Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
SEP 2000		**00-00-2000 to 00-00-2000**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
MCM Relevance of Anomalous Bottom Electrical Properties	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Naval Research Laboratory Code 7442,,Stennis Space Center,MS,39529**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**3**	

MCM Relevance of Anomalous Bottom Electrical Properties

Will Avera
Naval Research Laboratory Code 7442
Stennis Space Center, MS 39529-5004
Phone: (228) 688-4778 Fax: (228) 688-4476 e-mail: avera@nrlssc.navy.mil

Document # N0001499WX30437
http://nrlssc.navy.mil

Thrust Category: Shallow Water

LONG-TERM GOAL

The long-term goal is to quantify the impact that changes in ocean bottom electrical properties have on Mine Countermeasure (MCM) systems, and to develop in-situ techniques to compensate for changes in the MCM environment during an operation.

OBJECTIVE

The objective is to quantify the impact that known bottom electrical properties can have on MCM parameters and MCM sweeping operations.

APPROACH

The approach will be to use the very anomalous bottom electrical properties discovered in the ONR STRATAFORM area off the northern California coast to determine MCM sweeping parameters and evaluate the impact of similar unknown features on MCM operations. The data will be converted into a model of the anomalous conductivity region. A theoretical MACAS model will be developed to simulate measurements from the conductivity model, compute theoretical measurements for the area, and reformat the data for an inversion program to compute the MCM parameters. Results will be theoretical Q and Ed parameters covering the area of the conductivity model. These MCM parameters will be converted into MCM sweeper operational parameters for evaluation of the significance to operational effectiveness.

WORK COMPLETED

Data from the STRATAFORM area were obtained from Woods Hole and used to construct a model of the equivalent subsurface anomalous electrical properties. A model of the MACAS system has been constructed and theoretical data produced in a grid covering the anomalous region. MCM parameters have been computed for the anomalous region and estimates of the MCM sweep parameters determined for the model. Modifications to the model have been made to evaluate the effect from changes of water depth encountered in the STRATAFORM area. This work is still in progress with plans to generate a report on the conclusions.

RESULTS

Initial results indicate that the anomaly discovered in the STRATAFORM area can have significant effects on MCM sweep parameters. Based on these calculations the effective MCM sweep widths can change sufficiently to create a hazard for MCM operations.

IMPACT/APPLICATION

This work is focused on improving the Navy's ability to conduct MCM operations. The connection between the sediment properties and the resulting MCM environmental parameters is poorly understood. Application of these numerical techniques and results will help relate the sea bottom electrical properties to MCM operations and quantify the impact of changes in the ocean bottom environment. Also these models are being used in work to determine the effects of multiple influence systems for ASW applications.

TRANSITIONS

Models from this work have been transitioned to the NRL Multiple-Influence Detection task for evaluation of similar ocean bottom features for emerging ASW systems/applications.

RELATED PROJECTS

Related projects include the NRL Multiple-Influence Detection task, which has investigated the effects of the environment on data fusion of different sensor types for ASW applications.

PUBLICATIONS

Avera, W., T. Kooney, L.D. Bibee, R. Mang, E.C. Mozley, and J. Reynaud, Towed Electric Field Source For Oceanographic Surveys, Sea Technology, February 2000.