

# Simulating Fish Stock Responses to Fishing Pressures in the Western Baltic with the multispecies model OSMOSE

Mittwoch, 18. Juni 2025 14:42 (12 Minuten)

The Western Baltic Sea (WB) is under increasing impacts from climate change and biodiversity degradation caused by eutrophication, pollution, increased land use and increased resource uptake. Between 1994 and 2019, WB has been overfished, leading to fish stock depletion of cod (*Gadus morhua*), herring (*Clupea harengus*), and sprat (*Sprattus sprattus*). The interconnected dynamics between cod-herring-sprat, where predator recovery can limit prey populations growth through trophic cascades, pose a challenge to predict management of these fish stocks.

We carried out model simulations using the OSMOSE multispecies model configured for the WB region and analysed the impacts of fishing and environmental pressures. By implementing various scenarios for fishing and environmental changes, sustainable management strategies could be suggested. Our analyses of fishing pressure scenarios revealed that there is a rapid decrease in all fish species present in the model, with the poorest recovery of cod stock, whereas environmental changes related to plankton availability, have the strongest effect on herring stock. The analysed impacts affect yield and biomass of the cod, herring and sprat, while also shifting the dynamics in their food web and altering fish size, weight and age class abundance.

Our research highlights, that sustainable management of WB fisheries requires species-specific strategies that account for different responses to changes in the ecosystem. OSMOSE Model output demonstrates environmental change vulnerability in WB fish communities and future effects of fishing pressure on fish and fisheries.

**Autor:** MUSIDLOWSKA, Ada (FB2 Biogeochemical modelling)

**Vortragende(r):** MUSIDLOWSKA, Ada (FB2 Biogeochemical modelling)