



Minerals geophysics



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Trends and tables 2016

One of the longest running traditions in the geophysical community (started in 1965) is continuing with the 2016 edition of the 'Mineral Exploration Trends and Developments' or ET&D, written by Dr Pat Killeen and published by the Northern Miner. The review has a short introduction/summary, a section that focuses on major developments in the overall industry (Corporate Highlights), then the detailed sections on the airborne and ground industries. Along with the formal ET&D Killeen produces a set of tables outlining the capabilities of the global airborne geophysical service groups and equipment manufacturers. Geochemical technology is covered but the content in this section has decreased over time.

The ET&D effort is supported by the Canadian Exploration Geophysical Society (KEGS) who enlist sponsors to provide the fiscal support needed to enable publication. Input for the Trends and Tables is strictly voluntary and Killeen solicits input each October for the upcoming edition. All contributors to the previous edition are contacted for input into the next edition, and new contributors are also encouraged to submit. The mechanism for adding new contributions is possibly not as efficient as it could be, and one of the reasons that Pat's email contact is provided at end of this column is so that groups interested in being included can ask to be put on the October 'call for information' list.

The introduction for the 2016 ET&D cites the continuing slow level of activity in the industry, but notes that innovation continued regardless. In the Corporate

Highlights section it is immediately apparent that while activities in North America, Europe and Africa are well represented, there is little being reported from Australasia or South America. The airborne industry is clearly an international business and some of the apparent underrepresentation of Australia, in particular, could be the result of Australian groups being considered as 'branch offices' for several of the major companies based in Canada.

In the Airborne Section it is apparent that heli-time domain EM systems have become the industry standard for airborne EM surveys; the systems mentioned include:

System	Company	Head office
VTEM	Geotech Ltd	Canada
HeliTEM	CGG MultiPhysics*	Canada
SkyTEM	SkyTEM	Denmark
Xcite	New Resolution Geophysics	South Africa
GPRTEM2	Geophysics GPR	Canada
Poco	Terraquest	Canada
P-THEM	Pico Envirotec	Canada
AirTEM	Triumph Surveys	Canada

**Early May, Neos Geosolutions, a privately held oil and gas service company, announced their plans to purchase CGG-MultiPhysics; <https://neosgeo.com/news-events/transaction-overview.html>.*

In addition, several groups do offer fixed wing TEM services; CGG-MultiPhysics and Spectrem Ltd. Sander Geophysics Ltd offers the only fixed wing frequency EM system reported in the ET&D.

A number of groups announced on-going improvements to their technologies, likely focusing on efficiency improvements to reduce operational costs.

The major 'new kid' on the block for airborne technology are the UAVs, both remotely piloted and autonomous. A decade ago Fugro Airborne and Universal Wing had programmes to develop UAVs for geoscience applications, with both companies focusing on magnetometer surveys. These initiatives failed commercially, although functional technical systems were developed and operated. A new generation of UAV systems has now arrived largely, it seems, outsourced from military programmes, and these are being touted as the

transformational technology of the airborne business. However, payload capacity and endurance remain challenges as well as security concerns in some jurisdictions. The technology has many supporters so it will undoubtedly continue to evolve and most likely find some niche areas where the UAVs become the competitive technology over traditional systems.

Looking at future demand of an early stage technology can be tricky. In the early 1940s IBM's president, Thomas J Watson, reputedly said: 'I think there is a world market for about five computers'. As a personal aside on the role of UAVs, a senior executive of a survey company, when recently asked about the ultimate role of UAVs in the airborne survey industry, stated 'people don't appreciate how cheap pilots are'.

On the airborne gravity gradiometer (AGG) front one contractor became insolvent, but it is understood that some of their systems have been acquired by third parties who wish to enter into the AGG survey business. No significantly new technologies have appeared for some time but there are rumours that two new systems will have exciting results to show at a gravity workshop planned for the next ASEG conference.

In closing on the airborne sector, magnetic and radiometric surveys internationally were critical to the health of the airborne industry in the past, otherwise difficult, year.

On the ground technology (including borehole technology) front, many groups report advances and improvements in the acquisition and processing of data. The major development in my opinion is the rapid introduction of 3D or array style IP systems. These were first reported on at a SEG 2014 workshop and the major systems discussed at that time were:

System	Company	Head office
Orion 3D	Quantec	Canada
Volterra	SJ Geophysics	Canada
DIA532	Dias	Canada
3D-E-SCAN	Crone Geophysics	Canada
NEWDAS	Newmont Mining	USA
MIMDAS	Geophysical Resources and Services Pty Ltd	Australia
FULLWAVER	IRIS	France

Some of the companies reporting in the ET&D appear to be working on similar systems.

Also, on the IP front, Geosoft Ltd has introduced an IP module into their VOXI modelling package. This module is currently undergoing beta testing and will be released the third quarter of 2016.

On the measurement of physical properties, three groups dominate the field of the building and supply of systems; GF Instruments, Instrumentation GDD and Terraplus. It is encouraging to see all three are expanding their product lines, thereby making the acquisition of high quality petrophysical data easier and less expensive.

The full ET&D report and tables can be accessed on the KEGS website: <http://www.kegsonline.org/?dir=6&sub=23&typo=news&doc=946&action=show&title=Trends%20in%20Geophysics%202015>.

If you have a story you would like included in the next ET&D please contact Pat Killeen at pkilleen@xplor.net to get on the mailing list.

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