

## Testimonial VLIZ MIRICLE project (EDIDP)

The MIRICLE project (MIne Risk CLearance for Europe, grant agreement No Project EDIDP-UCCRS-MCM-2020-061-MIRICLE) was a 24-month collaborative endeavor (2022-2023), funded by the European Defence Industrial Development Programme (EDIDP) and the Ministries of Defence of the participating countries. The project was executed by a consortium of 18 partners spanning 10 European countries, under the coordination of Naval Group Belgium. The main objective of MIRICLE was to achieve a European and sovereign capacity in future mine warfare and create a path for the next generation 'made in Europe' countermeasure solutions.

With the increasing threat of mines and improvised explosive devices present in all conflicts involving naval forces, countries need to strengthen the protection of their maritime domain, to ensure the protection of their assets and to safeguard the freedom of civil navigation. In this regard, mine countermeasures (MCM) are undergoing a major operating transition, from traditional mine hunting to an unmanned and autonomous innovative solution.

As such, the MIRICLE project set out to realize the following objectives within the project:

- To provide a comprehensive and forward-looking definition and assessment of the MCM technologies;
- To elaborate a technological development roadmap for next generation countermeasure solutions, that corresponds to Member States' procurement plans and paves the way for future European Defence Funds (EDF) developments;
- To coordinate the development of interoperable new type of assets (vessels) and MCM Toolbox.

The project was based on a meticulous approach that encompassed various stages: studies, design, prototyping and testing. Prototypes and demonstrators were developed for selected technologies, while sea-based testing were conducted to validate specifications for the next-generation MCM vessels and toolbox. The experimentation phase witnessed the successful testing of an XL Unmanned Underwater Vehicle (UUV) and a prototyped mine disposal system in Toulon Bay, showcasing the efficiency of coordinated operations. Also, the project tested multiple systems to detect buried mines, addressing a significant operational shortfall in current MCM techniques. The project's test focusing on interoperability and communication highlighted the feasibility of utilizing systems from various suppliers in a multisystem heterogeneous MCM mission.

Flanders Marine Institute (VLIZ), was one of the five Belgian partners in the consortium (together with Naval Group Belgium, Exail Robotics Belgium, dotOcean, Space Application Services). Within the project, VLIZ was able to forward its research on the acoustic imaging of the seabed to spatially map and visualize buried (archaeological and geological) structures and objects - in this case buried mines - in the highest possible detail. Furthermore, VLIZ was the leader for the work package on 'Port and Offshore Testing', building on the expertise of the institute in the field of marine robotics.

It was the first EDIDP-project in which VLIZ participated. However, besides becoming familiar with some new terms, administrative forms and security concepts, the execution of the project was to a large extent comparable to the Horizon Europe projects we are familiar with as a research institute. The participation in MIRICLE has already led to a follow-up proposal in the context of EDF, in which VLIZ is also included as a partner. In addition, the MMinE-SWEEPER-project (Horizon Europe) was recently approved, further strengthening the project portfolio of VLIZ in the field of innovative acoustic detection of objects which are buried under the seabed, in combination with marine robotic platforms.



Figure. Schematic representation of the MCM vessels and toolbox that were addressed in the MIRICLE-project.

More information: [launch of the project](#) & [finalisation of the project](#)