GEOSOFT Oasis montaj

UXO Marine

Geosoft software extension for Oasis montaj

Global consultants and marine surveyors use Geosoft software to easily work with and manage the rapidly expanding volume of site investigation surveys aimed at detecting and mapping unexploded ordnance (UXO), buried cables and pipelines, and other seabed artefacts.

The montaj UXO Marine extension provides a comprehensive workflow and tools to process, detect, and analyse marine magnetic data.

UXO Marine works with data from all individual and multi-sensor arrays, as well as gradient systems such as the Marine Magnetics Seaquest (2 to 4 sensor) and the Geometrics TVG, to rapidly and reliably convert high volumes of magnetic data into accurate target detection, mapping and analysis. Your custom-built arrays are also fully supported. As well, you can import and map electromagnetic (EM) and other data types as required.

Data can be processed in profile form for sparse line spacings (often the case in gradient surveys), or in 2D grids for surveys with full data coverage. UXO Marine can provide quality assurance (QA) and quality control (QC) both on-board and after a survey is complete. Geophysical correction tools identify and remove the many types of noise in the data from background geology or instrument-inherent sources.

Through a variety of adjustments and corrections, UXO Marine provides unique capabilities for accurately locating the subsurface position of the sensors, the magnetic data, and ultimately the potential UXO targets in large volumes of data.

Once targets are chosen, magnetic anomalies are analysed with various approaches to refine target locations and estimate depths. Apparent size and magnetic moment calculations help to further characterise UXO targets for informed decisions.

Use UXO Marine to:

- Ensure data quality through instrument tests and other QA/QC processes
- Automatically position all sensors in multi-sensor arrays
- Full suite of enhanced navigation corrections and standard magnetic data corrections
- Drape magnetic survey data to constant "altitude" above the sea floor
- Enhance data with filtering and residuals for noise removal
- Pick targets automatically from profiles or gridded data using analytical signal calculation capabilities
- Interactively add and delete targets in profile or map views
- Automatically analyse the locations, depths, and ferrous weights / magnetic moments of targets
- Produce specialised reports and maps
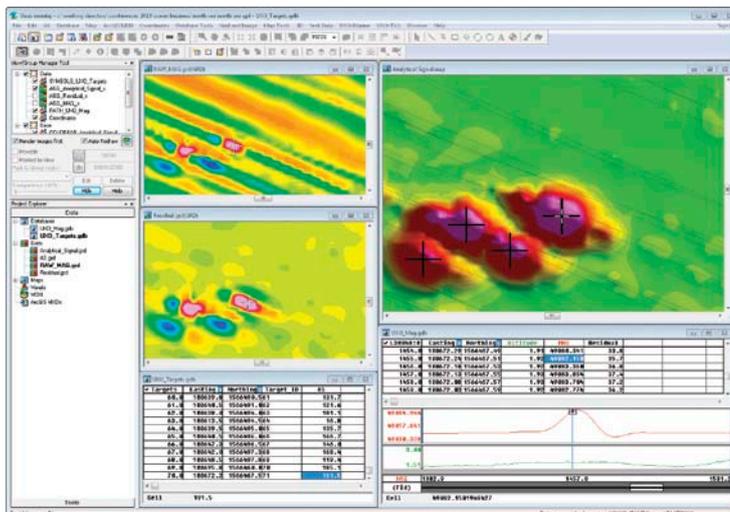
UXO detection and characterisation relies on the ability to easily access and work with large volumes of data during each step of the investigation process: acquisition, quality control, processing, analysis and visualisation.

Using UXO Marine, geoscientists can organise and handle their data with ease and speed, ensuring rapid data processing, Quality Control (QC) and Quality Assurance (QA). Multiple survey data files can be imported automatically. Comprehensive target analysis tools enable quick analysis and qualification of target picks.

Data Corrections and Processing

Effectively manage your data by applying standard lag, heading, and base station (diurnal) corrections. Sensor offset and survey path corrections ensure proper data positioning.

Ensure accuracy by levelling gradient data to remove any DC shift between left and right magnetometers due to calibration differences. UXO Marine also allows you to drape data upward and downward to a common survey altitude above sea bottom for consistency in depth interpretations and analysis.

UXO Marine contains filters to remove data spikes, smooth profile and gridded data, remove backgrounds and enhance features of interest.

Automated and Interactive Target Picking

Using the specialised Analytic Signal tools included in UXO Marine, you can automatically pick targets from any magnetic dataset, including gradient data.

The analytic signal calculation properly re-positions the peak of magnetic anomalies over the centre of the target, even with remanent magnetisation present. Targets are then selected using automated peak picking algorithms from gridded analytic signal data, or from profile data where lines are too widely spaced for gridding.

When picking targets interactively from profile data in the database, the "Add Target" tool will automatically find the closest peak to the picked location.

Interactively add, delete, and manage targets from profile or gridded data.

Target Analysis

Quickly improve the location of potential targets and calculate apparent depths, sizes, and magnetic moment using UXO Marine's magnetic modelling and other analysis capabilities.

If using gradiometer data in the modelling, the target locations are re-calculated by fitting two or more magnetic profiles from the sensor platform to the target location to generate a solution for a magnetic dipole.

The measured altitude of the magnetometers above the seabed can be subtracted from the calculated target depths to obtain target burial depths.

Data Corrections and Processing

UXO Marine lets you prepare and customise a wide variety of standard maps with linework, imagery, and customer-specific layouts. Target results may be displayed on individual maps or plotted on any survey area map. Maps may now be rotated to be parallel to the survey boundaries, for optimal presentation.

- Prioritized list of locations (dig sheet)
- Depths and coordinates
- Apparent magnetic moment
- Optimal path for UXO removal
- Audit log of data processing steps performed

All UXO Marine data and reports can be exported in industry-standard formats such as ArcGIS SHP files, PDF, CSV and many others as needed.

Key Functionality

- Supports total field sensors, multi-sensor arrays and gradient magnetic datasets,
- Full suite of data corrections and QA/QC procedures,
- Accurate selection and management of targets,
- Target analysis for depths, accurate locations, calculated magnetic moment and more,
- Delivery of maps and reports in industry-standard formats

*The UXO Marine extension requires Geosoft Oasis montaj.

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