

February 2016 News Notes

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Alumni Change Lives

Kevin Meyer is a PhD student working with Prof Anne Carey. Here he describes how funding from the Friends of Orton Hall fund helped to further his graduate studies.

High standing islands like Taiwan represent an extremely outsized contribution of particulate and solute fluxes to the world oceans for their size. Over much of Taiwan, the vast majority of rainfall driving these fluxes occurs during the wet season and is commonly driven by typhoons. However very few studies have looked at these storm fluxes, and we know very little about the weathering sources of the solutes and how they change under different environmental conditions. My research involves analysis of these typhoon storm waters using geochemical



tracers to pinpoint changes in weathering sources. For the samples to be useful, good base flow chemistry is required. I was able to collect these samples last summer. However, without Friends of Orton Hall, I would have had a difficult time getting water samples back to the US. Shipping can be prohibitively expensive, but thanks to FOH, my samples are safely stored in Mendenhall, and have begun to be analyzed. Funding through FOH also allowed me to present my research at GSA last year. Without this support, I would have had a difficult time affording lodging and food in Baltimore, not to mention the registration and abstract fees. This was the first time I have been able to give a talk at a conference, and the large positive response and personal feedback I received made me recognize that I'm on track with my research, but could still change some of my specific goals. The feedback I received from people who know the mechanics of the chemistry I use better than I do was able to point me in directions I wouldn't have thought of on my own. This opportunity has furthered my education, helped to create new research ties, and helped to strengthen some that I already had.

2016 Shell Distinguished Woman in Science Lecturer

Annually since 2007, Shell Exploration and Production Company has provided funds to Ohio State that we may invite a distinguished women scientist to come visit and present a lecture. The 2016 Shell Distinguished Woman in Science Lecturer was Professor Leigh Royden from the Department of Earth, Atmosphere and Planetary Sciences at MIT. Prof Royden has won many awards including the GSA Donath Medal, Fellowship in AGU, the GP Woollard award from the Geophysics Division of GSA for her contributions to the study of geologic processes through quantitative geophysical modeling, and most recently EGU's Mueller Medal in tectonics and solid Earth studies for her contributions to the understanding of sedimentary basins, thermal



evolution of mountain belts, and the dynamics of the lower crust and its relevance to the growth and structure of mountain ranges and plateaus. She presented her lecture entitled, “Subduction, double subduction, and the ultra-fast convergence of India and Eurasia” on 18 February to a full house of students, staff and faculty, including a group of geoscience students from Denison University. In addition to her presentation, she met and talked with faculty, staff and students, reflecting on her own career and learning about the on-going research at SES. The pictures above shows her eating lunch with a group of the School’s female students. The picture at left shows Prof Carey, Prof Royden’s host at SES, helping direct questions after the presentation.



Shaken, not stirred: Negative feedbacks between earthquakes and submarine landslides

Prof Derek Sawyer and his graduate student Joshua DeVore published a study in December 2015 in the journal *Geophysical Research Letters* that sheds light on a paradox: given that earthquakes are a primary trigger of underwater landslides, why do the most earthquake- active areas on Earth have fewer submarine landslides than passive margins?

Sawyer and DeVore provide an answer to this paradox by demonstrating a simple, but surprising, result: sediments are stronger on active margins and thus are less prone to landsliding. Their dataset contains over 1000 shear strength measurements made by the Ocean Drilling Program in a range of active and passive margins (see Figure on following page). They show that within the upper 100 meters below seafloor, which is where seafloor landslides originate, sediments on active margins have higher shear strength by a factor of 2-3 relative to the same interval on passive margins.

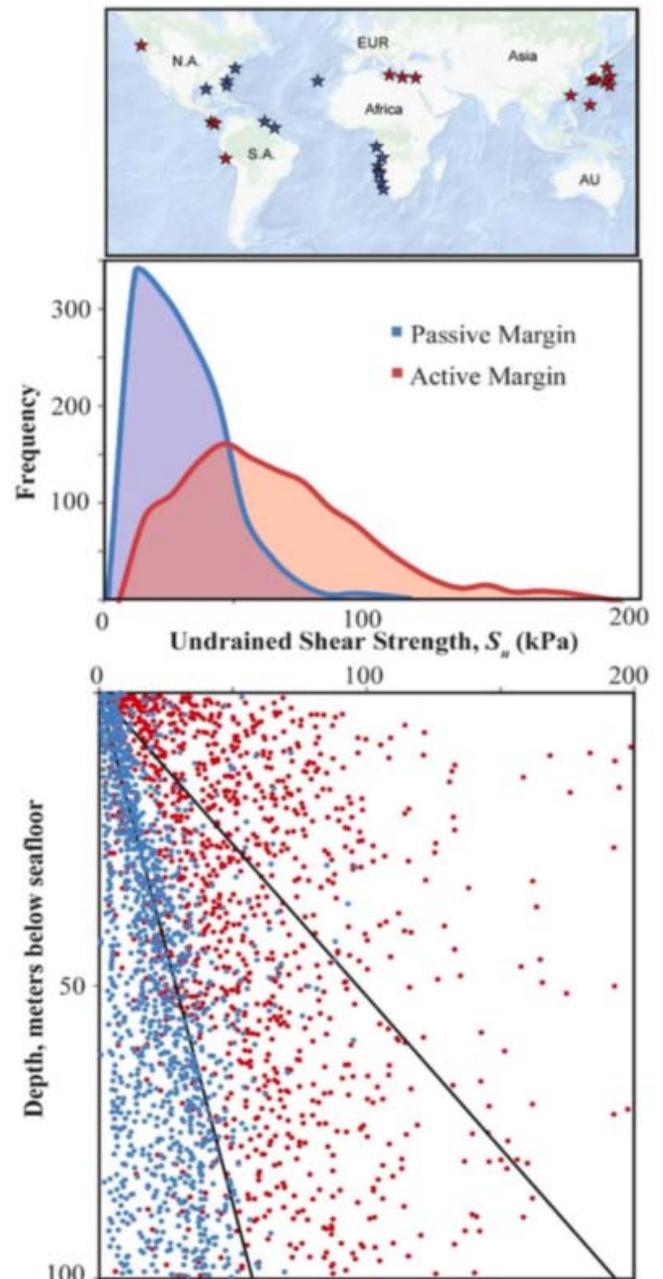
Shaken, not stirred: continued

The fact that active margin sediments are stronger than passive margins is a surprising result in light of conventional understanding that seafloor sediments compact at similar rates with burial depth regardless of location (Athy's Law). The more compaction, the higher the shear strength, which is the key parameter to withstand landsliding. This study suggests additional mechanisms other than progressive burial should be considered in compaction models along active margins.

The paper lends support to the conceptual model of 'seismic strengthening' in which it is proposed that the repeated exposure to shaking from small-magnitude earthquake events can physically dewater sediments and thus enhance compaction and strength. This model remains mostly untested however. Sawyer has been awarded 2 years of funding from the American Chemical Society to investigate the mechanism behind the enhanced strengthening and results can have important implications for understanding the feedbacks between earthquakes and submarine landslides as well as for understanding the physical processes that govern mudrock properties early in burial history. Funding will support graduate student research beginning in September of this year.

More details can be found in the published article:

Sawyer, D. E., and J. R. DeVore (2015), Elevated shear strength of sediments on active margins: Evidence for seismic strengthening, *Geophysical Research Letters*, 42, doi:10.1002/2015GL066603.



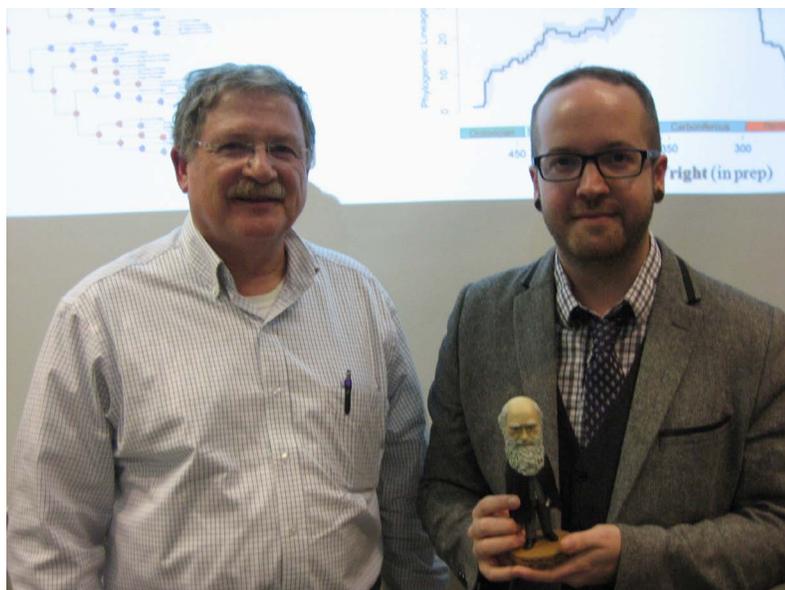
Tibet's Primeval Ice

In the January 29, 2016 issue of *Science*, there is an article entitled "Tibet's Primeval Ice", that features Prof Thompson's work on the Guliya ice cap in Tibet. The subtitle is: "The quest for the world's oldest ice could yield a Rosetta Stone for how Asia responds to a changing climate." Congratulations, Lonnie! Image: *Science* magazine.



Distinguished Graduate Student Lecture

On 28th of January Mr. David Wright gave what is planned to be an annual event in SES, the SES Distinguished Graduate Student Lecture. Davey pictured above with his PhD advisor, Professor Emeritus Bill Ausich, and a certain Mr. Darwin, gave a presentation entitled, “Unifying Fossils and Phylogenetic Biology to Study Evolution in ‘Deep Time’.” Davey has a BS from the University of Kansas, and received a MS at Ohio University before coming to Columbus in 2012. While at OSU. He has won the School’s Distinguished First-Year Graduate Student Award, a Michael Johnson Outstanding post-candidacy PhD student award, and the School’s Graduate Student Distinguished Teaching Award. He also



has been nominated for a University Teaching Award. This past semester he was awarded through a university wide competition, a prestigious OSU Presidential Fellowship. Among his other accomplishments and services to the community, he has won numerous travel and research awards and grants including ones from the Paleontological Society, Sigma Xi, and the Association of Applied Paleontological Sciences. He has been an invited participant in a number of workshops including one on Computational Macroevolution and one on Paleobiology Databases and Analytical Methods. He gave an outstanding presentation, setting the bar very high for those that will follow in the coming years. We all congratulate Davey for being the first SES Distinguished Graduate Student Lecturer.

Crowdfunding campaign to fund Arctic field work

A crowd-sourced campaign to support SES research is drawing to a close **today!** George Grant (MSc) will be traveling to Ellesmere Island, Canada, in July to examine a mummified forest deposit in Quttinirpaaq National Park. Grant is advised by Prof Joel Barker. The mummified forest site, at 81.5 degrees north, is well beyond current treeline and reflects a period during the Pliocene when global climate was warmer than it is today and boreal forests extended to the Arctic Ocean. The photo at right shows a mummified spruce tree



recovered from the Ellesmere Island field site. Climate conditions during the Pliocene fall within conditions that are predicted for the end of this century and by reconstructing ecosystem composition and climate at this site, we can gain insight about what changes we might expect in the Arctic in response to climate warming and the role of a vegetated Arctic in the global carbon cycle as climate approaches conditions last seen during the Pliocene. To support this campaign, see the OSU crowdfunding campaign page ([link](#)).

February GEOS Update

OSU Geoscience in Energy at Ohio State (GEOS) chapter members attended the Ohio Geological Society Winter Gala (see picture at right) on January 22nd to take advantage to meet, learn, and network with local geoscience professionals. Many thanks to OGS for their great event!!

OSU Professor Dr. Daniel Leavell presented “One key to achieving a diverse geological career is to maintain your adaptability” to GEOS Students at our monthly chapter meeting on February 2nd, 2016. Students were exposed to the vital aspects of a diverse geoscience career, and the different career options in the geosciences. We also covered



membership details, distinct scholarship opportunities, and our future field trip in April: see picture at left.

On February 9th, students from GEOS and the Buckeye Shale Energy Organization viewed the educational film Switch and learned about the complex and diverse needs for our energy future.

Contact us at aapg@osu.edu if you have interest in interacting with the chapter or for more information on all things GEOS in 2016!!

Stayed tuned and GO BUCKS !!!

Prof Grottoli wins award

Prof Andrea Grottoli is this year's recipient of the International Society for Reef Studies Mid-Career Award ([link](#)) in recognition of her biogeochemical and physiological research on tropical corals. This award is made annually in recognition of excellence in research during the preceding approximately 10 years by a mid-career scientist. In combination with this award, Prof Grottoli was also awarded the status of Fellow within the International Society for Reef Studies. Fellow status is awarded to a proportion of members in recognition of scientific achievement and / or service to reef conservation or management and / or service to the Society. A full bio of Prof Grottoli is available at her site ([link](#)). Congratulations, Andrea!



Brevia

The Science Channel's TV broadcast of 'What on Earth?' on 9 Feb. 2016 featured interviews by Prof Ralph von Frese and his former student Laramie Potts (Assoc. Prof., New Jersey Institute of Technology) on their putative meteorite impact basin discovery in Wilkes Land, Antarctica. Congratulations, Ralph!

Alumnus Mike Strobel was featured in a story about Oregon snow surveys entitled "Snow surveyors gather in Bend to train" ([link](#)). Congratulations, Mike!

Prof Lonnie Thompson was featured in a story in NewScientist.Com entitled "El Niño means glaciers in the Andes are melting at record rates ([link](#))". According to Prof Thompson, accumulation on Quelccaya this year is 40% less than any year measured since the weather station was placed on summit in 2003.