

# Wavelets

## Geophysics Field School: Earthly Interactions

By Azie Aziz, Robert Stewart, and Li Chang



**Figure 1:** Cabins and rainbow at the YBRA Field Camp, Montana.

By tradition, the great teacher Confucius said, “I hear and I forget. I see and I remember. I do and I understand.” How apt, even some 2,500 years later. In our world of geoscience education, the quotation reminds us of how important it is to put into practice what’s been taught in the classroom. Books, the internet, and lecture hall instruction are all critical in learning. But, we don’t fully appreciate the concepts of geologic scale, wavefield sampling, data generation, measurement error, and a host of other key factors until in the field working with actual instruments.

Our professional societies and many members of the industry recognize the need for field experience in new geophysicists, as well as the expense in providing it. We are thus, most appreciative to the SEG Foundation and TGS for their support of our field program.

An essential part of the undergraduate geophysics program at the University of Houston (UH) is the Geophysics Field Camp. For the last five summers, the UH has hosted a field program at the memorable Yellowstone Bighorn Research Association (YBRA) camp near Red Lodge, a quaint town southwest of Billings, Montana. The field facility has a library, cabins (sleeping a total of 100 campers and instructors – **Figure 1**), and dining hall – all in the spectacular setting of the Beartooth Mountain Range.

In August 2013, five faculty from UH and UT-Austin, along with technical staff and assistants from the Allied Geophysical Lab, joined 33 students for the Camp. Acquisition techniques ranged from the 3D reflection seismic method through S-wave refraction seismic, total station and GPS surveying, VSP, well logging, gravity and magnetic measurement, ground-penetrating radar (GPR), and Lidar. Our targets included hydrocarbons in the Elk Basin oilfield (**Figure 2**), complex

tear faults on Mt. Maurice, numerous glacial deposits, and coal mine workings.

The daily schedule was intensive - participants start with breakfast at 7:00 am, undertake surveys for the full day, and finish in the late evening with a presentation of their days’ data. Occasional fatigue was usually overcome the next day by a new technique, scenic landscape, and enthusiastic fellow students and instructors. Friday night at the Bear Creek Saloon pig races and a free Saturday white water rafting also helped to re-invigorate.

Students are divided into four working groups and remain with that group for the first half of the Camp. Each group has a unique geophysical survey per day. Then everyone is mixed into new groups for the second half of the Camp to provide further team experience. Skills related to professional field practice - safety, note-taking and photography, radio communication, and leadership (plus mutual patience) – are emphasized.

Manual activities like planting and orienting three-component geophones, pushing the GPR cart (**Figure 3**), and untangling refraction cables are accomplished along with field calculations of dominant frequencies, various velocities, and event identification.

Field camp provides an opportunity for students to learn a wide variety of geophysical and interpersonal



**Figure 2:** Seismic crew at the Elk Basin oilfield, Montana.

SEG  
WAVELETS



Wavelets continued on page 29.

# Geoscience Center News

By Bill Gafford

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Our Geoscience Center was designed to be a multi-use facility where we would have space for our growing collection of geoscience-related books and manuals, a small meeting room, a classroom for educational purposes, a storage area for the items in our museum collection, and workspace to refurbish items in preparation for displays at various locations. The classroom has also served another purpose as a gathering place for some of our older members and their spouses where they have enjoyed visiting and reminiscing. Gene Womack planned the event, and it was enjoyed by all who attended. In addition to trading stories about their oil patch experiences, the attendees were able to provide us with some needed information and explanation about some of our older geophysical instruments. We were also able to get some suggestions to help get our air gun model working again. Below are a few pictures from the first gathering in November. Among those attending were Zed and Mae Dennison, George and Maggie Parker, Dick and Betty Conroy, Virgil and Barbara Harris, Bob

and Margaret Sheriff, and their daughter Jeanne, Les Denham, Elwin Peacock, Ed Lengel, Rhys Evans, Lee Lawyer, Dick Baille, Carl Bergland, Tommy Chisenhall, Gene Womack, and Bill Gafford. Additional events such as this are planned for the first Thursday of each month.

Work is also continuing on preparing the space for teacher workshops and decorating the walls with geoscience related maps and charts. We will also have equipment for computer presentations and slide shows.

If you are interested in volunteering, if you would like to visit the Geoscience Center, or for more information or directions, please contact me at [geogaf@hal-pc.org](mailto:geogaf@hal-pc.org) or at 281-370-3264.



*Wavelets continued from page 28.*

skills. Most students come to the Camp with little or no field experience. After the ten days, some have discovered their true passion for working outdoors, designing surveys, operating complex and precise instruments, working in a team for a common goal, and acquiring physical data. This enhances students' abilities and broadens their horizons in pursuing a future in exploration geophysics. Many of their careers will ultimately be centered at the office or lab, but there will always be an appreciation for the beauty and rigors of real field work. And how much effort went into getting that data on the computer screen!



**Figure 3:** Ground-penetrating radar (GPR) team at a dinosaur excavation site.

## SAVE the DATE



# GOLF

## TOURNAMENT

MONDAY, APRIL 28, 2014

You are invited to the 2014 Geophysical Society of Houston Golf Tournament on April 28, 2014 at the Kingwood Country Club. This year's tournament promises to be a great event with more door prizes and several enhancements have been added. We will be utilizing all 3 courses at Kingwood: Marsh, Lake and Island. Breakfast will be served prior to play and is included in the entry fee!



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