

EM Processing and Mapping for UXO Detection

Processing and Mapping of Electromagnetic and Magnetic Data for Detection of Potential UXO Targets at a Controlled Test Site.



Test site

Overview

Unexploded Ordnance (UXO) samples (dummies) were buried at known locations at a test site in the eastern USA. The samples ranged in size from 20 mm to 155 mm, and were buried at depths of up to 4 feet. High resolution, GPS-controlled EM-61 and total field magnetic surveys were performed by SAIC to develop surveying techniques that are most suitable for the detection of UXO target location, and to determine the effectiveness of these methods.

Data were processed in Geosoft's high volume spatial data processing and analysis software. Importance was placed on the ability to import and process various formats of data and being able to georeference different coordinate systems within the software.



Em-61 surveying

Summary

The electromagnetic and magnetic surveys carried out by SAIC at the test site in the eastern USA produce data suitable for UXO target detection.

Interim results are presented in electromagnetic and magnetic maps — these consist of maps showing the location and depth of the actual target along with the processed survey data.

Using results processed and mapped in Geosoft, and acquired using SAIC's highly controlled survey technology, the locations of the buried UXO targets can be interpreted using Geosoft's UX-Detect software. Knowing their exact location, remediation of the site can be conducted with increased effectiveness — and with significantly increased success potential.

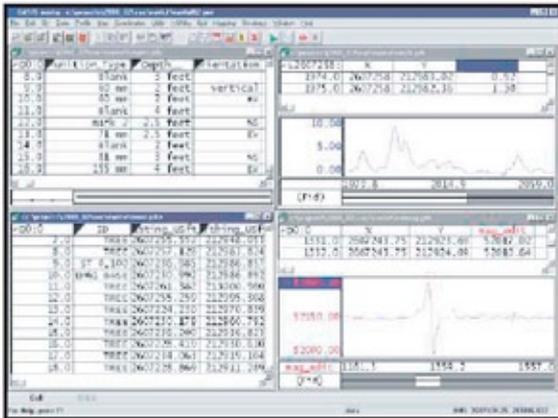
EM-61 Data							
Easting	Northing	MapX	MAPY	Top	Bot	Norm	Diff
2607232	212885	232	895	-6.93	1.5	3.44	-8.43
2607232	212885.66	232	885.66	-7.68	1.5	3.65	-9.18
2607232	212886.32	232	886.32	-6.75	2.25	4.14	-9

Magnetics Data									
X	Y	QUAL	INDOOP	G-858.1	G-858.2	LINE	MARK	TIME	DATE
-76.4229117	36.8998331	2.00	1.40	52147.44300	0.00000	0	1	14.22.09	2/01/13/00
-76.4229117	36.8998331	2.00	1.40	52147.37600	0.00000	0	1	14.22.09	3/01/13/00
-76.4229117	36.8998331	2.00	1.40	52147.42700	0.00000	0	1	14.22.09	4/01/13/00

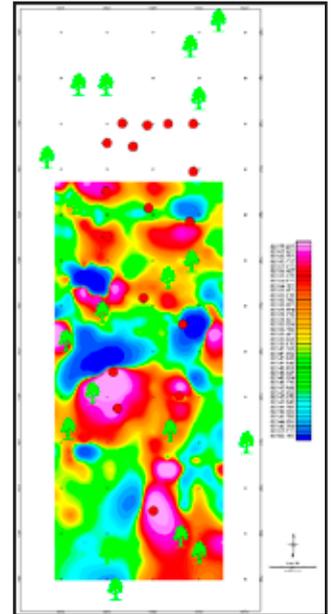
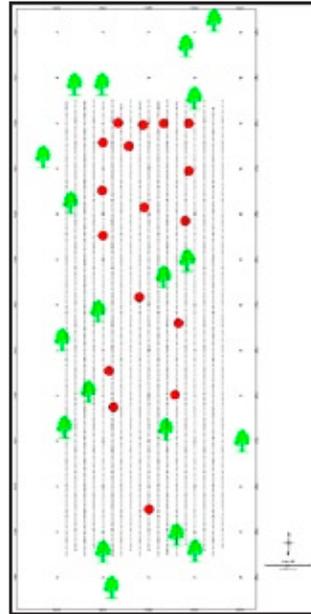
Actual Target Data								
Hoie Number	Murston Type	Depth	Orientation	Nose direction	GPS E	GPS N	Taps E	Taps N
1	37 mm	2 feet	vertical	NA	2607255.477	212978.774	2607258.7	212980
2	20 mm	8 inches	EW	East	2607250.841	212979.411	2607253.2	212980
3	20 mm	5 inches	vertical	NA	2607246.937	212978.830	2607248.7	

Tree Location Data				
ID	Easting(USft)	Northing(USft)	Longitude(dms)	Latitude(dms)
'ST 4-0'	2607237.236	212883.909	-76.42321423	36.89970516
'ST 21-0'	2607267.24	212884.123	-76.42314582	36.89970448
TREE	2607239.058	212876.056	-76.4232086	36.89968343
TREE	2607253.22	212887.683	-76.4231593	36.8997145
TREE	2607267.518	212908.299	-76.42310887	36.89977025

Data have been recorded in various formats, and using different coordinate systems.



Data have been imported into Oasis montaj and are now ready for processing and mapping.



This base map contains field measured tree locations, actual dummy burial sites, and em-61 survey stations. The topographic base has not been included for reasons of confidentiality.

Em-61 results have been processed and presented as a gridded image. These data are now ready for interpretation.



SAIC
 10260 Campus Point Dr.
 San Diego, CA, US, 92121
 Phone: 1-800-430-7629
 www.saic.com

Geosoft Software & Solutions featured in this story.

- Oasis montaj
- UX-Detect

Geosoft and all products, solutions or service names are registered trademarks or trademarks of Geosoft Inc. in Canada and other countries. ® indicates Canadian registration. Other brand and product names are trademarks of their respective companies. Copyright © 2008, Geosoft Inc. SAIC.cs.2008.01