02/2025

CONMAR

PROJEKTNEWS

From the DAM Research Mission sustainMare

Does dumped munition promote biodiversity and the richness of epifauna in the Baltic Sea?

A recent CONMAR study, published in the journal *Communications Earth and Environment*, examined this question. Here's what it's about: Within the CONMAR project the team from the Senckenberg research institute is investigating potential effect of the dumped munition on the marine ecosystems.

That time, in October 2024, we used an ROV (called 'Kapitän Blaubär') connected to the ship with a 400-m cable, steered from board. The ROV was equipped with thrusters, water samplers, positioning unit, sonar and, of course, camera. We were very lucky, and several rather amazing coincidences came together.

First, it was an uncharted dumpsite, which was important on its own. Then a colleague on board decided to install an action camera on the ROV to see what it is capable of. And then there was the fact that we had excellent visibility, which is rather rare in the Baltic Sea.

So, we watched the dive through the ROV in-built camera, and saw about 10 weird objects in a varying stage of the degradation – some were completely intact, while some haven been corroded and dissolved almost completely. The curious thing was that, when we finished the dive and watched the action-camera recording, it turned out that the resolution and quality of the video was like 100 times better in every way, then the video from the in-built camera. We saw in incredible details the surface of those objects with all the actinians, crabs and even small worms living there on the surface of the metal parts of the objects.

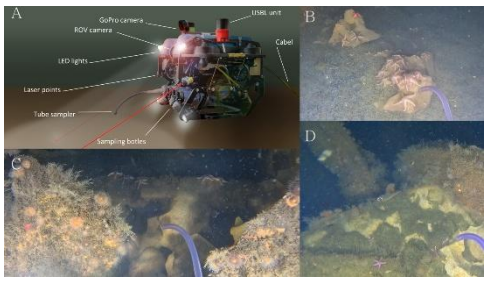

Fig 1. ROV 'Käpt'n Blaubär'; B-D Sampling of individual exposed munition objects using 'Käpt'n Blaubär's 'tube sampler.

And we said – we should write a paper about it! We managed to identify the objects lying on the ground as warheads from Fi-103 flying bomb (also known as V1) packed in a transporting frame. And the most astonishing was the density calculated on the metal parts of the warheads – over 40.000 individuals per m². However, the exposed explosives at some of the objects was

GEFÖRDERT VOM

DAM Deutsche Allianz Meeresforschung

Bundesministerium für Bildung und Forschung

Freie Hansestadt Bremen

Hamburg Behörde für Wissenschaft, Forschung, Gleichstellung und Bezirke

MV Mecklenburg-Vorpommern

Niedersächsisches Ministerium für Wissenschaft und Kultur

SH Schleswig-Holstein Ministerium für Bildung, Wissenschaft und Kultur

mostly bare. This probably means that although fauna can fully develop within a centimetre of the explosives, where concentrations of toxic explosive chemicals are quite high, the concentrations on the surface of the explosives are already too high for the organisms to survive. Altogether we found 8 species. That might not sound like a lot, but this area lies at ~20 m depth in the central area of the Lübeck bay, where regular oxygen deficiency occurs, mostly from August to October each year. So, only a few species can survive there: either highly mobile, and can potentially escape the area if the oxygen values drop; or – they are extremely tolerant, as the sea anemones, who can survive for weeks under almost completely anoxic conditions; or – they are quickly developing organisms, like the polychaetes, which can fully develop in just a few weeks, if the conditions are favorable.

Contact: Andrey Vedenin
andrey.vedenin@senckenberg.de>

Searching for evidence in the North Sea with the FS Heincke

The research cruise HE 669, conducted jointly by REMARCO and CONMAR, took place from 27 September to 10 October 2025 and led a multidisciplinary team from Bremerhaven across several regions of the North Sea before returning to port.

During the cruise, five key areas were sampled: the wreck of MS Brummer in Norwegian coastal waters, the wreck of Vigo in German waters, the munition dumping sites near Sylt and Helgoland Steingrund, and a reference area near Borkum Riffgrund presumed to be unaffected by munition-derived contaminants.

Despite several days of rough seas and challenging weather, all planned stations were successfully sampled, and the teams returned to Bremerhaven with freezers and refrigerators filled with valuable samples. The coming weeks will be dedicated to processing and analyzing the extensive sample collection. Scientists from all collaborating institutions will integrate microbial sequencing, chemical analytics, ecological data, histopathology, and biomarker measurements to develop a comprehensive picture of how explosive residues affect the North Sea ecosystem, from microbes in the sediment to top predators.

Fig 2. Impressions from HE669. © Romina Schuster/ AWI

The results of HE 669 will make a significant contribution to ongoing efforts to understand the environmental impact of underwater munitions. This expedition also involved interdisciplinary and cross-project research. This is one of CONMAR's key strengths.

Contact: Romina Schuster
romina.schuster@awi.de

4th CONMAR Annual Meeting in Rostock

From 8 to 9 December 2025, the CONMAR team met at the invitation of colleagues from the University of Rostock in the wonderful and venerable university building. We were delighted

to welcome various external guests to our annual meeting this year: In addition to representatives from PtJ, two advisors from the Ministry for Climate Protection, Agriculture, Rural Areas and the Environment of Mecklenburg-Western Pomerania and Mr Robert Mollitor (Head of Munitions Recovery, Mecklenburg-Western Pomerania) and Eyk-Uwe Pap (General Manager, Baltic Taucher) also took part in the meeting.
To kick off our meeting, Mr Pap and Mr Mollitor reported on the munition clearance operation in Grossklützhöved/Boltenhagen in Mecklenburg-Western Pomerania, which took place in autumn as part of the German government's immediate action programme 'Unexploded munitions in the North and Baltic Seas'.
The meeting was full of fruitful exchange and valuable discussions. Another focus of the event was on the integration of CONMAR into the working groups of the research mission.

Fig. 3 CONMAR Annual Meeting at the University of Rostock

Contact: Daniela Henkel *dhenkel@geomar.de*

CONMAR at the 'Meeresumweltsymposium' in Hamburg

On 8–9 October 2025, the annual 'Meeresumwelt - Symposium' of the 'Bundesamt für Seeschifffahrt und Hydrographie', BSH took place in Hamburg. In addition to topics such as offshore wind energy and sustainable shipping, the agenda also included the issue of munitions in the sea. CONMAR was represented by Torsten Frey, who presented the project results to an interested audience with his lecture on multi-criteria analysis for prioritising munitions clusters for clearance. The removal of munitions contamination in the North Sea and Baltic Sea is enshrined in the German government's coalition agreement as a national task – a strong signal for concrete action.

Fig. 4. Torsten Frey as a panelist at the 'Meeresumwelt-Symposium' © Volker Hess/ Seascape

Contact: Daniela Henkel dhenkel@geomar.de