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The Continuous Plankton Recorder survey: plankton in the ICNAF area in 1975

by

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INTRODUCTION.

The survey by the Continuous Plankton Recorder was continued on the same basis as in other years. A bibliography of the survey (1931 to 1972) is given in Edinburgh, Oceanography Laboratory, 1973. Annual reports on the plankton of the water round the British Isles and the Irminger Sea have been published every year since 1946 in Annales Biologiques of ICES. This is the fifth annual report on the results from the ICNAF area. An inventory of the survey for 1975 and a report on the plankton, incorporating results from the automated data processing procedures (see Colebrook, 1975) are available on request.

METHODS.

Continuous Plankton Recorders are towed at a depth of 10m by merchant ships and Ocean Weather Ships once in each month, when possible, along a number of standard routes (Figure 1). The rolls of silk are cut into sections representing 10 miles of tow and alternate sections, bearing the plankton from $3m^3$ of water, are analysed. The methods of analysis have been described by Rae (1952) and Colebrook (1960). The area of the survey has been sub-divided into a grid of rectangles (each of 1^o of latitude by 2^o of longitude) which are then grouped into larger areas; in this paper these larger areas correspond with ICNAF areas 1-5.

Sampling has been seriously affected by changes in shipping schedules. There was no sampling during 1975 on the D route before September and the E route before December.

The mileage sampled in ICNAF areas in 1975 was as follows:

Sub-area	Mileage	Notes
1	1308	No sampling from January to May
2	1133	No sampling from January to March, May and June
3	3667	No sampling January, February, May and June
4	382	Sampled in December only

The results for a few of the common species in the best sampled area (3) are given in Figures 2 and 3. For each month, the mean number of each organism per Recorder sample (of $3m^3$) for sub-area 3 has been calculated. The data for 1975 are presented as histograms (gaps in the baseline indicate that there was no sampling in January, February, May and June), these can be compared with the average seasonal cycles for the period 1961 to 1974 which are provided by line graphs. Both the monthly means for 1975 and the long term means were calculated from logarithmic transformations of the original counts.

Information from other areas, and for species not illustrated here, will be supplied on application to the Director, Institute for Marine Environmental Research, Oceanographic Laboratory, 78 Craighall Road, Edinburgh EH6 4RQ, Scotland.

RESULTS.

An estimate of phytoplankton (Figure 2A) was obtained from a visual assessment of the green coloration of the filtering silk; phytoplankton was abundant in April and again at the end of the year. Numbers of Thalassiosira spp., Chaetoceros spp. and Thalassiothrix longissima were much above average in April and Thalassiosira spp. were also abundant from October to December.

Copepods (Figure 2B) were most abundant from July to September, although there was no sampling in May, the month when numbers are usually highest. Numbers of copepodite stages I-IV of Calanus finmarchicus (Figure 2C) were low in March and April but were above average from July to September.

The over-wintering adult stages (V-VI) of C. finmarchicus (Figure 2E) usually appear in high numbers at 10m in February; numbers than decline and there is a second peak of adults in August and September. In 1975, numbers were much above average in March and again from July to September. Numbers of this order in the second half of the year are unusual and have only been observed during the last two years.

There has been a trend of increasing numbers of Euchaeta norvegica from 1961 to 1975. In 1975 (Figure 2D) Euchaeta was below average in spring but it was

abundant from July to September. As in 1974, numbers of other common copepods (Paracalanus spp., Pseudocalanus elongatus and Temora longicornis) were low and were abundant later in the season than usual.

Euphausiacea (mostly Thysanoessa longicaudata) (Figure 2F) were more abundant in 1975 than in any year since sampling started in this area in 1961; numbers were above average in seven of the eight months in which samples were taken (April and July to December).

Numbers of young fish were extremely low in 1975. Sebastes spp. (Figure 3A) and Clupeidae (Figure 3B) were absent from Recorder samples during months when peak numbers have been found in previous years. Sebastes has been scarce in sub-area 3 since 1968 and was found in April only of 1975, while Clupeidae were absent from Recorder samples except in September. There were no records of Ammodytidae or Mallotus villosus in 1975.

CONCLUSIONS.

Phytoplankton was abundant in spring and at the end of the year and copepods were numerous from July to September; Calanus finmaricus was unusually abundant during these months and numbers of Euphausiacea were above average most of the year. Young fish were most unusually scarce; Sebastes spp. and Clupeidae were the only species which were found in Recorder samples.

ACKNOWLEDGEMENTS.

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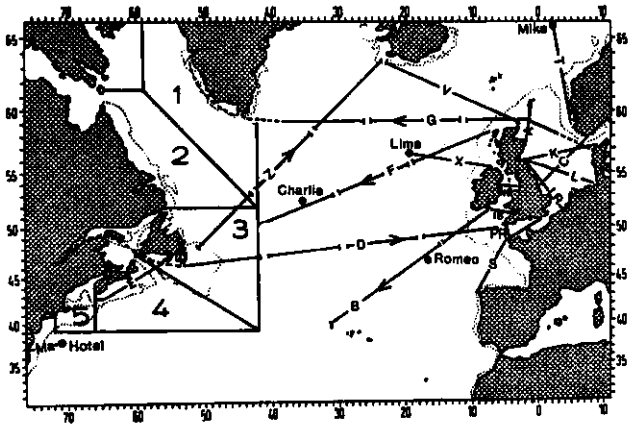

Fig. 1. The Continuous Plankton Recorder Recorder Survey during 1975. The routes are identified by code letters and Ocean Weather Stations by their international numes. The boundaries of ICNAF areas 1-5 are outlined.

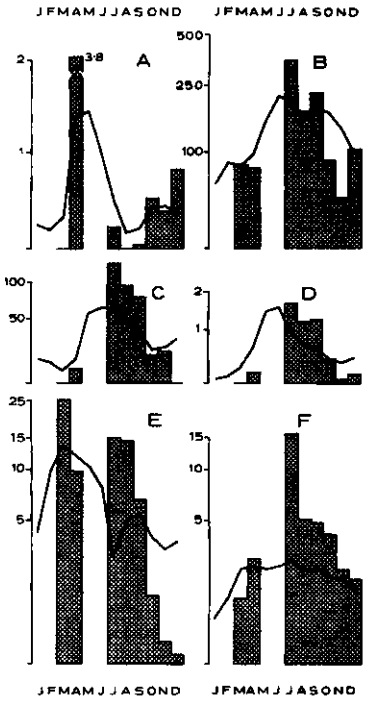

Fig. 2. Histograms showing average numbers per Recorder sample of (A) phytoplankton (B) total copepods (C) *Calanus finmarchicus*, stages I-IV (D) *Euchaeta norvegica* (E) *Calanus finmarchicus* stages V-VI and (F) Euphausiacea in ICNAF Subarea 3 in 1975. The line graphs show the mean values of the period 1961 to 1974. For further details, see text.

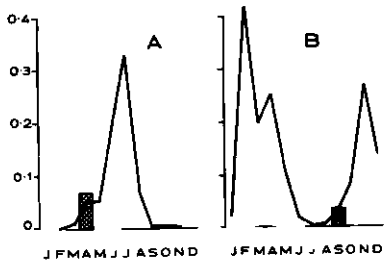

Fig. 3. Histogram showing average numbers per Recorder sample of (A) *Sebastes* spp. and (B) Clupeidae in ICNAF Subarea 3 in 1975. The line graphs show the mean value of the period 1961 to 1974. For further details, see text.