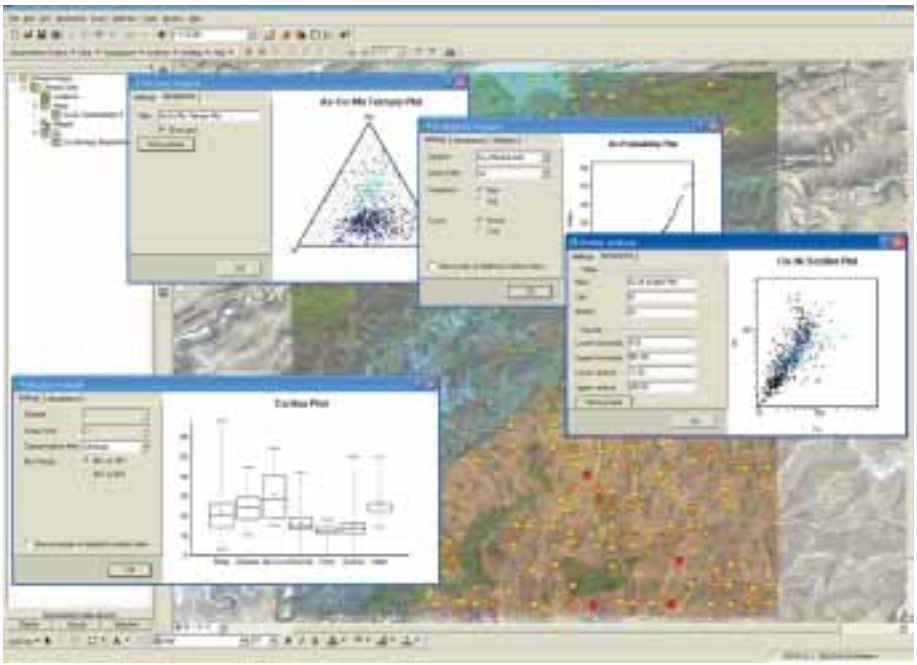
Getting the GIS

Though GIS has had a role to play in recent searches for mineral deposits, use of it in the exploration industry has been growing for several reasons. One of the obvious factors is that there are more tools available to help explorers effectively work within the GIS environment - conducting advanced geospatial analysis, and creating accurate, quality results.

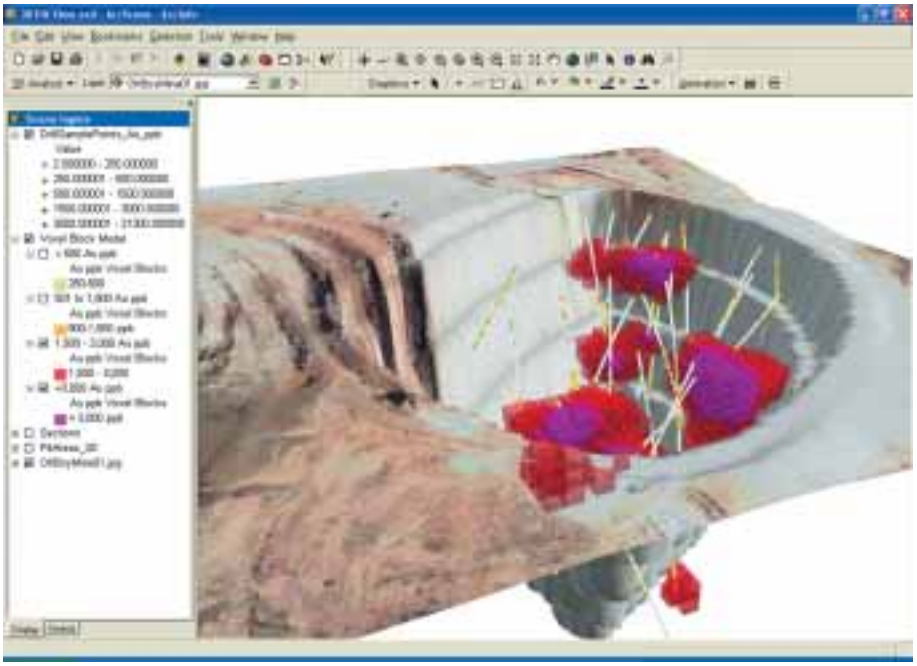
Resource exploration brings up many questions that GIS technology can effectively answer. Exploration teams need to integrate and make sense of reams of geological and geochemical information in order to find orebodies. GIS supports this complex workflow by managing and analysing the data and displaying it in a spatial context.

The real breakthrough of the technology has been adding and improving exploration workflow support for geologists and specialists working with large and multidisciplinary exploration datasets. "I think one of the most critical aspects in the recent uptake is direct workflow support," says Geoff Wade, ESRI's Natural Resource Industries Manager. "But to support the most complex of specialist workflows, GIS really needs to be in the hands of a specialist solution builder. Our global partnership with Geosoft has been essential to fulfilling the specific needs of explorers working within ArcGIS."

In collaboration with ESRI, Geosoft has been building next generation GIS solutions for exploration industries and the geosciences sector. "We identified several explorer challenges, from basic format incompatibility issues, to a lack of advanced tools for visualising and interpreting earth datasets (geology, geochemistry, and geophysics) inside GIS systems," said Louis Racic, Geosoft's Director of Desktop Applications. "And we set out to create a whole solution for explorers that would bridge these gaps."



The analysis tools available in Geosoft's Geochemistry for ArcGIS extension help uncover geochemical relationships. Shown here are a number of these interactive tools linked with a map of DEM contours, surface geology and sample results



An example of mining data that has been incorporated into the ArcGIS extension with the pit plan displayed on ArcScene

From an interoperability standpoint, Geosoft has made it a development priority to support all of the leading GIS data formats, and other common data formats, says Racic. "There is nothing more frustrating than spending time fiddling with incompatible data formats. Our goal is to eliminate the need to convert data formats entirely, and free up time for the exploration team to collaborate in an integrated environment."

Geosoft chose to extend its exploration workflows to the ESRI ArcGIS environment to meet customer demand for simpler and more

seamless solutions that met their exploration project needs. "ESRI technology easily scales to the growing data and spatial challenges that exploration organisations are facing," said Racic. "And we've also seen strong adoption of ArcGIS within global, government geological surveys and the academic geoscience sector."

One result has been strong market demand for Geosoft ArcGIS exploration workflow solutions. "Our target for ArcGIS extension software was our highest growth product last year, and we were taking orders for the new Geochemistry for ArcGIS before its release to market," said Racic. "We're seeing strong interest in the Geochemistry extension from the government sector as well as the exploration industry."

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Geosoft has advanced its exploration strategy in GIS with the recent release of a Geochemistry for ArcGIS extension that has the ability to analyse geochemical data within the ArcGIS environment, according to Racic. And it provides a powerful exploration workflow solution that's not currently available in the market.

Geochemical investigations require the ability to process and analyse all components of geochemical sampling in context with the geology and geophysics. With the tools available within Geochemistry for ArcGIS, explorers are able to extract knowledge from their data by examining multivariate relationships, uncovering underlying structures, identifying outliers and anomalies and then presenting results by creating informative, visually impactful maps.

Using the Geochemistry extension for ArcGIS, explorers can simplify their geochemistry quality control process and maintain data in an ESRI file geodatabase using a data model optimised for geochemical data. They can select and subset data interactively from maps based on lithology and regions to enhance data display; create advanced geochemical maps within the ESRI ArcGIS desktop environment; and analyse multi-element geochemistry using a variety of tools including: interactive multiple histogram plots, Pearson's correlation reports, scatter plots, probability plots, ternary plots and box plots; to identify outliers and define populations.

Wade recommends a gradual adoption of GIS by the exploration department, but one that is incorporated by every member of the interdisciplinary team: "We find it particularly effective if several members of the project team embrace the technology at the same time, thereby supporting each other in the education process and gaining extra benefit from data sharing, improved workflow support and an improved communication capability," he says.

There is no doubt that explorers today are operating in a rapidly changing exploration environment that is increasingly reliant on data and applications available through the Internet. There's more digital data to make sense of, greater integration and interpretation challenges and larger drilling projects to manage. Geosoft sees this as a matter of choice: "retool to deal with the new complexities of exploration and take advantage of all the rich, digital data and applications coming online, or risk being left behind, and missing out on future opportunities." ***IM***