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

2001 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 9/01

STAFF:

M Boon (SIC)
S Milligan
J Ellis
M Dunn (pt 1)
B Harley (pt 1)
I Holmes (pt 1)
L Greenwood (pt 1)
D Carlin (pt 1)
J Keable (pt 1)
M Brown (pt 2)
A Cook (pt 2)
R Scott (pt 2)
M Parker-Humphreys (pt 2)
M Bergmann (University of Wales, Bangor (pt 2)
L Ahern (University of Galway) (pt 2)

DURATION:

11 September – 4 October 2001

LOCATION:

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

AIMS:

1. To carry out a beam-trawl survey of groundfish in the Irish Sea, Bristol Channel and Celtic Sea to i) obtain fisheries independent data on the distribution and abundance of commercial flatfish species, and ii) derive age compositions of sole and plaice for use in the assessment of stock size.
2. To collect biological data including maturity and weight at age of sole, plaice, lemon sole and other commercially important finfish species.
3. To determine the distribution and relative abundance of juvenile and adult sole and plaice.
4. To quantify the seabed sediments and epibenthos using 2m and 4m beam trawl by-catch.
5. To collect fish samples in support of other CEFAS projects and training courses.
6. To collect surface seawater samples for processing on return to Lowestoft for the analysis of tritium and caesium (AE001) (BD Smith EG 1).

NARRATIVE:

CORYSTES sailed from Lowestoft at 1500h on Tuesday 11th September. After a good passage through the Channel, Corystes dodged up to shelter behind Lundy in worsening weather conditions (SW-W gale 8). The weather improved overnight on 13th September and Corystes proceeded towards the eastern Celtic Sea to start the beam trawl survey grid in the

Inner Bristol Channel (BCI) at 0700h on 14th September. At 1100h Corystes slowed and a 3-minute silence was observed for those who died in the attacks on America. Fishing then continued until 1700h when Corystes commenced water sampling in the Bristol Channel and Severn Estuary for tritium analysis. The next day fishing continued in Swansea Bay and Carmarthen Bay until 1800h when Corystes returned to the Severn Estuary to complete the water sampling. The water sampling stations in this area were completed by 0900h on 16th September and trawling recommenced. All BCI stations were completed by 17th September, and Corystes proceeded to Cardigan Bay to commence the St George's Channel (SGC) stations. During the late evening of 18th and early morning of 19th September, 2m beam trawl and Day grab samples were taken in Tremadoc Bay and 'Muddy Hollow'. Corystes then proceeded to the North Wales coast to commence the Irish Sea South (ISS) and Irish Sea North (ISN) beam trawl stations. During the late evening of 22nd September, five 2m beam trawl and one Day grab samples were taken off Morecambe (Prime 17). Fishing continued until late afternoon on 23rd September when Corystes docked at Workington for a change of staff and to take on stores. All ISN stations were completed by 25th September and after an overnight steam, fishing in the Western Irish Sea (ISW) commenced the next morning. On the evening of 26th September, five 2m beam trawl and one Day grab samples were taken off southwest Isle of Man (Prime 405). The ISW stations were completed on 28th September, the remaining SGC stations were completed the following day and the Outer Bristol Channel (BCO) stations begun. Worsening weather conditions (S-SW gales) meant that the South East Ireland (SEI) stations were abandoned and Corystes dodged eastwards to take shelter behind Lundy and then in Bideford Bay. On 2nd October, and still in poor conditions, Corystes started steaming towards Lowestoft, picking up three more beam trawl stations in BCO en route. On the morning of 4th October, five 2m beam trawl and one Day grab samples were taken off Dungeness; Corystes then continued steaming for Lowestoft, docking at 2300h on 4th October.

RESULTS

Aims 1 & 2

The trawl survey covering the Irish Sea, Bristol Channel and Celtic Sea is divided up into seven sectors within which there are 120 half-hour beam trawl tows. All 67 stations used for tuning data (ISN, ISS, BCI) in the Northern and Southern Shelf assessment working groups were fished successfully, and 103 stations in total were completed (Figure 1).

The survey gear was the standard 4m beam trawl with chain mat, flip-up ropes and fitted with a 40mm cod-end liner. A mini-CTD unit was attached to the headline rope to record temperature and salinity profiles at every station. A water sample was taken at the first and last station every day for salinity calibration purposes, and surface temperature and salinity readings were logged at every station using the continuous recorder.

All fish and selected commercial shellfish were identified to species, weighed and measured (large catches of an individual species were sub-sampled beforehand). One station in Tremadoc Bay (Prime 313) and two stations off the Irish coast (Prime 214 & 220) were reduced to 15 minute tows because of expected large catches of weed or small flatfish, and two others (Prime 203 & 233) could be reduced to 15 minutes in future for the same reason. Prime station 1 in Luce Bay was not fished due to potential unexploded ordnance, and Prime

2 was moved southeast out of the restricted area. A few other stations were moved short distances to avoid snagging undersea cables (an increasing problem in this busy sea area).

Length stratified samples of otoliths were taken as below:

	VIIa	VIIf	VIIg	Total
Plaice	1493	353	3	1849
Sole	621	483	49	1153
Dab	221	204	3	428
Lemon sole	84	66	3	153
Brill	20	6		26
Turbot	1	11		12
Megrim		1	1	2
Cod	53	10		63
Whiting	137	73	5	215
Hake	5		8	13
Anglerfish	29	14	2	45
Bass		2		2
Total	2664	1223	74	3961

All otolithed fish were weighed individually and assigned a maturity stage (except whiting which were not weighed). All station details, fish catch, length distributions and biological data were entered into the Fishing Survey database.

Aim 3

Pre-recruit plaice were most abundant off the east coast of Ireland, and in inshore waters off north Wales and northwest England, and in Liverpool Bay and the Solway Firth (Figure 2). However, the small plaice caught off the Irish coast appear to be mainly 4-5 year olds; a more detailed analysis of this data will be made when the fish have all been aged. Pre-recruit sole were most abundant in the Bristol Channel and in inshore waters off north Wales and in Liverpool Bay (Figure 3). Numbers of young sole were much lower this year than in the two previous September surveys, which suggests that the strong 1998 year-class has not been repeated since.

Aim 4

The macro-epibenthic by-catch was quantified at all 4-metre beam trawl stations, supplementing data collected from 1997-2000. The inshore fishing grounds were characterised by a high abundance of invertebrates, including starfish (*Asterias rubens*), swimming crabs (*Liocarcinus* spp.), hermit crab (*Pagurus bernhardus*) and whelk (*Buccinum undatum*). Further offshore the fauna was more diverse, with queen scallops (*Aequipecten opercularis*), small crab species and a variety of echinoderms all abundant. The *Nephrops* grounds to the west and south-west of the Isle of Man had a sparse epifauna, with catches typified by the burrowing urchin *Brissopsis lyrifera,* red whelk (*Neptunea antiqua*) and the crab *Goneplax rhomboides.*

The 2-metre beam trawl was used on various muddy habitats. Two stations in Tremadoc Bay were sampled, and five replicate samples were collected from two fishing stations on *Nephrops* grounds (one off Cumbria and the other south-west of the Isle of Man). Catches at these two grounds were characterised by flatfish (e.g. long rough dab and witch), burrowing crustaceans (thalassinoid shrimps, *Goneplax* and *Nephrops*) and shrimps (*Crangon allmanni, Processa* sp., *Pandalus* sp., *Alpheus glaber*). The sea slug *Armina loveni* was also caught regularly.

Invertebrate samples collected for other projects included shrimps (*Crangon crangon* and *C. allmanni*), whelks, queen scallops, samples of the bryozoan *Alcyonidium,* hermit crabs and tissue samples from various echinoderms.

Aim 5

- Melanie Bergmann (University of Wales) joined Corystes after the mid-cruise break in Workington to collect roundfish stomachs and livers as part of a collaborative project on 'Essential Fish Habitats' between CEFAS Lowestoft (Stuart Rogers) and the School of Ocean Sciences (University of Wales, Bangor). Stomachs of cod, haddock and whiting were taken for dietary analyses from fish at selected stations throughout the Irish Sea (Prime stations 2-6, 15, 16, 28, 40, 45, 48, 49, 60, 61, 203, 206, 214, 220, 229, 233, 401, 408, 409, 419, 423, 425, 430, 438, 441, 447, 501, 502). Livers were also sampled for subsequent lipid content analysis, and tissue samples taken for nitrogen stable isotope analysis. These analyses will be used to evaluate the quality of different Irish Sea habitats for gadoid fish species.
- Linda Ahern (University of Galway) joined Corystes after the mid-cruise break in Workington to look for the toxic diatom species *Pseudonitzschia* by taking vertical seawater samples with a small phytoplankton net (mesh size 10μm). Stations were chosen mainly for their close proximity to known physical oceanographic features such as the Western Irish Sea and Celtic Sea Fronts, where stratified water columns are known to support the seasonal growth of the diatoms. Additional stations were sampled in other areas to facilitate comparison with the frontal areas.
- Otoliths were taken from lemon soles in the size range 5-20cm for M. Easey (CEFAS, Lowestoft). One small fish was frozen and returned to Lowestoft.
- Samples of 100 whelks were frozen from stations in Carmarthen Bay, Liverpool Bay, Solway Firth and off eastern Ireland for a study on population genetics (University of Hull).
- Up to 25 commercial size fish of each species (cod, whiting, dab, flounder, plaice and sole) were frozen from eight selected stations, for later contaminant analysis by Dr A. Franklin (CEFAS, Burnham).
- White muscle tissue was collected from 3 whiting (240-260mm) and 3 dabs (190-210mm) at every 4m beam trawl station, as available. Up to 5 queen scallops (50-60mm) per station were also collected. The samples were frozen for later isotope analysis by Dr S. Jennings (CEFAS, Lowestoft).
- All lesser and greater weevers caught in ICES division VIIa were frozen for Dr. R. Nash (Port Erin Marine Lab, University of Liverpool).

- Specimens of each species of fish caught were frozen individually for use on future RN/SFI identification courses, for T.Watson and Dr. C. Fox (CEFAS, Lowestoft).
- No additional plaice otoliths were collected for I. Holmes (CEFAS, Lowestoft) due to the heavy targets already set for this cruise.
- All spider crabs *(Maia squinado)* caught on Pt 2 of the survey (about 25 in total) were kept alive in a seawater tank for R. Turner (CEFAS, Lowestoft).

Aim 6

Surface seawater samples of 51 litres from each of 37 selected stations in the Irish Sea, and one litre from each of 38 stations in the Bristol Channel and Severn Estuary were collected for Tritium and Caesium analysis by B. Smith (CEFAS, Lowestoft).

Our thanks go to all the officers and crew of RV Corystes for their help and support during this survey.

M J Boon
5 October 2001

INITIALLED: RM

SEEN IN DRAFT:

Master:

Senior Fishing Mate:

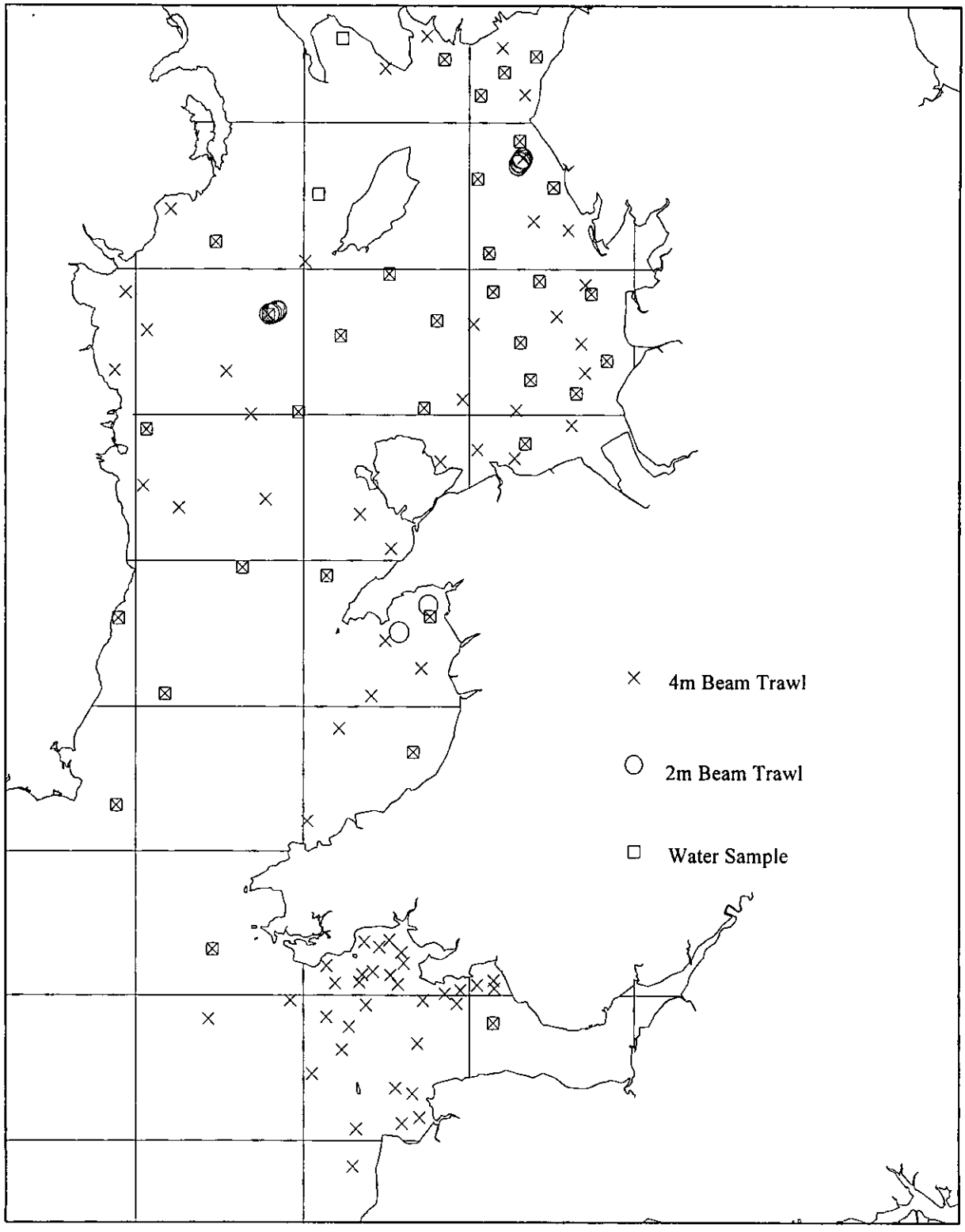
DISTRIBUTION:

Basic List +

M Boon	M Bergmann (University of Wales, Bangor)
S Milligan	L Ahern (UC Galway)
J Ellis	M G Pawson
M Dunn	R S Millner
D Carlin	M J Armstrong (DANI, Belfast)
B Harley	P Connolly (DOM, Dublin)
I Holmes	FCO (for Republic of Ireland)
L Greenwood	Sea Fisheries Committees:
R Scott	Cumbria
M Brown	North Western and North Wales
A Cook	South Wales
M Parker-Humphreys	Devon
J Keable	Cornwall

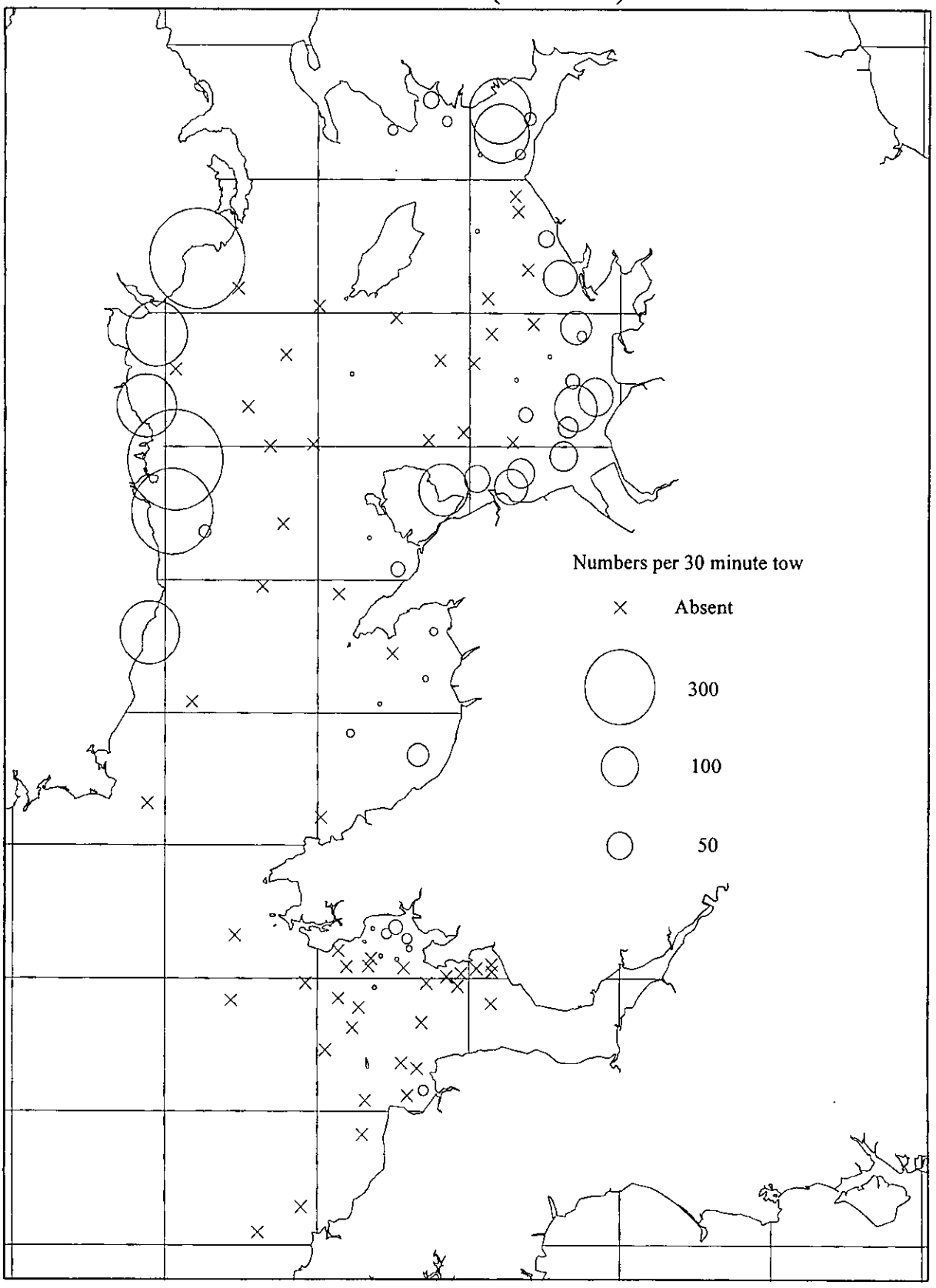
Figure 1

Corystes Cruise 9/01- Station Positions



Corystes 9/01

Pre recruit Plaice abundance (< 21 cm)



Corystes 9/01

Pre recruit Sole abundance (< 21 cm)