

THE CENTRE FOR ENVIRONMENT, FISHERIES AND AQUACULTURE
SCIENCE.

LOWESTOFT LABORATORY, LOWESTOFT, SUFFOLK NR33 0HT

2000 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 12b/00

STAFF:

S Rogers (SIC)

J Ellis

M Boon

T Dinmore

J Dann

M Dunn (pt 1)

B Harley (pt 1)

M Brown (pt 1)

S Flatman (pt 2)

L Greenwood (pt 2)

N Bunn (pt 2)

Z Lightfoot (pt 2)

J Fenton (Swansea Univ.) (pt 1)

DURATION:

12 September – 3 October 2000

LOCATION:

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

AIMS:

1. To carry out a beam-trawl survey 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 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 2m and 4m beam trawl by-catch, remote acoustic seabed discrimination system (QTC) and Day grab.
5. To collect fish samples in support of other CEFAS projects and training courses.
6. To collect biological data on the reproductive cycle and population genetics of the bryozoan genus *Alcyonidium*.
7. To collect surface sea-water samples for processing on return to Lowestoft for the analysis of tritium.

NARRATIVE:

CORYSTES sailed from Lowestoft at 0900 h on Tuesday 12 September and after a good journey through the Channel began the beam trawl survey in the Outer Bristol Channel, southwest of Lundy Island. Beam trawling continued until dusk, and work then began on the collection of water samples at stations in the Bristol Channel and Severn estuary. On the following day, more beam trawl stations in Swansea Bay and Carmarthen Bay were completed and during the night water samples were collected from the final group of stations near Avonmouth. Corystes completed work in the Bristol Channel on 17 September and, after working in Cardigan Bay, was ready to begin trawling in Liverpool Bay on the morning of 20 September. The survey continued until the evening of 22 September when Corystes docked at Douglas, Isle of Man for a change of staff and to take on stores. After a half day delay in departure due to poor weather, beam trawl stations near Sellafield, in the Solway Firth, and along the Scottish coast to Wigtown were sampled over the next two days. Samples of benthos were collected from the North Channel and north of the Isle of Man, and the remaining beam trawl stations in the important northeast Irish Sea sectors were completed. Strong southerly winds delayed the progress of the survey in the northwest Irish Sea, so that from 26 to 29 September only 15 further stations were completed. On the last day available for work, 30 September, trawl stations in St Georges Channel were fished and at dusk the final benthos samples were collected in the Celtic Deep. With more gales forecast, CORYSTES commenced her return passage to Lowestoft, and docked at 0030h on Tuesday 3 October.

RESULTS:

Aims 1 and 2.

The trawl survey covering the Bristol Channel, Celtic Sea and Irish Sea is divided into 7 sectors, within which there are 120 half-hour beam trawl tows. All 67 stations currently used for tuning data in the Northern and Southern shelf assessment working groups were fished successfully, and in total 96 of the 98 core stations in the region 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. All fish and selected commercial shellfish were identified to species where possible, weighed and measured. Length stratified samples of otoliths were taken from selected species:

Species	VIIa	VIIIf	VIIg
brill	15	29	
cod	8	1	
lemon sole	83	50	
anglerfish	25	10	
plaice	1942	425	2
sole	779	611	5
turbot	3	23	
whiting	144	67	2

All otolithed sole, plaice, lemon sole, anglerfish, turbot, brill and cod were weighed individually and assigned a maturity stage. All station details, fish catch, length distributions and biological data were input to the Fishing Survey database.

Aim 3.

Pre-recruit sole and plaice are most abundant in the Bristol Channel, Liverpool Bay, and in inshore waters of northwest England and the Solway Firth (Figure 2). During the September 1999 survey there were unusually large numbers of pre-recruit sole in the Bristol Channel Inner sector. Juvenile fish were still abundant during this survey, and although no age determination has been carried out yet, these fish are probably part of the strong 1998 year-class. The numbers of plaice caught in the Bristol Channel were average and comprised mainly pre-recruit fish less than 19 cm in length. The sole catches taken in the sectors Irish Sea South and Irish Sea North were average in comparison with the 10 year time-series, while in contrast the plaice catches showed a slight increase.

Aim 4.

Surface temperature and salinity readings were logged at every station using the continuous recorder, 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 where possible at stations sampled with 2m beam trawl, and a Day grab was used to ground-truth these data.

The macro-epibenthic by-catch was quantified at all but one of the 4m beam trawl stations, supplementing data collected from 1997-1999. Common starfish (*Asterias rubens*) dominated the inshore waters of the Solway Firth and Liverpool Bay. Further from shore, *Asterias rubens* occurred in lower numbers, but were typically of a much larger size. Other large echinoderms (e.g. the sunstars *Crossaster papposus* and *Solaster endeca*, and common urchin *Echinus esculentus*) were more abundant in deeper waters.

The 2m beam trawl was deployed at 23 sites located primarily near the main trawl stations. Five sites located away from routine stations are identified by 'B' in Figure 1. These benthic samples will be used to supplement equivalent data already collected from the eastern English Channel, North Sea and Celtic Sea during 2000 with the same gear, thus providing an extensive data set of epibenthic assemblage structure and diversity. Interesting assemblages sampled included a shingle bed in Cardigan Bay where the top shell *Gibbula magus* was abundant, and a very diverse horse mussel (*Modiolus modiolus*) community in the North Channel.

The proportion of common starfish showing signs of prior damage was recorded at all sites where they occurred in sufficient numbers. Approximately 10,000 starfish were examined, with the greatest proportions of damage observed in Liverpool Bay (30-39% damaged). In contrast, starfish from sites in the North-eastern Irish Sea (e.g. off Cumbria and in the Solway Firth) and certain sites in Welsh inshore waters (where static gears are often used) had much lower proportions of arm damage (<10%).

Aim 5.

- Gill arches were taken from Irish Sea haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), and cod (*Gadus morhua*) for analysis of gadoid genetic diversity.
- All lesser weevers (*Echiichthys vipera*) caught in the Irish Sea were frozen for Dr Nash (Port Erin, Isle of Man), and all those collected in the Bristol Channel were frozen for T Horton (University of Reading), to be used for studies of population structure and parasitism.
- The length, wing width, total weight and maturity was recorded for all rays caught.
- Four adult nurse hounds (*Scyliorhinus stellaris*) caught in Carmarthen Bay and Swansea Bay were tagged with data storage tags and released. It is hoped that their recapture will provide data describing the daily movements of these poorly studied fish.
- The otoliths and vertebrae of samples of anglerfish (*Lophius piscatorious*) removed for ageing studies. Otoliths were also collected from John dory (*Zeus faber*).
- Samples of commercially exploited flatfish and gadoids were collected at selected NMP and EQS stations as part of long-term monitoring of these offshore sites.
- Diseased flatfish mostly infected with the virus *Lymphocystis* were frozen for analysis at CEFAS Weymouth.
- Specimens of common and unusual fish species were frozen for later use during fish identification courses at CEFAS Lowestoft.
- Gonads of maturing plaice and sole were photographed and samples preserved as part of a study of flatfish maturation.
- Samples of sole were collected from the Bristol Channel to supplement market sampling otolith tallies.
- Edible crabs (*Cancer pagurus*) were collected from Cardigan Bay for radioactivity studies.

Aim 6.

Colonies of the bryozoan genus *Alcyonidium* were collected as part of a collaborative study with scientists from the University of Wales Swansea. Samples of *A. diaphanum* were collected for studies on reproductive biology, morphology and population genetics. Additional specimens of a new species of *Alcyonidium* were collected from South Wales, one of two locations from where this bryozoan has been collected. Colonies of the little-known *A. parasiticum*, which occurs on hydroids, were also preserved.

Aim 7.

Surface sea water samples of 1 litre were collected from 43 stations in the Bristol Channel and Severn Estuary. These samples will be analysed ashore for their Caesium and Tritium content.

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

S Rogers 03/10/00

INITIALLED: R M

R Miller

SEEN IN DRAFT:

Master

Adh

Senior Fishing Mate.

R Gibson

DISTRIBUTION:

Basic List +

S Rogers

J Ellis

M Boon

T Dinmore

J Dann

M Dunn

B Harley

M Brown

S Flatman

L Greenwood

N Bunn

Z Lightfoot

J Fenton (Swansea Univ.)

M J Armstrong (DANI, Belfast)

P Connolly (DOM, Dublin)

FCO (for Republic of Ireland)

Sea Fisheries Committees:

Cumbria

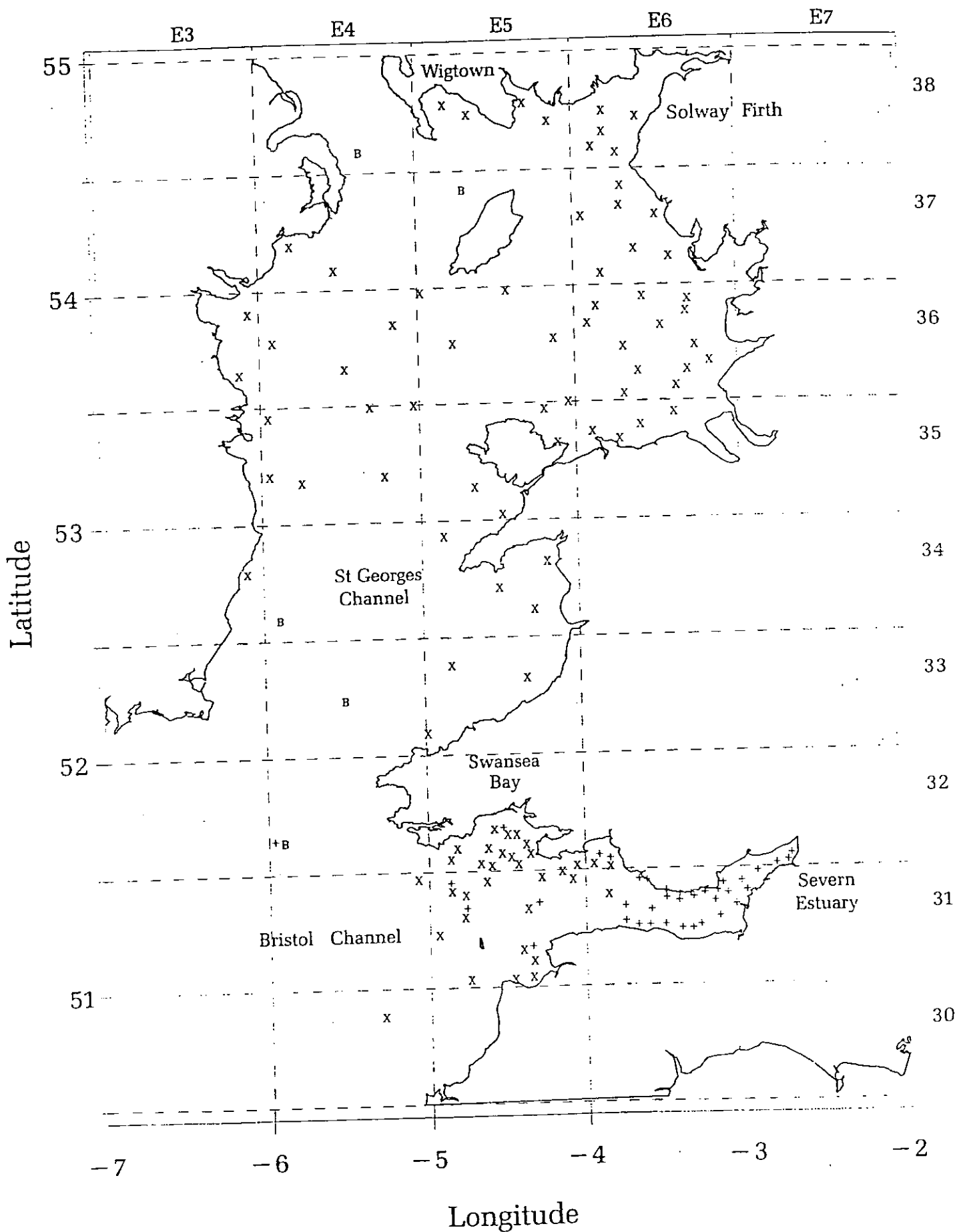
North Western and North Wales

South Wales

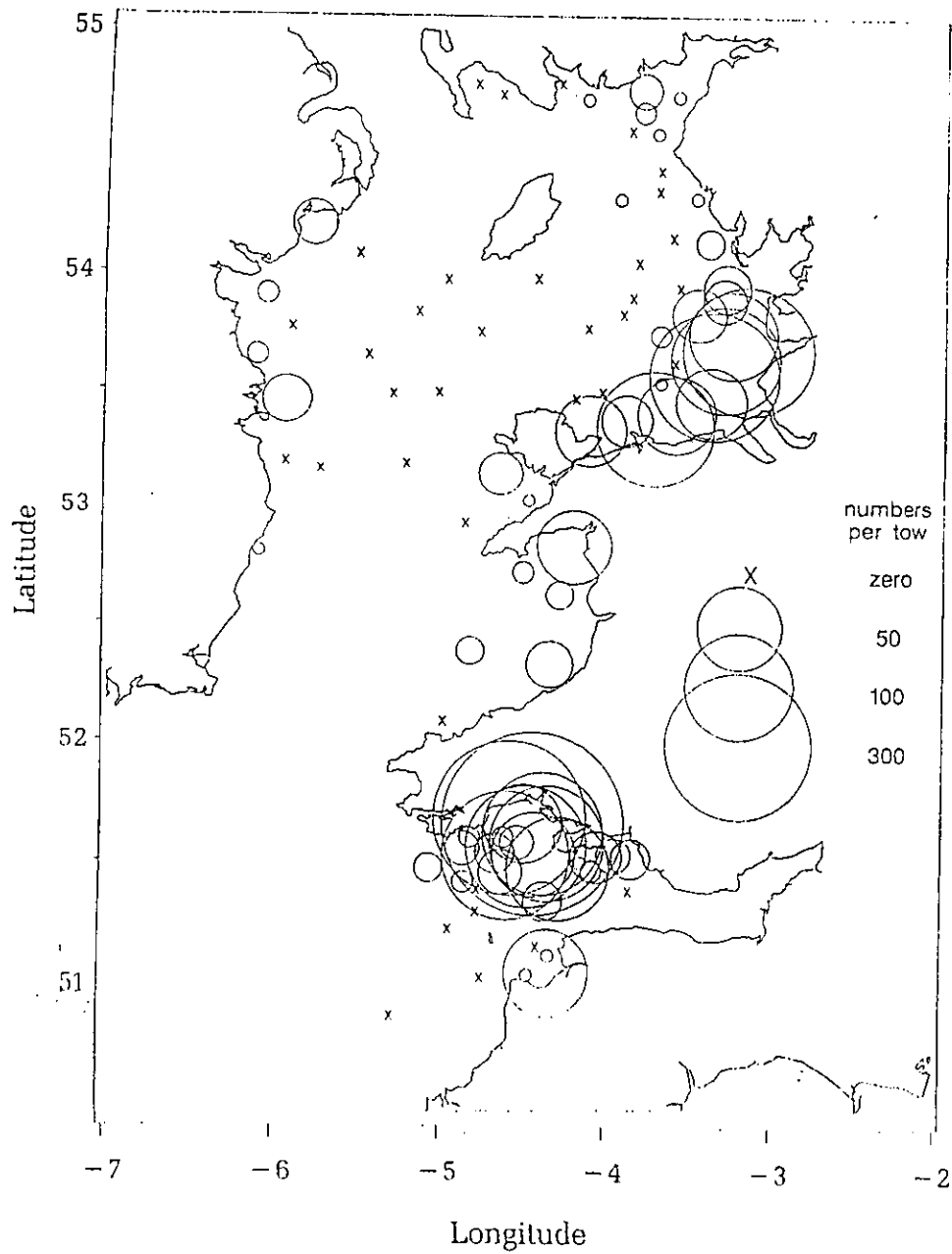
Devon

Cornwall

Figure 1
 CORYSTES station positions (Sept 2000)
 + water sample; X 4m beam trawl; B extra 2m beam trawls



2000 BEAM TRAWL SURVEY PRE-RECRUIT SOLE (< 21 cm)



2000 BEAM TRAWL SURVEY PRE-RECRUIT PLAICE (< 21 cm)

