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RLA 10334

CENTRE FOR ENVIROMENT, FISHERIES AND AQUACULTURE SCIENCE LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 OHT

1998 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 9b/98

STAFF:

M R Vince	A J Winpenny
L E Woolner	J Ellis
M J Boon	B F M Harley (Part 2)
I D Holmes	M J Brown (Part 1)
K S Leonard (Part 1)	B Taylor
D McCubbin (Part 1)	I T McMeekan

DURATION: Left Swansea 0915 h 8 September
Arrived Liverpool 1550 h 28 September
(All times are Greenwich Mean Time)

LOCATION: Irish Sea (VIIa), Bristol Channel and Celtic Sea (VII f & g)

AIMS:

1. To carry out the annual beam-trawl survey of groundfish in the Irish Sea, Bristol Channel and Celtic Sea.
2. To collect data on maturity and weight at age of sole, plaice and lemon sole.
3. To determine the distribution and relative abundance of juvenile and adult sole and plaice.
4. To quantify the seabed sediments and epibenthos using the QTC acoustic seabed discrimination system and trawl by-catch.
5. To collect fish samples in support of other CEFAS projects and training courses.
6. To collect and process surface sea water for the analysis of ^{99}Tc and Cs radionuclides as part of the Irish Sea project. (A 1217)
7. To collect sediment cores for analysis of accumulation of ^{99}Tc and Cs radionuclides in the Irish Sea. (A1217)
8. To collect surface sea water samples for processing on return to Lowestoft for the analysis of tritium. (AE001) (BD Smith EG 1)
9. To collect live plaice and sole for transportation by a local fishing boat to the laboratory at Conwy. (S. Baynes)

NARRATIVE:

CORYSTES sailed from Swansea at 0915h on 8 September and started the beam trawl survey at 1100h. Four hauls were completed before nightfall when CORYSTES commenced the tritium surface water sampling stations positioned mid-channel between Barry and Avonmouth. Next morning 2 trawl hauls were completed before strong north-westerly winds forced CORYSTES to dodge and eventually anchor at 2130h in Barafundle Bay. Gale force westerly winds persisted throughout the

following day but finally abated to allow the survey to recommence on the morning of 11 September. During the night the coastal tritium surface water sampling stations were completed. On 12 and 13 September 16 of the remaining 17 trawl stations in the Bristol Channel Inner section were completed despite strong north-westerly winds.
During the night CORYSTES steamed round to Cardigan Bay, but continuing strong winds prevented work until the afternoon when 4 tows were made. With the prospect of a short spell of settled weather it was decided to steam overnight to the north-east Irish Sea where many of the important trawling and radionuclide sampling stations were situated. On 15 September 6 trawl stations and 8 environment sampling stations were completed before gale force north-westerly winds returned.
The following day, with no prospect of completing the trawl and environmental stations to the south-west of the Isle of Man, CORYSTES carried out 6 inshore trawl stations off the east coast of Northern Ireland and Eire. Calm conditions on Thursday 17 provided the opportunity to carry out the water and sediment sampling stations located to the south-west of the Isle of Man, in addition to the trawl stations in the same area. All went well until the third deployment of the Precision CTD; with recovery almost complete and the instrument at the surface, the cable parted allowing the complete rig to return to the seabed. In the absence of suitable gear to attempt recovery, CORYSTES continued with the rest of the planned day's work. On Friday 18 a start was made on the survey trawl tows in Irish Sea South sector. The following day after completing two tows south of the Isle of Man, CORYSTES steamed to Douglas where she docked at 0910 h. The remainder of the day was spent taking stores, water and gear for the attempt at recovery of the CTD.
On Sunday 20 at 0830h with the change of staff and gear complete, CORYSTES steamed to the first trawl station positioned off the Solway Firth. By the evening 4 survey tows had been completed off southern Scotland before the ship began a grid of 6 surface water sampling stations. The following morning with exceptionally fine weather predominating CORYSTES commenced the search and recovery of the CTD, which was located on arrival at the last recorded position. Recovery proved to be more difficult, and despite repeated attempts with both trawl and grapple, was not successful although the CTD was seen on the sounder on each deployment of the trawl.
The next morning the trawl survey was recommenced and continued in the hours of daylight until the evening of 27 September with the last station off south east Ireland. CORYSTES returned north through the Irish Sea to Liverpool where she docked at 1550 h 28 September.

RESULTS:

Aims 1, 2 and 3.
The trawl survey covering the Bristol Channel, Celtic Sea and Irish Sea is divided into 7 sectors, amounting to a total of 120 half-hour tows. On this cruise 101 valid hauls were completed covering 6 of the 7 sectors. Only 1 tow was missed from the stations used in the plaice and sole recruitment estimation for VIIa and VIIf+g stocks. Strong wind, the additional stations to sample radionuclides and the loss of the precision CTD contributed to an effective reduction of about 5 days fishing survey time.
The survey was carried out using the usual 4m beam-trawl fitted with a 40mm cod-end liner. A track chart indicating trawl stations is attached. All station details, fish catch length distributions, and biological data were input to the Fishing Survey database.

Surface temperature and salinity readings were logged at every station and a CTD profiler was used at the first and last trawl station on most days. A water sample was collected for salinity calibration purposes at each CTD station. The QTC seabed discrimination system was used on all but the deepest trawl stations.
All fin-fish and selected commercial crustaceans were identified to species, weighed and measured. Length stratified samples of otoliths were taken from selected species. (Table 1) All otolithed fish were sexed, and assigned a maturity stage, and all except whiting were weighed individually.
Catches of sole in the Bristol Channel Inner sector were higher than in any previous survey since 1988, but until all the otoliths are aged individual year class strengths cannot be estimated. In the Irish Sea sectors (ISS and ISN) the numbers of sole were higher than the survey mean for the years 1988 to 1997. Plaice catch rates in both the Bristol Channel Inner sector and Irish Sea were about average for the survey series.
Approximately half the sole and plaice otoliths taken from the Bristol Channel sector (BCI) were read during the day spent trying to recover the precision CTD.

Aim 4.
The benthic by-catch for all beam trawl stations was analysed and the numbers and/or biomass of invertebrates were recorded. Stations in the deep waters south of the Isle of Man and off south-east Ireland had a high diversity of echinoderms, with 10-12 species recorded per station. Three of these species (*Leptasterias, Solaster* and *Stichastrella*) had not been recorded during the 1997 survey. Stations in St. George's Channel were particularly rich for macro-epibenthic crustaceans, with 14-15 species recorded per station. Large numbers of *Scyliorhinus canicula* egg-cases (ca. 300) were recorded in one haul in the northern Bristol Channel and were mostly attached to *Alcyonium digitatum*.
Starfish (*Asterias rubens*) were observed from all but seven stations and the percentage of *Asterias* with signs of arm loss/damage was recorded. The lowest recorded value (<1%) occurred on a *Flustra* bed near Morecambe Bay, whereas sites in the Bristol Channel and Liverpool Bay contained higher rates of damage (22-26%). Hauls where large number of Queen scallops were recorded also had high levels of starfish arm damage (19%).

Aim 5.
Samples of commercial-sized dab, plaice, sole, and whiting were frozen for A. Franklin (FATE Burnham).
All lesser weevers (*Echiichthys vipera*) were frozen for R. Nash (Port Erin)
Length, wing width, weight and maturity of all rays caught were recorded. (M. Vince)
The spiral valve and a sample of liver were taken from 20 smooth hounds (*Mustelus spp.)* (J. Ellis).
Specimens of 32 selected species of fish were frozen for fish identification courses (T. Watson)
Bags of small crabs were frozen for lobster feeding (R. Turner)
A sample of 55 commercial sized male plaice were otolithed to augment Irish Sea market smples.(M. Vince)
Anglerfish (*Lophius piscatorious*) were sampled for otoliths and vertabrae for aging studies (T. Watson)

Aim 6.
Surface sea water samples of 50 litres were collected from 76 stations in the Irish Sea and passed through ion exchange columns to extract ^{99}Tc and Cs radionuclides.
The precision CTD was deployed successfully on 10 stations to obtain a temperature and salinity profile and large volume surface and bottom water samples. This was carried out to determine the accumulation of ^{99}Tc due to summer stratification.
Aim 7.
The Reineck corer was deployed on 13 stations in the Irish Sea to obtain samples of bottom sediments for the analysis of accumulation of ^{99}Tc and Cs radionuclides with depth.
In addition a late request resulted in one further core sample from Muddy Hollow in Tremadoc Bay. The core (for R. Law-CHEM. Burnham) was sliced, as requested.
Aim 8.
A total of 37 samples (1 litre) of surface sea-water were collected in the Bristol Channel for the analysis of tritium.
Aim 9.
Four additional hauls to those of the survey were used to collect about 40 live plaice and 90 live sole that were later transferred to a local fishing vessel for transport to the laboratory at Conwy.

It should be noted that this is probably the first time that CORYSTES has been used for such a 'multi-disciplinary' cruise. The use of the large Portacabin for processing water worked well and both laboratory teams benefitted from the experience.
Our thanks go to all officers and crew on CORYSTES for their help and support in all aspects of the work.

M. R Vince

INITIALLED: MGP

SEEN IN DRAFT:
A. R. Williams, Master
R. Graham, Senior Fishing Mate.

DISTRIBUTION:
Basic List +

M R Vince	A J Winpenny
L E Woolner	J Ellis
M J Boon	B F M Harley
I D Holmes	M J Brown
K S Leonard	B Taylor
D McCubbin	I T McMeekan

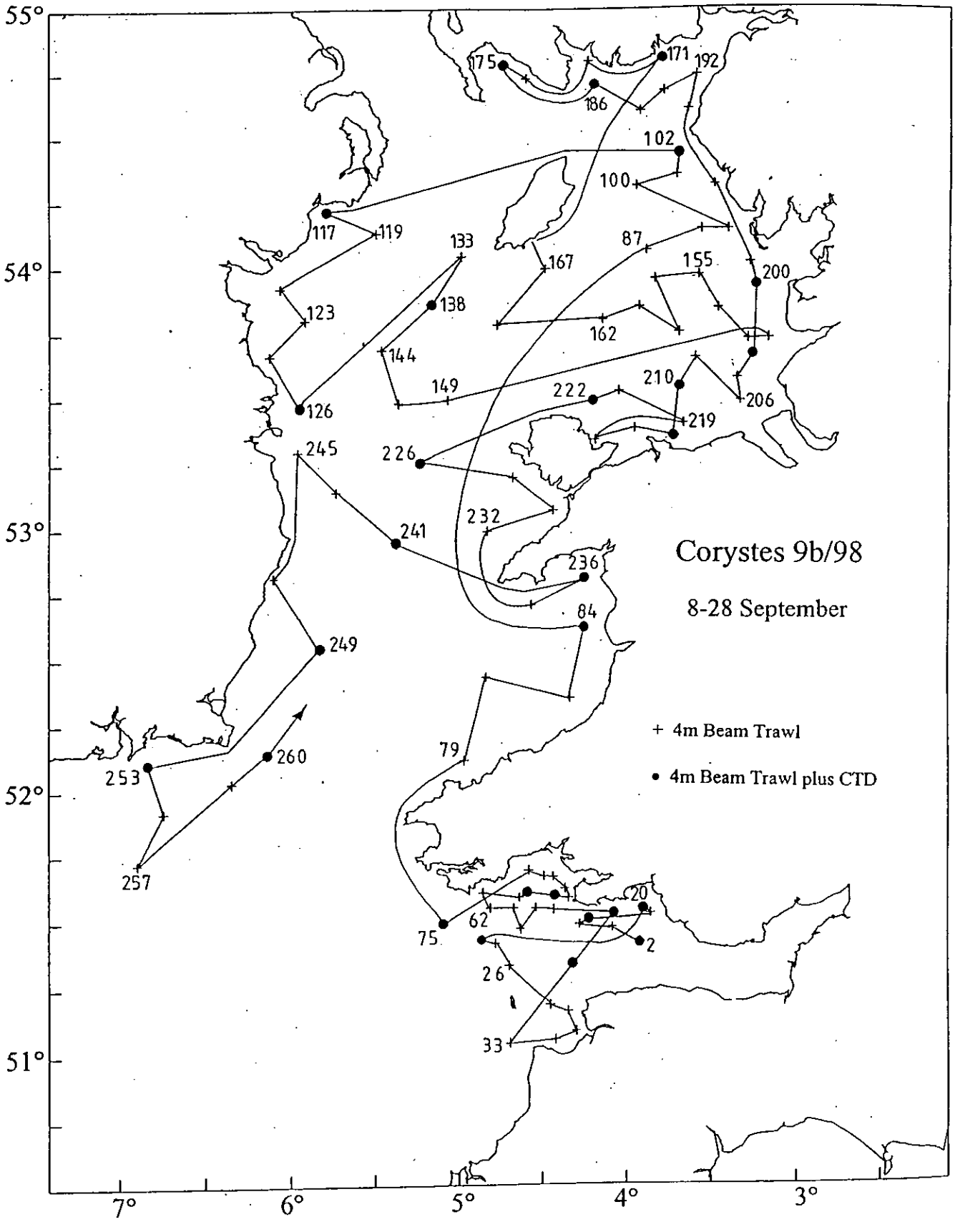
M J Armstrong (DANI, Belfast)
P Connolly (DOM, Dublin)
FCO (for Republic of Ireland)
Sea Fisheries Committees:

Cumbria.	Devon
North Western and North Wales.	Cornwall.
South Wales.	

Table 1

Corystes 9b/98 Otolith tally

		ISN (7a)	ISW (7a)	ISS (7a)	SGC (7a)	BCI (7f)	BCI 7g	SEI (7a+7g)	107a total	107f total	107g total	total nos
Plaice	m	209	171	175	212	175	3	22				
	f	290	178	223	285	194	4	21				
	total	499	349	398	497	369	7	43	1754	369	39	2162
Sole	m	66	14	171	81	282	4	2				
	f	66	16	232	142	319	1	3				
	total	132	30	403	223	601	5	5	790	601	8	1399
Whiting		26	37	43	31	57	0	2	138	55	3	196
Cod		-	-	-	-	-	-	-	5	3	0	8
Lemon Sole		-	-	-	-	-	-	-	82	25	12	119
Megrim (L whiff)		-	-	-	-	-	-	-	2	0	8	10
Anglerfish (L pisc)		-	-	-	-	-	-	-	28	2	5	35
Turbot		-	-	-	-	-	-	-	3	11	2	16
Brill		-	-	-	-	-	-	-	20	8	3	31
												3976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245
226
232
241
236
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79
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260
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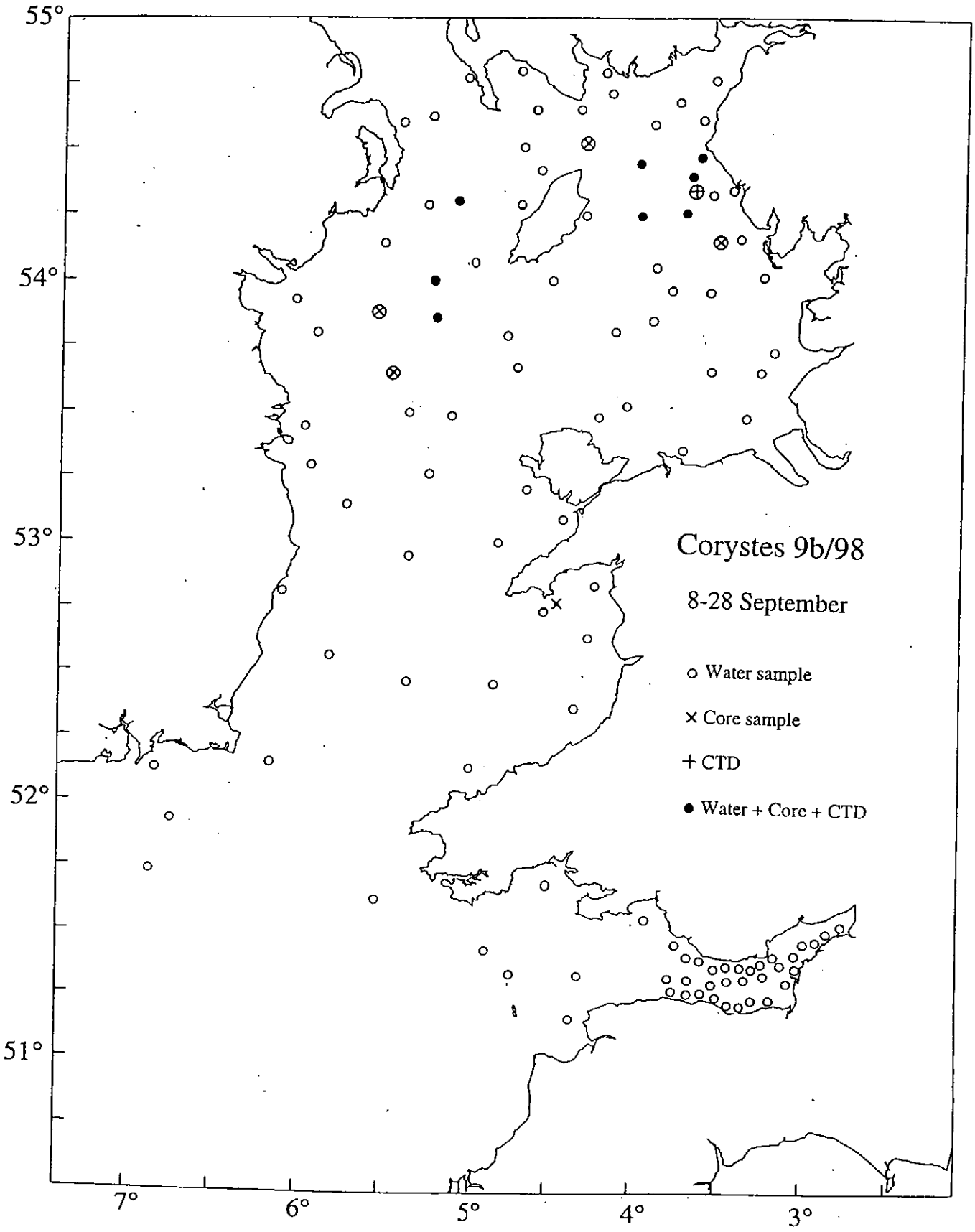
75
2
26
33
Corystes 9b/98
8-28 September
+ 4m Beam Trawl
• 4m Beam Trawl plus CTD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Corystes 9b/98
8-28 September
Water sample
Core sample
CTD
Water + Core + CTD