



# Undersea Warfare Autonomy in ASW and MIW

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## *At a Glance*

### What is it?

■ Ongoing antisubmarine warfare (ASW) and mine warfare (MIW) science and technology programs are the building blocks of a future undersea warfare vision, where autonomous systems dramatically improve the capability and capacity of fleet assets.

### How does it work?

■ Undersea Warfare Autonomy programs in ASW and MIW are developing cooperative autonomous systems that address fleet capability gaps. These programs also leverage Discovery and Invention in intelligent processing, advanced sensors and information fusion.

### What will it accomplish?

■ Greater autonomy will result in significant improvements to wide-area surveillance, detection, localization, tracking and attack capabilities against enemy submarines. It will also greatly reduce the mine countermeasures timeline, allowing larger area coverage with fewer false alarms. Autonomy will reduce operational visibility, remove the warfighter from the hazardous mission, and effectively multiply the force capabilities of our existing ASW and MIW assets.

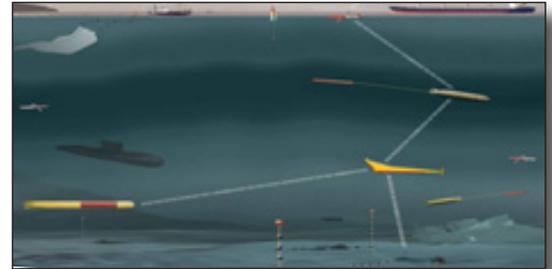
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The objectives of the Office of Naval Research Anti-Submarine Warfare (ASW) and Mine Warfare (MIW) efforts include:

- Advanced autonomy in unmanned robotic systems to expand reach and reduce threat exposure
- Next-generation data and contact fusion to expand the regional ASW, mine and amphibious warfare operating picture to the theater level
- A fully netted ASW system which integrates the calculated use of autonomous search and neutralization assets to maximize the localization and destruction of enemy submarines
- Autonomous launch and recovery and cooperative cueing of multiple unmanned surface and subsurface mine countermeasure assets, including autonomous neutralization
- Automated processing for single-pass, real-time detection classification and identification of mines
- Full automation of active/passive sonar operations



The objectives of distributed surveillance and battlespace shaping:

- Distributed, networked, unmanned sensors/systems
- Sustainable, intelligent, robust unmanned systems
- Autonomous maritime reconnaissance to identify targets under all environmental conditions
- Autonomous tracking and locating technologies

### Research Challenges and Opportunities:

- Cluttered littoral environments and areas with poor acoustic conditions
- Autonomy in unstructured and variable ocean environments
- Automatic detection, signal processing and drift modeling
- Power/Endurance—energy harvesting and/or air-independent solutions
- High-bandwidth undersea and RF communications
- Autonomous/undersea precise navigation

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