8.48	8.65	34.21	34.23	1.0	1.0	
111	174	118	182	8.48	8.65	34.24	34.22	1.0	1.0	
104	172	118	181	8.47	8.65	34.18	34.24	1.0	1.0	
106	173	118	187	8.47	8.65	34.23	34.24	1.0	1.0	
117	179	121	190	8.47	8.66	34.24	34.24	1.0	1.0	
127	183	126	190	8.47	8.64	34.23	34.22	1.0	1.0	
132	185	129	192	8.47	8.65	34.23	34.23	1.0	1.0	
132	178	130	188	8.44	8.63	34.24	34.26	1.0	1.0	
131	176	129	187	8.43	8.64	34.23	34.23	1.0	1.0	
123	172	128	186	8.43	8.61	34.22	34.22	1.0	1.0	
126	167	128	185	8.44	8.60	34.22	34.23	1.0	1.0	
126	165	127	184	8.44	8.51	34.24	34.25	1.0	1.0	
131	166	128	184	8.41	8.45	34.22	34.22	1.0	1.0	
132	167	127	183	8.40	8.45	34.24	34.24	1.0	1.0	
127	170	126	186	8.39	8.43	34.24	34.25	1.0	1.0	
117	173	124	186	8.37	8.45	34.23	34.24	1.0	1.0	
119	176	125	184	8.35	8.45	34.22	34.25	1.0	1.0	
119	174	124	184	8.35	8.44	34.23	34.25	1.0	1.0	
113	172	122	184	8.36	8.43	34.22	34.26	1.0	1.0	
118	173	123	183	8.36	8.43	34.26	34.22	1.0	1.0	
123	175	123	185	8.36	8.43	34.25	34.23	1.0	1.0	
123	172	122	182	8.37	8.42	34.23	34.24	1.0	1.0	
125	173	123	183	8.37	8.41	34.25	34.24	1.0	1.0	
123	173	121	183	8.37	8.41	34.24	34.23	1.0	1.0	
128	173	122	184	8.38	8.41	34.21	34.22	1.0	1.0	
130	172	125	181	8.38	8.40	34.22	34.22	1.0	1.0	
121	170	125	180	8.39	8.39	34.21	34.22	1.0	1.0	
102	168	123	178	8.37	8.40	34.20	34.25	1.0	1.0	
95	171	120	180	8.37	8.40	34.20	34.23	1.0	1.0	
100	173	118	183	8.38	8.40	34.23	34.21	1.0	1.0	
104	175	117	183	8.38	8.40	34.24	34.24	1.0	1.0	
113	177	115	182	8.38	8.39	34.23	34.22	1.0	1.0	
117	174	115	181	8.35	8.38	34.23	34.22	1.0	1.0	
117	167	114	179	8.35	8.38	34.22	34.21	1.0	1.0	
118	166	114	178	8.35	8.36	34.24	34.23	1.0	1.0	
112	162	115	174	8.33	8.33	34.19	34.23	1.0	1.0	
111	166	114	169	8.31	8.30	34.22	34.24	1.0	1.0	
112	166	114	170	8.31	8.25	34.22	34.25	1.0	1.0	
113	165	113	173	8.24	8.22	34.20	34.24	1.0	1.0	
121	169	116	177	8.09	8.19	34.25	34.24	1.0	1.0	
118	173	117	181	7.96	8.16	34.28	34.24	1.0	1.0	
109	171	117	184	7.94	8.13	34.27	34.26	1.0	1.0	
120	178	118	188	7.94	8.10	34.24	34.29	1.0	1.0	
125	177	120	189	7.94	8.08	34.25	34.25	1.0	1.0	