

Restoration can do strange things to zooplankton

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While zooplankton is an important link between primary estuarine pelagic resources (phytoplankton, detritus) and higher trophic levels, it is little studied in long-term monitoring of estuarine systems.

In this talk, we explain the difficulties in studying estuarine zooplankton which may explain this lack of data.

The long term OMES monitoring of the Sea- Scheldt (1996-present) has fortunately included monthly analysis of zooplankton at 6 stations along the brackish - freshwater gradient.

The obtained 20 year dataset has showed that the zooplankton community has changed substantially in parallel to water quality improvement, especially in the freshwater reach of the Scheldt. Essentially, *E. affinis*, a typical brackish water spring species, has become dominant in the freshwater reach, and the originally abundant cyclopoid copepods have practically disappeared. We consider a number of questions arising from this quite spectacular change in the zooplankton composition – and give (some) answers.

What permitted *E. affinis* to develop in the freshwater reach? Why does it do better there than in the brackish water reach? Is it a returning fugitive rather than an invader? Why did the cyclopoid copepods decline in abundance? Does improving water quality decrease zooplankton biodiversity? At what taxonomic level should we consider zooplankton biodiversity in restoration context?

We have also quantified the grazing impact of *E. affinis* on different types of microalgae within the natural phytoplankton community, and show that its impact is mainly on diatoms, and rarely on other phytoplankton taxa. The trophic role of zooplankton grazing in the upstream reach of the Scheldt is considered from a management and restoration viewpoint. Which zooplankton community is needed to control algal blooms? To allow higher trophic level development? What are the environmental conditions necessary for which zooplankton community?