



GOCAD® Mining Suite – Product catalogue

Base Module

Advanced geological modelling with an interactive 3D-GIS spatial analysis and query environment. Build and analyze integrated, quantitative, multi-disciplinary 3D earth models.

GOCAD, originally developed for the petroleum industry by [Paradigm B.V.](#), leverages very significant oil and gas R&D investment. GOCAD Mining Suite is our customized extension of GOCAD. It performs precise structural modelling, surface (wireframe) construction, stratigraphic and regular block modelling, and geostatistics. It has mining-specific import/export filters and utilities.

Add-on modules include explicit, implicit and parametric 3D geological modelling environments, natural connections to geologically-constrained geophysical forward modelling and inversion, multi-disciplinary 3D exploration targeting, exploratory and geochemical data analysis, and geotechnical hazard estimation and monitoring.

Add-On Modules

Personalized approaches to best suit your needs. Choose among the following expertise to add functionality to the Base Module.

- + [Advanced Geological Modelling](#)
- + [Advanced Geological Interpretation](#)
- + [Interpolation and Geostatistics](#)
- + [Geophysical Data Interpretation and Modelling](#)
- + [Geochemistry and Exploratory Data Analysis](#)
- + [Targeting](#)
- + [Geotechnical](#)

GOCAD 3D Mining Viewer

3D visualization of GOCAD Mining Suite objects and project files that allows you to modify graphical attributes such as paint-by-properties, transparency, and contours. It also allows cutting through 3D block models and importing a wide range of geoscientific file formats.

Advanced geological modelling

Explicit (CAD-Based)

GOCAD Structural Modelling: A framework that facilitates the construction of a structural model for both simple and complex structures. Its integrated workflow guides you through the modelling of faults, fault networks and horizons, enabling perfect fit to the input data. It is designed to lead the novice and help the experienced user while allowing them to remain free to perform quality control on proposed solutions.

Stratigraphic Modelling and Fault Analysis Tools: A complete set of tools to visualize and modify azimuth and dip, displace faults, juxtapose maps, create isochore surfaces, tune fault/fault or horizon/fault contact and control horizon crossing.

GOCAD 3D Sgrid Builder: Workflow-based module that facilitates the construction of 3D stratigraphic grids, for modelling both simple and complex geological depositional environments. It can control overturned beds, listric faults, inverse or Y-faults and faults terminating in the middle of a layer.

Implicit

SKUA™: Optimized for stratified geological settings, it is [Paradigm B.V.](#) industry leading 3D implicit modelling software environment.

SKUA Structure: Developed to allow you to quickly build 3D models defined by fault networks and stratigraphic horizons. SKUA uses a volumetric modelling algorithm that builds the entire 3D model in a single pass. Models are constrained by well/drillhole markers, interpretation points and curves, structural measurements and a stratigraphic column that defines stratigraphic rules between horizons. Because of its implicit nature, 3D models can quickly be updated (recomputed) to honor new drilling and other type of subsurface data.

SKUA Stratigraphy: This module allows you to construct a gridded version of the 3D structural model outputted by SKUA Structure. SKUA Stratigraphy's output in a 3D grid called "Geologic Grid". It is designed specifically for applying geostatistical techniques in a faulted and folded geologic environment. Geologic Grid cells can be deformed to follow stratigraphy and can be cut to properly accommodate fault geometry. A unique coordinate transformation based on depositional time can be applied to the grid to unfold and remove the displacement associated with faults. This constitutes the ideal setting for using geostatistics for modelling rock properties.

Parametric

Sparse: Developed in collaboration with the [Geological Survey of Canada](#) to address the problem of constructing 3D structural geology models given sparse structural and geological data. It provides the user with the tools needed to quickly build smooth 3D curves and surfaces that honour structural data while maintaining the freedom to use [GOCAD Mining Suite](#) editing and interpolation tools.

Advanced geological interpretation

Maps, Cross Sections and Log Display: A comprehensive set of tools for displaying and performing quality control of geologic data in 'composite' log display views, cross sections and maps. You can copy and paste your results to any document type or create scaled hardcopies.

Well Correlation and Stratigraphic Analysis: It provides a suite of comprehensive tools for interpreting, displaying and performing quality control of geologic data in along-hole views, cross sections and maps. With this module, you can perform rapid and accurate interpretation of geologic structure and stratigraphy with data ranging from regional geologic interpretations to detailed stratigraphic analysis.

Interpolation and geostatistics

Deposit Resource Modelling: Contains a flexible and dynamic workflow for populating grids with multiple properties. It offers an extensive suite of geostatistical algorithms for spatial estimation and simulation to model any continuous variable. A post-processing workflow provides tools for summarizing and analyzing simulation results, together with decision-making support tools such as volumetric map computation and connectivity analysis.

Categorical Properties: Ideal for modelling any discrete variable. It includes a flexible object-based stochastic simulation algorithm and an efficient multiple-point simulation algorithm (Impala) for geologically realistic discrete models.

Reservoir Data Analysis: Designed to guide users in establishing reliable input statistics for constructing robust property models. It focuses on de-clustering, histogram identification and trend modelling for both discrete and continuous properties; with or without seismic data.

Geophysical modelling and inversion

Potential Fields: Provides rigorously quantitative interpretation of potential fields data within a 3D earth modelling context. Modelling and inversion UBC-GIF workflow for gravity and magnetic data using geological models, structural and petrophysical constraints, as well as traditional filtering and interpretation tools, within an exceptional 3D visualization environment. The module works with VP Suite's [VPmg](#) and UBC-GIF's [MAG3D and GRAV3D](#) software. UBC-GIF program and VP Suite must be purchased separately.

Electromagnetics: The module is composed of two parts: Electrical and Electromagnetic.

The Electrical menus provide users with a set of tools for integrated access to 2D and 3D DC resistivity and induced polarization forward modelling and inversion programs from UBC-GIF ([DCIP2D and DCIP3D](#)). Features include data import, visualization, editing, preparation and execution of inversions, predicted data comparison, and inversion model analysis. It also allows you to apply a broad range of constraints including lithological, structural, petrophysical and other geophysical information.

The Electromagnetic menus include data import, visualization, editing, preparation and execution of forward and inverse modelling for layered-earth (1D) models, using data such as time-domain airborne EM data with UBC-GIF ([EM1DTM](#)) and VP Suite ([VPem1D](#)) for geologically constrained inversions. Also included is Radio Imaging, and primary field EM modelling for loop and dipole sources in a free-space.

The Electromagnetics Module does not include UBC-GIF program nor VP Suite, which must be purchased separately.

Seismic: Enables you to do 3D forward modelling for hard rock environments. It can model seismic reflection data using 3D geological/petrophysical models. The 2D forward modelling code provides straight and curved ray travel time data within discretized 2D planes. It also offers tomography programs to image velocity fields between boreholes.

Interpretation Modelling: Interprets complex geological settings using a fast, fully-featured seismic interpretation tool within an innovative 2D and 3D seismic visualization and modelling environment. It has an interactive display and allows interpretation of data in any arbitrary orientation. It includes the interpretation of horizons, faults and geobodies.

Seismic Attribute Analysis: Computes a wide range of seismic attributes (instantaneous, response, geometric, spectrum and statistics) in a 3D seismic cube, 2D section and on any extracted horizon, as well as seismic facies classification. It is an essential tool for multi-attribute analysis and interpretation.

Velocity Modelling and Time-to-Depth Conversion: Helps the user to build time or depth velocity models and use them to transfer from time to depth or depth to time any horizon, seismic volume, fault or 3D stratigraphic grid. Any type of velocity information can be loaded easily and then used as input to the modelling process. Its flexibility caters to most standard velocity modelling workflows.

Geochemistry and exploration data

ioGAS Link: Developed in collaboration with [ioGlobal - Reflex](#) to combine the power of exploratory and geochemical data analysis with advanced visualization and 3D-GIS query. The real-time connection between ioGAS and [GOCAD® Mining Suite](#) provides users with a unique and powerful interpretation environment. The ioGAS Link Module does not include the [ioGAS and ioGAS-GOCAD Mining Suite live link](#) applications, which must be purchased separately.

Targeting

Targeting Workflow: Provides 2D and 3D mineral potential modelling solutions for exploration geoscientists and maps hazardous ground for geotechnical specialists. Multiple exploration or mining hazard criteria can be combined using a variety of knowledge and data-driven methods to respectively highlight prospective ground and hazardous mining areas. Quantitative analysis and advanced visualization tools are used to identify and rank identified targets. A unique workflow interface dynamically guides the user through an expert process yielding reliable and repeatable results for better, faster decision making.

Geotechnical

Geotech: Provides integrated, real time, 4D-GIS based geotechnical hazard assessment for open pit and underground mining projects. Multiple criteria can be combined using a variety of knowledge-driven and data-driven methods to highlight hazardous ground. The workflow interface guides the user through the construction of a hazard model and then applies it in either a standard or real-time monitoring mode. Hazard definitions, normalizations and weightings under the main categories of geology, rock quality, mine seismicity, structure, stress and geometry are completely user-defined.

For purchase inquiries, you may contact sales@mirageoscience.com.

For installation support, please contact our licensing team at licensing@mirageoscience.com.

For technical support regarding usage of our software, the support team is there to help support@mirageoscience.com.