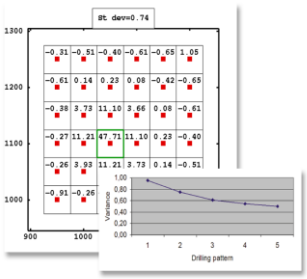
Geovariances
Where no one has gone before

Geostatistics for Mining Engineers and Geologists

Integrating Various Data

- Combine all available data (ore grades, geology, contaminant or trace elements information, geophysics) in one single database for **geologically oriented processing**.



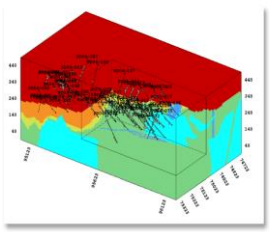
Among different criteria measuring the kriging efficiency, the kriging variance is a good indicator for discriminating different drilling patterns and optimizing drilling mesh dimensions.

Getting the Best Sampling

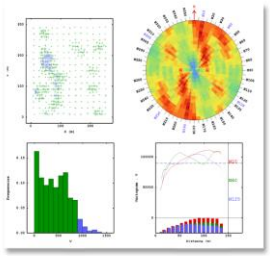
- Assess the impact of sampling patterns on the **reduction of uncertainty** in resource evaluation.

Building a Robust and Accurate Block Model

- Achieve **detailed domain analysis** using advanced coding of data and block models.
- Reveal the **spatial distribution** of the mineralization and **correlations** between grades with advanced variographic analysis of your data.
- Build your **block model** using the kriging method suited to your deposit and data characteristics.
- Refine your block model with a consistent **geological model** to control the metal distribution.



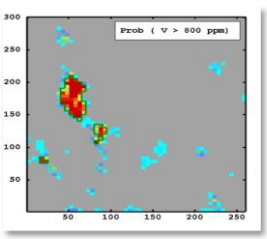
Soft or hard boundaries may be defined for accurate geological or production domaining.



In-depth data analysis allows to identify outliers and anisotropies.

Assessing the Risks

- Explore the **grade distribution** characteristics with the conditional simulations. Numerous equiprobable grade values are provided giving information on the variability of the block model.
- Identify the **grade realizations** which best represent the whole grade variability to characterize the risk attached to a project due to resource uncertainty.
- Improve **grade control** using the appropriate simulation technique to investigate the production sampling pattern.



Mine planning can be refined by introducing pessimistic and optimistic scenarios into the model.

iSATIS

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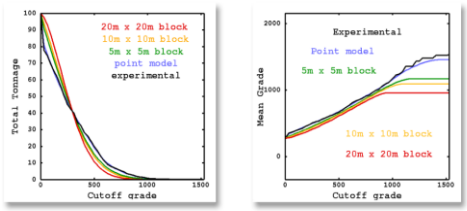
Adjusting the Selective Mining Unit (SMU)

- Evaluate the **recoverable resources** (ore, metal quantities) from the Grade-Tonnage curves according to SMU size and economic grade cut-off.



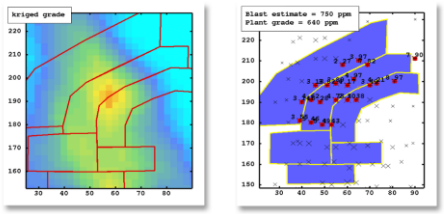
Various techniques are used to check the Block Support Effect: Uniform Conditioning (multivariate), Global Correction (through the anamorphosis function), conditional simulations.

Evaluating the Information Effect

- Anticipate the **ore/waste decision** at the feasibility stage to avoid misclassification at the production stage using non-linear techniques.

Classifying the Resources

- Obtain **reliable classification of the resources** into measured, indicated or inferred categories from Confidence Intervals computations.
- Compare grades sampled at the plant facility with predicted grades for **reconciliation**.



Estimated grades on blocks are compared to grade values at the plant facility, accounting for polygons, i.e. blasts.

Automating the Geostatistical Process

- Set up routine production workflow using batch facilities. Day-to-day production samples are easily integrated to quickly **update grade estimates and enhance mine planning.**

ISATIS from Exploration to Production

Exploration

- Global resource estimation
- Drilling pattern optimisation
- Geostatistical insight on the geological representation
- Uncertainty assessment

Feasibility

- Local recoverable resource estimation
- Sensitivity of project profitability to SMU dimensions
- Grade-Tonnage curves
- Evaluation of the information effect on the ore recovery at the future production stage
- Resource classification

Production

- Grade Control
- Grade Reconciliation
- Routine estimation update

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