Mira Geoscience
...modelling the earth

eNewsletter Q2-2013

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In this issue:

Don't miss out!

Here is a quick glance at our Upcoming Events Calendar:

» **August 11-14** ASEG in Melbourne, Australia

» **August 12-15** SGA Biennial Meeting in Uppsala, Sweden

» **September 22-27** SEG Annual Meeting in Houston, USA

» **September 24-27** SEG Conference – Geoscience for Discovery in Whistler, Canada

» **Sept. 29 – Oct. 2** GRC Annual Meeting in Las Vegas, USA

» **October 21-24** Earth Modelling 2013 in Vancouver, Canada

» **December 2-4** Saskatchewan Geological Survey Open House in Saskatoon, Canada

» **December 2-6** NWMA Meeting in Reno, USA

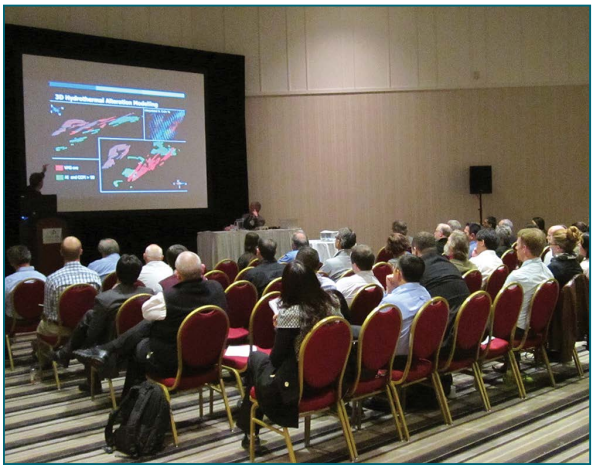
» ...more details on page 4 or on our Upcoming Events page

We hope that 2013 started out on the right foot for you, like it did for us! So many great achievements to look back on and so many exciting developments to look forward to.

In software news, we released GOCAD® Mining Suite 2009.4, Fullagar Geophysics VPmg7.1 and VPem1D v2.1 in March. Our software development team was strengthened by the arrival of four new staff members. Our trainers have been traveling the globe, offering personalized training and workshops. We had a great time at RoundUp and PDAC, and we enjoyed participating in the AMIRA P1022 workshop in Perth ("*Rapid 3D Inversion of TEM Data*"). And now it's our turn to offer you a look at our program for Earth Modelling 2013.

Our consulting team has also been busy, working on substantial client projects in 3D data management as well as our more traditional project work in integrated earth modelling, advanced geophysical interpretation, and exploration targeting.

Earth Modelling 2013



Earth Modelling 2012

Last October, we announced that our 2013 annual meeting would be held in Vancouver, Canada, October 21-24. Since then, we have been putting together an exciting program that will bring direct, practical benefits to all attendees.

Following is our program at a glance...

Earth Modelling 2013 combines a one-day conference on 3D earth modelling technology developments and mining industry applications with a one-day symposium on advanced quantitative data integration.

The full program includes case studies, technical presentations, keynote speakers, "speed geeking", workshops, short courses, social events and opportunities for networking.

Each year we offer a range of talks on the real-life applications of 3D earth modelling in exploration and mining.

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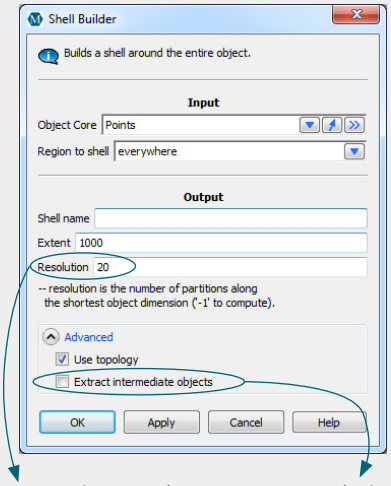
GOCAD Mining Suite:

May's tip of the month

Proximity isoshell builder

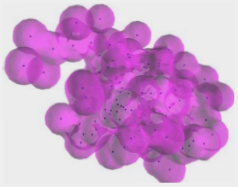
This command is ideal if, for example, you want to rapidly build an alteration halo around your orebody. It performs shell queries by quickly creating closed surfaces at a specified distance from nodes of an object.

It generates a temporary 3D grid around the core object, computes the distance from each cell to the object and creates isosurfaces at a distance equivalent to the chosen Extent.



You can increase the resolution to smooth out the shell or set it to -1 to automatically compute a default value.

To preserve the interim Voxet, select Extract intermediate objects in Advanced Settings.



To receive our tips or to view previous ones, visit our site.

Sunday October 20	Monday October 21	Tuesday October 22	Wednesday October23	Thursday October 24
Pre-conference short course	Geomodelling: Concepts, applications and technology	Quantitative data integration symposium	Workshops	Short courses
Introduction to GOCAD Mining Suite	Technical session: Geomodelling technology developments Case studies: Geoscienctists at work Developer's sandbox: Software developments Speed geeking: Innovative developments Welcome Reception	The program will feature a range of presentations covering key aspects of data integration in the earth sciences, including: - Business objectives - Role of modelling - Data support - Analytics - Expert systems	Geophysics for integrated earth modelling Building integrated 3D earth models for mineral exploration	Geologically-constrained geophysical inversion What's new in Mira Geoscience's software suite

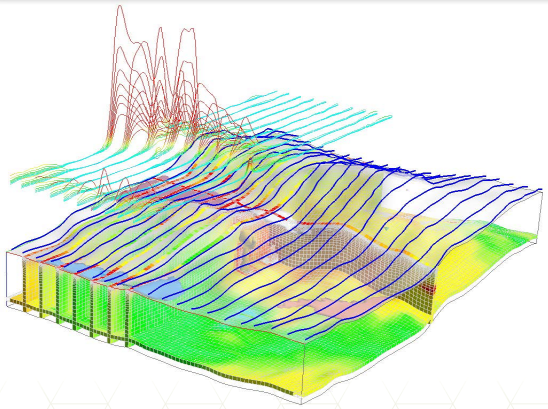
We invite anyone who uses 3D modelling for mineral exploration or geotechnical applications to submit a case study. Details are available here.

Situated between the mountains and the Pacific Ocean, Vancouver is a place unlike any other. Earth Modelling 2013 will be held in the luxurious Four Seasons Hotel in downtown Vancouver, in the heart of the city's premier shopping and entertainment district. Breathtaking mountains, the sparkling ocean and a cosmopolitan flair will make the experience unforgettable.

Book your room at the Four Seasons Hotel now! Reservations and additional information are available here. For more information on Vancouver, visit Tourism Vancouver.

Register now! We look forward to seeing you there!

What's new in software development



Last March we announced the release of GOCAD Mining Suite 2009.4, VPem1D and VPmg7.1, compatible with GOCAD/SKUA® version 2009.4 from Paradigm™.

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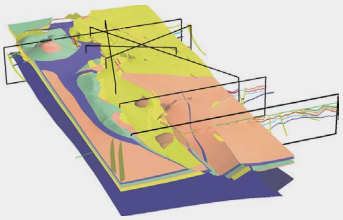
In the news:

International Mining
February 2013

Spotlight Feature Article - Mineral Exploration Trends & Technology. Paul Moore. "*Mira Geoscience provides specialised software and consulting services in 3D geological modelling, geophysical inversion and interpretation, interpretive drillhole targeting, and geotechnical hazard evaluation. It also...*"



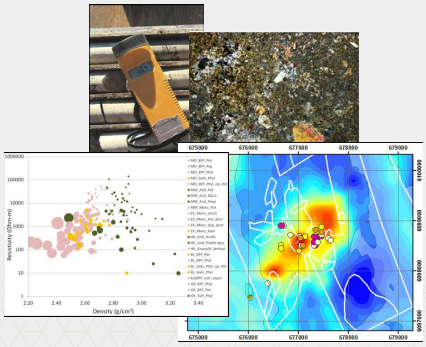
Supporting Underground Openings: Support organisation.

John Chadwick. "*3D mine from Mira Geoscience showing a mine development (coloured by relative rockburst hazard potential) intersected by 3D fault structures. Geotechnical hazard evaluation is one modelling task that Mira can perform, ...*"

Contributions:

Mineral Exploration Roundup 2013
Vancouver, Canada – January 29

Abstract volume: *Linking Physical Rock Properties to Porphyry Alteration and Mineralization: Examples from the QUEST and QUEST-West Project Areas.* Dianne E. Mitchinson and Randy J. Enkin.



GOCAD Mining Suite 2009.4 highlights

Base Module:

- New print-to-scale output of our 2D-Sections interpretation.
- Reduces the number of clicks and provides a more versatile user dialog.
  - 2D/3D gridding and distance computations between objects were merged.
  - Enables filtering of class geological queries, recoding discrete information on drillholes (e.g. lithology) and updating geology logs based on well markers.

Targeting Workflow: improved memory management for working on very large projects.

Sparse: Structural Fields Interpolator: uses multi-core environments for faster computation.

Potential Fields: new functionalities to prepare data for inversion and permit easier model extraction.

- VPmg Workflow: improved data/model visualization and application of geological constraints. Now handles self-demagnetization and interaction between magnetic 3D bodies (with VPmg 7.1).

Electromagnetics: runs 1D TEM inversions, supports both EM1DTM and VPem1D, includes data and model import/export, connects and runs AEM system information to the inversion software.

For more details on GOCAD Mining Suite 2009.4 and all of its modules, visit our website.

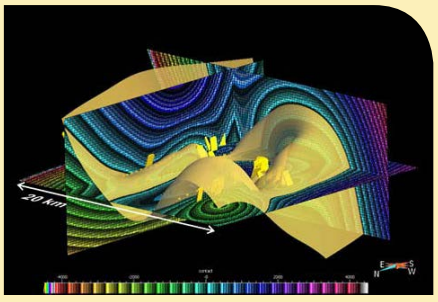
Fullagar Geophysics highlights

VPem1D2.1 is a new program that performs 1D TEM inversions in a 3D geological framework, facilitating a variety of inversion styles.

VPmg7.1 incorporates a number of minor enhancements and more stability.

Radial basis function

Our long history of R&D in partnership with the Geological Survey of Canada has played an important role in the creation of several of our products.



Recently, we have been working together on radial basis functions for implicit surface modelling as part of GOCAD Mining Suite. This modelling technique has gained popularity for its efficiency and remarkable speed.

Enhancements include use of stratigraphic inequality and gradient constraints from off-marker points and structural observations, as well as local anisotropy weighting. These improvements will dramatically enhance our clients' ability to expand to camp and regional scale 3D modelling in more complex domains.

Upcoming events

23rd International Geophysical Conference & Exhibition

Melbourne, Australia, August 11-14

This ASEG-PASA hosted conference is a great forum to learn about the newest geophysical techniques and practices. This year we will host a one-day workshop: **Geophysical interpretation, Modelling and Inversion in GOCAD**. It will cover the essential aspects of geophysical interpretation, modelling and inversion including geologically-based gravity, magnetic and AEM inversions. Also, our President, Dr. John McGaughey, has been invited as a keynote speaker to give a talk on "Geological Interpretation of Potential Fields Data".

If, like us, you will be attending, we invite you to take a few minutes to stop by Booth 49 and see what's new in the industry's most powerful integrated 3D exploration and geotechnical hazard evaluation solutions. It's the perfect time to discover all of our latest technology and interpretation innovations. Members of our highly skilled, multidisciplinary team will always be at our booth to greet you and show you the latest innovations.

SGA Biennial Meeting

Uppsala, Sweden, August 12-15

The Geological Survey of Sweden and the local organizing committee are hosting their 12th biennial meeting at Uppsala University this summer. It is an excellent opportunity to present and exchange knowledge in the field of mineral deposits research. Nigel Phillips and Gervais Perron from Mira Geoscience will host a two-day workshop: **3D/4D Modelling of Mineral Deposits**. This workshop is designed for geoscientists wanting to characterize mineral deposits based on integrated multi-disciplinary 3D earth models. In addition, Gervais Perron has been invited as a session convenor for the 3D modelling of ore deposits Scientific session.

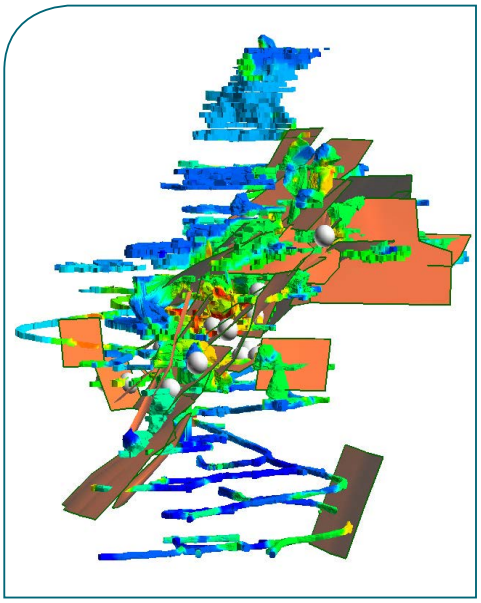
A closer look at our geotechnical hazard assessment

Over the past several years, our geotechnical hazard analysis business has grown steadily. We have long recognized the similarity in some of the key technical challenges of mineral exploration and geotechnical engineering. In both cases integrated 3D earth models are the foundation of interpretation, and the capability of rapidly creating these models has opened a new world of analytical possibilities.

This is particularly true in the recognition of geohazard risk. Whatever the particular hazard under analysis (for example, slope failure, rockburst, or water inflow), the problem is conceptually similar to the mineral exploration problem: how can we integrate complex, multi-disciplinary datasets to identify locations where certain special combinations of conditions exist? In exploration the objective is mapping the 3D distribution of mineralization potential. For geotechnical hazard the problem has an added twist in that we must forecast hazard risk as a function of both space and time, as both the geometry of the problem and many of the individual datasets are time-dependent.

We have developed the Geohazmap Workflow module to provide a powerful solution for geotechnical hazard estimation and monitoring, including true four-dimensional back-analysis. It is intended for use in underground or open pit mines as well as engineered rock structures for civil applications, such as tunnels and slopes. A multitude of earth model objects, such as rock quality models, stress, joint mapping, faults, and excavation geometry, can be combined using a variety of knowledge and data-driven methods to highlight hazardous ground. It provides quasi-real time updates on the basis of monitored observations such as microseismic data, ground deformation, radar, and laser sighting.

The process has proven successful at mine sites around the world, from forecasting rockburst and water inflow hazard in deep Canadian mines, to slope stability hazard in large South African open pits, to roof fall hazard in Australian coal mines.



A 3D mine project showing a mine development (coloured by relative rockburst hazard potential) intersected by 3D fault structures.