Geological data analysis technology

Resource estimation can be complex, but new developments in geostatistical modelling software are delivering greater efficiency, speed and flexibility, Jamie Wade writes.

Statistical and geostatistical analysis of data is a crucial part of resource evaluation. However, this analysis step can be particularly time consuming especially if there are multiple elements, such as iron ore for example, and multiple domains.

Geological data analysis has, over the last decade, tended to include more information and interactivity, says Snowden senior consultant John Graindorge.

"Software developments have largely been in making software capable of handling more and more complex algorithms in a time frame appropriate for resource evaluation," Graindorge explained to *Australian Mining*.

"This problem has been recognised and geostatistical modelling software has improved to the point where a 3D spatial workbench can be easily extended with new modules and functionality."

Perhaps the most significant changes in how geologists have been able to visualise, interpret and report on geological and mining data sets, adds Snowden principal analyst Rob de Bruin, is in the integration of 3D visualisation and modelling of geological data with other tools.

Significant changes have been made in how geologists now visualise data.

"When it comes to geological data analysis, geologists are now demanding good data visualisation, comprehensive graphical analysis and 3D images, and integrated specialised tools within the same software environment to cover the whole exploration mining cycle," de Bruin said.

"Related to this, reporting and auditing of the whole process is becoming more important. How was a result obtained? What were the steps? Can the results be recreated with or without the original people?"

Snowden's new geostatistical modelling platform – Supervisor V8 – is said to have addressed these challenges allowing for the quick addition of new tools that enable geologists to stay within the one environment, decreasing or removing the reliance on a string of hard-to-maintain-and-audit batch processes.

A unique feature of the new software platform, says Snowden's group general manager – geosciences Ivor Jones, now enables geologists to more easily analyse the statistical characteristics of an orebody and the spatial continuity of the grade data.

"The ease and speed with which the platform handles multiple elements and domains, and the ability to change these inputs or add data filters and quickly get new results, will be key features of its success," Jones told *Australian Mining*.

A significant part of the new platform is a statistical analysis module – Analysor V8 – used to generate summary statistics and statistical plots.

The module has two new features: a correlation matrix said to quickly show, with interactive scatter plots, the relationship between the various different elements; and a de-clustering analysis tool, which is said to make assessing data clustering and choosing an appropriate declustering cell size easy than ever before.

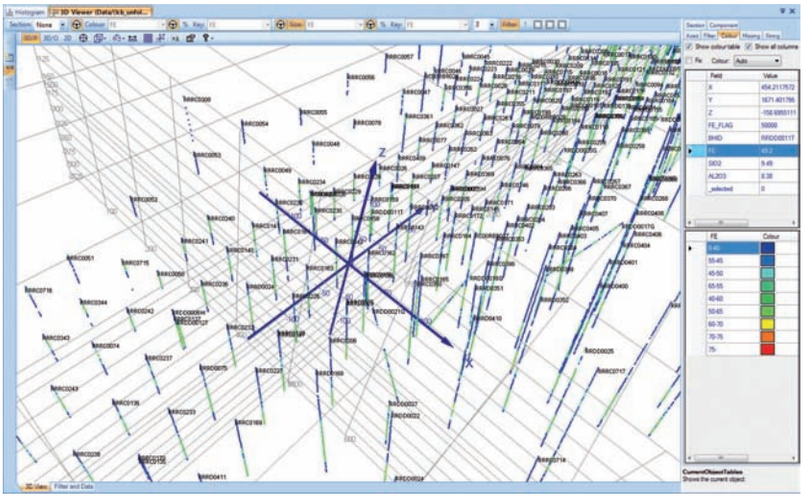
Another key module under Supervisor V8 is a continuity analysis and modelling application or geostatistical module. The module – Visor V8 – is said to allow rapid analysis and model spatial continuity within an ore body.

Variogram fans are generated to assist in determining the key directions of continuity.

Once the directions have been selected, directional variograms can be modelled.

"With increasingly large datasets, Visor V8 is up to 20 times faster than other software – including previous versions of Supervisor – due to the optimised algorithms," Graindorge said.

"Other benefits of the module are its unique interactive viewing of fans and variograms, and the ability to model all three directions of continuity on the screen at once."



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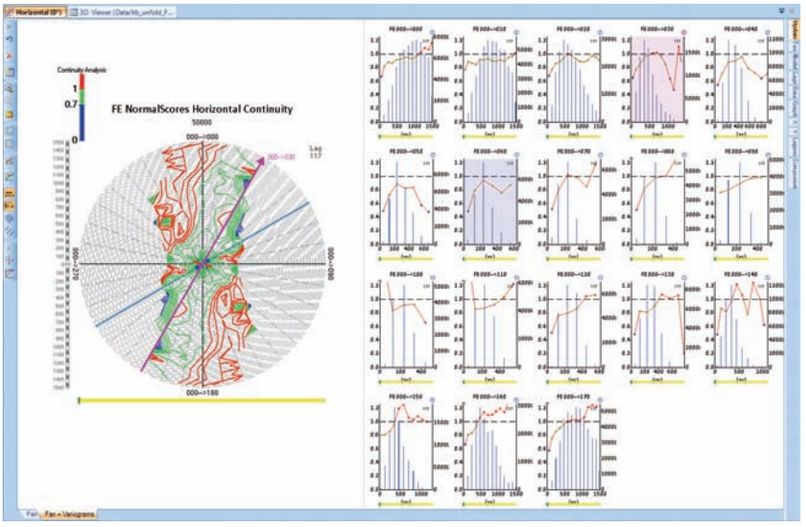

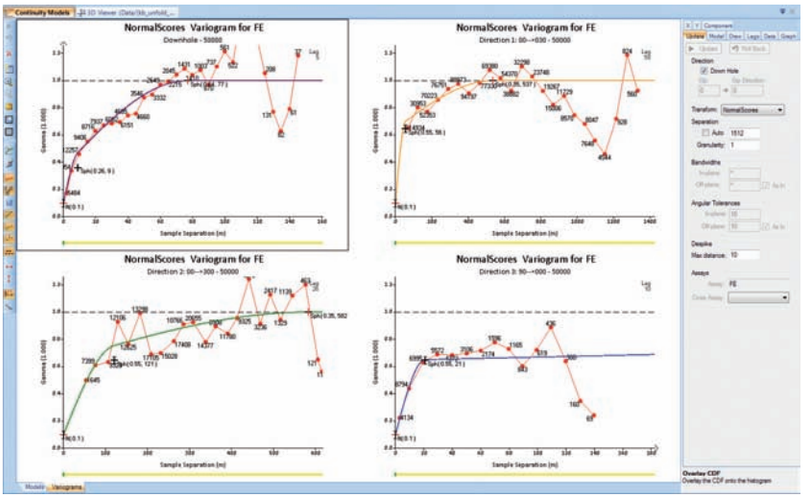

Directional models shown on the new geological software.