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Influence of the severe winter 1962-'63 in dutch coastal waters

by

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During the extremely long and cold winter of 1962-'63 efforts have been made to collect data on the influence of these abnormal climatical conditions on the fauna of the dutch coastal waters, and especially on the stocks of the Brown Shrimp, Crangon crangon. From November till March 3 developmental stages of the Shrimp do normally occur, viz. adult shrimps, eggs and larvae. In addition, some attention has been paid to bottom invertebrates, some of which form the main food of the Brown Shrimp.

An interesting object for study is the Veerse Meer, a stagnant saltwater lake, recently created by the Deltaworks in Zeeland 1). In November 1962 good stocks of Brown Shrimp, Plaice and Flounder occurred in this lake together with rather small numbers of Soles. Gradually the watertemperature dropped below zero C. and eventually a thick layer of ice developed, to cover the whole lake for several months in succession. In March 1963, after thawing up, the stocks of Shrimp, Plaice, and Flounder were still there but not a single Sole could be caught. Dead specimens of Whiting, Herring, Sprat and Eel were found in the Veerse Meer, but live specimens of these species could still be caught in reasonable numbers. Brown Shrimps, Flounders and Plaice had apparently been able to stand the unusually extreme conditions in the winter 1962-1963.

Large numbers of small Soles, born in 1962, were caught during investigations in the Waddensea in September 1962 2). In 1963 considerable attention has been paid to small Soles caught by shrimpers. Up to the end of July, when the yearclass 1963 began to appear in the catches, small Soles were extremely scarce, indeed.

Considering the abundance of young Soles in the autumn of 1962, it must be assumed that in the dutch coastal waters virtually the entire yearclass 1962 of Sole perished in the winter 1962-1963.

Every autumn a migration of Shrimps takes place, from the shallows in the coastal aerea to deeper sections of the North Sea, but during the severe winter 1962-1963 the shrimps fled abnormally far. From January till April dutch shrimpers operated at distances of 30-50 miles off the dutch coast, mainly in the area of the Brown Bank. Although good quantities of shrimps could be caught

there and prices were very high, the number of ships involved was small, since only rather big and well equipped ships can participate in the high sea fishery. The low intensity of shrimp fishing during this winter worked without doubt in favour of the shrimpstocks. In the preceding autumn relatively large quantities of undersized shrimps had been caught by the dutch fleet.

	Catch of undersized shrimps in tons.		
	September	October	November
1962	1703	1945	1159
Main catch in these months in 3 previous years	1594	1218	1118

In winter, a medium sized small shrimp needs 7 more months to reach the size of a consumption shrimp. The low intensity of shrimp fishing during the winter did favour the stocks to such extent, that large catches of consumption shrimps could safely be forecast for the period May-July 1963.

The catches of consumption shrimps in the early summer of 1963 did, indeed, break all records.

	Catch of Consumption shrimps by dutch vessels (in tons)		
	May	June	July
1963	598	566	1068
Main catches in these months in 4 previous years	362	357	375

The observations described above indicate that there is no reason to assume, that the severe winter of 1962-1963 had a deleterious effect on the stocks of adult shrimps. In addition, it can be stated that the eggs, found attached to the pleopodes of shrimps caught in winter, made a healthy and normal impression. In March 1963 most of the eggs appeared to be in the final stage of development, as could have been expected under normal conditions. Larvae of shrimps were indirectly caught by the research vessel "Willem Beukelsz" fishing for herring larvae in the Channel in mid January.

It is remarkable that most of the larvae of *Crangon crangon* were caught off the Seine Mouth and not a single specimen due south of Street Dover. A great difference in water temperature was, however, observed between these two areas: Street Dover 3.2° C., off the Seine Mouth 6.5° C.

No shrimp larvae at all could be found in the Veerse Meer in March 1963. Everywhere else the impression has been gained that the development of eggs and larvae of the Brown Shrimp took place almost normally in the early spring of 1963, with at most a slight retardation.

In shallow waters live specimens of several common bottom invertebrates, such as *Pectinaria belgica*, *Nereis diversicolor*, *Nereis virens*, *Arenicola*,

