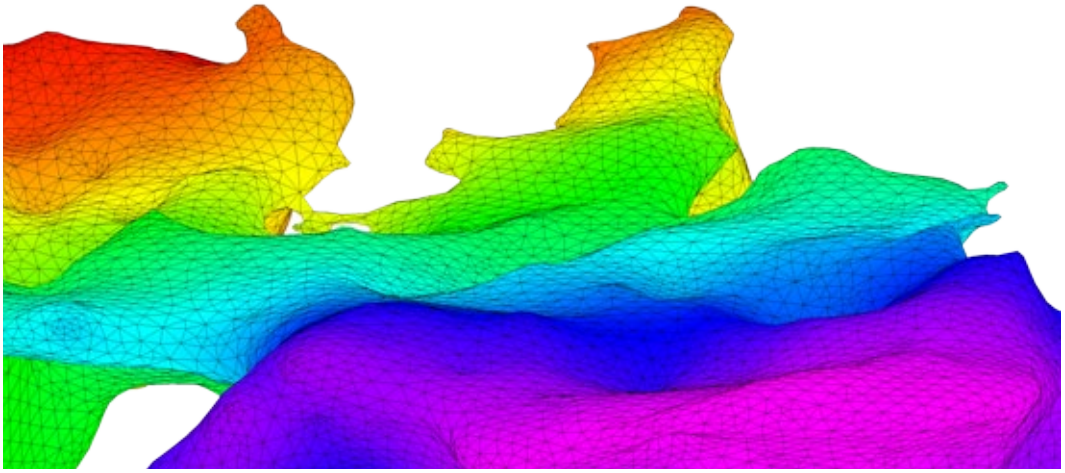
MAPTEK™ Vulcan™

Faster 3D geology modelling

Marcelo Arancibia, Senior Vice President Maptek™ South America, describes a technique to increase productivity in generating 3D geological models for large complex metalliferous orebodies.



THE GEOLOGIST ALWAYS HAS A THREE DIMENSIONAL PICTURE IN MIND - EVEN WITHOUT COMPUTERS.

The Geology Adjusted Modelling method was presented at the Australian Users Conference in April. It uses existing Vulcan™ tools, and has been tested with the help of customers in Chile.

A test case considered a deposit with four different geological units. There were 50 geological sections at 25m intervals, with half perpendicular to the others.

The case study compared the different traditional techniques and evaluated the results against the Geology Adjusted Modelling method.

Various traditional techniques are used for generating solid models, including: 2D solid extrusion models; manual 2.5D solid models connecting sections; inclusive manual 3D solid models observing the drilling intercepts; exclusive manual 3D solid models for totally shared walls between adjacent solids; and implicit mathematical 3D solid models. The mathematical models are supposed to be automatic, however geological polygon lines and points must be used to control the geology!

Using traditional techniques, building the 3D solids for the test case took one month. The same 3D models were built in only 20 minutes using the new technique.

Modelling is based on observed data from mapping or geological logs. The interpretation of sections and/or plans always reflects the geological knowledge of the deposit.

Geologists transform the drilling data into 'hard' intercept data to produce sections or lines - polygons of geological control. Such sections become the base data used by the Geology Adjusted Modelling technique. There is no need to create solids as the starting point.

Block model tools developed for resource estimation and subsequent reserve assessment are used to generate the solid and/or surface models representing the deposit, directly from the geological data.

Techniques for the estimation of block model domains include: continuous and/or categorical Indicator estimation; continuous or categorical Indicator simulation; pluri-Gaussian simulation; and truncated Gaussian simulation.

Block model population for the test case was through estimation by the nearest neighbour method, but any other geostatistical estimation method could have been used.

The output showed that the resultant Geology Adjusted Model was identical to the block model developed by traditional methods from 3D solids. The 20 minute execution time proves the new technique to be a winner!