REMOVAL OF WRECKS AND MUNITIONS FROM EUROPEAN SEAS

Overview of Ongoing Projects

Funded by
the European Union

MMinE-SwEEPER

MMinE-SwEEPER:

Marine Munition in Europe - Solutions with Economic and Ecological Profits for Efficient Remediation

Funding: Horizon Europe
Duration: 10/2024 - 03/2028

The MMinE-SwEEPER project aims to enhance Europe's capacity for non-military UXO clearance. It focuses on advancing technologies such as automated detection, environmental monitoring, burial and corrosion predictions, and secure data exchange. Additional efforts include compiling knowledge, addressing legal frameworks, developing training, and stakeholder outreach. Outcomes include AI-supported detection, identification, and Smart-AUV/USV integration, with technologies reaching a stage where they are tested in real-world conditions and ready for further development toward commercial use.

https://mminesweeper-munition.eu/

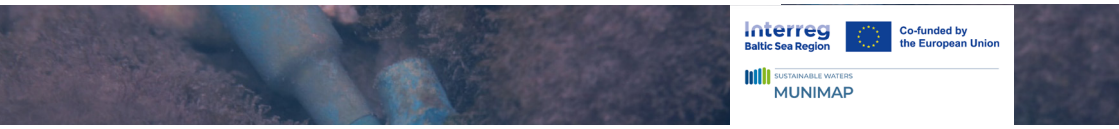
Project Coordinator:
Prof. Dr. Jens Greinert, GEOMAR Helmholtz Centre for Ocean Research Kiel

Partners:

- Aarhus University (DK)
- Baltic Marine Environment Protection Commission - Helsinki Commission (FI)
- Bundeswehr Technical Center for Ships and Naval Weapons, Maritime Technology and Research (DE)
- Cranfield University (UK)

- Explosive Ordnance Disposl Service Schleswig-Holstein (DE)
- Federal Police Germany (DE)
- Flanders Marine Institute (BE)
- Fraunhofer ICT (DE)
- Institute of Oceanology of the Polish Academy (PL)
- IQUA Robotics (ES)
- JPI Oceans (BE)
- National Research Council of Italy (IT)
- Naval Hydrographic and Oceanographic Service (FR)
- North.io (DE)
- Norwegian Defence Research Establishment (NO)
- Royal Military Academy Belgium (BE)
- SeaTerra (DE)
- The Border Guard Academy in Koszalin (PL)
- University of Tromso - The Arctic University (NO)

Contact: mmine-sweeper@geomar.eu



MUNIMAP:

Baltic Sea Munitions Remediation Roadmap

Funding: Interreg Baltic Sea Region Programme 2021-2027
Duration: 3/2024-2/2027

MUNIMAP will accelerate and coordinate national munition management programmes by developing a modular roadmap for Baltic Sea munitions reme-

diation. This includes policy recommendations, IT tools for site prioritisation, monitoring strategies, and innovative, cost-effective, eco-friendly remediation methods, all designed with user groups.

Pilot activities will cover key remediation stages: detection, risk assessment, prioritisation, remediation, monitoring, and result evaluation. The project supports national authorities and agencies facing legal, financial, and practical challenges in managing sea-dumped munitions while ensuring safety and environmental protection.

https://interreg-baltic.eu/project/munimap/

Project Coordinator:
Prof. Jacek Bełdowski, Institute of Oceanology Polish Academy of Sciences

Partners:

- Aarhus University (DK)
- Alfred Wegener Institute, Helmholfz Centre for Polar and Marine Research (DE)
- Baltic Marine Environment Protection Commission - Helsinki Commission (FI)
- Council of the Baltic Sea States (SE)
- German Environment Agency (DE)
- International Centre for Chemical Safety and Security (PL)
- K.U.M. Environmental- and Marine Technology (DE)
- Latvian Institute of Aquatic Ecology (LV)
- Lithuanian Environmental Protection Agency (LT)
- Maritime Office Gdynia (PL)
- Military University of Technology (PL)
- North.io (DE)
- Norwegian Defense Research Establishment (NO)
- Polish Naval Academy (PL)

- University of Helsinki - Finnish Institute for Verification of the Chemical Weapons Convention (FI)
- University of Tartu (FI)

Contact:
Jacek Bełdowski (Project Coordinator): hyron@iopan.pl
Katarzyna Fidler (Project Manager): kf@eu-projects.pl
Agnieszka Jędruch (Communication Officer): ajedruch@iopan.pl

MUNI-RISK

Co-funded by the European Union

Mitigation of Risks due to submerged munitions for a sustainable development of the Baltic Sea

Funding: EMFAF
Duration: 11/2024-10/2027

MUNI-RISK is an EU-funded project focused on tackling the risks from old munitions lying on the seabed in the Baltic Sea. These munitions, remnants of past conflicts such as the Second World War, pose environmental and safety risks that need to be carefully managed. MUNI-RISK brings together scientists and practitioners to find solutions that support safe maritime activities, such as fishing, and responsible marine resource development, including building offshore wind farms. By the end of the MUNI-RISK project, countries around the Baltic Sea will have practical tools and guidelines to safely manage munitions risks.

https://muni-risk.eu/

Project Coordinator:
Senior Scientist Hans Sanderson, Aarhus University

Partners:

- Council of the Baltic Sea States (SE)
- GEOMAR Helmholtz Centre of Ocean Research Kiel (DE)
- Institute of Oceanology Polish Academy of Sciences (PL)
- Regional Municipality of Bornholm (DK)

Contact: Hans Sanderson: hasa@envs.au.dk

EROVMUS

Enhanced Remote Operated Vehicle interface for Munition Studies

Funding: MarTERA ERA-NET COFUND
Duration: 07/2022 - 06/2025

Project EROVMUS aims to enhance Remotely Operated Vehicle (ROV) interfaces for more efficient and cost-effective operations in underwater munition missions. It will develop a multisensory platform and improved software, focusing on navigation, autonomous identification, and image enhancement. A heads-up display will integrate sensor data, reducing screen clutter, while virtual reality solutions will enable large virtual displays. The project will test and optimize tools for compatibility with various ROVs, fostering innovation, job creation, and competitiveness in the European underwater tech sector.

https://www.era-learn.eu/network-information/networks/martera/martera-call-2021/enhanced-remote-operated-vehicle-interface-for-munition-studies

Project Coordinator:
Prof. Jacek Bełdowski, Institute of Oceanology Polish Academy of Sciences

Partners:

- DotOcean (BE)
- Flanders Marine Institute (BE)
- National Insitute for Reserch and Development on Marine Geology and Geo-ecology (RO)
- Ocean Tech Poland (PL)
- Port Oostende (BE)
- Q.VITEC (DE)
- Technical University of Clausthal, Research Center for Environmental Technologies (DE)

Contact:

Jacek Bełdowski (Project Coordinator): hyron@iopan.pl
Agnieszka Jędruch (Communication Officer): ajedruch@iopan.pl

Interreg North Sea
Co-funded by the European Union
REMARCO

REMARCO

Remediation, Management, Monitoring and Cooperation addressing North Sea UXO

Funding: Interreg North Sea Region Programme 2021-2027
Duration: 07/2023 - 06/2027

After decades in seawater, the munitions from the world wars are in various stages of corrosion. Apart from the dangers of an uncontrolled explosion,

water, sediment and samples of organisms were taken as part of the predecessor project North Sea Wrecks, which showed traces of toxic munitions compounds in the subsequent laboratory analyses. These are suspected of causing health problems in exposed mussels and fish and could also end up on people's plates via food. With REMARCO, we want to contribute to the reduction of pollution of marine ecosystems by World War II munitions by developing remediation concepts for munitions hotspots and testing internationally validated (partially) automated monitoring concepts. In addition, REMARCO provides software-based risk assessment systems for the responsible authorities in the NSR area to prioritize contaminated marine areas. Furthermore, REMARCO provides information and data relevant for regional organizations (e.g., OSPAR, UNESCO) to include the topic in international monitoring strategies and in the assessment of cultural assets (wrecks).

www.interregnorthsea.eu/remarco/about-us

Project Coordinator:
Dr. Matthias Brenner, Alfred Wegener Institute, Helmholfz Centre for Polar and Marine Research (DE)

Partners:

- Expload (NL)
- Flanders Marine Institute (BE)
- German Maritime Museum (DE)
- Royal Belgian Institute of Natural Sciences (BE)
- University Medical School Schleswig-Holstein, Institute of Toxicology and Pharmacology (DE)
- NHL Stenden University of Applied Sciences - Maritime Institute Willem Barentsz (NL)
- North.io (DE)
- Periplus Consultancy (NL)
- SeaTerra (DE)

Contact:
Matthias Brenner: matthias.brenner@awi.de
remarco@awi.de

Interreg South Baltic — Co-funded by the European Union — BaltWreck

BaltWreck:

Preventing massive marine waters chemical pollution from the teaking wrecks and munition/ weapon dumps in the south Baltic

Funding: Interreg South Baltic Programme 2021-2027
Duration: 7/2024 - 6/2027

The BaltWreck project aims to reduce pollution in the Baltic Sea caused by hazardous substances from military and civilian shipwrecks, such as fuels and munitions. The project focuses on developing diagnostic methods for wrecks, studying remediation technologies for hazardous fuels and munitions, assessing the toxicological risks to marine ecosystems, and creating risk management tools. It includes engaging local municipalities in decision-making through workshops and campaigns, providing recommendations for policy makers, and creating documentation for cultural heritage institutions and virtual wreck tours to enhance tourism.

https://www.imp.gda.pl/en/projects/interreg-programmes/baltwreck/

Project Coordinator: Prof. Adam Cenian, Institute of Fluid-Flow Machinery Polish Academy of Sciences

Partners:

- Association of Polish Communes Euroregion Baltic (PL)
- Chalmers University of Technology (SE)

- CLEANERGY (PL)
- Gdynia Maritime University (PL)
- GEOMAR Helmholtz Centre for Ocean Research Kiel (DE)
- German Environment Agency (DE)
- Jagiellonian University (PL)
- JT Ship Service Tomasz Jatkowski (PL)
- Klaipeda University (LT)
- Leibniz-Institute for Baltic Sea Research Warnemünde (DE)
- Nature Research Centre (LT)
- North.io (DE)
- University of Gdansk(PL)

Contact:
Adam Cenian, cenian@imp.gda.pl

CONMAR II

Concept for conventional Marine munition Remediation in the German North and Baltic Sea

Funding: sustainMare "Protection and sustainable use of marine areas" funded by the Federal Ministry of Education and Research Germany
Duration: 12/2024-11/2027

CONMAR, funded by the German Ministry of Education and Research, aims to study the impact of marine munitions in the North and Baltic Seas. It integrates data from various sources to assess distribution, ecological impact, and potential remediation strategies. Through collaboration with stakeholders, CONMAR seeks to inform policy and advance the understanding of this environmental issue.

https://conmar-munition.eu/

Project Coordinator:
Prof. Dr. Jens Greinert, GEOMAR Helmholtz Centre for Ocean Research Kiel

Partners:

- Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (DE)
- German Environment Agency (DE)
- Global Climate Forum (DE)
- Leibniz-Institute for Baltic Sea Research Warnemünde (DE)
- Senckenberg am Meer (DE)
- Thünen Institute (DE)
- University Medical School Schleswig-Holstein, Institute of Toxicology and Pharmacology for Natural Scientists (DE)
- University of Rostock (DE)

Contact: conmar@geomar.de

BorDEx

Development and construction of a mobile demonstrator for the thermal disposal of explosives from coastal dumped munitions

Funding:
Federal Ministry for Economic Affairs and Climate Action of Germany (BMWK)
Duration: 07/2024 - 06/2027

The BorDEx project (development and construction of a mobile demonstrator for the thermal disposal of explosives from coastal munitions waste)

creates a basis for the disposal of critical munitions waste in coastal areas that has not yet been technically feasible. By building a mobile demonstrator, the disposal of conventional, large-caliber, difficult-to-transport munitions from maritime areas is to be taken one step closer to a standard procedure with different locations.

https://bordex.de/

Project Coordinator:
Dr. Bastian Niemeyer, GEKA

Partners:

- Dussmann Industrial Automation (DE)
- Dynasafe Environmental Systems (DE)
- Fraunhofer ICT (DE)
- GEOMAR Helmholtz Centre of Ocean Research Kiel (DE)

Contact:
Bastian Niemeyer: bastian.niemeyer@geka-munster.de
Andreas Krüger: andreas.krueger@geka-munster.de

IRAV

Industrial clearance of hazardous waste from dumping sites at sea

Funding: Federal Ministry for Economic Affairs and Climate Action of Germany
Duration: 6/2023 – 11/2025

The IRAV project address challenges like sedimented ordnance. The project develops technological and experimental solutions to overcome these

hurdles. Demonstrators are created to validate the feasibility, applicability, and cost-effectiveness of the individual technologies. IRAV leverages its own technical infrastructure, including mission ships, mobile autonomous platforms, data acquisition and processing systems, and a comprehensive suite of distributed sensors and sub-systems. The project also incorporates findings from other research projects to close remaining gaps. System designs will prioritize compatibility with relevant interfaces of other systems

https://www.iwes.fraunhofer.de/en/research-projects/current-projects/irav.html

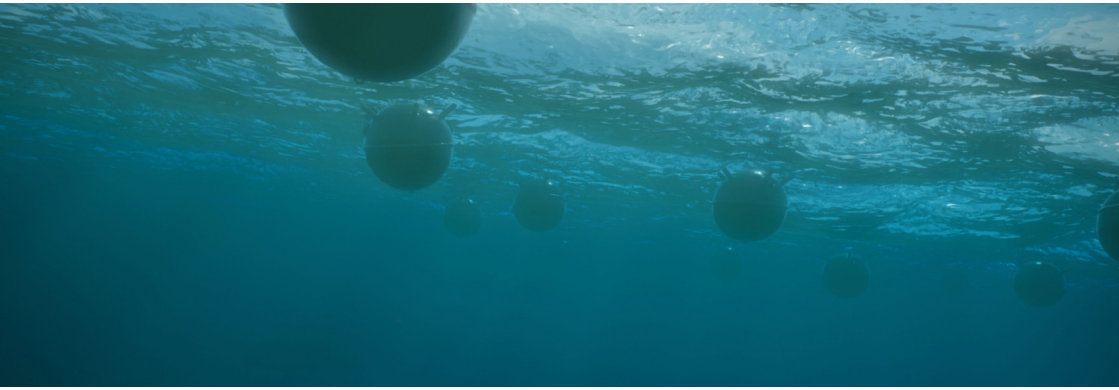
Project Coordinator:
Franziska Auer, ATLAS ELEKTRONIK GmbH

Partners:

- Fraunhofer IWES (DE)
- ATLAS MARIDAN ApS (DK/DE) [Commissioned Partner]
- Stascheit Kampfmittelräumung (DE)
- Thyssenkrupp Marine Systems (DE)

Contact:

Franziska Auer: Franziska.Auer@atlas-elektronik.com



‘Munitions in the Sea’ Knowledge Portal:

Our community page on LinkedIn: