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Some Peculiarities of Plankton Development in the Norwegian Sea in 1962

by

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In 1962, as in previous years, observations on the plankton condition were carried out in the Norwegian Sea. Particular attention was given to the study of food conditions of herring in spring and summer. In spring, the food base of herring larvae during the period of their hatching was studied in the spawning ground area (the Faroes).

We have at our disposal the most complete data on the state of plankton in June, when the research vessels of the Polar Institute (PINRO) and the Fishery Reconnaissance completed the longitudinal hydrological sections over the entire area of the Norwegian Sea. The analysis of the materials collected gave the opportunity to reveal some peculiarities in the plankton development in 1962.

The retarded plankton development over the whole area of the Norwegian Sea and the later onset of the biological seasons were characteristic for 1962, compared with 1959/1961. Thus, for example, the location of the main zone of "blooming" (the zone of development of Phaeocystis Poucheti was found in the East-Icelandic waters, Diatomea - in the mixed waters, Pēridinea - in the coastal waters) in June 1962 was analogous to that observed in May 1959.

Based on the study of the Calanus finmarchicus population, we can suggest that the spawning of Calanus began later in the Norwegian Sea in 1962, than in the previous years, and the period of its spawning was considerably prolonged. When comparing the age composition of the population of Calanus finmarchicus in June 1959 and 1962, we draw the conclusion that the mass spawning of Calanus finmarchicus observed in the central part of the Norwegian Sea in 1962 began probably one week and a half to two weeks later than in 1959. Later development of plankton in the Norwegian Sea affected the food conditions for herring and their larvae. In April, unfavourable conditions for the feeding of herring larvae were observed in the spawning ground area (the Faroes) because eggs, nauplii and the young of Copepoda (the necessary food for larvae) were practically not found in plankton at the time of larvae hatching.

However, the prolonged period of spawning of Calanus finmarchicus, one of the main items of herring, contributed to the long period of fattening of adult herring.

High indices of plankton biomass were observed in the areas of fattening of herring during the spring and summer seasons. In June, the mean biomass in the entire southern part of the Norwegian Sea was considerably greater than in 1958, 1960 and 1961 and reached that of 1959 (Table 1. and Figure 1.).

Calanus finmarchicus, Pseudocalanus elongatus and Oithona similis dominated in all the water masses investigated by quantity of specimens. Besides, Calanus hyperboreus, Metridia longa, Eukrohnia hamata made up a considerable part of the plankton in polar waters, and Collozoum sp., Limacina retroversa - in the Atlantic waters.

One of the peculiarities of the spring/summer period of 1962 was an exclusively small amount of Aglantha digitale and ctenophores in the central part of the basin. This can probably be accounted for by the fact that the decreased heat content of waters, which was observed in the Norwegian Sea in 1962, adversely affected the development of these species. The comparatively large concentrations of ctenophores and medusaes were observed at the end of the summer (August-September). The absence of Medusae was favourable to herring, feeding occurred at the beginning of the summer 1962.

Table 1. Distribution of mean biomass of plankton in mg/m^3 in the Norwegian and Greenland Sea in June

(0-50 m layer, a Juday net No. 8)

Sections		1958	1959	1960	1961	1962
Only the waters of the Norwegian Current	76°30'N 13-c			1495	1382	1122
	74°30'N 11-c			1247	725	469
	72°50'N 10-c			1211	1512	1269
	71°10'N 9-c			1464	1240	1154
	69°20'N 8-c			1160	1230	1528
	67°30'N 7-c			1256	735	818
The average biomass at the northern sections				1305	1137	1060
In the mixed and polar waters only	65°45'N 6-c				540	1346
	63°00'N 5-c		1070	920	552	1204
	60°44'N 1-c	440	1406	940		636
The Faroe-Shetland Channel	2-c	480	672	440		1604
The average biomass at the southern sections		460	1049	766	546	1197

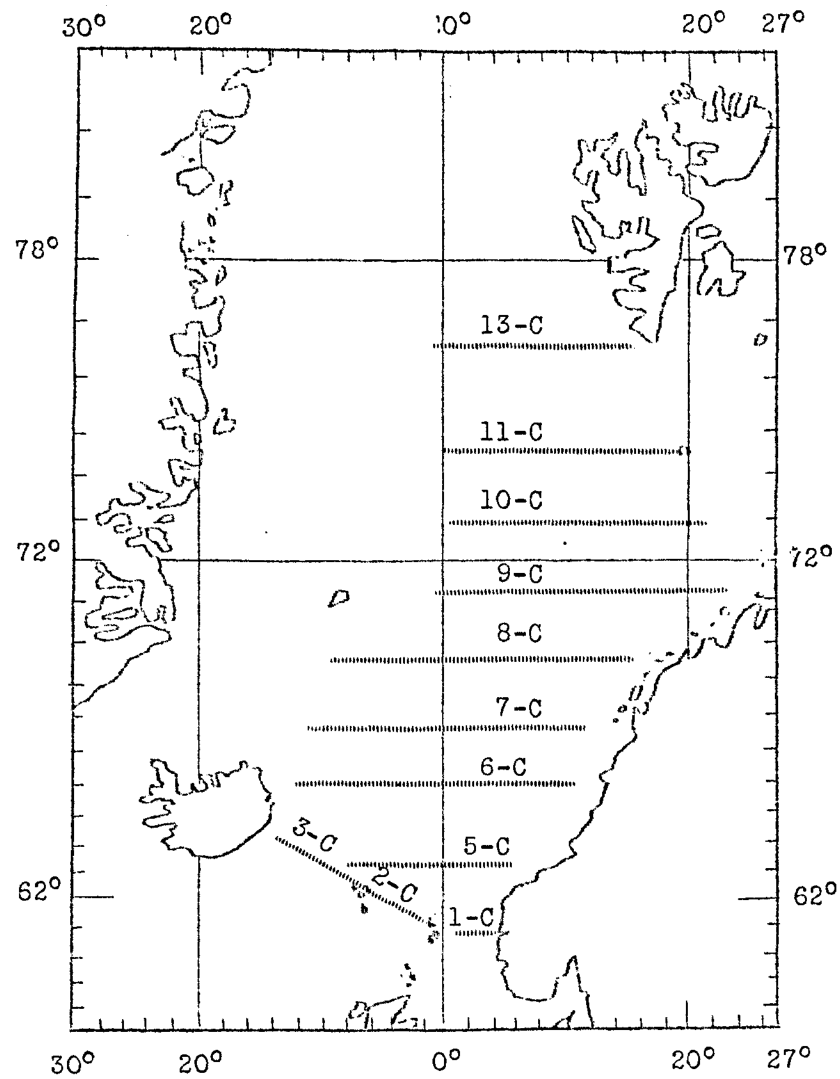

Figure 1. Scheme of standard sections in the Norwegian Sea.