

Quantification of plankton and fish in offshore wind farms using a novel multibeam echosounder approach.

Gloe, Dominik, Schröder, Friedrich, Preu, Benedict, Köbke, Jörg, Kafemann, Rudolf, Möller, Klas Ove, Floeter, Jens

The further development of Offshore Wind Farms (OWFs) in temperate seas can potentially change the natural corridors of top-down and bottom-up processes affecting zooplankton organisms: on the one hand, planktivorous fish are known to aggregate in the vicinity of OWFs; but on the other hand locally induced upwelling may increase the summer nutrient levels in the surface mixed layer, fueling primary and subsequently secondary production. To be able to balance bottom-up and top-down effects non-invasive ecosystem surveys are required, as sampling restrictions apply in this anthropogenically altered areas. Zooplankton densities within OWFs could be obtained by integration of optic and hydroacoustic methods which show already promising results in estimating pelagic planktivore fish biomass. Here we describe a novel non-invasive method to estimate pelagic fish densities with multibeam echosounders (MBES), which have the advantage to detect pelagic planktivores between the power plant foundations and not only directly under the vessel. We outline the methods and present application examples of zooplankton - fish surveys conducted in and around North Sea OWFs.

Keywords: planktivorous fish, zooplankton, top-down, offshore wind farm, multibeam echosounder

Contact author:

Dominik Gloe
dominik.gloe@uni-hamburg.de
Institute for Hydrobiologie and Fisheries Science
Universität Hamburg
Große Elbstraße 133
22767 Hamburg - Germany