

# Going outside, acquisition and learning in the field

Kevin L. Bertram\*, Malcolm B. Bertram, Kevin W. Hall, Kristopher A.H. Innanen, Don C. Lawton and Joe Wong  
klbertra@ucalgary.ca

## ABSTRACT

CREWES continues to perform seismic acquisition in the field using industry equipment. This opens up the possibility of taking ideas from the minds of students and staff and bringing them outside to try in real world situations. Students, staff and sponsors are able to see our equipment and suggest new methods in using it. CREWES data sets are often created using this equipment. CREWES also brings some of this equipment and several support staff to the annual geophysics undergraduate field school. The Geophysics program at the University of Calgary is one of the very few that has access to commercial grade seismic equipment and has the opportunity for students to use it. For many students this is the first time that they actually observe and participate in the acquisition of seismic data. This provides a much better understanding for these future geophysicists of how the environment affects data. This year CREWES assisted with a survey at the Brooks CMC test site, did a small demonstration at Earth Science for Society and aided with the annual geophysics field school.

## SAFETY



FIG. 9. Safety meetings are held every morning in the field.

## ACKNOWLEDGEMENTS

- Outsource for permitting and navigating the paperwork.
- Castle Mountain Ski Resort for providing a base of operations for the GOPH549 field school.
- Inova and ESG for technical support.
- Carbon Management Canada for the opportunity to perform acquisition at the test site near Brooks, Alberta.
- Microseismic Industry Consortium.
- GOPH549 students for doing all the work at field school.
- CREWES staff and students.
- CREWES sponsors and NSERC.

## EARTH SCIENCE FOR SOCIETY

For the second year in a row CREWES participated in Earth Science for Society. This is an event held at the Calgary Stampede Grounds that is designed to introduce some of the aspects of geoscience to young students and the public.



FIG. 10. A line truck, the Geode system with geophones in a 4 X 4 piece of lumber, a seismometer (between the orange cones), a computer displaying a slideshow and a couple of GPR carts all on display for the public at Earth Science for Society.

## FIELD SCHOOL

The University of Calgary has been running a geophysics field school for decades. The purpose of the field school is to introduce students to the acquisition of various forms of data. The students then spend some time analyzing these data and present a report to their professors each evening. After acquisition is done, students spend several tutorial sessions working with what they have learned in the field and present reports which are graded. An oral exam also takes place.



## BROOKS SURVEY

In May of 2015, CREWES staff and students assisted in a geophysical survey at Brooks Field Research Station (Hall et. al., 2015). This survey used the Aries system with single component geophones as well as the Hawk system. Only a few Hawks were used, just to allow some of the staff to get some practice deploying them and to have a look at how the data compared to the Aries. Both the Aries and the Hawks were laid out in a Southwest to Northeast line. This line was centred about an observation well that was recently drilled. A second line of single component geophones being recorded by the Aries system was laid out parallel to the first one hundred metres to the northwest. As well as the surface spread there was also a three component ESG SuperCable belonging to the Microseismic Industry Consortium deployed in the observation well.

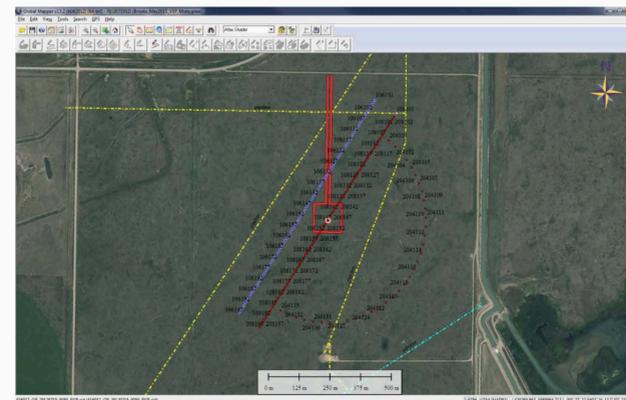


FIG. 11. The survey area viewed from above and at ground level.



FIG. 16. Students surveying in the field.

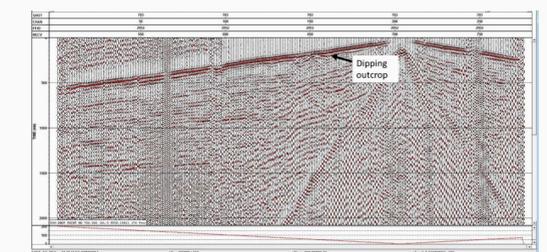


FIG. 18. An example of raw data acquired by students.

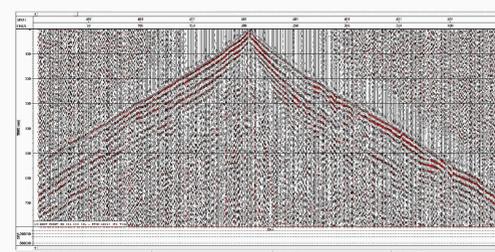


FIG. 17. First break velocities differ about the source due to topography and dipping geology.

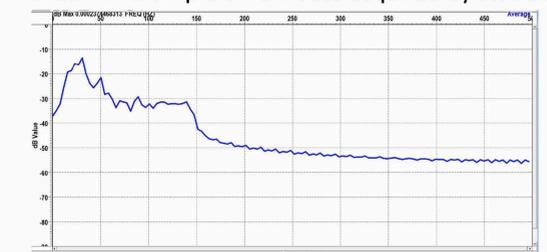


FIG. 19. Amplitude spectrum about a reflection in above data.