

**Environmental Security Technology Certification Program (ESTCP)**

**DETECTION, CLASSIFICATION, LOCALIZATION, AND REMEDIATION OF  
MILITARY MUNITIONS IN UNDERWATER ENVIRONMENTS**

**OBJECTIVE**

Demonstration projects are sought for technologies to detect, classify, or remediate military munitions found at underwater sites. Technologies that will facilitate management of underwater munitions sites are also of interest. Capabilities are needed for a wide variety of aquatic environments such as ponds, lakes, rivers, estuaries, and coastal and open ocean areas. Munitions of interest range from small projectiles and mortars to large bombs, although proposals need not address the entire range of potential munitions with a single solution. Many of the sites of interest have depths less than 5 meters although water depths up to 35 meters are of concern.

Proposed technologies should have completed required proof-of-concept work showing evidence of the technology's capabilities. Initial demonstrations may be at a controlled test site, in which case subsequent testing at live munitions response sites will depend on the performance demonstrated during the controlled tests. Demonstrations directly on live sites, with appropriate supporting performance information, will also be considered.

Technologies applicable to the detection and remediation of explosives in soil or groundwater are not responsive to this topic, but may be relevant to the ESTCP Environmental Restoration program area.

ESTCP has particular interest in technologies addressing the following topics:

**Wide Area and/or Detailed Survey Techniques.** Systems are needed to cost-effectively survey large (kilometer-scale) areas to identify concentrations of munitions and areas free of munitions. Technologies addressing this aspect of the problem must provide high areal coverage rates but may be successful with only modest probabilities of detection and classification. In areas found likely to be contaminated, subsequent detailed data collection may be required to define the nature and extent of munitions contamination. In this regime, individual items must be detected with high probability and sufficient location accuracy that they may be unambiguously identified for retrieval or continued monitoring.

Proposals addressing novel sensors, platform integration, or large-scale collection of field data at real munitions sites will be considered.

**Development of Standardized Underwater UXO Demonstration Sites.** Well-documented test beds are needed to demonstrate the effectiveness of a variety of acoustic, magnetic, EMI, and optical systems that have been developed to detect and classify UXO in the underwater environment. A workshop held at the 2018 SERDP and ESTCP Symposium provides guidelines, requirements, timelines, and responsibilities for the development, management, and use of those test beds ([Workshop Report: Underwater UXO Standardized Test Beds](#)). Proposals are welcome for the development and management of multiple test bed sites. These proposals should include

historical and real-time environmental measurements and characterization of the proposed sites; development of methods for placement, positioning, and recovery of targets of interest; an approach to obtain assessments needed to obtain all environmental permits required for the demonstrations; and plans to provide logistics, facilities, plans, and other needed support to accommodate multiple system demonstrations.

**Cost-Effective Recovery and Disposal Methods.** Improved methods are needed to cost-effectively and safely recover munitions from the underwater environment. Current practices employing divers for manual retrieval of targets are typically dangerous and expensive. Proposals should focus on recovery in the shallow water environment, where munitions are likely to be encountered by the public (to depths routinely accessed by recreational divers), and should address explosive safety issues. Cost-effective, safe, and environmentally acceptable remediation techniques are also needed for underwater items that cannot be moved due to explosive safety concerns and where blow-in-place operations underwater can significantly impact marine life.

**Management of Underwater Munitions Sites.** SERDP and ESTCP have been supporting research involving the burial and/or mobility of underwater munitions when subjected to underwater environmental forces. Improved understanding of munitions transport and fate may help inform site munitions response management decisions. Proposals to test or validate models addressing this topic will be considered.

Relevant existing projects can be viewed on the [ESTCP website](#).

## **BACKGROUND**

Many active and former military installations have ranges and training areas that include adjacent water environments such as ponds, lakes, rivers, estuaries, and coastal ocean areas. In other sites, training and testing areas were deliberately situated in water environments. Disposal and accidents have also generated significant munitions contamination in the coastal and inland waters in the United States. Munitions may migrate in the fluid underwater environment and it is not uncommon for munitions to wash on shore during storm events. Dredging projects frequently encounter munitions.

The U.S. Army Corps of Engineers (USACE) and the U.S. Navy have identified more than 400 underwater sites that are potentially contaminated with munitions. The majority of areas are in shallow water (0-35 m) where the munitions pose a threat to human health and the environment. Some of these sites date back to the 18th century and others were used as recently as this decade. Property potentially containing munitions in underwater environments exceeds 10 million acres.

## **POINT OF CONTACT**

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For pre-proposal submission due dates, instructions, and additional solicitation information, visit the [ESTCP website](#).