GREYSHARK™ at REPMUS 2026

From Operational Performance to Connected Naval Capabilities
EUROATLAS & EvoLogics | REPMUS 2026 Report



Exercise: REPMUS / Dynamic Messenger 2026

Location: Sesimbra & Tróia, Portugal

Domains: Naval Mine Warfare | Underwater Warfare

EXECUTIVE SUMMARY

REPMUS 2026 marked another milestone in the development of GREYSHARK™, the Autonomous Underwater Vehicle (AUV) jointly developed by EUROATLAS and EvoLogics.

Following its first participation in 2025, GREYSHARK™ returned to Portugal with a fully integrated sensor configuration, focusing on Naval Mine Warfare (NMW) and Underwater Warfare (UWW).

The battery-electric prototype GREYSHARK™ P1B, named Grace, demonstrated autonomous seabed surveys, integrated sensor operations and mission data sharing within a wider operational environment.

During Naval Mine Warfare activities, GREYSHARK™ surveyed 22 search boxes of approximately 800 × 400 metres each, covering about 7 km² in approximately six hours. **More significant than the area itself was how the data was delivered: within a live, connected workflow from the vehicle to a shared underwater situational picture.**

Port- and starboard-mounted Synthetic Aperture Sonars (SAS), combined with a downward-looking Multibeam Echo Sounder (MBES), enabled efficient seabed coverage. The MBES closed the gap between the SAS systems, reducing additional survey passes. An integrated high-resolution camera supported visual identification of underwater contacts.

Sensor data was pre-processed onboard GREYSHARK™ and transmitted live via radio to its Command & Control station during the mission. From there, it was transferred to the north.io TrueOcean platform, combining sonar data and photographs from different platforms into a shared underwater situational picture.

This demonstrated a key element of modern **System-of-Systems operations:** integrating data from different autonomous platforms and sensors to support naval decision-making.

In Underwater Warfare experiments, GREYSHARK™ acted as a target for underwater gliders investigating hydrodynamic disturbances caused by moving underwater vehicles. Results are still being evaluated.

REPMUS also provided opportunities to engage with international naval delegations and discuss operational requirements and future applications.

Following extensive testing, prototype Grace has been retired from active service. Lessons learned are being incorporated into the first battery-electric GREYSHARK™ S1B series-production vehicle, scheduled for completion in November 2026.

1. REPMUS 2026 – A DEMANDING OPERATIONAL ENVIRONMENT

RREPMUS is a major multinational exercise for maritime unmanned systems, bringing together navies, research institutions and industry to test technologies, improve interoperability and develop operational concepts.

Held in Portugal from 31 August to 25 September 2026, the exercise involved more than 3,700 participants, 36 navies, approximately 300 unmanned systems and 14 ships.

The concentration of manned and unmanned platforms, alongside fishing vessels, commercial shipping and recreational craft, created a demanding maritime environment.

Safe operations required careful mission planning, maritime traffic awareness and reliable coordination.

For GREYSHARK™, this highlighted the importance of capabilities beyond its primary mission sensors. The integrated Forward Looking Sonar (FLS) provided obstacle awareness and supported underwater collision avoidance. STANAG 4817-based communication capabilities and coordinated procedures supported safe integration into the exercise environment.

REPMUS therefore provided valuable experience not only in vehicle performance but also in operating autonomous underwater systems within complex, coordinated maritime activities.

BUILDING ON REPMUS 2025

For EUROATLAS and EvoLogics, REPMUS 2025 was the first opportunity to demonstrate GREYSHARK™ in a multinational operational environment.

Lessons learned guided further development, sensor integration and operational procedures.

In 2026, GREYSHARK™ returned with an advanced configuration to demonstrate measurable mission performance and improved integration into naval operations.

2. NAVAL MINE WARFARE – EFFICIENT SEABED SURVEY AND CONTACT IDENTIFICATION

Naval Mine Warfare was a primary focus of GREYSHARK's participation.

Mine countermeasure operations require efficient seabed surveys while minimizing the exposure of personnel and naval platforms to potential threats.

GREYSHARK™ demonstrated autonomous seabed surveys using its integrated acoustic and optical sensors.



Figure 1: battery-electric prototype GREYSHARK™ P1B, named Grace, after mine-countermeasure operations

DEMONSTRATED AREA COVERAGE

During REPMUS 2026, GREYSHARK™ surveyed 22 designated search boxes, each measuring approximately 800 × 400 metres (about 0.32 km²). The exact dimensions varied slightly from box to box.

The combined nominal survey area of **about 7 km² was completed in approximately six hours.**

Performance Indicator	Result
Vehicle	GREYSHARK™ P1B Grace
Search boxes	22
Individual box size	Approx. 800 × 400 m (varied slightly per box)
Combined nominal survey area	Approx. 7 km²
Survey duration	Approximately 6 hours
Data workflow	Fully live: pre-processed onboard, radio link to C2, fused in north.io TrueOcean

These results demonstrate GREYSHARK's ability to survey large underwater areas efficiently. Actual performance depends on mission requirements, environmental conditions and sensor settings.

The average area coverage achieved during REPMUS 2026 reflects the specific exercise conditions, including separate search boxes, transit distances, manoeuvring and safety procedures. The integrated SAS and MBES configuration offers the potential for higher area coverage rates during continuous, open-area survey missions. Actual performance depends on mission requirements, environmental conditions and sensor setting.

What sets GREYSHARK™ apart is its ability to deliver pre-processed mission data during ongoing operations. Unlike conventional workflows that rely on vehicle recover and post-mission data processing, GREYSHARK™ transmitted mission-relevant sensor information via radio to its Command & Control station for integration into the north.io TrueOcean underwater situational picture while the mission was still underway.

OPTIMISED COVERAGE THROUGH COMPLEMENTARY SENSORS

GREYSHARK™ combined port- and starboard-mounted Synthetic Aperture Sonars (SAS) for high-resolution seabed imaging with a downward-looking Multibeam Echo Sounder (MBES).

The MBES covered the gap directly beneath the vehicle between the two SAS coverage zones, reducing the need for additional survey passes.

This complementary sensor configuration enabled more efficient survey patterns and contributed to the area coverage performance demonstrated at REPMUS 2026.

DETECTION, CLASSIFICATION AND IDENTIFICATION

GREYSHARK‘s integrated sensor configuration supports the main stages of underwater mine contact assessment.

Detection: SAS and MBES provide acoustic data to detect underwater objects and potential mine-like contacts.

Classification: High-resolution acoustic imagery supports contact assessment based on shape, dimensions and acoustic characteristics.

Identification: An integrated high-resolution camera provides optical imagery for visual identification where visibility and image quality permit.

Combining acoustic classification and optical identification in one autonomous vehicle supports efficient mine countermeasure operations and provides operators with complementary information for contact assessment.

3. SYSTEM-OF-SYSTEMS – FROM SENSOR DATA TO UNDERWATER SITUATIONAL AWARENESS

Modern naval operations increasingly depend on connecting platforms, sensors and command-and-control systems.

Autonomous underwater vehicles must therefore not only collect data but also contribute information to a shared operational picture.

REPMUS 2026 demonstrated an important part of this System-of-Systems approach.

CONNECTED DATA WORKFLOW

During the exercise, GREYSHARK™ collected and pre-processed sensor data onboard before transmitting it via radio to the GREYSHARK™ Command & Control station.

From there, the data was transferred to the north.io TrueOcean platform for integration into the underwater situational picture.

This demonstrated a connected workflow from autonomous underwater data collection to external data fusion.

MULTI-PLATFORM, MULTI-SENSOR DATA FUSION

The north.io TrueOcean platform enables sonar data and photographs from different platforms and sensor carriers to be combined and associated with individual underwater contacts.

Operators can assess the same contact using complementary sensor information collected from different perspectives.

For example, sonar imagery supports detection and classification, while additional acoustic data and high-resolution photographs can improve contact assessment and identification.

Combining these sources contributes to a more complete underwater situational picture.

This platform-independent approach is particularly relevant for Naval Mine Warfare, Critical Underwater Infrastructure protection and other missions requiring reliable underwater situational awareness.

GREYSHARK™ AS PART OF A CONNECTED NAVAL FORCE

REPMUS 2026 demonstrated GREYSHARK's ability to contribute to a wider operational architecture rather than operating as an isolated platform.

Future maritime operations will increasingly depend on integrating autonomous systems, conventional naval platforms, sensors and command-and-control structures.

GREYSHARK™ is designed to operate autonomously while contributing mission-relevant information to a wider naval System-of-Systems.



Figure 2: GREYSHARK™ P1B Grace in front of a navy ship, Photo: EvoLogics

4. UNDERWATER WARFARE – SUPPORTING NEW DETECTION CONCEPTS

Alongside Naval Mine Warfare, GREYSHARK™ P1B Grace participated in Underwater Warfare experiments as a moving underwater target.

The objective was to investigate whether underwater gliders equipped with suitable sensors could detect hydrodynamic disturbances caused by a moving underwater vehicle.

Detecting and tracking unmanned underwater vehicles is becoming increasingly relevant as autonomous systems gain importance in maritime operations.

The evaluation of the collected glider sensor data is still pending. No conclusions regarding detection performance can therefore be drawn at this stage.

Nevertheless, the experiments contributed to research into underwater detection methods and cooperation between autonomous underwater platforms.

5. MULTINATIONAL COOPERATION AND NAVAL ENGAGEMENTINNOVATION THROUGH COOPERATION

INNOVATION THROUGH COOPERATION

REPMUS brings together navies, research organisations and industry to develop and evaluate maritime technologies.

The GREYSHARK™ team spent four weeks in Portugal supporting preparation, integration, operational activities and technical discussions.

Close cooperation between EUROATLAS, EvoLogics and partners including Rheinmetall and north.io contributed to the successful execution of the programme.

The exercise highlighted that operational autonomous capabilities depend not only on vehicle performance but also on interoperability, shared procedures and effective cooperation.

MARITIME SAFETY AND RESPONSIBILITY

The importance of maritime safety became particularly evident when a fishing vessel sank off the coast of Sesimbra during REPMUS 2026.

The incident triggered a search and rescue operation coordinated by Portuguese authorities, supported by maritime assets in the area.

The EUROATLAS team assisted using its own Rigid-Hulled Inflatable Boat (RHIB).

The incident reinforced the importance of safety at sea, mutual assistance and cooperation as fundamental responsibilities of the maritime community.

INTERNATIONAL NAVAL ENGAGEMENT

REPMUS also provided opportunities to demonstrate GREYSHARK™ to international naval delegations and discuss operational requirements, mission profiles and integration into naval structures.

Key areas of interest included Naval Mine Warfare, Critical Underwater Infrastructure protection and System-of-Systems integration.

These discussions connected technological development with operational needs and provided a valuable basis for further capability assessments and engagement with interested navies.



Figure 3: GREYSHARK™ P1B Grace is being lifted into the water, Photo: EvoLogics

6. FROM PROTOTYPE TO SERIES PRODUCTION

GRACE – A SUCCESSFUL DEVELOPMENT CHAPTER

REPMUS 2026 marked the conclusion of an important development chapter for GREYSHARK™.

The battery-electric prototype GREYSHARK™ P1B, named Grace, played a central role in system development, sensor integration and operational testing.

Through technical trials and multinational exercises, Grace provided valuable experience under practical operating conditions, helping EUROATLAS and EvoLogics evaluate performance and identify improvements.

Following successful completion of its missions, Grace has been retired from active service.

TURNING EXPERIENCE INTO PRODUCT IMPROVEMENTS

Lessons learned from the prototype programme have been translated into engineering and product improvements, including changes to the vehicle‘s external design.

These improvements are being incorporated into the battery-electric GREYSHARK™ S1B series-production configuration.

The first S1B series-production vehicle is scheduled for completion in November 2026.

This represents an important transition from prototype development and operational experimentation towards a standardised product configuration for future naval applications.

Experience gained during REPMUS 2025 and 2026 has made a significant contribution to this progress.

7. OUTLOOK – ADVANCING AUTONOMOUS UNDERWATER CAPABILITIES

REPMUS 2026 demonstrated substantial progress in the GREYSHARK™ programme.

In Naval Mine Warfare, GREYSHARK™ completed a 22-box survey with its integrated SAS and MBES configuration, supported by optical capabilities for contact identification, and delivered the data in a fully live, connected workflow.

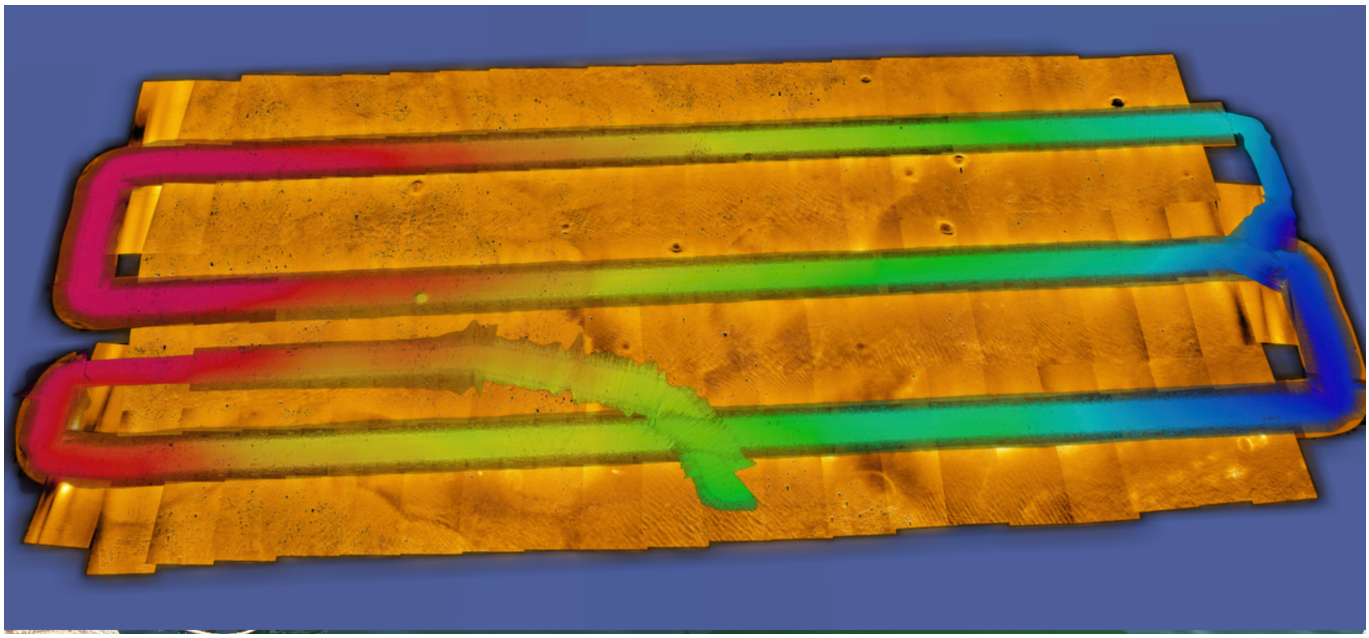

Figure 4: Downward-looking MBES data illustrating coverage of the nadir gap between the port and starboard SAS swaths., Photo: EvoLogics

Live integration with the north.io TrueOcean platform demonstrated connected autonomous operations and platform-independent data fusion in practice.

Underwater Warfare experiments contributed to the investigation of new detection concepts, while international naval engagement helped align technological development with operational requirements.

The transition from prototype Grace to the GREYSHARK™ S1B series-production vehicle marks the next step.

EUROATLAS and EvoLogics will continue developing GREYSHARK™ in cooperation with naval customers and technology partners, focusing on mission performance, operational safety and interoperability within a wider naval System-of-Systems.

REPMUS once again demonstrated the value of multinational experimentation in bringing maritime technologies closer to operational use.

Grace has completed her mission.
Her legacy lives on in the next generation of GREYSHARK™.

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GREYSHARK™ – Advanced Underwater Autonomy

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