THE OHIO STATE UNIVERSITY

SCHOOL OF

EARTHSCIENCES

October 2015 News Notes

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Alumni Change Lives

Joshua DeVore is a Graduate Student working with Prof Derek Sawyer. Here he tells how Friends of Orton Hall helped further his studies.

My project aims at understanding how the in-situ preconditioning factors on active margins effect the physical properties of sediments. Geomorphic studies of global margins show that passive margins display larger and more ubiquitous mass-wasting events when compared to active margins. It has also been shown that shallow sediments (< 50 cm) show enhanced shear strength on active margins and seismicity has been hinted at as the explanation for this observation. I am using existing Integrated Ocean Discovery Program (IODP) data combined with geomechanical laboratory experiments to quantify how sediment physical properties such as shear strength, fabrication, bulk density, and porosity develop in the presence of seismicity. My research has focused mainly on the socioeconomic impacts from a geohazards perspective. What we have found thus far is that active and passive margins generally have similar shear strength parameters, from a classic soil mechanics perspective. This would indicate that both should have very similar shear strengths. However, the shearing forces imparted by seismicity has caused the active margin sites to have enhanced shear strength, up to 3 times stronger, increased fabric development, and has also contributed a larger cohesive strength component than seen on passive margins. This contributes to preferential fluid flow pathways and armors slopes preventing failure on active margins while also controlling the style of slide behavior (blocky vs fluidized). The Friends of Orton Hall award allowed me to network with industry leaders at the AAPG/SEG Student Exo in Houston, TX. There I received feedback on my research and advice on how my research could be more applicable to a different audience. This gives my research a multifaceted application which will allow it be used across a variety of fields.

The photo is from southwest Colorado. I was mapping intrusive bodies just outside of Gunnison for a project and came across a huge vein of quartz; this piece had been dislodged. I have never seen a piece of quartz that big before or since.

AAPG Chapter Update

Local Brand Change

We entered this semester with an effort to simplify and locally brand ourselves from the other SES student organizations (SGE and AIPG). In order to avoid confusion, we have decided to locally change our name to GEOS (Geoscience in Energy at Ohio State) - A Student Chapter of AAPG & SEG. We are still nationally affiliated to AAPG and SEG. Hopefully this will help all the SES students distinguish between all the Student Orgs at OSU. We will be transitioning our branding to this throughout the semester. Let us know if you have any questions.

Mock Interviews & SEG/AAPG Student Expo

On Sept 16th, several of the students attending the SEG/AAPG Student Expo in Houston, Tx on Sept 22-23 were able to practice their interviewing skills and receive professional feedback from a panel of faculty. Thank you to all the faculty who donated their time to prepare our members for the expo.

At the SEG/AAPG Student Expo, 6 students presented research (4 graduate / 2 undergraduate) in front of technical experts from industry (2nd most posters out of any university present). A total of 8 students attended the event, attending different short courses from Exxon, Shell, and Corelab, while interacting and interviewing with several companies. We hope to continue our direction of developing our members for interactions with industry and professional opportunities.

OhioSeis & Core Open House

On Sept 16th, several student member accompanied by Dr. Derek Sawyer attended the OhioSeis & Core Open House at the H.R Collins Lab and Core Repository in Delaware, Ohio. Students were able to observe a shallow seismic data acquisition by alumnus Daniel Blake and interpret several different cores from all over Ohio. Thank you to ODNR for hosting us.

October Meeting Host Battelle Geoscientist

On October 7th, geoscientist Autumn Haagsma shared her journey to Battelle, and the diverse applications of geoscience utilized by her on several different projects.

Upcoming and Recent Events

- Video Short Course: "Seismic Amplitude Interpretation." By Dr. Fred J. Hilterman., October 24th, 10am-2pm, Mendenhall Laboratory.
- GEOS Monthly Meeting, November 4th, 5pm, Mendenhall Laboratory 291.
- Columbus Blue Jackets Hockey Social, November TBD.
- Orton Museum & Archive Event, December 3rd. More info to come.

Contact us at aapg@osu.edu for more information on all things GEOS. Stayed tuned and GO BUCKS !!!

Reflection Seismology Class Starts Off with a Bang

Seismic data is the standard tool for imaging the earth's interior with applications in hydrocarbon exploration, gas hydrates, environmental imaging, sedimentary basin research, and tectonophysics research. Reflection Seismology (EARTHSC 5780) is being taught this semester by Prof. Derek Sawyer with a high enrollment of 34 students including juniors, seniors, and graduate students.

In September, the class had the rare opportunity to take a full-day tour of an ongoing three-dimensional seismic survey. The Freeport 3D seismic survey is being acquired by TGS over a nearly 700 mi^2 area in eastern Ohio including parts of Carroll, Harrison, and Guernsey counties. Acquisition began in late December of last year and is expected to be completed in October.

Seismology students observing three vibroseis trucks at a predefined shot point.

Students were first provided lectures on topics including challenges of acquiring data on land at all times of the year, permitting and receiving landowner permission, accurate source and receiver positioning, and safety. Students then spent the remainder of the day touring field stops to see components of the acquisition including drilling 30-foot deep holes for dynamite charges, seeing (and feeling) dynamite shots and vibroseis trucks in action (above photo), analyzing the raw field data, and how helicopters are used to efficiently and safely move field personnel and instrumentation around the hilly terrain.

The field trip was an outstanding opportunity for students to see seismic data acquisition and reinforce concepts that they are learning bank in the classroom.

Undergraduate student Mario Gutierrez remarked "as a geoscientist it is important to understand how seismic data are acquired and processed. Going on the field trip allowed us to observe many of the potential variables of acquisition and their potential flaws when utilizing seismic as a tool to for subsurface interpretation."

Seismology students posing at the end of a long day.

Graduate student Edwin Buchwalter said he was "very impressed by the scale of effort and shear amount of data that goes into a seismic survey. This is something that you cannot understand without driving around multiple counties to see the different components of the operation in action."

Undergraduate Michaela Wells: "I for one loved the field trip. The School of Earth Sciences does a great job incorporating field trips into classes, especially upper level classes that are directly applicable to our future careers. This field trip took me from a classroom where I use pencil, paper and imagination and let me apply my knowledge in a real world setting."

Thank you to TGS for providing this opportunity.

Christine Chen attends conference in Greenland

Christine Chen is a PhD student working with Prof Ian Howat. Here she describes a recent trip to Ilulissat.

I presented my research on the formation and development of inland lakes on the surface of the Greenland ice sheet to the public for the first time at the Ilulissat Climate Days conference held June 2-5, 2015, in Ilulissat, Greenland. Its unique location allowed for international representation from researchers, although most were primarily from the US and Europe. It was a great experience due to the wide range of presentations from the innovative use of tagged ringed seals to determine oceanic conditions of temperature and salinity in ice fjords, to the examination of sediment plumes from outlet glaciers to gain a better understanding of Greenland hydrology, to an examination of a mass balance pause found in 2013 by OSU Professor Mike Bevis. Many state of the art data products were introduced, such as the ESA launch of their satellite suite of Sentinels, a complementary NASA Operation IceBridge dataset to be efficiently constructed from appending instrumentation to the existing C130 and LC130s, US military cargo planes which fly in and out of Greenland, or the high resolution arctic digital elevation models created here at OSU by Dr. Myoung-Jong Noh and Professor Ian Howat. While most of the conference had a science focus, there were offshoot sessions on climate and local society since locals heavily rely on hunting and fishing for their livelihood and are observing changes in their environment. Offshore drilling permits was a topic mentioned in the Opening Ceremony. I was surprised to hear that while many areas around Greenland have been licensed, no company has found resources yet. A few artists and social scientists who focus on aspects of Greenland or Greenlandic culture attended as well. Their presentations included photographs of the past and present to show cultural changes within Greenland and 3D printouts of icebergs which were scaled down but modeled with sonar accuracy. Rich experiences outside the conference include a hike along the Ilulissat ice fjord, sending postcards to people back home, brief glimpses into local community life as children frolic on playgrounds, chained sledge dogs lie in the sun, and locals visit Braettet, the fresh fish market in morning and early afternoon. There was also an opportunity to collect fish fossils in Kangerlussuaq. Many thanks to OSU OEE and DTU for the experience.

Prof Dave Cole: Research Group Update

PhD student Bohyun Hwang was the recipient of a AAPG Michael Johnson grant

Postdoc Dr. Siddharth Gautam attended the Deep Carbon Observatory Early Career Scientist Symposium in the Azores; he gave a talk and a poster

Undergrads Matt Edgin and Mario Gutierrez, and grad student Edwin Buchwalter attended the AAPG Student Expo in Houston; each gave a poster

Postdoc Dr. Reza Soltanian joined the Cole and Moortgat groups to work on reservoir modeling of tracers used in the DOE funded CO_2 injection site at Cranfield MS

Prof. Cole and PhD student Alex Swift attended the VM Goldschmidt Conference in Prague. Cole co-convened a science session on "Reaction Mechanisms, Rates and Transport Processes in Minerals, Glasses and Melts" and gave a talk.

Alex attended a pre-Goldschmidt Mineralogical Society of America and Geochemical Society Short Course on "Pore Scale Geochemical Processes". Prof Cole and his colleague, Dr. Larry Anovizt at ORNL had a chapter titled "Characterization and Analysis of Porosity and Pore Structures" in the Reviews in Mineralogy and Geochemistry volume that accompanied the course.

Brevia

Earth Sciences alumna, Natasha Lewis, B.S. with research distinction 2014, died suddenly on Tuesday, September 29, 2015 in Norman, Oklahoma, where she was a graduate student in the Conoco Phillips School of Geology and Geophysics at The University of Oklahoma. Her funeral was held on September 7, 2015 at the Family Christian Center in Toldeo.

Professor Grottoli's work was featured in the online magazine Environmental Monitor (link)

I2M's Michael D. Campbell, P.G., P.H., C.P.G., BA, OSU 66, and MA, Rice U, 76, has been selected to receive the National AIPG Section Leadership Award for his efforts to: 1) re-activate the Texas Section of the AIPG, 2) maintain the AIPG-TX website presence through the years of inactivity, 3) expand the web site's coverage and usefulness to the members of the Section, and 4) pursue other Section-building activities in his role of Vice-President, Eastern Texas. The formal presentation was made at the AIPG Annual Business Luncheon held in Anchorage, Alaska on September 18 (more).