

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

1998 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 4

STAFF:

Part A

- J H Nichols (SIC)
- T Boon
- S Warnes
- B Rackham
- D Brown
- M Etherton
- R A Ayers
- T Bailey

Part B

- J Casey (SIC)
- T Boon
- S Warnes
- P Welsby
- D Brown
- M Etherton
- T Dinmore
- P Blowers
- M Lucas, University of Durham
- Y. Y Liao, University of Durham

DURATION: Part A: 14 - 29 August 1998
Part B: 30 August -14 September, 1998

LOCATION: North Sea

AIMS:

1. To carry out a groundfish survey of the North Sea using a standard GOV trawl in order to obtain information on:
 - a) Distribution, size composition and abundance of all fish species caught.
 - b) Age - length distribution of selected species.
 - c) Distribution of fish in relation to their environment
 - d) Distribution of macrobenthos and anthropogenic debris
 - e) Surface and bottom temperature and salinity data using reversing bottles
 - f) Length-weight information using individual fish measurements
2. To collect material for fish identification courses (T. Watson, CEFAS Lowestoft)
3. To preserve material from diseased fish (S Feist, CEFAS, Weymouth)
4. To investigate starfish damage as an indicator of trawling intensity (K Ramsay, CEFAS, Conwy)
5. To collect and process surface sea waters for the analysis of Cs radionuclides as part of contract AE001.

NARRATIVE

RV Cirolana sailed from Lowestoft at 1428h BST 14 August and steamed to a position 45nm ENE of Lowestoft to take a surface water sample for Caesium analysis. Benthos samples, for EG Burnham on Crouch, were collected using a 2-metre beam trawl at two positions east of Lowestoft. On completion, at 2115h the vessel steamed south to begin the International Bottom Trawl Survey of the North Sea, combined with a water sampling survey for radionuclide analysis. The survey was started, off the Thames estuary, at 0615h 15 August. At 1545h on the following day the six trawl stations and three surface water sample stations, in the Southern Bight of the North Sea, had been completed. During the night of 16/17 August a further four beam trawl hauls were carried out for benthos samples, in the vicinity of the Norfolk Banks. One beam trawl net was lost and the beam broken during one of these tows. The trawl and surface water sampling survey continued in good weather for the next few days, completing three trawl hauls per day. Weather conditions then gradually deteriorated, until by 22 August the vessel was working off the Danish coast in 25-30 knot NW winds and a heavy swell. These conditions persisted for the next four days but did not interrupt the survey. On 25 August, on the second haul of the day, the trawl net was badly damaged and needed five hours to repair with all available hands on deck. The trawl was shot again at 1630h and two further successful tows were made. The following three days were spent working back to the west doing three trawl hauls per day. Large volume surface and bottom water samples were also taken along latitude 57°N, at 2° intervals of longitude, for Caesium analysis. Working conditions remained unpleasant with strong NNW winds, up to 30 knots on 27 August, and a heavy swell. Three further trawl stations were worked, in fine weather, on 28 August. The final trawl station of the first half of the cruise, was completed by 0600h on the following morning. The vessel docked at the AMEC Howden Quay, on the North side of the Tyne, at 1100h BST 29 August to change four of the scientific staff and to embark two visiting workers from the University of Durham.

Cirolana sailed from the Tyne at 1924h BST 30 August in fine weather and headed north to collect 2 surface water samples during the night and to resume the trawl survey. On 31 August, three trawl stations were completed although the trawl gear was damaged on the second tow of the day. Cirolana proceeded eastwards and a further three successful survey tows were completed by the evening of 1 September. By dawn of 2 September, weather conditions had deteriorated and Cirolana spent the day dodging a heavy swell with winds up to 35 knots. On 3 September, when the weather had moderated slightly, two further survey tows were completed. Weather conditions then worsened overnight and no progress with the trawl survey or water sampling was made on 4 September. Conditions had moderated sufficiently to resume the survey on the morning of 5 September. The trawl survey grid and water stations were completed by the afternoon of 11 September, including a successful repeat of the tow where the trawl gear was damaged on 31 August. Cirolana then spent the following morning fishing two additional tows in ICES rectangles 36E9 and 36FO, which had been allocated to Scotia but which she had not been able to complete. Cirolana then headed south to latitude 52°40'N, longitude 02°25'E to undertake sediment sampling using a Day grab. The weather deteriorated to gale force 8 overnight and a heavy swell developed. A single sediment sample was collected on the

morning of 13 September. Three attempts were made at collecting a second sample without success. Cirolana then proceeded to a third sediment sampling station, arriving at 1315h. The swell had increased considerably by this time, making working conditions on the deck too dangerous to continue. With the prospect of sea conditions worsening even further, the survey was terminated at 1320h on 13 September, and Cirolana set a course for Lowestoft, where she docked at 0003 h BST on 14 September.

Results

Aim 1. All seventy four standard, 30-minute trawl survey stations and two stations additional to the standard grid were successfully completed. Three of the standard tows were declared invalid due to incorrect gear configuration (1) or damage to the trawl (2), but these were successfully repeated. Trawling was carried out using the GOV trawl rigged to the standard specification for International Young Fish Surveys. At each GOV tow, surface and near bottom temperature readings were taken together with water samples for salinity analysis. A chart indicating the position of each valid trawl station is attached (Figure 1). Scanmar equipment was used to monitor headline height and door spread. At each station, the catch of each species was weighed and all fish, or representative samples were measured. Samples of otoliths for age determination were taken as specified. Benthos and crustacea were identified to species wherever possible, and any anthropogenic waste material was recorded and weighed. The resultant data were input to computer database using the CEFAS Electronic Data Capture System, and preliminary summations and analyses were made. Charts showing the sea surface and near-bottom temperatures and the distribution of catch rates for selected species are shown in (Figures 2-9)

These data will be analysed further at CEFAS Lowestoft and will provide a major input to the ICES assessment of North Sea gadoids.

Aim 2. Specimens of approximately 50 different fish species were preserved for the Laboratory's fish identification courses.

Aim 3. No diseased fish were encountered on the survey.

Aim 4. The incidence of limb regeneration of starfish was recorded at nearly all trawl stations (K Ramsay, CEFAS, Conwy)

Aim 5. Thirty eight surface water samples for caesium studies and salinity were taken at stations on the grid used on previous groundfish surveys (Project AE001)

A total of five, 50-litre, near-bottom water samples were taken along latitude 57°N at 2° intervals of longitude, for Caesium analysis. Separate surface and near-bottom salinity samples were also taken at each of these sampling locations.

Fourteen surface water samples, for analysis for Technetium 99, were collected at prescribed locations, five of which were taken in duplicate for an inter-comparison exercise.

A total of 26, 1-litre surface water samples were taken at prescribed locations over the North Sea for Tritium analysis.

Miscellaneous

- a) A total of 6, 2-metre beam trawl samples and 1 sediment sample were collected as part of project AE005. These were requested by C. Whalley, CEFAS Burnham after the cruise programme was circulated.
- b) Biological studies on the following numbers of specimens, were undertaken by M Lucas and Y-Y Liao, University of Durham:

Anarhichas lupus (4)
Lophius piscatorius (10)
Raia radiata (37)
Raia naevus (7)
Raia fullonica (1)
Raia montagui (1)
Scyliorhinus canicula (32)
Squalus acanthias (7)

J Casey / J H Nichols
14 September, 1998

Seen in Draft

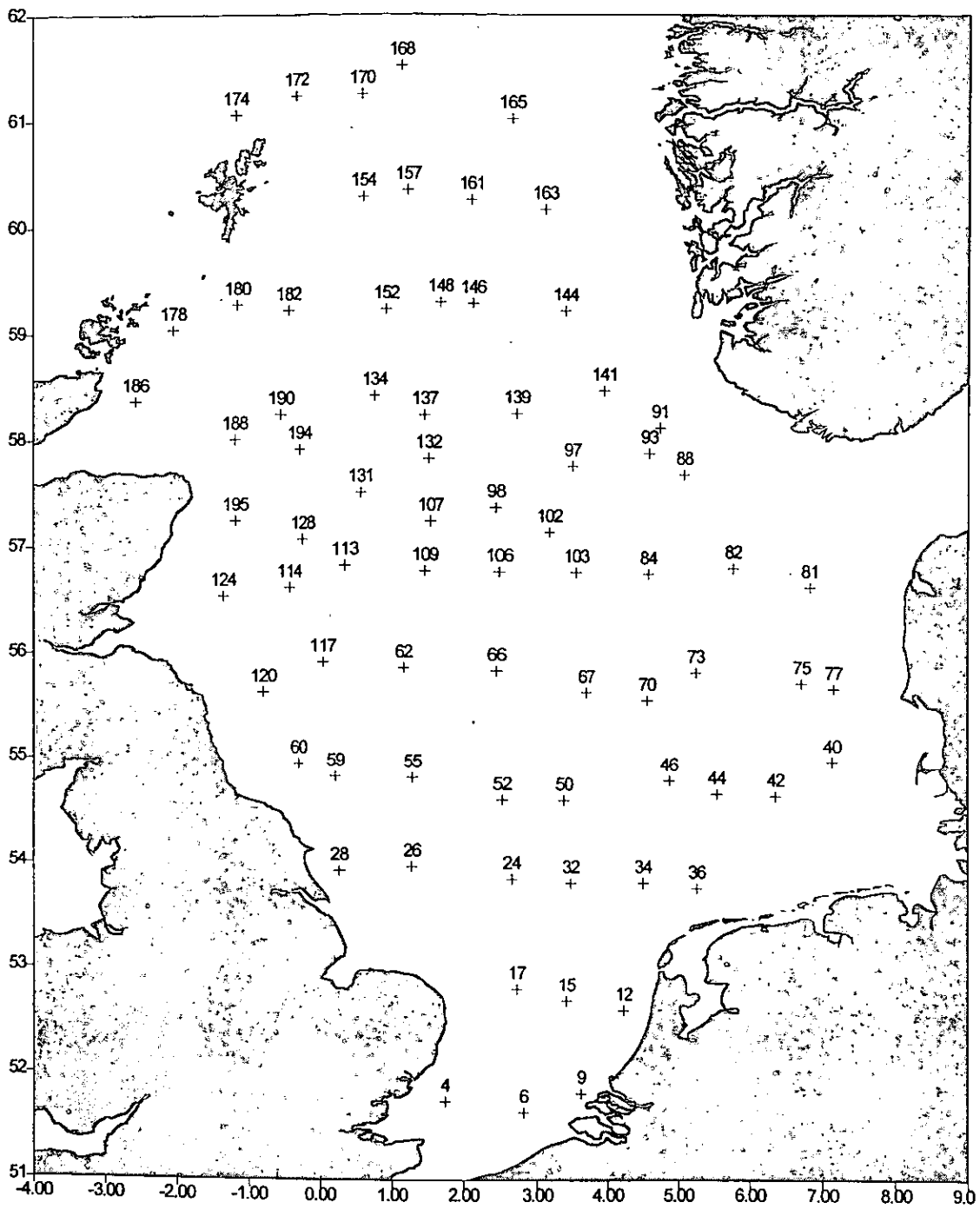
B A Chapman - Master
M Reynolds - Senior Fishing Mate

Distribution: Basic list +

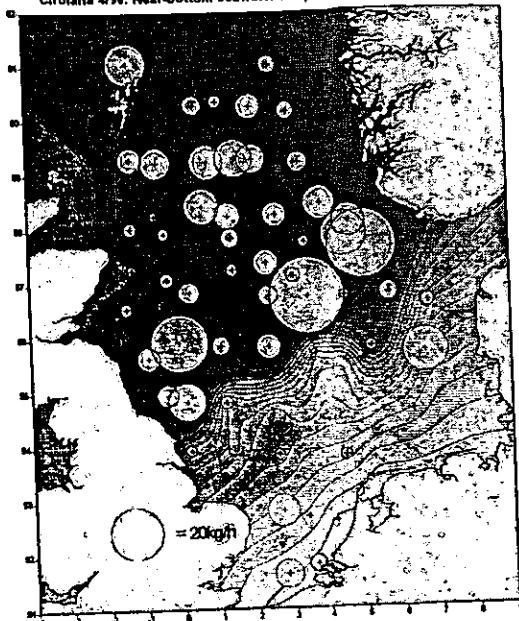
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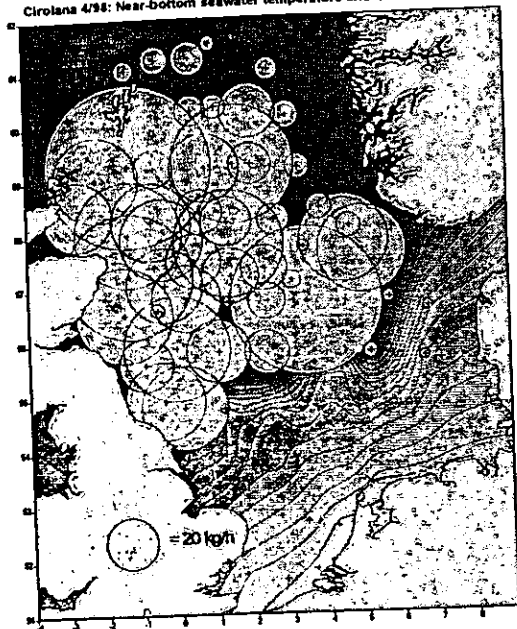
Figure 1. Cirolana 4/98: Valid GOV Trawl Stations



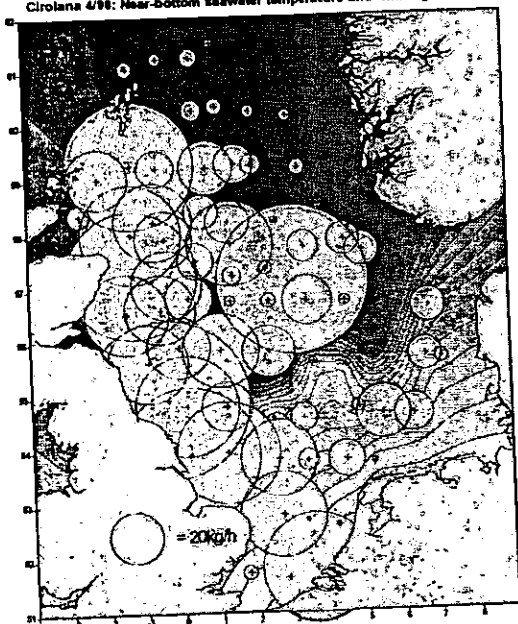
Cirolana 4/98: Near-bottom seawater temperature and cod catch rate



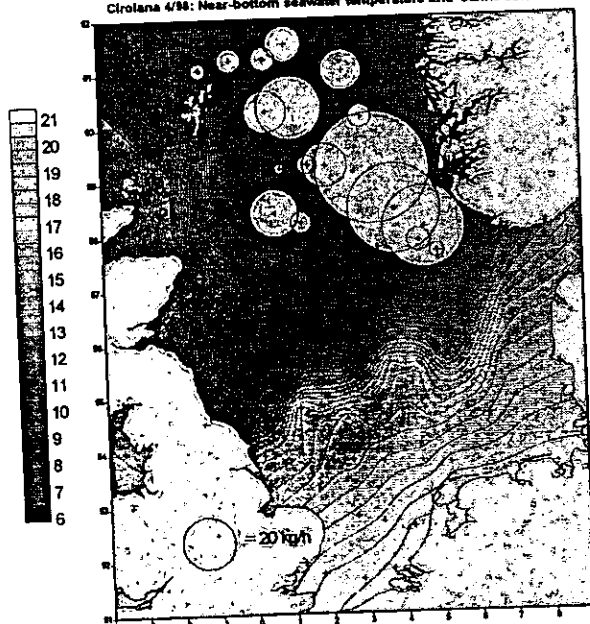
Cirolana 4/98: Near-bottom seawater temperature and haddock catch rate



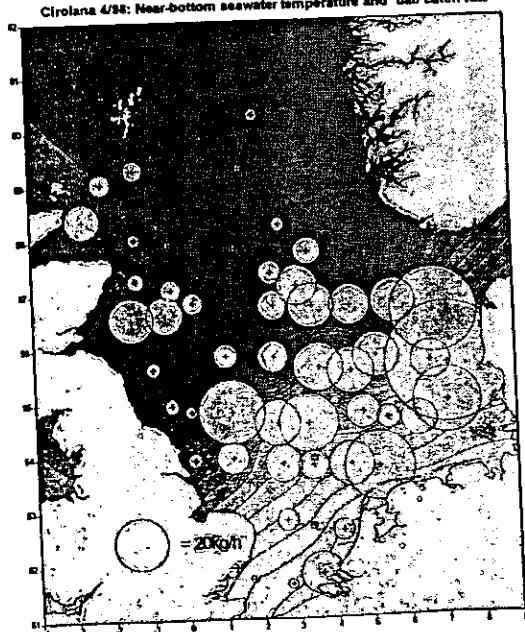
Cirolana 4/98: Near-bottom seawater temperature and whiting catch rate



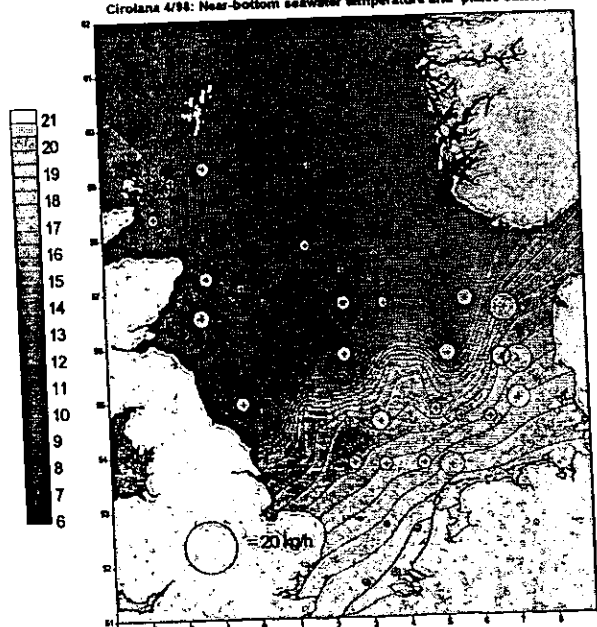
Cirolana 4/98: Near-bottom seawater temperature and saithe catch rate



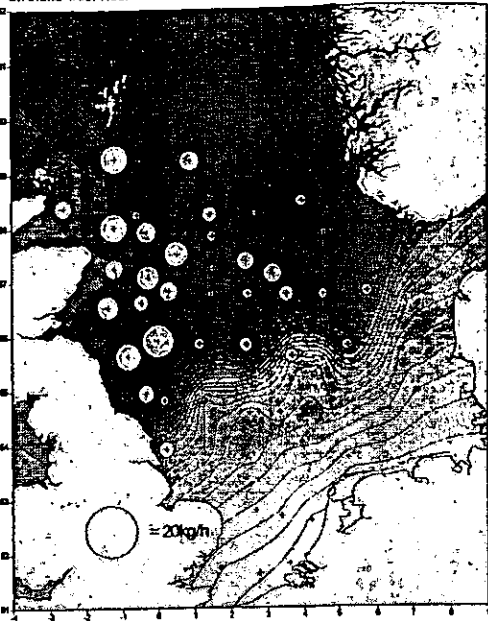
Cirolana 4/98: Near-bottom seawater temperature and dab catch rate



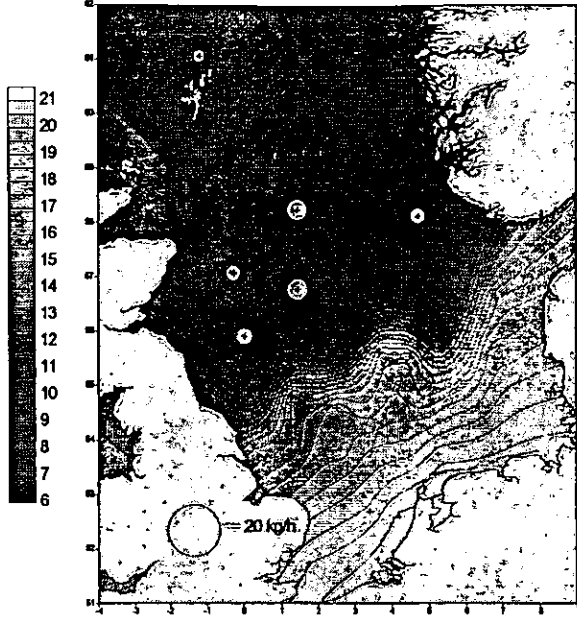
Cirolana 4/98: Near-bottom seawater temperature and plaice catch rate



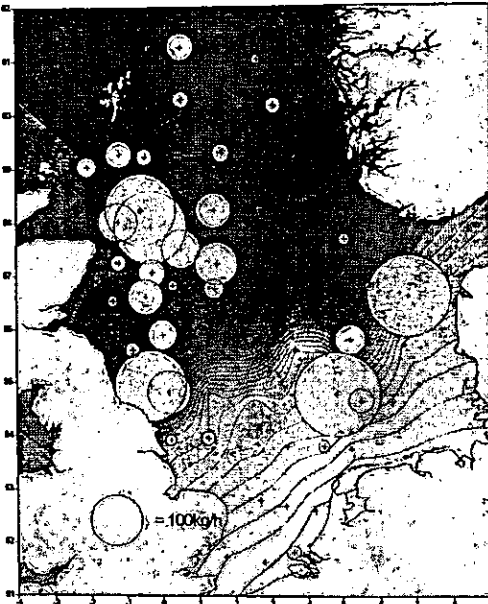
Cirolana 4/98: Near-bottom seawater temperature and lemon sole catch rate



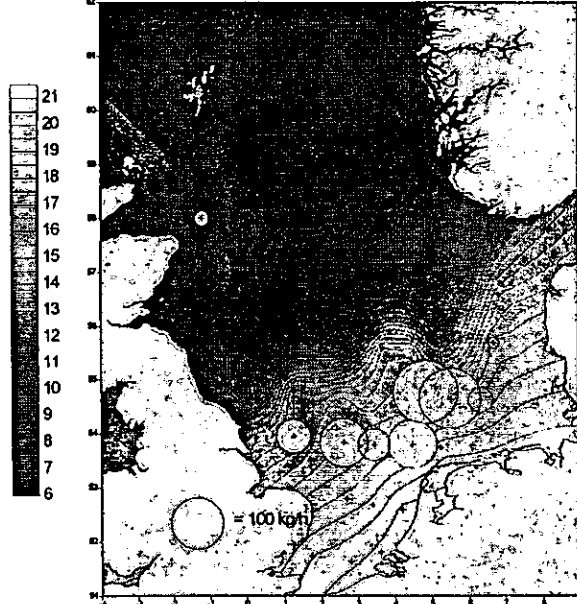
Cirolana 4/98: Near-bottom seawater temperature and anglerfish catch rate



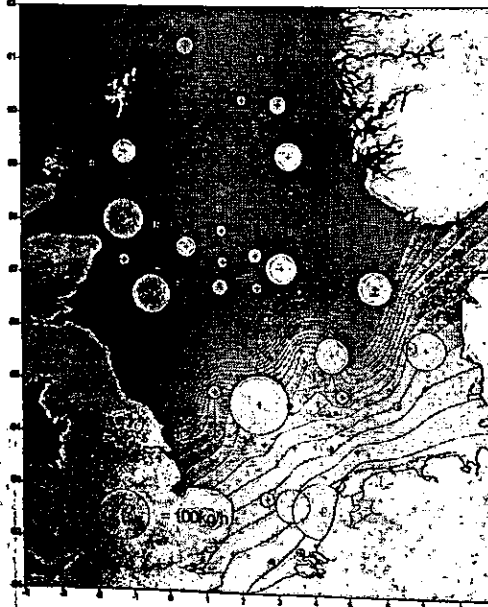
Cirolana 4/98: Near-bottom seawater temperature and herring catch rate



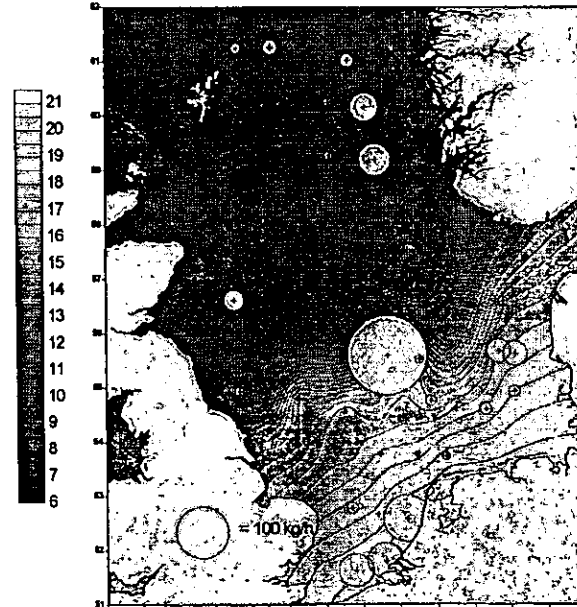
Cirolana 4/98: Near-bottom seawater temperature and sprat catch rate

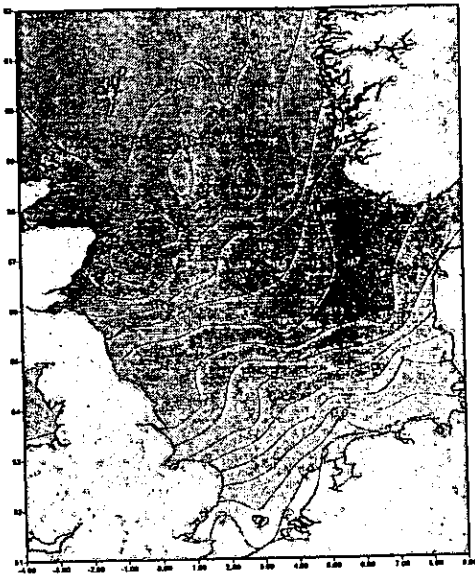


Cirolana 4/98: Near-bottom seawater temperature and mackerel catch rate

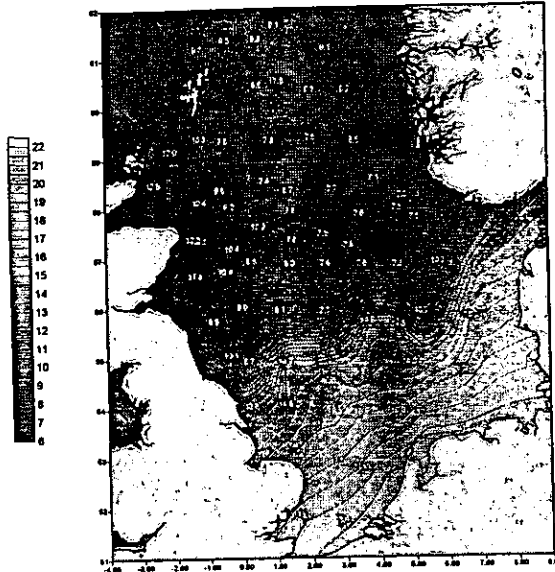


Cirolana 4/98: Near-bottom seawater temperature and horse mackerel catch rate

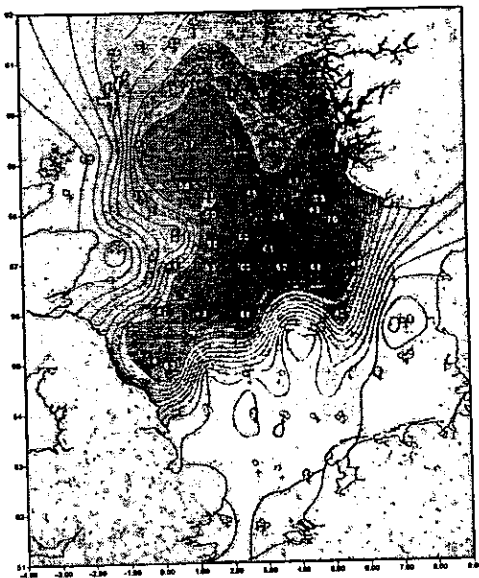




Sea surface temperature



Near-bottom temperature



Delta temperature (surface - near bottom)

Cirolana 4/98