IOW press release, July 10, 2024

Effects of bottom trawling: IOW leads large Baltic Sea field experiment with four research vessels

On July 16, 2024, a 19-day research cruise will start in the Baltic Sea led by the Leibniz Institute for Baltic Sea Research Warnemünde (IOW) to investigate the impact of bottom trawling on the seabed and the organisms living there. In addition to the IOW research vessel ELISABETH MANN BORGESE, three more research vessels from other institutions are involved in the large-scale bottom trawling simulation experiment near Warnemünde. The experiment is part of the collaborative project of the German Marine Research Alliance (DAM) to study the effects of bottom trawling on marine protected areas in the North and Baltic Seas.*

According to national and international conservation regulations such as the EU's Natura 2000 Directive, marine protected areas aim at protecting special habitats and their biotic communities. Nevertheless, fishing still takes place in the protected areas in the German North and Baltic Seas, including the use of bottom trawls to catch demersal fish such as plaice, sole and cod. Scientific evidence already shows that this fishing method can cause significant physical damage to the seabed. Yet how exactly this affects sensitive marine habitats has hardly been investigated in the Baltic Sea.

"We see the permanent marks that bottom-contact fishing leaves in the seabed. However, we neither understand how this changes the biotic communities and seabed functions the in the long term, nor what the immediate short term effects on the seabed and its inhabitants are, for example through sediment resuspension," says Klaus Jürgens from the IOW. The marine biologist heads the DAM subproject on the influence of mobile bottom-contact fishing in the Baltic Sea and, as chief scientist, is responsible for the field experiment coming up next week. "We want to use our experiment – which will of course not take place in a protected area and under controlled conditions – to comprehensively document all relevant processes for the first time in the Baltic Sea."

Taking such a close look using a wide variety of methods and marine technology requires a great deal of logistical effort. This is why four research vessels from four different research institutions are taking part in the experiment: the IOW research vessel ELISABETH MANN BORGESE, the research vessel ALKOR from the GEOMAR Helmholtz Centre for Ocean Research Kiel, the research catamaran LIMANDA from the University of Rostock and the fisheries research vessel CLUPEA from the Rostock Thünen Institute of Baltic Sea Fisheries.

During the field experiment, the CLUPEA will fish a 200 m x 2600 m study area with a bottom trawl comparatively heavy for the Baltic Sea, so that subsequently the sediment's rearrangement and release of substances as well as possible changes in the biotic communities can be documented. The two large research vessels, ALKOR and ELISABETH MANN BORGESE, are primarily used for sampling and measurements with large equipment (lander, sediment grab, water sampler, multi corer) and as floating laboratories, where the water and sediment samples collected on site are processed or prepared for laboratory analyses on land. Various physical and chemical parameters will be analysed, as well as microbial and chemical processes at the boundary layer between water and sediment. Of particular interest, in addition to the release of pollutants and nutrients, is how much of the sediment-bound carbon is released during trawling and whether and how the composition and activity of sediment-dwelling organisms changes. Video recordings and high-resolution hydroacoustics document the underwater effects of trawling and how the sea floor changes due to the trawl marks. Research divers are deployed from the LIMANDA to investigate small-scale effects through precise sampling directly at the trawl marks.

"The coordination of four research vessels carrying out very different tasks in parallel in such a small study area will be a logistical challenge – especially as a large field trial like this, in which a wide variety of measurements are carried out simultaneously, has never been conducted in the Baltic Sea before,"

comments Klaus Jürgens. “However, if we want to understand the influence that bottom trawling has on the matter fluxes between seabed and water and on the benthic communities – from bacteria to invertebrates such as mussels, worms and crustaceans to bottom-dwelling fish – then a comprehensive methodological approach like this is exactly what we need,” concludes the project leader.

Scientific contact
Prof. Dr. Klaus Jürgens | Head of the IOW working group Microbial Ecology
klaus.juergens@io-warnemuende.de | Tel.: +49 (0)381 – 5197 250

IOW Media contact:
Dr. Kristin Beck, Tel.: +49 (0)381 – 5197 135 | presse@io-warnemuende.de

The IOW is a member of the Leibniz Association that connects 96 independent research institutions that range in focus from natural, engineering and environmental sciences to economics, spatial and social sciences and the humanities. The institutes are jointly financed at the state and national levels. The Leibniz Institutes employ a total of 20,500 people, of whom 11,500 are scientists. The total budget of the institutes is 2 billion Euros. www.leibniz-association.eu