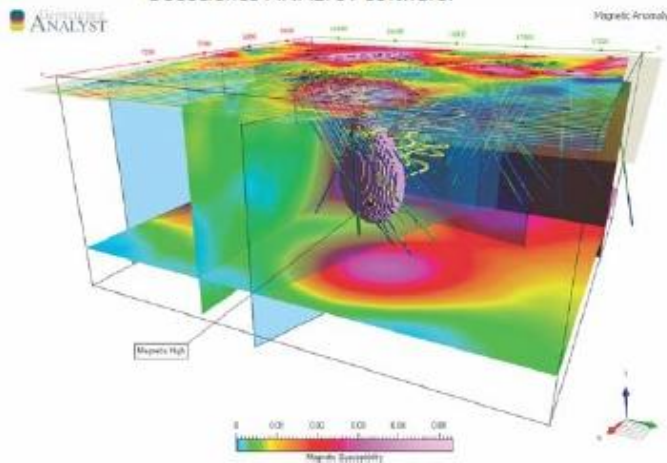


A 3-D image produced by Mira's new Geoscience ANALYST software.



Credit: Mira Geoscience

of heli-borne and 70,000 line-km of fixed-wing flying. Expanding into Central America, the company was awarded a 35,000 line-km fixed-wing project in Nicaragua.

Tundra Airborne Surveys of St Catharines, Ont., provides combined magnetic horizontal gradient, radiometric, and VLF-EM surveys using its own Diamond DA-42 Twin Star and a leased Piper Navajo from KASI Aviation Services of Dorval, Que. The company reported a quiet year. Its partnership with Scott Hogg & Associates continued with a small Heli-GT/radiometric survey for Happy Creek Minerals over the Fox property in B.C., followed by a Heli-GT survey over two blocks in Saskatchewan's Pikoo Diamond District for North Arrow Minerals. At the beginning of the year, in partnership with Geophysics GPR International, TAS completed over 10,000 line-km of fixed-wing magnetic survey with the DA-42 for the Quebec government over the Gaspé Peninsula.

Airborne Data Acquisition and Processing

Since 2012, Aarhus Geophysics, based in Denmark, has been heavily involved in research on modelling and inversion of the Airborne IP (AIP) effect. The AIP mode forward modelling and inversion is carried out using a multiparametric approach, including a full suite of Cole-Cole parameters. Aarhus claims a proven track record of AIP effect inversions on gold, uranium, massive sulphides, copper porphyry, BIF, kimberlite, VMS, permafrost and groundwater surveys. The company has produced a case study of AIP multiparametric inversion of VTEM data flown in 2008 over the Mt. Milligan copper-gold porphyry deposit in central B.C., as a part of Geoscience BC's Quest initiative. The airborne VTEM survey displayed a strong IP effect over the mineralized zone, and was inverted to extract the Cole-Cole parameters. Results showed a positive correlation between the published near-surface chargeability from ground IP surveys and chargeability from VTEM airborne data. Aarhus operates internationally with partner companies in Canada (Promiseland Exploration of Vancouver) and Australia (Newexco of Perth).

Condor Consulting reported a strong shift in activity away from basic targeting programs traditionally supported by juniors, to more integrated geophysical and geological assessments, often involving complex legacy data. The company's GeoInterp service saw several major projects in and around Saskatchewan's Athabasca Basin. Gravity has grown in popu-

larity as a technique being applied around the margins of the basin to map alteration systems that could be associated with uranium mineralization. Ground gravity data provided by Forum Uranium from its Maurice Point property was used to model the equivalent airborne gravity gradient response. Condor's assessment is that the gravity lows typical of the Maurice Point area could be mapped below about 200-300 metres of sandstone cover. Condor also collaborated with Terry Hoschke, a geophysical consultant in Perth, in a CAMIRO project to compile aeromagnetic responses over porphyry copper-gold deposits. The last time such a project was undertaken was 45 years ago. Condor continues to be a re-seller for the Pitney Bowes Business Insight (PBBi) Encom line of geophysical software and is now a re-seller for the Model Vision Pro software being marketed by Sydney-based Tensor Research.

In 2015, Toronto-based Geosoft made it easier to share files and data by providing support for Leapfrog models, ASEG-ESF, LCT, and SEG-Y files. Geosoft 2-D maps can also be exported as Adobe PDF files that include georeferencing and map layers. A new 3-D drillhole planning tool enables proposed holes to be drawn directly in 3-D within the context of other geological, geophysical, and geochemical data and new isosurface options provide more control over how surfaces are created. The voxel math tool now supports open and closed surface operations. In addition, several new database channel math functions have been added, including concatenation of string values and access to data on offset rows. The VOXI Earth Modelling constraint builder now supports vector voxels and the ability to build complex constraint models containing multiple surfaces. The company has also updated the airborne survey planning tools. An approximation of a draped flight path can be created to determine if the exploration target body can be detected with the proposed survey specifications. The detection map enables quick identification of areas where the survey may not detect the potential target.

Geotech improved its proprietary Airborne Induced Polarization (AIP) mapping algorithm, which allows it to extract Cole-Cole chargeability parameters routinely from its VTEM time-domain EM survey data. AIP mapping is now offered as a commercial product for all of its VTEM system surveys, past and present. The company has also implemented AIP removal for deleterious IP effects in its helicopter time-domain EM data, for example in permafrost terrains. Geotech's proprietary superparamagnetic (SPM) extraction algorithm has also been applied for identifying and differentiating SPM-contaminated EM decays from true nickel-copper-platinum group element target responses for its recent VTEM surveys in Greenland. The proprietary Av2Dtopo ZTEM inversion for converting tipper responses to resistivity-depth sections is now provided for free for all its ZTEM natural field EM surveys. The quality and efficiency of its 3-D ZTEM inversions has also been improved by adopting a cloud-based, parallel-processing computing approach using the UBC MT3d code. Software changes to its ZTEM core-processing allow the company to extract tipper data at lower frequencies (22.5 and 15 Hz) than previously possible.

In collaboration with TerraSurvey of Pretoria, South Africa, GyroLAG has validated the integration of a new LiDAR camera on both gyrocopters and UAV. It continued in partnership with Fraunhofer FHR and Hochschule Koblenz University in Germa-