

## Phoenix MTU Purchased by Missouri State U.

Last fall, Missouri State University purchased an MTU-5A system with MT magnetic sensors to explore one of the geological wonders of the world.

Kevin Mickus, a professor of geophysics at Missouri State, has been working in eastern and southern Africa since 2003. His work in Ethiopia has concentrated on understanding the structure of the East African Rift System (EARS) using gravity, magnetic and magnetotelluric methods with Phoenix equipment.

“I wanted to collect my own MT data, with my own equipment, in Ethiopia and other regions,” said Dr. Mickus. “After analyzing the qualities of other systems, and discussing them with colleagues, I decided to purchase the Phoenix broadband system. The system will be used in the southern Ethiopian rift in order to understand why it suddenly widens into a rift similar to the Basin and Range in Nevada, USA.”

The EARS is a place where the earth’s tectonic forces are presently creating new plates by splitting apart old ones. Simply, a rift can be thought of as a fracture in the earth’s surface that widens over time. EARS is an excellent field laboratory in which to study a modern, actively developing rift system.

Dr. Mickus and his graduate students recently completed some work in northern Ethiopia’s Afar depression, one of the world’s most geologically hyperactive regions; the researchers’ gravity and magnetic data have shown that oceanic-style rifting has been initiated on the continental margin. (The continental margin is the zone of the ocean floor that separates the thin oceanic crust from thick continental crust. Together, the continental shelf, slope and rise are called the



Professor Mickus in his lab with his new Phoenix MT equipment

continental margin.)

The Afar region is an area of high heat flow, evidenced by the geothermal activity in the Tendaho Graben. MT data collected in the graben have indicated low resistivity values coincident with geothermal springs. MT data collected using Phoenix systems during the past four years will be modeled using 3D inversion methods and integrated into the crustal structural studies. Dr. Mickus was so impressed with the results from Phoenix equipment that he decided to make this recent purchase for his EARS work. Dr. Mickus noted that he will also use his system to study magma processes at Mount Erebus, the most active volcano in Antarctica. This work will begin in November 2014. ■

### CONTENTS

- 2 New TDEM Loop  
Canada  
Published Papers
- 3 Phoenix Around the World
- 4 On the Road  
Visitors  
Coming Up

## New Phoenix TDEM Loop Smaller, Lighter

Phoenix has released a new air loop, the TDL-1000, for mid-depth TDEM applications.

The bandwidth of the new air loop is DC to 40 kHz, a range suitable for measuring transients in the time window from approximately 80 microseconds to approximately 80 milliseconds.

The reduced size and weight make the new model much more convenient for field use. In addition, the shipping weight and dimensions are considerably less, providing substantial savings and convenience over the lifetime of the sensor. The performance of the new sensor is equivalent to the previous model.

**Right:** The TDL-1000 (orange square) measures only 53 cm on a side and weighs just 2.7 kilograms – significantly less than the previous model (grey circle) that was 123 cm across and weighed 11 kilograms. ■



## Canada

Hudbay Minerals Inc. (Hudbay) has recently purchased a Phoenix TXU-30 transmitter for two electromagnetic programs: large surface-loop time-domain (TDEM) and borehole pulse time-domain (BHPM). Hudbay is unique in the exploration industry – the company currently purchases all its own geophysical equipment but has in-house geophysical contractors who do the data collection. This approach allows the flexibility needed to follow a multi-drill program with BHPM while completing significant TDEM surveys within the shorter field seasons typical of northern Manitoba and Saskatchewan.

In less than a week, Hudbay's team was able to learn the Phoenix system and incorporate it with their previously purchased equipment. Once comparisons were made to the data collected with their lower-powered transmitter, the benefits of using the higher-powered TXU-30 for TDEM and BHPM surveys became clear immediately. Hudbay is currently using the TXU-30 in all their TDEM production surveys, with excellent results.

The additional power has increased the signal-to-noise ratio on all projects. This improvement has, in turn, increased the accuracy of Hudbay's interpretation and models – being able to see anomalies that were previously lost in the noise has ultimately increased their confidence in their final drill targeting. ■



The Hudbay geophysical team with their new equipment

## Published Papers

Phoenix MT equipment user Dr. Yohannes Didana, of Adelaide U., Australia, has recently co-authored a paper describing MT work carried out in the Afar Depression of NE Ethiopia. The Afar depression is a triple-rift junction.

**Citation:** Didana, Y.L., S.Thiel, and G.Heinson (2014), *Magnetotelluric imaging of upper crustal partial melt at Tendaho graben in Afar, Ethiopia*, Geophys. Res. Lett. of the AGU, 41, doi:10.1002/2014GL060000, published by Wiley-Blackwell.

**Note:** If you are a Phoenix equipment user with a published paper you would like mentioned in our newsletter, please let us know.

## Russia

Phoenix has had a long and fruitful relationship with the National Mineral Resources University of St. Petersburg. From 2011 to 2013, using Phoenix equipment, the university completed three excellent MT-AMT projects in East Siberia, Kola Peninsula and Chukotka.

**Right:** Left to right, PhD student Natalia Senchina; Dr. Eugeny Ermolin, Assistant Professor, the leader of three very successful MT-AMT projects that are well known in Russia; Vladimir Shevnin, Professor of Geological Faculty of Moscow State University and the leader of Russian Geological Engineering Geophysics; and Phoenix VP Olex Ingerov

**Lower right:** Left to right, Nicholas Fox (Kinross Russia, Director, Exploration KFE), Dr. Eugeny Ermolin, Rob Chapman (Operations Manager WA, Intertek Genalysis, Minerals, Australia); Kenneth B. de Graaf (Senior Vice-President, Director Minifocus Exploration Corp.) and PhD student Natalia Senchina



## Canada

During March and April, Phoenix performed an MT survey in northern Saskatchewan to localize deep ore bodies.

**Right:** Caroline Finateu (centre) and Murat Urakov (right), both of Phoenix, with a local helper.

**Below:** Caroline Finateu sets up a station in deep snow.



## Australia

The National Geosequestration Laboratory (NGL) of Australia has purchased a 12-channel MT/high-power TEM system. The NGL is a world-class research and development facility established to advance carbon storage technologies that play a crucial role in achieving a low-emission economy for Australia. NGL is a collaboration between CSIRO (the Commonwealth Scientific and Industrial Research Organisation, Australia's national science agency), the University of Western Australia and Curtin University.

Phoenix geophysicist Yann Avram visited Australia in May for training and acceptance

of the system with Curtin University and Professor Brett Harris. Dr. Harris works on the theoretical development and practical application of geophysical methods in hydrogeology, environmental engineering, mineral exploration, hydrocarbon exploration and coal exploration. Yann conducted the field training near Perth with Konstantin Tertyshnikov, Eric Takam, Brett Harris, Andrew Pethick, Van Anh Cuong Le and Dominic Howmin.

**Right:** Yann Avram speaks with geophysical software developer Andrew Pethick and Associate Professor Brett Harris.



## ON THE ROAD

**South America:** Carlos Guerrero participated in the LatinVE&P 2014 Foro & Exposición (Oil and Gas) in Lima, Peru in late March; in early April, the 4th Colombia Oil and Gas Summit and Exhibition; and in May, the Simexmin V Simpósio Brasileiro de Exploração Mineral in Ouro Preto, Minas Gerais, Brazil.

**Right:** Bob Hoff, geophysicist from TDI-Brooks International, visited the Phoenix booth to discuss how the different geophysical techniques, MT and seismic, complement each other in oil and gas exploration.

**Lower Right:** Carlos Guerrero in the CGG Brazil booth with CGG senior geophysicist, Canadian David Smith, and CGG Brazil employees, Ana Leite and Marcio de Souza.

David visited the Phoenix office in June 2013 to learn about Phoenix IP systems.

**Kazakhstan:** Phoenix Geophysics participated in the MINEX Central Asia expo/conference in Astana, March 31–April 2. While in the capital city, Phoenix and Geotech personnel visited the well-known Nazarbayev University. **Below:** Left to right, Sergey Musatov and Gennadiy Kim of the Phoenix representative office in Tashkent; Paolo Berardelli of Geotech; Leo Fox and Olex Ingerov, Phoenix.

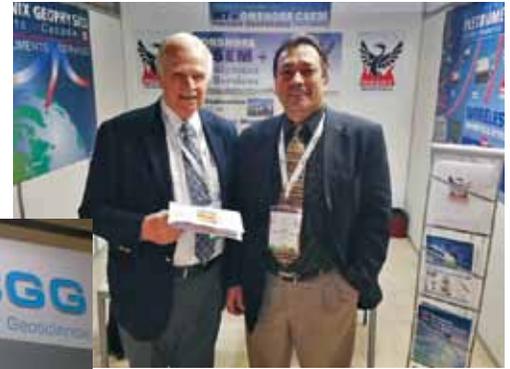


Photo: Alexander Prikhodko, Geotech

## VISITORS



**China:** In early January, Phoenix hosted visitors from Xian Coal, China. Xian Coal is a longtime Phoenix client – the company purchased their first Phoenix equipment in 1984.

## COMING UP

- **August 24–30:** Phoenix is a Gold Sponsor of the the 22nd EM Induction Workshop being held in Weimar, Germany. Leo Fox and Yann Avram will attend; please visit our booth.
- **September 30–October 2:** Phoenix personnel will exhibit at KIOGE, the Kazakhstan International Oil and Gas Expo, Almaty, Kazakhstan.
- **October 26–31:** SEG, Denver, Colorado. Please visit our booth during the exposition and 84th annual meeting.



## Phoenix Geophysics

3781 Victoria Park Avenue, Unit 3  
Toronto, Ontario, Canada M1W 3K5

Tel +1 416 491-7340 Fax +1 416 491-7378  
mail@phoenix-geophysics.com  
www.phoenix-geophysics.com

Printed in Canada

