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BIOLOGICAL OCEANOGRAPHY CRUISE REPORT LF/31/93 22-25 NOV 1993

PERSONNEL

B Stewart	SSO (SIC)
C Gibson	SPSO
P Elliott	SO
S Bloomfield	ASO
S Thomson	Student
G McCullough	Student

CRUISE OBJECTIVE

To map temperature, salinity and nutrient distributions in the NW Irish Sea and also to assess an operational protocol for the multi spectral light meter.

CRUISE NARRATIVE

Tuesday 23 November 1993

The vessel departed Belfast harbour at 0645 hrs to arrive at station 4 (see attached sampling grid) in the North Channel at 0915 hrs. The weather was dry with a light force 2-3 south east wind. The vessel proceeded southwards along a grid of sampling stations to arrive at station 45 at 2055 hrs. Work was completed at 2230 hrs and overnight in a strengthening south easterly wind the vessel sailed slowly in a north westerly direction towards station 36.

Wednesday 24 November 1993

The survey continued from station 36 at 0700 hrs and departed in a southerly direction along a sampling grid of coastal stations to arrive on station 59 at 1100 hrs. Weather conditions were overcast with heavy rain in a strong south easterly wind. An attempt to sample the open sea stations 62, 57 and 49 was abandoned owing to heavy seas in a force 7-8 south easterly wind. As no shelter was available in the immediate area the vessel then sailed in a northerly direction to station 46 where severe weather conditions prevented deployment of the rosette water sampler and zooplankton nets. The survey continued on a northerly course "surface mapping" through station 33 and eventually moderating weather conditions permitted deployment of the water sampler and zooplankton nets at stations 22, 15 and 14. The vessel continued north to dock in Belfast at 2200 hrs.

Thursday 25 November 1993

Equipment was dismantled and packed for removal to ASRD Newforge Lane. The scientific crew disembarked at 1300 hrs.

PARAMETERS MONITORED

The entire cruise track was surface mapped for nutrients, temperature, salinity and fluorescence at approximately one mile intervals and chlorophyll a at approximately five mile intervals. At stations on the sampling grid, where weather conditions permitted, the CTD/rosette water sampler was deployed to acquire nutrient, chlorophyll a, temperature, salinity and fluorescence data from the depth profile. Duplicate vertical zooplankton hauls were also taken from these stations and underwater light measurements were made using a multi spectral light meter at stations 4, 16, and 26. Algal samples were taken at stations 4, 16, 26, 38, 45 & 47 and stored frozen for carbon/nitrogen analysis. The Bowers & Connelly corer was successfully deployed at stations 38, 45 & 47 where sediment samples were acquired and stored for C/N and chlorophyll a analysis with a further sample from each station stored preserved with formalin for benthic assessment.

SUMMARY OF RESULTS

From the acquired nutrient and CTD profile data the entire survey area was found to be mixed from surface to bottom with a typical temperature and salinity of 11.7 ^{o}C and 34.20 ppt for the open sea; 9.0 ^{o}C and 33.60 ppt for the coastal area south of Dundalk Bay and 11.0 ^{o}C and 34.30 ppt respectively for the county Down coastal area. Surface mapped nutrients were fairly constant throughout the open sea, North Channel and northern coastal stations; typical inorganic nitrogen range 5.0-6.5 μm N l^{-1}, a modest increase in 1993 Sept/Oct values. However the southern coastal stations 36, 47, 48 & 59 showed typical values 9.0-12.0 μm N l^{-1}, similar to the 1992 winter maxima and a significant increase over the 1993 Sept/Oct values typically 2.0-4.0 μm N l^{-1}.
Several experimental underwater light profiles were carried out using the multi spectral light meter in order to establish a standard operational protocol for the system. Excellent under water light profiles were obtained when the multi spectral sensor was positioned 2 metres below the surface and measurements recorded over 100 seconds as the sensor was slowly lowered to a depth equivalent to approximately twice the Secchi disc reading. It was decided to adopt this protocol for underwater light measurements on future surveys.

PROBLEMS ENCOUNTERED AND REQUIRING IMMEDIATE ATTENTION

Major problems were encountered with the ammonia method on the TRAACS nutrient analyser which I was unable to resolve at sea. As a result ammonia data was not acquired during the cruise. The problem will be fully investigated in December when TRAACS is returned to the ASRD laboratory for service.

I was unable to carry out temperature checks on the Hydro-Bios CTD as mounting brackets required to attach reversing thermometers to the rosette water sampler are still outstanding from the suppliers Duncan & Associates.

During a period of severe weather on Wednesday 24 November, chemical solutions spilled from the TRAACS reagent cabinet. The dilute solutions present a minimal hazard and were quickly contained by absorbant paper and cleaned up. I have approached Mr Clarke about fitting additional mountings and fixtures to ensure extra stability of the cabinet and reagent bottles during rough sea conditions. He has agreed to give this matter his attention when TRAACS is returned to the laboratory for service in December.

The operation of the GOP CTD software was arrested during the cruise owing to lack of memory on the Tandon computer hard disk. A small number of files were deleted to allow the CTD to continue operating. Dr Gowen has been informed and will decide the extent of further file deletions.

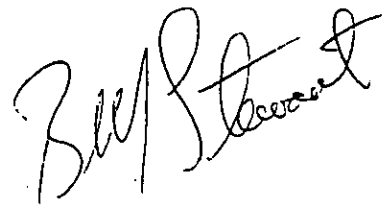
In the early part of the cruise dubious salinity values were displayed from the "bin" mounted WS Oceans CTD; typically 32.2 ppt in the North Channel (Hydro-Bios CTD, 34.09 ppt). As a check the CTD was removed from the bin and used to profile 0-10 metres at station 16. The resulting salinity values were compared to values obtained from the rosette mounted Hydro-Bios CTD.

DEPTH metres	HYDRO-BIOS SALINITY ppt	WS OCEANS SALINITY ppt	HYDRO-BIOS TEMP ^{o}C	WS OCEANS TEMP ^{o}C	WS OCEANS COND' mS cm^{-1}
1	34.16	34.8	11.81	11.4	39.2
3	34.16	34.8	11.81	11.4	39.2
5	34.16	34.9	11.81	11.4	39.2
7	34.16	34.9	11.81	11.3	39.2
10	34.16	34.9	11.81	11.1	39.2

When the WS Oceans CTD was replaced in the bin the salinity indicated 34.68 ppt (Hydro-Bios CTD, 34.16 ppt); a salinity difference similar to that observed when in the profiling mode. It is difficult to explain the low salinity value recorded by the WS Oceans system in the North Channel or why when the system was replaced in the bin after profiling the salinity reading should suddenly increase from 32.2 to 34.7 ppt. I have experienced this type of problem on previous cruises with the WS Oceans system which incidently has just been returned from the manufacturers following a calibration check and as such the value of the data obtained from the "bin" mounted CTD system must be questioned.

ACKNOWLEDGEMENTS

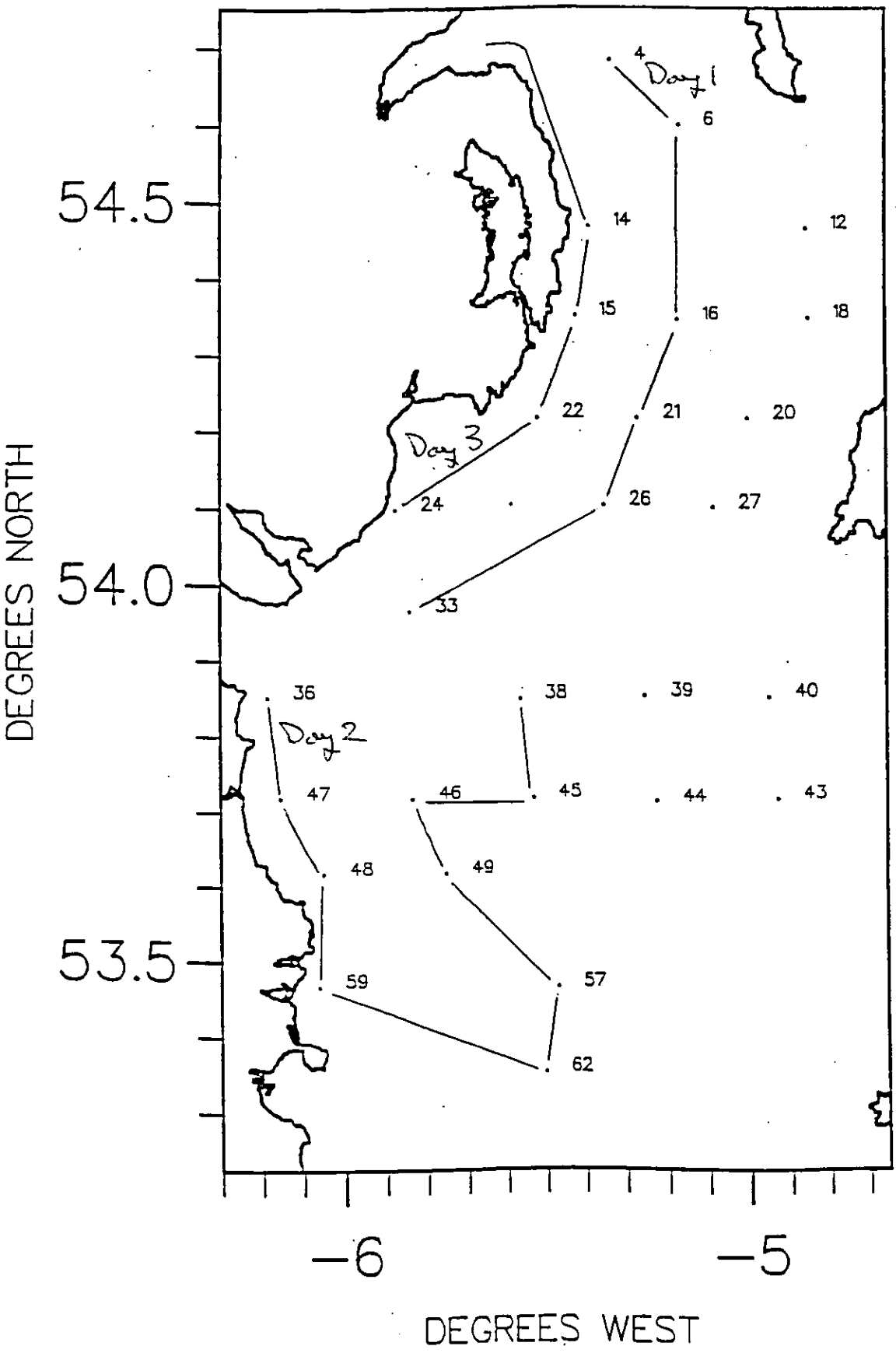
The ships's master, officers, engineers, catering staff and crew are thanked for their cooperation during this cruise.



BM STEWART

29 November 1993

Proposed cruise track 23-26 Nov '93



BIOLOGICAL OCEANOGRAPHY CRUISE LF3193, 23-26 November 1993

PROPOSED WORK SCHEDULE

Day 1	Station	Lat.	Long.	Activity
	4	54 41	05 20	CTD,zoopl,Secchi,light,C/N
	6	54 36	05 10	CTD,zoopl,Secchi
	16	54 21	05 10	CTD,zoopl,Secchi,light,C/N
	21	54 13	05 16	CTD,zoopl,Secchi
	26	54 06	05 21	CTD,zoopl,Secchi,C/N
	33	53 58	05 50	CTD,zoopl,Secchi
Day 2	36	53 51	06 11	CTD,zoopl,Secchi
	47	53 43	06 09	CTD,zoopl,Secchi,light,C/N,corer
	48	53 37	06 03	CTD,zoopl Secchi
	59	53 28	06 03	CTD,zoopl,Secchi
	62	53 21	05 30	CTD,zoopl,Secchi,light,C/N
	57	53 28	05 28	CTD,zoopl,Secchi,C/N
	49	53 37	05 45	CTD,zoopl,Secchi
	46	53 43	05 50	CTD,zoopl,Secchi
	45	53 43	05 32	CTD,zoopl,Secchi,light,C/N.corer
	38	53 51	05 34	CTD,zoopl,Secchi,light,C/N,corer
Day 3	24	54 06	05 52	CTD,zoopl,Secchi,light,C/N
	22	54 13	05 31	CTD,zoopl,Secchi
	15	54 21	05 25	CTD,zoopl,Secchi
	14	54 28	05 23	CTD,zoopl,Secchi