UltraTEMA-4 Marine Classification Results from ESTCP Demonstration

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Many former and active Department of Defense ranges and installations have Munitions and Explosives of Concern (MEC) in the underwater environment posing a potential, current, or future hazard. The Army Corps of Engineers has evaluated formerly used defense sites and found that there are more than 10 million acres potentially containing MEC in underwater environments, at approximately 400 sites.

There have been a number of technologies developed and tested for underwater MEC wide-area detection, including some 15 projects under the SERDP and ESTCP programs. The objective of this project was to design and demonstrate a vessel-towed single-pass marine dynamic classification system for wide-area assessment and full coverage surveys. This was achieved by modifying and integrating Gap Explosive Ordnance Detection’s and Black Tusk Geophysics’ existing UltraTEM® package and associated software into Tetra Tech’s towed electromagnetic array (TEMA) platform, and then demonstrating its capabilities over a series of blind targets at a controlled site. If approved, this would be the first marine system approved for advanced geophysical classification in the United States.

This paper presents results from the successful demonstration of the technology for ESTCP conducted in September 2022 in Sequim Bay, WA. Several different combinations of altitude and transmitter frequency were tested over the calibrated IVS and blind test grid. Submeter underwater positioning systems combined with powerful transmitter coils and concurrent development of enhanced data inversion algorithms allowed the system to exceed its original design specifications for classification of medium to small targets of interest.