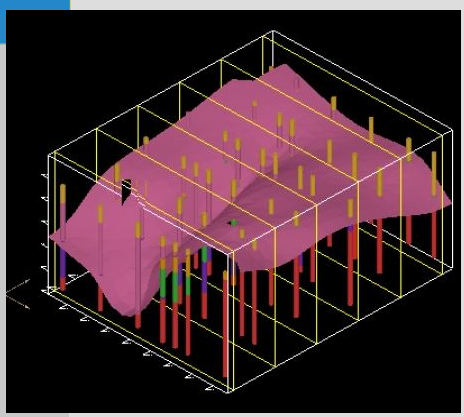
3D GeoModeller



Example of drillhole data being used to generate a stratigraphic surface

IRBA have recently completed an innovative geological modelling project in collaboration with Intrepid Geophysics (www.intrepid-geophysics.com) using 3D GeoModeller (www.geomodeller.com)

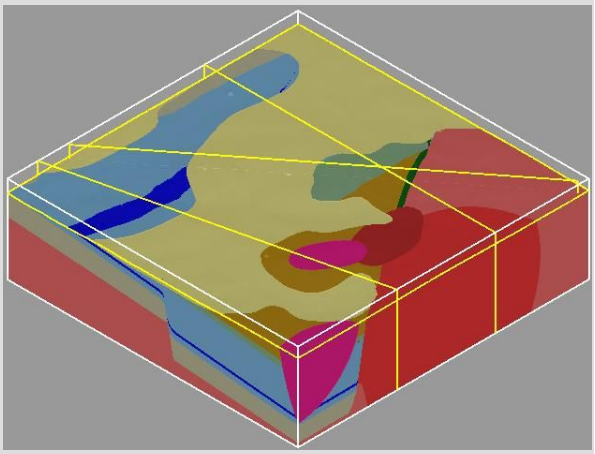
This software allows you to build 3D geological models using observed data and are quantified using the principles of geostatistics and a geological rules engine. In areas where data are sparce 3D Geomodeller can use gravity and/or magnetics data to provide both forward & inverse geophysical modelling to test and refine 3D geological interpretations.

The IRBA study utilised surface geological, drillhole, topographical and gravity data to produce a forward model that was then compared to the observed potential field model. Various adjustments were made to improve the correlation between the models before inversion.

The inversion is a statistically iterative process based on matrix mathematics. It requires each voxel in the model to be assigned various parameters, in the IRBA case densities, then calculates the potential field and tests and compares it against the observed fields. If the comparison is favourable the 3D geological model is modified and the process is repeated

Since the lithological data in our study had similar densities a 2 layer model comprising sediments and basement were the defining features of the 3D model. Cross sections were generated to confirm the model was honouring the observed data.

Some key conclusions from the generated 3D model were: an estimate of the depth to basement, indications that a gravity high probably had very thin sedimentary cover, and some of the surface faulting had little or no offset in the basement



Example of a model generated from 3D Geomodeller - the yellow lines show where 2D cross sections have been generated to verify the observed data with the model

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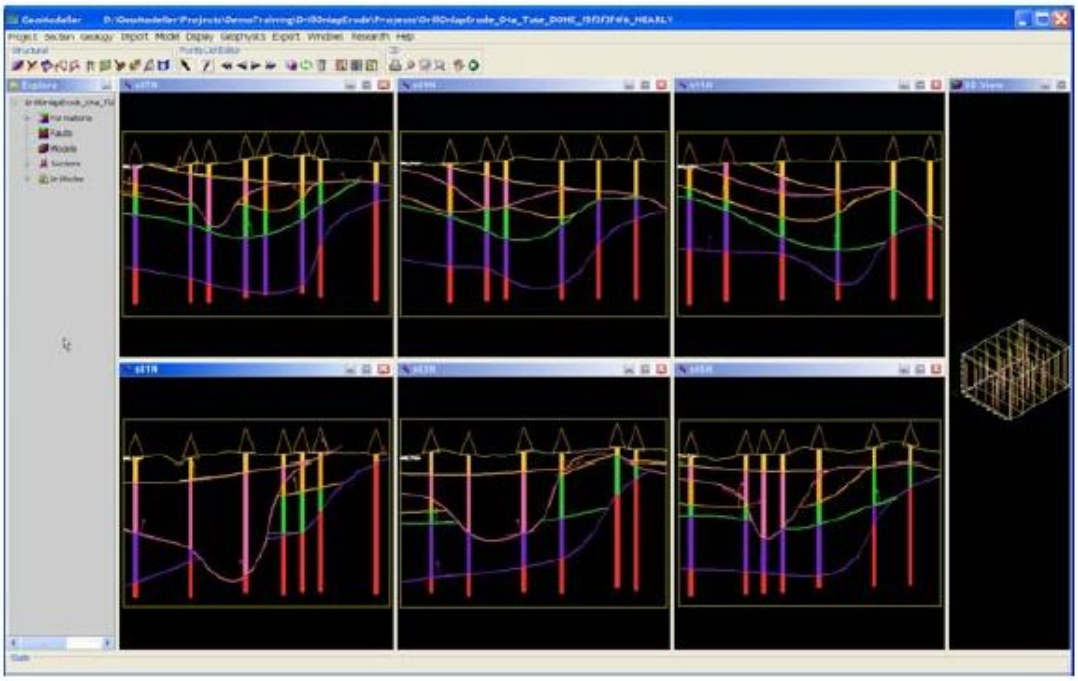

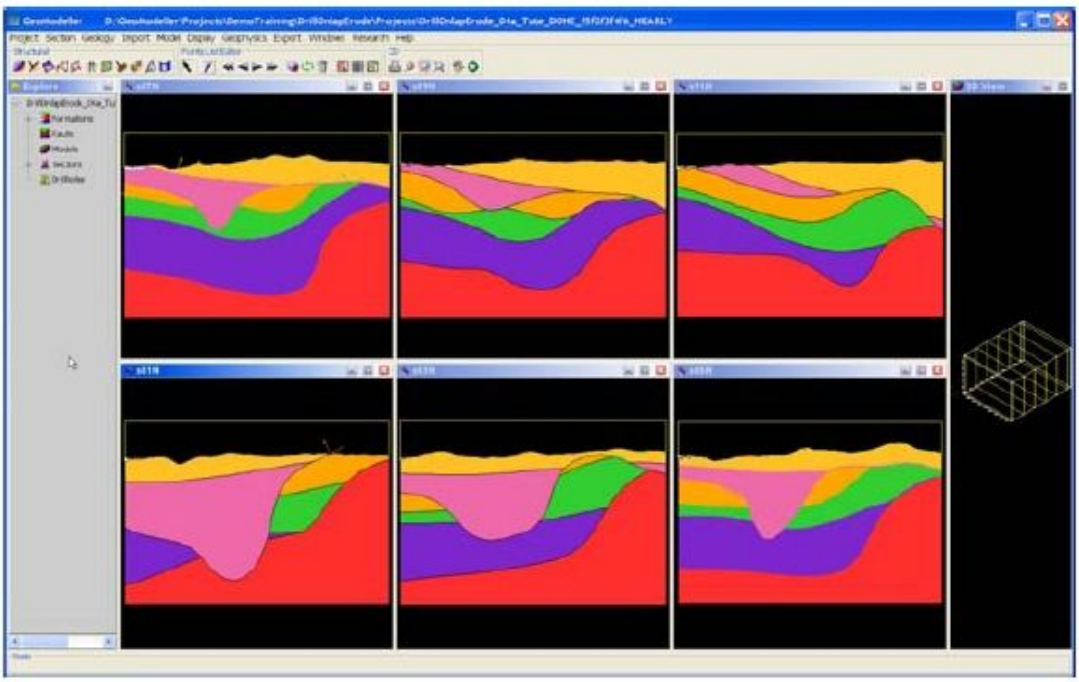

This demonstrates the iterative process of comparing cross sections of the drillhole data with the numerically defined 3D model which has been based on user specified geological rules.

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