Background:
The efficiency of unexploded ordnance (UXO) remediation is currently limited by the inadequate discrimination capability of existing UXO detection technologies. Inductive sensors with a single sensing coil are commonly used for detection. These single coil methods often detect all relevant metal objects but generally cannot discriminate between UXO and harmless clutter. Research into model-based methods, using such single coil sensors to discriminate between UXO and clutter, has shown limited success when variations in the orientation, material types, and UXO damage are considered. False indications continue to far outnumber verified detections. New methods are needed to not only increase the resolution of images so that information can be obtained about object shape and orientation but also to design sensors that provide predictable responses and additional information (e.g., different views of the buried object and clutter).

Objective:
The goal of this project is to develop inductive arrays for high resolution UXO imaging and discrimination. Existing Meandering Winding Magnetometer (MWM)-Array sensor and instrumentation technologies will be leveraged to provide estimates for UXO depth and properties and a discrimination capability.

Benefit:
This project will establish a proof-of-principle and demonstrate the current capability of the original prototype MWM-Array with new parallel architecture instrumentation. If successful, the program will clearly demonstrate the value of high resolution imaging and model-based methods for UXO detection, clutter suppression and object discrimination based on depth, shape and size. The long-term benefit is the fielding of a practical and robust solution for discrimination between UXO and non-UXO targets. Substantial reduction of false positive indications offers significant return on investment.

Accomplishments:
This project began in FY 2002. Accomplishments will be noted upon completion of the project.

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