

January 2015 News Notes

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Alumni Change Lives

Scott Aleshire is an undergraduate student in SES working with Professor Terry Wilson. Here he explains how funding from the Friends of Orton Hall fund helped to further his undergraduate studies.

I applied for FOH funding in order to attend the annual GSA meeting in Vancouver, British Columbia in October 2014. I wanted to attend the meeting because I have never been before, and I thought it would be beneficial to network since I am graduating in the spring, plus—who wouldn't want to check out Vancouver?! I also presented the research I have been working on with Dr. Terry Wilson, a poster entitled, "Structural origin of sedimentary intrusions present in the ANDRILL rock core, Southern McMurdo Sound, Antarctica". This research focuses on understanding the process of sedimentary injection (natural hydraulic fracturing), and what controls it in a glaciated rift environment such as Antarctica. Basically, we are trying to answer the question of whether clastic dikes in the core were caused by the overburden of the ice sheet, or if they are more related to regional extension of the Earth's crust. Preliminary results suggest that while glacial loading may be a driver, it is not absolutely necessary for the formation of clastic dikes. Further research will show how the clastic dikes relate to other tectonically-induced structures in the core. This research will help to improve models of sedimentary injection which are largely used in oil exploration practices, as these sandstone injections are relatively permeable "fluid highways". I received enough funds from FOH to pay for my airfare, lodging, and some food while I was there. I had a great time in Vancouver and at the convention! I learned a lot about new discoveries in the earth sciences, various geoscience organizations, and networked with professionals about job opportunities after graduation. It was a great experience, and made me excited for my future in geology. I was able to enjoy myself as well, I rented a bike and rode it around Stanley Park, which was awesome!



Prof Panero Featured on NPR's Science Friday

At the 2014 fall meeting of the American Geophysical Union, Professor Panero presented recent research results from OSU's Mineral Physics Group that constrain the amount of water that the mantle stores through a combination of mineral physics experiments and quantum mechanical calculations. The mantle water represents an amount between half and twice the mass of the Earth's oceans. This conclusion suggests that the Earth's water is cycled between the interior and the surface, and likely derives predominantly through the planetary formation process and not exclusively through later cometary delivery. Professor Panero was interviewed on NPR's Science Friday on January 2 to discuss these results. Listen to the interview here: [link](#)



Extinction of the Giant Ground Sloth

During the early morning hours of a Sunday in January 2012, an OSU undergraduate broke into the Orton Geological Museum and severely damaged several exhibits before the police arrived. Such vandalism is very disheartening; however, the Museum received a lot of positive publicity following this incident. Ironically, we also reaped exciting scientific results. When the police arrived our vandal ripped off a claw from "Jeff", our giant ground sloth, to defend himself. On this severed claw, fresh bone was exposed, and Dale Gnidovec (Museum Curator and Collections Manager) removed some bone for radiogenic age dating. We had a "Date the Ground Sloth" fundraiser to pay for the analyses, and Dale and his colleagues have published the results in the latest issue of *Quaternary Research*. "Jeff" is 13,180 - 13,034 years old, which makes it the youngest specimen known prior to the extinction of this species! A recent piece in OSU OnCampus provides further detail ([link](#)).



Alumni Profile: Abe Springer

I was honored to be invited to submit an alumni profile for the newsletter and I encourage other alumni to reflect back upon how their OSU experiences helped their careers. While I was an undergraduate student at the College of Wooster, a rookie professor at OSU (and Wooster alumnus), Scott Bair, visited Wooster, gave a guest lecture, and was recruiting new graduate students. Scott was gracious (or crazy) enough to supervise my senior thesis on the hydrogeology of the municipal wellfields of Wooster. This auspicious start to my hydrogeology career led me to accept an offer to do M.S. thesis research with Scott at OSU. We continued to



research the Wooster municipal wellfields and developed methods for delineating capture zones that became part of the State of Ohio's Wellhead Protection Area guidelines. When it came time to look for a Ph.D. program, Scott had just become a co-investigator on a long-term, agricultural water quality project, the Ohio Management Systems Evaluation area, and kept me in Columbus to work on it. I had the opportunity to help install over 40 monitoring wells, with OSU alumni Martha Jagucki of the USGS. In 1994, with a year to go on the project, I got a great offer to be the hydrogeology professor in the Geology Department at Northern Arizona University (NAU), so I finished up the dissertation and moved to Flagstaff, Arizona, where I have been ever since.

I have taught multiple courses on hydrogeology, geology, and liberal studies at NAU while keeping a very active research program. My background in capture zone analysis and agricultural management practices from OSU prepared me to actively participate in many regional and local watershed planning projects in the Southwest. Many of my graduate students have used MODFLOW to answer specific groundwater management questions. I have had the opportunity to advise 37 M.S. theses to completion, including Lisa (Schaller) Boldt, (OSU '10 alumni). In 2007, I had the opportunity to serve as the Fulbright Visiting Chair in Water and the Environment at the University of Lethbridge in Alberta, Canada. While in Alberta, I visited many of the places Frank Schwartz taught us about from when he was a professor at the University of Alberta. When our program at NAU reorganized from a Department to a School in 2009, I stepped up to be the Inaugural Director of the School of Earth Sciences and Environmental Sustainability. While I was Director, I created our new interdisciplinary PhD degree program which I coordinated for a few years after being Director. My research interests in hydrogeology and ecohydrology have been broad and extensive, as reflected by my sources of funding and journals of publication. For the past 15 years, my major research threads have been on springs ecosystems and assessing the hydrological response of landscape-level forest restoration. My collaborations with colleagues at the Museum of Northern Arizona related to springs ecosystems resulted in the creation of the Springs Stewardship Institute (<http://springstewardship.org/>). My son (Isaac, age 16) and I immensely enjoy all of the outstanding outdoor activities available to us in Northern Arizona. I have run 10,000's of miles on the trails around Flagstaff and Sedona, have done a few ultra-marathons, floated the Grand Canyon over 15 times, and visited over 1,000 springs. The four seasons of Flagstaff also provide ample opportunities to cross country ski and snowshoe the trails in the winter. We have also been known to run a model train or two at the Flagstaff Model Railroad Club. Please stop by and visit whenever you are traveling through Flagstaff or the greater Grand Canyon region. I'm happy to schedule you as a guest speaker. Abe.springer@nau.edu (929) 523-7198.

Planned Orton Museum Renovations

The Orton Geological Museum has been important for teaching, outreach, and research since it was founded by Edward Orton, Sr. in 1893. Today the Museum has more than 13,000 visitors annually. The exhibits have not changed much since 1983, and it is time for a make-over. The Museum hired Interactive Group (a museum design firm) to help plan the renovation. Museum funds paid for the initial planning phase of this project, which will include complete renovation of the current museum space; expansion of the museum to the downstairs hallway, second floor landing, and the front stairway (a three-story, to scale timeline); and a mounted cast of *Cryolophosaurus ellioti* in the foyer (graphic at right).



This, along with the likelihood of doubling or tripling the number of visitors, is good but it will be expensive. Right now we need additional funds to develop detailed design plans, and later we will need funds for exhibit construction. If you or someone you know would like to help, your contributions would be most welcome. If you have any questions, please contact Dale Gnidovec (gnidovec.1@osu.edu) or Bill Ausich (ausich.1@osu.edu). If you are able to help, checks made out to The Ohio State University (Orton Museum Support Fund #308759) can be sent to the School of Earth Sciences, or you can give online ([link](#)).

Prof Thompson featured in TIME magazine

Prof Lonnie Thompson was featured in TIME Magazine's single-issue magazine entitled "Great Scientists: The Geniuses, Eccentrics and Visionaries Who Transformed Our World," issued in late 2014. A graphic pulled from the spread at right shows the ten scientists selected for Earth Sciences, including Prof Thompson. Congratulations, Lonnie!



AAPG Section Update

As the Chapter prepares for the spring semester, we would like to introduce our new Field Trip Chair and highlight one of our undergraduate members. The member highlight for this month is on Andrew Sabula (feature at right).

Our new Field Trip Chair is Ryan Haugh (photo below). Originally from Nelsonville, but raised in Westerville, Ohio, math and science have always been Ryan's favorite subjects in school. Pursuing a undergraduate degree that included math, science and exciting field work made geology an easy choice. Ryan looks forward towards attending the AAPG ACE 2015 in Denver and Field Camp in Utah. In his free time, Ryan enjoys working out and watching movies. Currently conducting seismic work with Dr. Derek Sawyer, Ryan hopes to attend graduate school and continue towards a career in the petroleum industry.

If any alumni are interested in visiting or interacting with the AAPG Student Chapter at OSU during this coming spring semester, please feel free to contact us at aapg@osu.edu. Keep up to date on all things OSU AAPG at <http://aapg.org.ohio-state.edu>.

Stayed Tuned & Go Bucks!!!



Member Spotlight on Andrew Sabulta. I was first introduced to the Earth Science department when I decided to minor in Paleontology while earning my Zoology degree. Ever since, I have been enthralled with everything the department has to offer. I soon committed to earning a dual degree in Earth Science. With my newfound love for geology I discovered an amazing community of young geologists in OSU's AAPG chapter. From this community I have made many lifelong friends as well as been supported and encouraged as a young professional. Determined to explore opportunities across a broad range of subjects, I was able to attend Schlumberger's F.I.E.L.D. camp where I was given hands on training and exposed to multiple departments of oil exploration and production. In Summer 2014 I was awarded funding by the Undergraduate Research Office, which supported my research under professor John P. Hunter focusing on the paleontological analysis of archaic ungulates. In the fall I was able to attend AAPG's regional meeting, which allowed me to develop skills to communicate in a professional manner as well as be exposed to potential employers. Thanks to our AAPG chapter I have gained experience as well as confidence in my future as a professional geologist and look forward to continuing my involvement throughout my career.



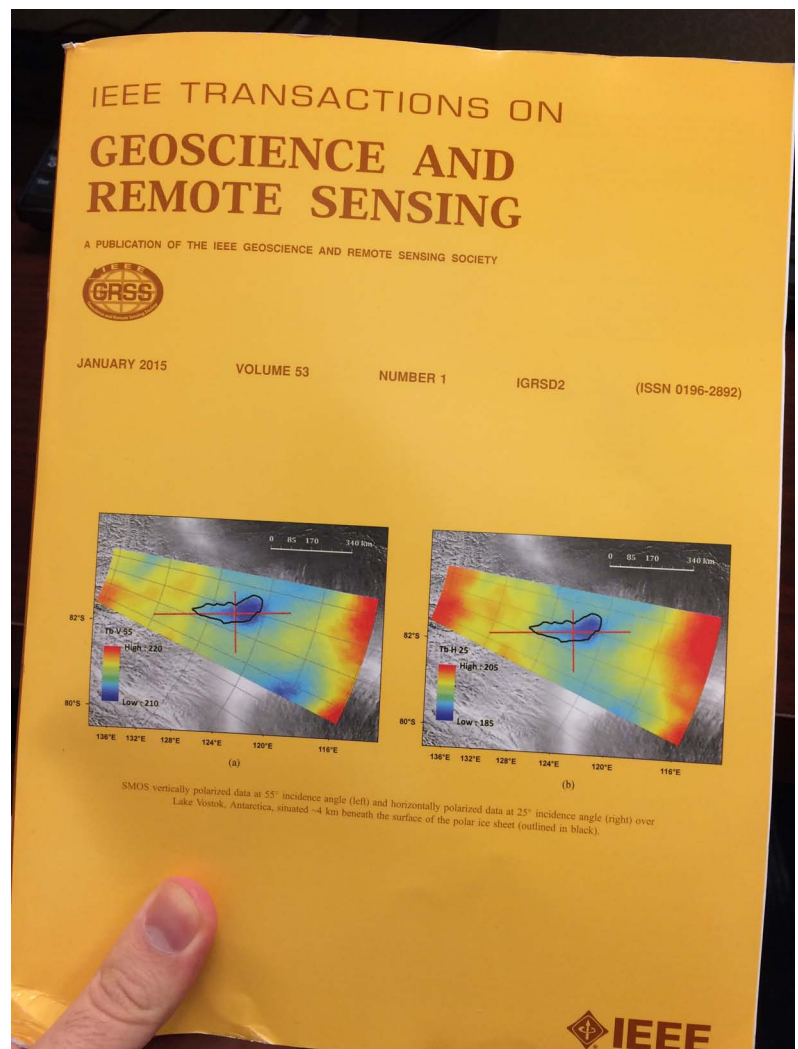
Prof Grottoli Receives NSF Grants

Prof Grottoli was awarded two grant awards from the National Science Foundation division of Biological Oceanography. The first grant is to test the hypothesis that ocean acidification slows down coral recovery from warm-water-induced bleaching events. Corals from the fall 2014 bleaching event in Hawaii are being kept at either ambient conditions or under ocean acidification conditions and their recovery rates are being monitored. The initial fieldwork in December at Grottoli's microblog ([link](#)). The second grant is to test the hypothesis that corals can acclimate and/or adapt to tropical marine conditions expected by the end of the century (i.e., warmer and more acidic). For this study, corals will be cultured for two years under a range of conditions ranging from current ambient to those expected by the end of the century. Various parameters will be measured throughout the study to determine which species adapted or acclimated, and which did not. This experiment will begin in summer 2015 and updates will also be posted to twitter. Both studies take place in Hawaii. Results from these studies will shed light on how corals adapt (or not), which species or populations of corals are more likely to survive, and will help to focus conservation efforts towards corals that are more robust.

Research by Profs Jezek & Durand Featured

Research by Profs Jezek and Durand was featured on the cover of the January issue of IEEE Transactions on Geoscience and Remote Sensing. Their article published in the issue described theoretical calculations illustrating the potential for estimating subsurface temperature profiles in ice sheets and other cold environments using microwave emission data.

Measurements from the European Space Agency satellite Soil Moisture Ocean Salinity (SMOS) satellite were featured on the cover. The 1.4 GHz SMOS measurements show an anomaly co-located with Lake Vostok, Antarctica, beneath 4 km of ice. This ability to sense features at depth using low frequency measurements is the basis for an ongoing project in collaboration with OSU's Electrosience Laboratory to develop an innovative ultra-wideband radiometer. First tests of the instrument are planned for 2016.



Brevia

Earth Sciences major, Hanna Brouman, BS with Research Distinction expected in Spring 2015, has been accepted to participate in a Winter Enrichment Program (WEP) at King Abdullah University of Science and Technology (KAUST) in Saudi Arabia. Hanna was among 50 students chosen in a competitive process to which 600 students from around the world applied. She will present her thesis research, “Noble gas geochemistry of the Marcellus Shale : A prospecting tool for hydrocarbon gas migration,” at a poster competition during the week she is at KAUST and she will also attend a variety of programs and lectures on technical and scientific topics. The WEP program takes place on January 18–23, 2015. All expenses for Hanna’s participation in the program are being paid by KAUST.

Prof Grottoli will be presenting as part of the 4th annual TEDxOhioStateUniversity event, to be held on February 14, in the Mershon Auditorium at the Wexner Center for the Arts. Congratulations, Andrea! For more information, click [here](#).

Cayman Unterborn’s PhD research was featured in the AGU GeoSpace Blog. Check out the blog post [here](#). Congratulations, Cayman!