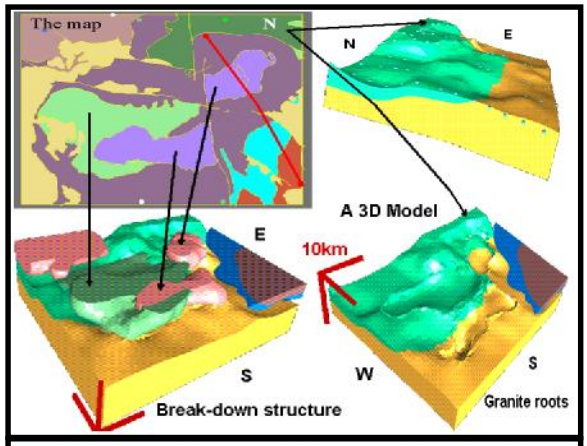
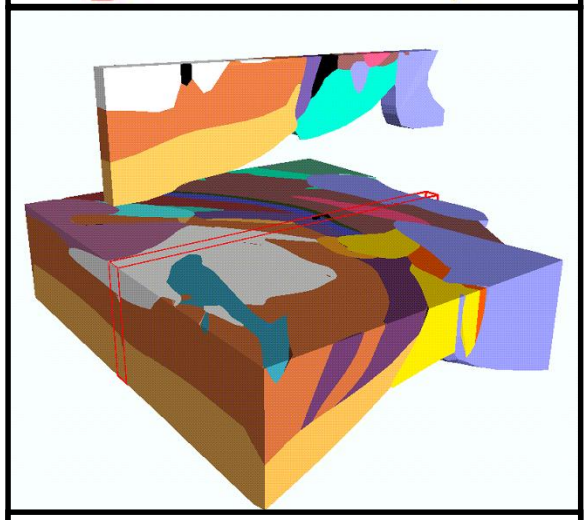
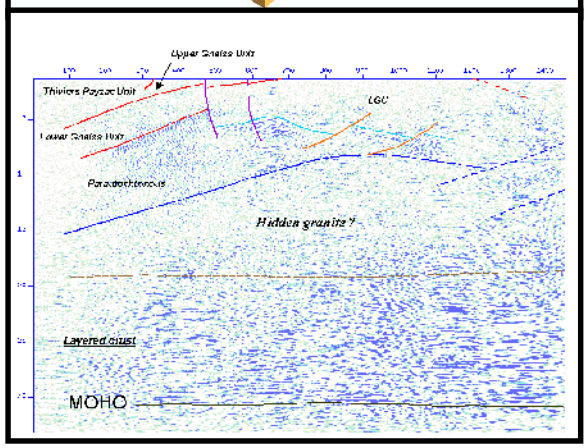
3D GeoModeller … the Geologist's *Geological Editor*







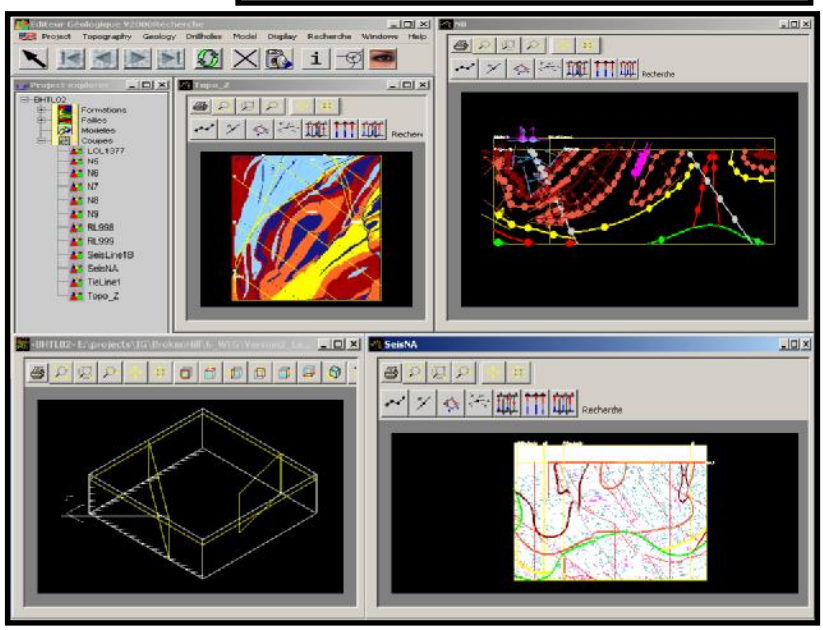
3D GeoModeller is a 'geological editor' which implements a radically different approach to geological modelling. Whereas much geological modelling is based on engineering-type CAD software, GeoModeller is purpose-built for geological modelling. Features which make it a leading edge technology include …

- uses primary geological observations, together with a template of allowed stratigraphic relationships, to 'build' the geological model
- has geologically-intelligent editing to refine the model.
- 'new' observations are easily added, and a revised model rapidly rebuilt to incorporate those new data
- has an ability to use geophysical datasets, such as gravity, to refine the model by gravity-modelling inversion.

Two common criticisms of applying the CAD packages to geological modelling have been (1) the difficulty of revising a model as new data become available, and (2) the need for specialist trained users due to the complexity of the software. Addressing these two issues were key design criteria for the GeoModeller software. As noted above, 3D models are built directly from the geological observations. Further, the software is an interpretative modelling tool that is ***user-friendly in the hands of project geologists*** … without the need for specialised software support services.

GeoModeller has been designed so that data of varied origin can be brought together into the same 3D space, thus ensuring their geometrical coherence. It never-the-less allows the geologist to work with all the usual tools such as maps, sketches, cross-sections, boreholes and surveys, and provides the user with the tools necessary to construct their interpretation of the project geology.

GeoModeller allows a user to build a coherent 3D geometrical model which respects the data and which, once constructed, can be represented in 2D on maps and cross sections, or in 3D in the form of volumes. Moreover, a perfectly constrained and coherent model is essential for reliably calculating volumes, carrying out hydrogeological simulations, calculating geophysical contributions (gravimetric or magnetic), and many other applications. The functionalities of GeoModeller also make it possible to exchange data and results with other applications.



In addition to specialised 3D modelling, the software has geophysical capabilities, including 3D forward modelling of gravity and magnetics, 3D inversion for gravity and magnetic anomalies, and generation of synthetic seismic sections.

Current research activities are seeking to further integrate geophysical solutions into the GeoModeller modelling space, to assist in developing geological models in those areas of poor geological outcrop, but where various forms of geophysical data are available. This R&D is being undertaken by Intrepid Geophysics, in collaboration with the BRGM, Geoscience Australia, and a consortium of Australian state and federal geological and research agencies.

Editeur géologique 3D GeoModeller software