

ROYAL MINERS INVADE THE ROCKIES: GEOPHYSICAL FIELD CAMP DELIVERS EDUCATION, EXPERIENCE, DIVERSITY, AND FUN

Mt. Princeton, in the heart of the Colorado Rocky Mountains, towered over an impressive geophysical joint summer field camp in May 2009. Thanks in large part to a grant of US \$6000 from the SEG Foundation, petroleum geophysics students from the Royal School of Mines at Imperial College London were able for the first time to join forces with geophysical engineering students from Colorado School of Mines and geoscience students from Boise State University for a learning experience none of the students will soon forget. The Upper Arkansas Valley of Colorado was the perfect spot for gathering geophysical data and learning about geothermal resources. The diverse mix of participants—graduate and undergraduate students from many different countries—provided an excellent lesson in teamwork which will serve the participants well in their future careers.

The goal of this joint field camp was to give students valuable experience in geophysical data acquisition and processing, while providing local residents with an assessment and understanding of the potential geothermal resources available in their area. Local hot springs are currently being used commercially by residents and resorts for hot water. The students were surprised to learn that the hot springs also play a critical role in the operations of a local alligator and tropical fish farm! A growing interest has developed in transforming this particular area into a hub for geothermal energy production.

A crucial benefit of this field camp was the opportunity for students to work closely with world-class professors—renowned experts in rock physics, geophysical engineering, petroleum geophysics, and seismology. Mike Batzle, Colorado School of Mines, led the project with help from his colleagues Kasper van Wijk and Lee Liberty at Boise State University and Helmut Jakubowicz, PGS Professor of Geophysics at Imperial College London. Also, before the students could begin gathering their data, they had to familiarize themselves with the geology of the Upper Arkansas Basin; so they found themselves on a geologic field excursion, led by Robert Reynolds (or “Dr. Bob,” as he was fondly called) of the Denver Museum of Nature and Science.

The students acquired deep seismic field data, resulting in the acquisition of a 9.6 km 2D deep seismic line, which was then processed and interpreted (Figure 2). They gathered DC resistivity, self-potential, gravity, magnetic, electromagnetic, and high-resolution 3D seismic data to better understand the geothermal activity of the area. Students learned the importance of data integration and, including the geological observations made with Dr. Bob, created a geologic cross section across the valley (Figure 3). Finally, on 5 June 2009, the students presented their interpretations at the Colorado School of Mines campus to Arkansas valley residents and other CSM staff and students.

What else did the students from London learn? They describe their experience driving a 23-ton vibroseis truck as



Figure 1. DC resistivity acquisition.

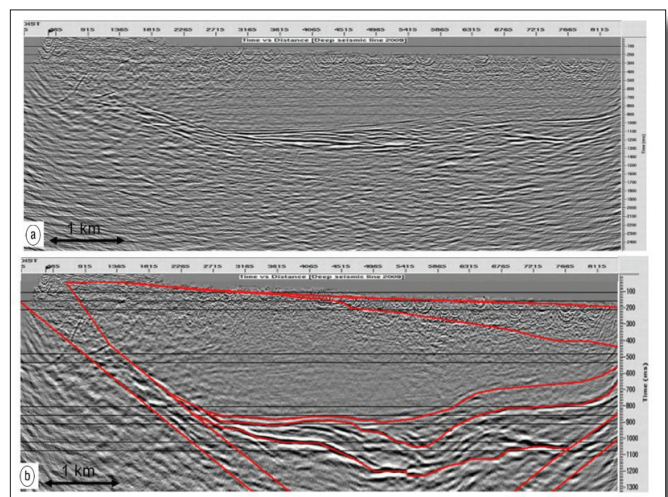


Figure 2. Deep seismic line through the basin: (a) uninterpreted (b) interpreted from 0–1300 ms.

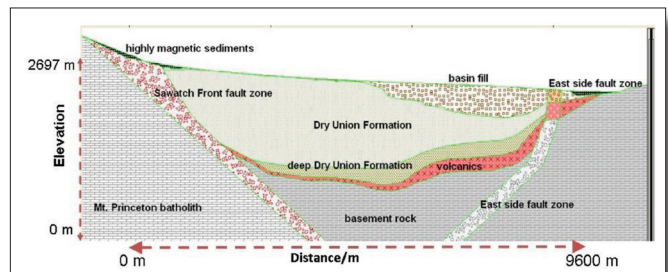


Figure 3. Final geologic cross section after integrating data.

“awesome.” They were most affected by the DC resistivity acquisitions, which required climbing steep hills with heavy reels of cable on their backs—not surprising considering the

elevation in the Colorado Rockies (Figure 1). They made time for fun and fellowship, visiting the Zapatta waterfalls and an alligator ranch, while getting to know one another and forging lasting bonds. One of their most enjoyable days involved a game of football (or “soccer,” as the American students call it).

The students from London summarized their experience nicely.

The most important part of the trip was, of course, our educational experience. The technical knowledge gained on this trip has been invaluable. We learned a lot about the practical aspects of geophysical data acquisition that complemented the theory taught earlier in the semester. Data acquisition is a lot harder than described in the textbooks and we now definitely appreciate the hard work and effort required to get good data. It was crucial for us to work well in teams with people from different cultures and backgrounds and that was indeed a valuable experience in preparing us for the working world. All in all, the technical and personal experiences we have acquired will remain with us and be extremely useful for the rest of our careers.

The 18 Imperial College students who participated in this field camp would like to join the SEG Foundation in giving thanks to the donors who made the field camp grants possible (TGS, Rutt Bridges, and Richard Degner of Global Geophysical) and to the three universities involved, as well as acknowledge the many other sponsors and individuals who contributed to the success of this remarkable field camp. You too can support important student programs like this field camp by contributing at www.seg.org/donate. **TLE**

SUMMER FIELD CAMP EXPANDS

The SEG Foundation has supported the Colorado School of Mines Field Camp since 1994. In recent years the Foundation has encouraged CSM to expand the educational experience to include students from other universities.



Collaboration between universities not only broadens the opportunity for deserving students to gain valuable field experience, but also adds extra richness to the student experience—as the adjacent article shows. In 2009 the Foundation was proud to make separate grants totaling US \$23,500 to CSM, to Boise State, and to Imperial College in support of this field camp in which 44 students participated.

Adapted from an article submitted by the MSc. Petroleum Geophysics Class 2008–2009, Royal School of Mines, Imperial College London, United Kingdom.

—*BRIAN YOUNG*
Development Officer, SEG Foundation

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