

Mapping makes

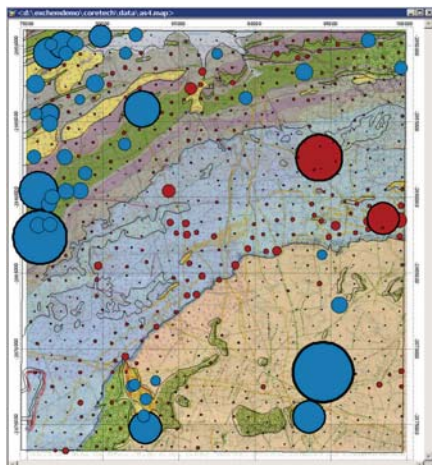
Computer mapping and data handling software have revolutionised the interpretation of exploration data. Michael Forrest reports on developments that are light years ahead of the technology he used 20 years ago.

Software has been developed to assist all aspects of mining, from blasting ore to controlling the refining processes. One of the most common applications is the creation of 3D models showing the location of ore reserves (see *Materials World*, September 2004, pp31-33).

Software is also available for exploration activities, such as mapping and verifying and, perhaps most importantly, for displaying the relationship between all types of data from geological maps to chemical analysis of samples and the results of instrumental surveys, such as gravity data.

Digging deep

Exploration is probably the most data-rich activity in mining. The data from an individual borehole or that generated from regional surveys can result in extremely large databases that swamp



Geochemical values plotted over geology show correlations and anomalies

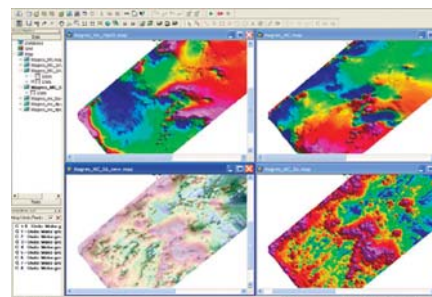
any attempt at correlation. Performing this function requires a high level of computer power to bring together spatial and recorded values.

Exploration collects very different types of data at different points in time. Many of today's discoveries are not new but are a result of past exploration brought up-to-date by more accurate information on the location of ore reserves, or in the light of a new model to explain the mineralisation. Improved precision of geochemical analysis, higher resolution of geophysical measurements, and verified location data combined with a digital terrain model can all add to the exploration programme.

There are many software programs available from a wide variety of vendors that have been used in the processing and archiving of exploration data. These include AutoCAD vector files, MapInfo TAB files and ArcView shape files. Raw data can be archived in a great variety of flat format database files as well as ASCII data and Excel files. Gridded data files are also common, as are those in raster format, such as satellite images. More importantly, map data is often recorded at different scales and projections that do not always match at sheet boundaries.

Figure it out

In order to make sense of exploration data and add value to it, a system is needed that verifies data and allows the integration of extensive data sets. One such system is available from Geosoft Inc, a Canadian company based in Toronto. Its Oasis montaj software has a core function that brings together exploration



Oasis montaj has advanced gridding capabilities that enable users to interpolate data. The software comes with a variety of advanced grid processing tools

data such as geological maps, drill holes and airborne geophysics. Through this system, data can be prepared to provide a transparent and seamless integration of data and applications. One user of the system, Rio Tinto, used Geosoft's Data Access Protocol (DAP) in its own exploration data management system. Its information technology manager Bill Whalen claimed that the new system cut the time spent in gathering and sorting historical data by geologists to a matter of minutes on desk-top machines, all available from a single interface.

Plugging things in

In addition to the core application Oasis montaj has a number of plug-in extensions designed to process and display exploration data. The Chimera extension is designed specifically for exploration geochemistry. Data from analytical laboratories contains standards and duplicates to verify the accuracy and precision of the data. Chimera identifies these values using graphing

