

SERDP PROJECT OF THE YEAR

MUNITIONS MANAGEMENT

WIDE AREA DETECTION AND IDENTIFICATION OF UNDERWATER UXO USING STRUCTURAL ACOUSTIC SENSORS

DR. BRIAN H. HOUSTON
Naval Research Laboratory
Code 7130
Washington, DC
(202) 404-3840
brian.houston@nrl.navy.mil

CO-PERFORMERS: Dr. J.A. Bucaro (Excet Inc.); Dr. T.J. Yoder and Mr. L. Kraus (Global Strategies Group); Dr. H.J. Simpson and Mr. M. Saniga (Naval Research Laboratory); Dr. L. Carin (Duke University)

A significant number of active and former Department of Defense installations have training and testing ranges with adjacent coastal and inland waters containing unexploded ordnance (UXO), some partially or completely buried in sediment and some lying on the sediment floor. There is little historical information about the specific locations or the number of ordnance in these areas. Traditional underwater search techniques are generally ineffective because they are unable to see beneath the sediment floor.

Dr. Brian Houston and his project team developed a technique for wide-area detection and identification of underwater UXO using an innovative structural acoustic sonar system. In the structural acoustic regime, acoustic wavelengths are comparable to the target dimensions. Sound penetrates the target, and the acoustic scattering is related to the vibrational dynamics of the object. The time-frequency features in the echoes can then be used to “fingerprint” the target without forming an image as in sonar approaches. Researchers made broadband multi-aspect scattering measurements on a number of UXO objects and several false targets in the laboratory and at St. Andrew’s Bay, Florida.

Wide-area structural acoustic detection and identification technology for underwater UXO represents a new capability for the Department of Defense, a capability with the potential to save time and reduce costs of surveying and mapping underwater UXO.

For more specific information about this project, stop by Poster #107.