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NEWS

DAM Research Mission sustainMare

Inter- and Trans-Mission Collaboration for Charting a Sustainable Future for Western Baltic Fisheries

From July 2–4, 2025, the SpaCeParti -2 team convened in the town Malente (Schlewsig-Holstein) for their second yearly meeting —an inspiring and productive milestone in the project's mission to develop spatial solutions for the transformation of the collapsing Western Baltic fishery. The project meeting was further enriched by exchange with colleagues from sustainMare's sister project iSEAL as well as from a sister mission CDRmare project RETAKE.

Bringing together a diverse group of ecologists, economists, and social scientists, the meeting focused on aligning scientific insight with actionable strategies across five interconnected work packages. Discussions tackled ecological modeling of fish stock life cycles and their overlaps with MPAs and offshore wind farms, supported by new otolith-based research on herring spawning habitats. At the same time, economic simulations were developed to assess how fisheries management scenarios—like spatial closures—could impact vessel profitability, effort, and livelihoods.

A central element of the project, the *real-world lab* in Stein-Wendtorf, is fostering bottom-up innovation. It brings together local fishers, researchers, and other actors to co-produce solutions like sustainable sea gardening with macroalgae. The team is also refining frameworks to evaluate such labs and understand how local context shapes transformation and is in the process of publishing results of Phase I.

On the governance side, initial findings point to limited integration of fisheries into current Marine Spatial Planning (MSP) processes. The team is working to bridge this gap, identifying how MSP could better support sustainable fisheries by protecting key areas and aligning with regional management policies.

Figure 1: Group photo of all participants © K. deGraaf | CeOS

Outreach and education also received attention, including plans for a "Back to School" kit that brings cutting-edge fisheries and conservation science into classrooms in the North and Baltic Sea regions. The "Back to School" working group is a joint project by members of projects CREATE, CoastalFutures and SpaCeParti.

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Together, the SpaCeParti -2 team is building momentum toward a science-based transformation of Western Baltic fisheries—one that is spatially informed, socially just, and ecologically resilient.

There is a strong political and societal demand for robust evidence to inform MPA management and fisheries governance—and the MGF projects are ready to make a decisive contribution.

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iSeal at the Weekend at the Jade 2025

From 03.07 to 06.07.2025, the weekend at the Jade took place in Wilhelmshaven. On board, the iSeal project represented by Dr. Ulrike Schückel and Dr. Sven Rossel. On the research vessel "FK SENCKENBERG", visitors were able to experience science on board during the open-ship activities from Friday to Sunday.

The iSeal project presents itself on board with a poster. Questions about the project and the challenges facing the Wadden Sea in times of climate change, new non-native species and the impact of fishing on the ecosystem were answered in a direct exchange with visitors.

Figure 2: Dr. Sven Rossel answers questions about the project iSeal.
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SpaCeParti Stein-Wendtorf real-world laboratory: Fishing with a straw cutter

A straw cutter was made in the real-world laboratory community of Stein to take part in the Probsteier Korntage festival. It will be on display in the village square throughout the summer and, on the initiative of our stakeholders from the tourism sector, has been equipped with two information boards from the coastal culture nature trail as informative accessories.
To this end, two boards from the successful real-world experiment of 2022-2024 were reprinted. With the help of QR codes, fishing-related topics can be explored using multimedia, and the SpaCeParti project can gather data for a partial evaluation of the use of the nature trail.

Figure 3: Straw cutter for the Probsteier Korntage festival
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EMB369: Complete recording of the community in areas with exclusion for bottom trawling

From June 23 to August 7, 2025, the Elisabeth Mann Borgese was at sea for MGF-Ostsee II. The aim of the cruise was to conduct a comprehensive inventory of the biotic communities for the first time since the exclusion on bottom trawling came into force in parts of the marine protected areas of the German Baltic Sea. Organisms ranging from bacteria to worms to crustaceans were recorded; various fish species were also detected using video sleds and environmental DNA (eDNA). In addition, a wide range of biogeochemical parameters were measured.

The journey took us to the Oderbank and Rönnebank between Rügen and Bornholm, all the way to the Fehmarn Belt. A brief stopover in the 2024 experimental area also enabled us to record the long-term geological changes following the use of trawl nets at that time.

Despite stormy periods and prolonged periods of bad weather, all planned stations were visited and successfully sampled. The samples and data are currently being evaluated and prepared for scientific publications.

Figure 4: Transfer of the crew to the Elisabeth Mann Borgese
© T. Bruhns | IOW

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CoastalFutures – BSH Workshop

On 15 July 2025, more than 25 representatives from the Federal Maritime and Hydrographic Agency (BSH), the Helmholtz Centre Hereon, Fraunhofer IWES, the University of Veterinary Medicine Hannover Foundation and the University of Hannover met at BSH to discuss the topic: **the use of models and model results for assessing the environmental impact of offshore wind farms in the North Sea**.

The BSH is responsible for maritime spatial planning and approval processes in the German EEZ. It also conducts strategic environmental assessments for these planning instruments including the site development plan, taking into account the statutory expansion targets of at least 30 GW of offshore wind energy by 2030 and at least 70 GW by 2045. Models and model results can play an important role in assessing potential impacts, particularly with regard to large-scale effects up to the year 2050.

Andreas Kannen from the Helmholtz Zentrum Hereon and co-spokesperson for the research mission pointed out that transdisciplinary cooperation and exchange with authorities and other stakeholders are central elements of sustainMare. The mission, comprising a total of seven projects, focuses on the protection and sustainable use of marine space from various perspectives. Within

the mission, the CoastalFutures project aims to analyze scenarios for the development of marine space and to develop models for analyzing and evaluating change. The BSH is an associated partner in CoastalFutures.

The event served to deepen the exchange between science (in this case, specifically modelling) and the responsible planning and approval authorities. It is particularly important that, on the one hand, scientists are familiar with planning and approval-related processes and their administrative context in order to be able to develop models that are relevant in practice. On the other hand, authorities need to be aware of the state and progress of scientific research. This was specifically emphasized by Nico Nolte, department head at the BSH. Against this backdrop, the results and usability of various models. Therefore, a range of modelling exercises from effects on the atmosphere to biology, were examined. It was specifically discussed how and where modelling can be incorporated to inform planning and approval processes.

Conclusion

Major issues such as climate change <-> expansion targets must be negotiated by society, and ultimately it is up to the legislator to decide. Planning and approval procedures then implement these political decisions. Models can be very helpful for various aspects of administrative processes. It is planned to continue this exchange and to further consolidate communication between BSH and sustainMare.

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Further pilot-clearance of marine munition

Another pilot clearance operation was carried out in August to recover World War II munition from the Baltic Sea. This project is part of the German government's Immediate Action Programme on unexploded munition in the North and Baltic Seas, which aims to test methods for the safe and scalable clearance of munition in German coastal areas. The programme started in 2024 and received €100 million in funding from the federal government. Following the initial clearances in the Bay of Lübeck in August and September 2024, the latest operation took place off the Mecklenburg coast near Boltenhagen. The Baltic-Lift platform, operated by "Baltic Taucher", was stationed off Grossklützhöved, where divers recovered munition from a pile next to a sunken barge (see Fig. 5). CONMAR researchers carried out comprehensive environmental monitoring on 12 and 26 August 2025.

These two measurement campaigns investigated whether clearance activities stir up sediments contaminated with munition compounds (MC),

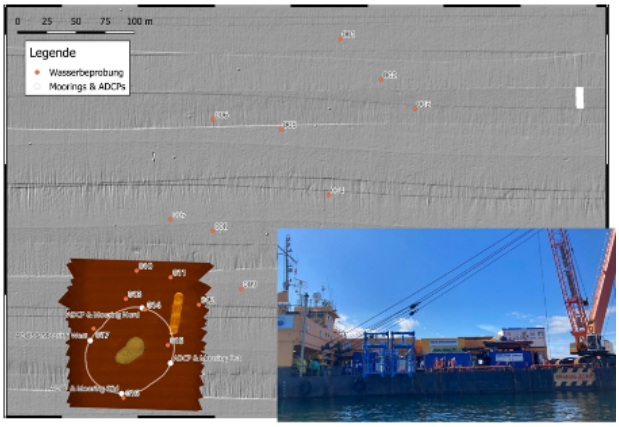

Figure 5: Sampling locations Großklützhöved and the clearance platform "Baltic-Lift" operated by "Baltic Taucher"

which could then spread into the surrounding marine environment. To this end, four mussel moorings and four current meters (two ADCPs and two ADPs) were deployed around the clearance site (within 50 metres) on 12 August with the help of PAMELA P. Water samples were then taken downstream of the clearance site on 26 August. With a

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water collector, a CTD sensor (which measures conductivity, pressure, temperature and turbidity)

and special MC pre-concentration sampling equipment on board, the researchers were able to complete their work successfully at all seventeen stations. Throughout the operation, the team was supported by the crew of the transport ship. As the ship had no winches or booms, the researchers had to use the traditional method of pulling by hand (see Fig. 6).

The samples will be processed at GEOMAR and analysed for MCs, heavy metals, and sediment concentrations. Combined with the evaluation of measurements taken by previously deployed ADCP/ADP sensors, which measure turbidity and currents, these investigations will provide valuable data for the environmental impact assessment during the clearance work.

Figure 6: On August 26, 2025, the sampling team began in Boltenhagen on the CTV (crew transport vehicle) belonging to the "Baltic-Taucher" company.

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Razor Clams in the Wadden Sea – Exploring New Research Approaches

How does climate change affect life in the Wadden Sea? Researchers from GEOMAR and the Alfred Wegener Institute (AWI) are investigating this question as part of the iSeal project. In the first phase, they used special experiments ("mesocosms") to study how different temperatures influence the metabolism, such as respiration, filtration, and growth of various clam species. The next phase will scale these findings up to the entire Sylt-Rømø Bay ecosystem. The goal is to create a "carbon balance" for the lower food web – that is, for phytoplankton (tiny algae) and filter-feeding clams. Special attention is given to non-native species, such as the Pacific oyster and the American razor clam. The razor clam poses a particular challenge: it burrows deep in the sediment and retreats instantly into its tube when disturbed. To gather reliable data on its distribution and biomass, AWI researchers are using an innovative multi-method approach. At the heart of this method is a remotely operated underwater vehicle (ROV), which records the seabed. From these videos, still images and 3D models are created to identify razor clam tubes. This approach is complemented by side-scan sonar and artificial intelligence, enabling large-scale, accurate surveys – and a better understanding of how these clams impact the Wadden Sea ecosystem.

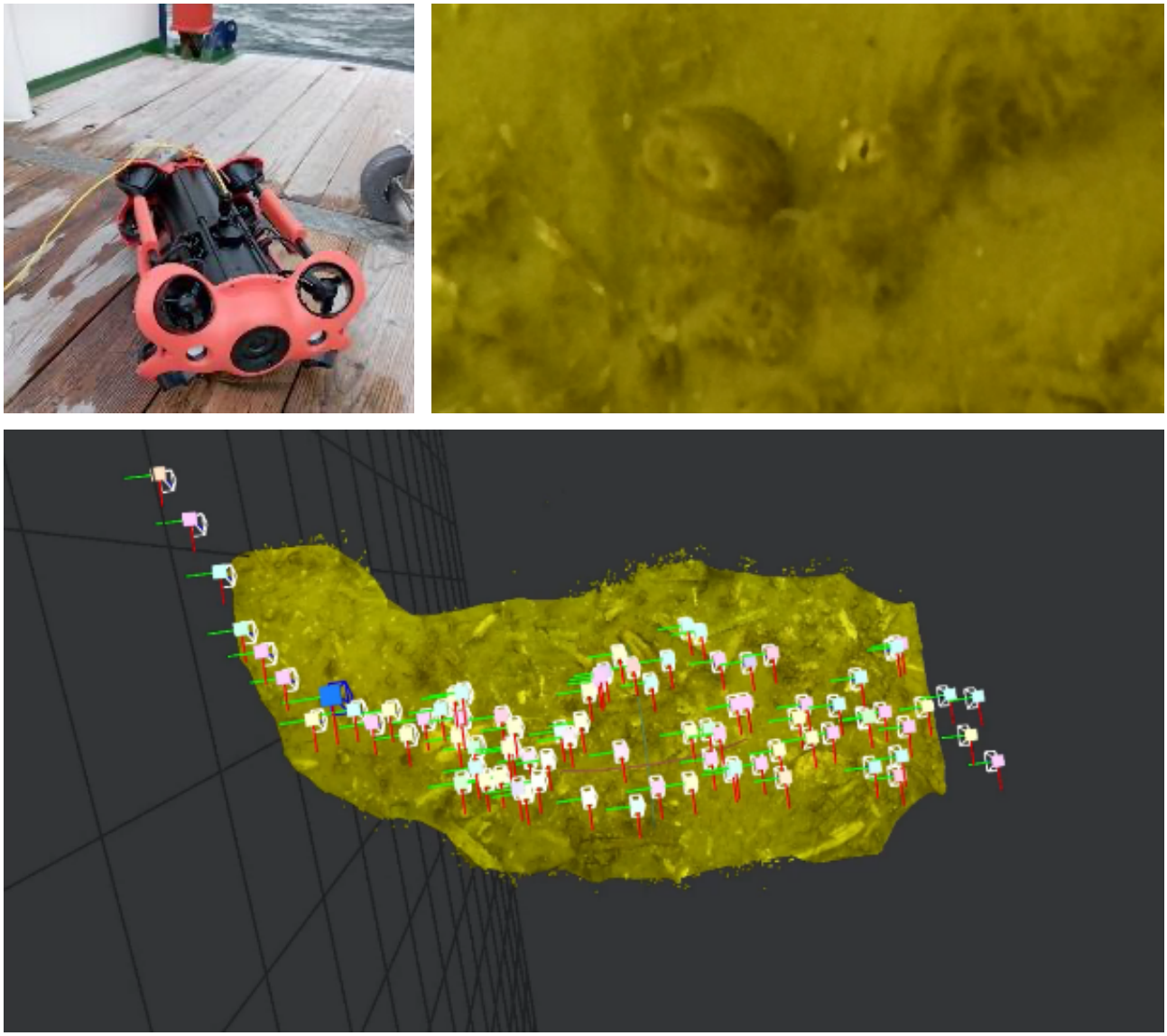

Figure 7: With a ROV (upper left) video sequences were taken form the seabed in the SRB. Live razor clams (upper right) were detected in the video. In the lab, videos were clipped into still images and stitched together into larger 3D models (lower image).

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Hot and stressful: Effects of climate change and fishing pressure on the benthos of Dogger Bank

As part of the project "MGF-Nordsee", Senckenberg researchers documented long-term changes in benthic communities at the Dogger Bank and examined possible links to fishing effort and climate. Between 1991 and 2021, summer temperatures near the seabed at the Dogger Bank tail end rose by a dramatic average of 4 °C, while fishing activity declined steadily over the same time period. Nevertheless, species diversity declined significantly during the study period.

The analysis of over 100 species also shows a marked regime shift around the turn of the millennium: in the 1990s, the influence of fishing

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dominated, while in the last two decades, rising temperatures appear to have had a stronger effect. Some species benefited from the warming, while many others declined—overall, biodiversity decreased. For example, some species, such as the starfish *Luidia sarsii* and the lemon sole *Microstomus kitt*, showed positive correlations with rising water temperatures, while others, such as cod *Gadus morhua*, showed negative correlations. The results underscore the importance of long-term data series for understanding the impacts of climate and human use on marine ecosystems. In view of planned fishing restrictions in the Dogger Bank protected area, they also provide a crucial basis for future management and conservation measures.

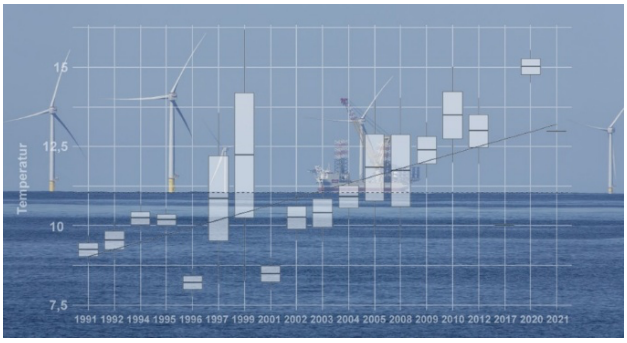

Figure 8: Mean water temperatures at the Dogger Bank tail end in summer (01.07.-31.08.) from 1991 to 2021. All data measured below 25 m. In the background: Construction of an offshore wind farm at the British part of the Dogger Bank (Menno de Boer, Doggerland Foundation). (© Sonnewald | SGN)

For further information see: Hahn, S. J., Brandt, A., & Sonnewald, M. (2025). Climate change and fisheries affect benthic composition and diversity in the North Sea—investigations at the Dogger Bank during three decades (1991–2021). Marine Biodiversity, 55(4), 1-15.

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Are Multi-Use Offshore Concepts the Key to Healthier Coastal Ecosystems?

At the end of May, the "Marine Protection | Multi-Use" working group met at the HIFMB in Oldenburg for its annual discussion round. The group's previous outcome was recently published in a short communication in Marine Policy. The background to the joint publication is the increasing use of European coastal and shelf seas. The simultaneous and sometimes conflicting economic and ecological needs require innovative approaches to spatial management that consider new usage concepts.

For example, the large areas earmarked for the expansion of offshore wind farms (OWFs) could be actively used for various concepts to improve the ecosystem, such as habitat restoration or the creation of artificial reefs as part of conventional scour protection. At the same time, various uses, such as extractive aquaculture or other offshore renewable energies, could be placed within OWFs to make more efficient use of limited marine space while maximizing the benefits of a location. So far, the ecological and spatial improvement potential of such multi-use concepts has not been fully exploited. One concern is that stronger focus on such enhancement approaches could lead to

Figure 9: Synopsis of the different management and intervention strategies with regard to the degree of environmental degradation and necessary efforts for improving the status. The star represents the estimated degradation level of the North Sea and Baltic Sea. In this sense, all forms of intervention are urgently needed to improve the environmental status.

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reduced efforts in other urgent nature protection needs such as Marine Protected Areas. We argue that co-designed by knowledgeable stakeholders, and effectively implemented, appropriate forms of multi-use concepts could help with impact reduction of OWF areas and the improvement of the already floundering ecosystem status of coastal and shelf seas.

For further information see: Horn, S., Buck, B. H., Amann, R., Boteler, B., Gee, K., Goseberg, N., ... & Wiltshire, K. H. (2025). Towards a strategy for offshore installations to enhance the environmental status of coastal seas: Multi-use concepts for ecosystem restoration. *Marine Policy*, *182*, 106893.

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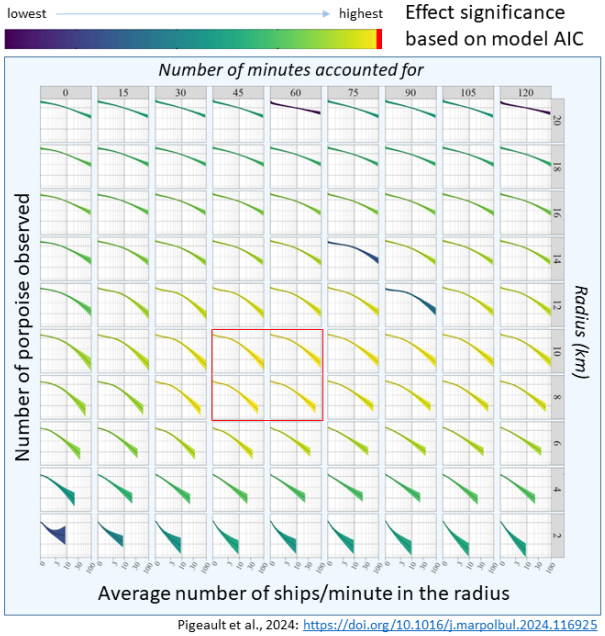
Maritime traffic affects harbour porpoise distribution in the North Sea

A new study by the Institute for Terrestrial and Aquatic Wildlife Research (ITAW, TiHo Hannover), conducted within the CoastalFutures project, showed that **heavy maritime traffic disturbs the distribution of harbour porpoises (*Phocoena phocoena*) in the North Sea.**

Harbour porpoises are the most abundant cetaceans in European waters and particularly vulnerable to anthropogenic noise, while also strictly protected under the EU Habitats Directive as key species for the ecosystem. The research team combined more than 80,000 kilometers of aerial survey data (2015–2022) with Automatic Identification System (AIS) vessel data. This large-scale approach revealed that harbour porpoises avoid heavily frequented shipping routes within a radius of up to 9 km. The most important factors were the number of ships and their proximity to the animals whose significance exceeded that of predicted sound levels.

The research then shows that harbour porpoises in the North Sea are subject to short-term disturbances, which can last from just a few minutes to several hours. Particularly significant effects are observed in areas with frequent traffic. In terms of application and benefits, the study provides models and results that can be directly integrated into management strategies and policy frameworks. Potential uses include the establishment of protected or quiet zones for harbour porpoises, as well as the adjustment of shipping routes and vessel speeds. The findings can also be incorporated into broader initiatives such as the EU Marine Strategy Framework Directive, maritime spatial planning, and national underwater noise reduction plans.



Pigeault et al., 2024: https://doi.org/10.1016/j.marpolbul.2024.116925

Figure 10: This graph shows the negative effects found between the number of vessels and the density of harbour porpoises, testing different radii and durations. In this case, the highest significance was reached over 9km and 1 hour to estimate the cumulative impact of maritime traffic.

Further information: Pigeault, R., Ruser, A., Ramírez-Martínez, N. C., Geelhoed, S. C., Haelters, J., Nachtsheim, D. A., ... & Gilles, A. (2024). Maritime traffic alters distribution of the harbour porpoise in the North Sea. Marine pollution bulletin, 208, 116925.

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