

February 2014 News Notes

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Alumni Change Lives

Joel Main (B.S. 2012, M.S. expected 2014) received support from the Friends of Orton Hall. Here, Joel describes how this helped advance his career.

I received my B.S. in Earth Sciences in spring 2012 and immediately thereafter began field work in Utah on the Gunnison Fault. My research was initiated on a small set of samples collected along Rock Canyon during Field Camp mapping by my advisor, Professor Terry Wilson. I went to Utah in 2012 while serving as Graduate Teaching Associate for summer Field Camp. With the support of the Friends of Orton Hall (FOH), at the end of field camp I completed two weeks of field research around Rock Canyon, where I did initial mapping and sampling of the fault zone, and got a head start on my M.S. research. Based on this pilot study, I developed a hypothesis and research plan, and obtained research grants from the Geological Society of America, the American Association of Petroleum Geologists, and the GDL Foundation. All this additional funding provided for a second field season and for the analytical portion of my research. FOH funding for the pilot study in 2012 was crucial in my grant success.

My research site, The Gunnison Fault, is one of the easternmost Basin-and-Range normal faults, bounding the west side of the Sanpete Valley, Utah. Little is known about the detailed geometry of the regional Gunnison Fault, its seismic hazard and role in the Intermountain Seismic Belt, and how and why the abundant travertine has precipitated along the fault. Travertine precipitation along the Gunnison Fault may provide a natural analogue for fault-related leakage from a geologic CO₂ storage reservoir. My research focuses specifically on travertine-cemented fault rocks that document the geometry, kinematics, and history of fault rupture and sealing cycles along the Gunnison Fault. With field mapping, textural analysis, stable isotope analysis and U-series dating, I am testing the hypothesis that CO₂ leakage from the CO₂-charged reservoir in the Navajo Sandstone of the Sanpete-Sevier Valley anticline occurs along a step-over zone in the Gunnison Fault. Processes and timing of cycles of fault rupture and sealing by CO₂-rich fluids documented from this natural system will help elucidate the storage of carbon in subsurface reservoirs over long time scales. The lab portion of my research is now underway and I expect to graduate at the end of Fall Semester 2014. Currently, I am applying for internships with petroleum companies and mining companies for summer 2014.



Antarctic Network of POLENET wrapping up successful field season

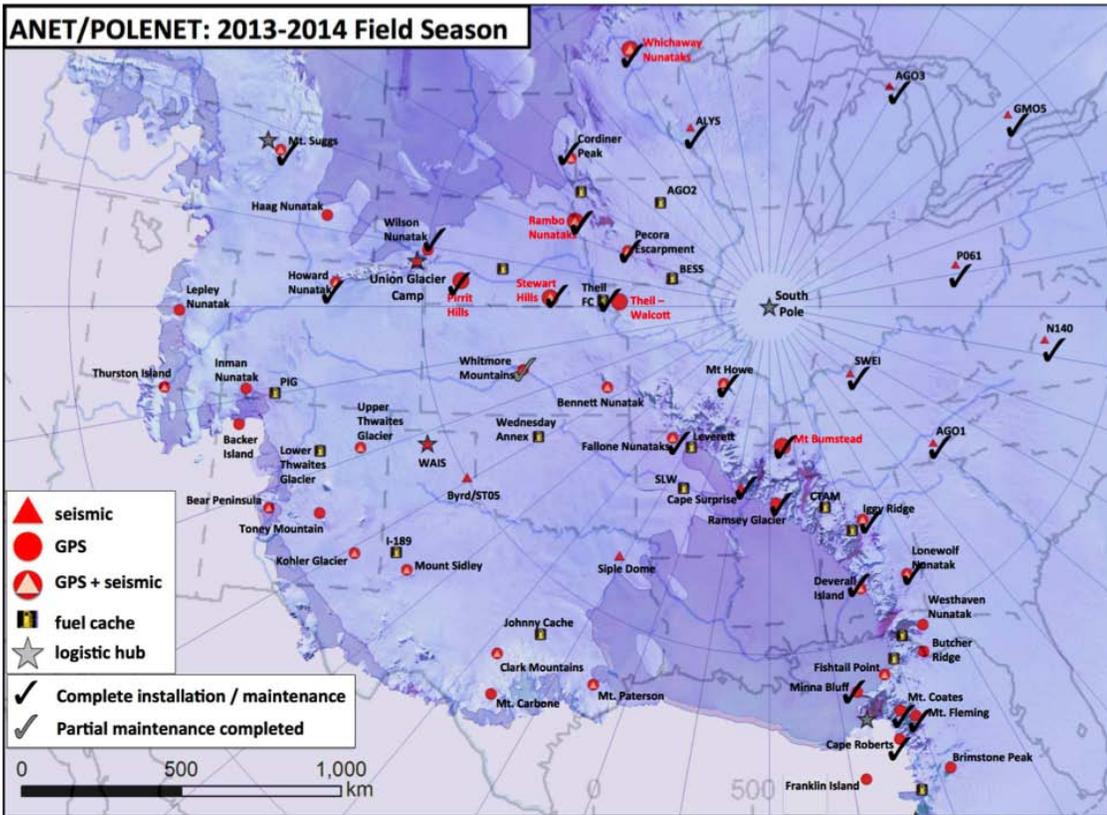
In this piece, Prof. Terry Wilson reports on her involvement with the POLENET project and her work in Antarctica.

The current austral summer season marks the start of 'Phase II' for the Antarctic Network (ANET) of the Polar Earth Observing Network (POLENET). In Phase I, a network of 36 GPS and 32 seismic sensors was deployed at 48 sites spanning a significant portion of the Antarctic interior. This year we succeeded in installing 6 new GPS and 3 new seismic instruments at 6 sites, as well as visiting 25 existing stations for servicing. The present configuration of the network is overlain on a map of the USA (on the following page) – it spans a region equivalent to Virginia to Wyoming in the E-W direction and Florida to Minnesota in the N-S direction! We reach nearly all of the sites using a fixed-wing Twin Otter aircraft, using several logistic hubs across the continent. This year the Ohio State/SES/Byrd Polar Research Center field team members included Terry Wilson (lead P.I. for the project), Eric Kendrick (Senior Research Associate), David Saddler (Research Assistant), and students Jie Chen and Loren Rosenbeck. Additional field team members came from our collaborating academic institutions Penn State and Washington University and the UNAVCO and Incorporated Research Institutions for Seismology (IRIS)/Program for Array Seismic Studies of the Continental Lithosphere (PASSCAL) facilities. Mike Bevis's group in SES is completing the GPS processing for the project. On-line reports of recent project results can be found [here](#) and [here](#).



Clockwise from top left: Eric Kendrick completing installation of the GPS antenna monument at Pirrit Hills; Field team with Twin Otter, left-to-right: Loren Rosenbeck (Ohio State), Nicholas Bayou (UNAVCO), Jie Chen (Ohio State), David Saddler (Ohio State); David Saddler's 'ice face'; Terry Wilson at Union Glacier Camp.





Map of ANET/POLENET GPS & seismic network in Antarctica, superposed over a map of the USA to better illustrate scale. Sites installed this year are labeled in red letters. Sites visited to date marked by a check. Existing sites in West Antarctica were not scheduled for work this season. Field sites were reached by Twin Otter aircraft from hubs at Union Glacier, South Pole and McMurdo Station.

Earth Sciences and Hockey

School of Earth Sciences undergraduate major, Chad Nidderly (B.S. 2015 expected, Earth System Sciences track) is as comfortable on the ice as he is in the field. On Saturday, February 1, 2014, Chad, a forward, started in the Buckeye men's varsity ice hockey game against Penn State at Ohio State's Schottenstein Center. After Penn State took a 2-0 lead in the first period, the Buckeyes scored five unanswered goals and won 5-2, including 2 power play goals, sweeping the Nittany Lions in the two game series. In scoring offence, the Ohio State team is ranked first in the Big 10 and eighth nationally, averaging 3.39 goals per game. The team travels to Ann Arbor next to play at Michigan, on TV on the Big Ten Network at 6:30 p.m. EST on Friday, February 28.

Chad, from Penticton, British Columbia, has spent several summers as an intern in the mining industry in northern Ontario, Canada. After graduation he looks forward to a career either in hard rock mining or in the energy industry.



Prof Thompson participates in review for China's National Science and Technology Program

From January 16-18th 2014, Prof Lonnie Thompson was a member of a nine-nation international review team made up of scientists, economists and policy-makers for China's National Science and Technology Program at the invitation of Minister of Science and Technology Dr. Wan Gang.

The Chinese government launched the National Medium- and Long-Term Program for Science and Technology Development in 2006. Currently, they are at the halfway point of its implementation. The Ministry of Science and Technology in China (MOST) organized a mid-term evaluation of the 15-year Program which included reviews from an international perspective.



The 12 members of the International team were asked to present on four topics:

- I. Overall evaluation of China's Science and Technology Development
- II. Evaluation on China's Science and Technology innovation policies and policy ecosystem.
- III. Challenges and opportunities brought by global trends
- IV. Evaluation of China's innovation capacity in key areas

Prof. Thompson presented on the "Challenges and opportunities brought by global trends". The review team consisted of a Nobel Prize winner in chemistry to world experts in economics and policy issues. Representatives included 3 Americans along with representatives from Germany, Norway, Korea, France, Russia, Denmark and Australia. In the photo above, Prof. Thompson is featured second from the right in the first row.