autumn beam trawl survey data from 1985-2018 were analysed. Common trends in fish density over time were identified for the most important species using complementary multivariate techniques and linked to environmental variables. Further, changes in abundances of singular species were analysed using univariate linear models, which can explain patterns over time by the addition of explanatory variables to the models. Lastly, changes in length over time were also modelled for commercially interesting species. Using such a combination of different methods and data gives a good general overview of the most important drivers of local fish abundances linked to climatic and anthropological stressors. Information about such drivers are key for better understanding the marine environment and thereby influencing policy in terms of fisheries management and climate change mitigation.

Work related to ICES via WGNSSK (Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak) .

## (22) Tributyltin: an aggressive bottom-up stressor in a marine multistressor environment. A quality status report

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The restrictions and the concerted action of the global ban on the use and presence of tributyltin (TBT) in marine applications to protect ecosystems in the marine environment in 2008 was mainly based on the economic impact on shellfish industries and the dramatic extinction of local mollusc populations in the past. In contrast to the vast datasets on effects on molluscs, the knowledge on impacts on species from other taxa remained in the uncertain until almost two decades ago. The assumption on a long-term TBT-mediated pernicious metabolic bottom–up regulation of the crustacean *Crangon crangon* population was provoked by the outcome of an EU-project 'Sources, Consumer Exposure and Risks of Organotin Contamination in Seafood.' This work reports high TBT body burdens in *C. crangon* in 2003, at the start of the transition period to the global ban. Experimental research on the TBT impact in *C. crangon* focused on agonistic interference with natural ecdysteroid hormones at the metabolic pathways regulating growth and reproduction and the biogeochemical distribution of the chemical. Metabolic, topical and population-relevant biological endpoints in *C. crangon* and other crustaceans are evaluated in relation to the temporal and spatial trends on TBT's occurrence and distribution in the field during and after the introduction of the tributyltin restrictions and endocrine-related incidents. Arguments are forwarded to relate the German Bight incident on growth and reproduction failure in the *C. crangon* population, despite the lack of direct evidence, to the pernicious impact of tributyltin in 1990/91 and previous years. The extreme occurrence of TBT in *C. crangon* from other parts of the southern North Sea and evidence on the high body burdens as dose metrics of exposure also feeds the suspicion on detrimental impacts in those areas. We further demonstrate the complexity of distinguishing and assessing the individual roles of unrelated stressors on a population in an integrated evaluation at the ecosystem level.

The Marine Chemistry Working Group **(MCWG) is chaired by Koen Parmentier** (RBINS). This group got considerable input from the Working Group on Biological Effects of Contaminants (WGBEC) and to a lesser extent from Working Group on Crangon Fisheries and Life History (WGCRAN).

## (23) Towards open science products for ecosystem science

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Ecosystem science needs to integrate a variety of (biological) data sources and to use state-of-the-art methods to improve the knowledge of complex marine ecosystems. In this talk, we demonstrate how the Data Centre of Flanders Marine Institute (VLIZ) is organizing an open science data flow from collecting data to the development of biological products on Essential Ocean Variables (EOVs) that serves ecosystem assessments.