THE OHIO STATE UNIVERSITY

SCHOOL OF EARTHSCIENCES

May 2015 News Notes

Alumni Change Lives

Rachel Adams recently received her M.S. degree with Prof Yo Chin. Here she describes how the Friends of Orton Hall (FoH) fund helped further her graduate studies.

My research focused on the transformation of chlorpyrifos (CP) and its methyl analog chlorpyrifos-methyl (CPM) in prairie pothole wetland pore waters. The prairie pothole region (PPR) is a vast network of interconnected wetlands that form an essential ecosystem for breeding waterfowl and aquatic plants in North America. Because the majority of pothole wetlands are on or bordered by cropland, PPR wetlands are persistently exposed to pesticides and herbicides. Naturally occurring reduced sulfur species in wetland pore water have the potential to break down these agricultural chemicals.

Chlorpyrifos is one of the most commonly used organophosphate active ingredients in the world. CP expresses both acute and chronic toxicity in aquatic organisms and mammals and its use has been linked to slowed brain growth in human infants due to prenatal exposure. CP is also relatively persistent in the environment, with half-lives ranging from a few days to several months depending on the formulation and environmental conditions. Understanding the fate of chlorpyrifos in the environment is an important part of protecting both ecological and human health in the region.

Our team collected sediment cores from PPR wetlands and extracted pore water. We spiked pore water with our target compounds and monitored the transformation over time. Our results showed that CP transformed up to 4 times faster in pore water with reduced sulfur species relative to hydrolysis. However, no rate enhancement was observed in the transformation of the more hydrophobic compound CP. We found that CP was much more likely to partition to dissolved organic matter (DOM) in wetland pore water, inhibiting the overall reaction. The results of this study demonstrate CP is relatively persistent in wetlands with high levels of DOM and that partitioning to organic matter may be more significant in determining transformation kinetics of hydrophobic compounds than the presence of reactive species in the environment. The FoH award made it possible for me to present the results of this research at the 2014 AGU Fall Meeting in San Francisco, California. I appreciate the opportunity to present my results and meet professionals in the geologic sciences.

Prof Howat Aids in Nepali Disaster Relief Efforts

Dr. Myoung-Jong Noh and Prof Ian Howat are producing high resolution elevation models for use in the Nepali earthquake relief effort. These data are critical for a range of uses, including mapping infrastructure, planning rescues and assessing slope stability. They are using state-of-the-art data processing software authored by Dr. Noh and an emergency allocation from the Ohio Supercomputer Center. All data will be distributed openly online and sent directly to international relief agencies. Read the OSC press release and article in the Columbus Dispatch. The story was picked up by the AP, and run in dozens of news outlets across the country.

Hillman Begins Postdoctoral Research with Sawyer & Cook

Dr. Jess Hillman is a new arrival to Ohio State, working with Prof Derek Sawyer and Prof Ann Cook. Here she describes her career path thus far, and her postdoctoral research.

I recently completed my PhD at the University of Otago, New Zealand under the supervision of Dr Andrew Gorman and Dr Ingo Pecher. My doctoral thesis focused on the investigation of seafloor depressions off the east coast of New Zealand's South Island to explore potential links to methane transport processes between the seafloor and ocean. This project involved using a wide range of geophysical techniques including multibeam bathymetry and backscatter, 2D and 3D seismic, boomer seismic and water column imaging to produce high resolution maps of the seafloor geomorphology and investigate near subsurface structures. Prior to this I received my BSc (Hons) in Geoscience from the University of St Andrews, Scotland. Whilst studying at St Andrews I completed several internships working for an environmental consultancy firm in Oman and the UAE, Petroleum Development Oman (PDO) in Muscat, Oman and Red Rock Resources in NW Greenland.

At Ohio State my postdoctoral research is supervised by Dr. Ann Cook and Dr. Derek Sawyer and will be focused on investigating gas hydrates in the Gulf of Mexico as part of a collaborative project with the University of Texas Austin and Columbia University. The aim of this project is to use seismic data to select several locations as targets for pressure coring, conventional coring, well logging, in situ measurements and laboratory analysis to study the state and genesis of gas hydrates. This data will allow us to develop a comprehensive characterization of methane hydrate morphology, concentration, formation permeability, geochemistry and in situ thermodynamic conditions. This will form a thorough foundation for future analyses and simulations required to understand the behavior of hydrate reservoirs during production. My role in this project will primarily be to carry out interpretation of 3D seismic volumes from the Gulf of Mexico to identify potential drill sites.

AAPG Chapter Update

AAPG/SEG Student Chapter at OSU - May Update

After a very exciting and successful academic year, the AAPG/SEG Student Chapter ended the spring semester with the integration of SEG, leadership elections, and preparing for our trip to the AAPG ACE 2015 in Denver, Colorado.

Officer Elections

We are very excited to introduce our E-Board for the 2015-2016 academic year.

- **AAPG President** - Mario Andres Gutierrez.
- **SEG President** - Joshua DeVore
- **Vice President** - Andrew Burchwell
- **Secretary**- Colin Whyte
- **Treasurer** - Lienne Sethna

We hope to approach the next year with a balanced undergraduate and graduate approach to further the development of energy applied geoscience at SES!

AAPG ACE Denver 2015

25 AAPG/SEG student members will represent SES/OSU at the upcoming AAPG ACE 2015 in Denver, Colorado from May 31st- June 3rd. Four students will be presenting posters/talks.

Please join us at the following events/activities in Denver.

- **OSU Alumni Breakfast** - June 1, 7-9am, Hyatt Regency - Convention Center
- **OSU Alumni Private Cocktail Party** - June 1, 5:30-7:30pm, Hyatt Regency - Convention Center
- **AAPG/SEG Chapter Field Trips** - June 4 & 5
- Dinosaur Ridge, Green Mountain, North & South Table Mountain - Golden, CO
- Laramide Structure Along the Northeastern Flank of the Front Range

For any questions about the alumni events, contact Jackie Hartzell (hartzell.2@osu.edu).
For any questions about the field trips, contact Mario Gutierrez (gutierrez.101@osu.edu)
Come by the SES/OSU Booth #214 to visit with the chapter members and faculty.

See y'all in Denver!!!

AAPG Chapter Update (cont.)

Member Highlight - Levent Akinci

I am an international student pursuing my M.S. degree under the supervision of Dr. Derek Sawyer. Currently, as part of the Basin Research Lab, I am exploring the feedbacks between active salt diapirism and submarine landslides, using data that has been newly acquired offshore North Carolina in the Cape Fear Landslide complex. This involves coupling observations made using seismic data along with numerical modeling techniques to understand how rising salt triggers and responds to the removal of significant overburden thickness due to a large submarine landslide. I am Turkish and Singaporean, and grew up throughout Southeast Asia, as my father worked in the petroleum industry. Prior to starting at OSU, I received my Bachelor's degree in geological sciences from the University of Miami, Florida. Since then, I completed an internship with the Integrated Reservoir Solutions division of Core Laboratories in the United Kingdom, where I evaluated log and core data from active petroleum exploration projects in Tanzania and Brazil. Additionally, I have done a geohazards short course run by Shell, and a salt tectonics field course in the Sivas basin in Turkey run by Total in conjunction with the Turkish Association of Petroleum Geologists.

Levent will be presenting his poster "Salt Diapirism and Slope Failure in the Carolina Trough, Eastern North American Margin" at the AAPG ACE 2015 Denver on June 3rd 8:00 am-12 pm.

Krissek Recieves Distinguished Service Award

Prof Larry Krissek received the President & Provost's Award for Distinguished Service, as noted in the February edition of the News. An excellent story about Prof Krissek and the other award winners was recently run in onCampus (link). Once again, Congratulations, Larry!

President and Provost's Award for
DISTINGUISHED
FACULTY
SERVICE

Congratulations to SES Award Winners

The SES end-of-year banquet was held at the Faculty Club on April 14th. The following awards were presented at the banquet. Congratulations to all SES award winners!

Undergraduate Book Awards

Jessica Pentecost
Lienne Sethna

Undergraduate Scholarship Winners

Buschman: Katherine Fleeman, Megan Mave

Echols: Devon Goeller, Alan Mason, Sean Newby, Samuel Perry

Lieberman: John Daniele, Matthew Edgin, Ryan Haugh

Rector: Christina Jauregui, Mackenzie Scharenberg

Shipley: Zuri Brooks, Mario Gutierrez, Stephen Maldonado

Tuovinen: Samuel Perry

SGE Tarr: Amber Huston

SGE Field Camp: Matt Edgin, Mackenzie Scharenberg

AAPG ACE travel award: Alex Rytel

Distinguished 1st year graduate student "Estwing Award"

Edwin Buchwalter

Distinguished teaching award

Davey Wright
Jameson Scott

Distinguished service award

Melissa Wrzesien
Deon Knights

Distinguished PhD student "Johnson Award"

Selina Cole

Distinguished Senior PhD "Spieker Book Award"

Jeff Pigott
Maya Wei-Haas

Book Awards in Geodetic Science

Apoorva Shastry
Yuna Duan
Ben VanderJagt
Anita Thomas

Distinguished First Year Graduate Student in Geodetic Science "Estwing Award"

Nlingilili Habana

Distinguished Senior Graduate Student in Geodetic Science "Spieker Book Award"

Dongyue Li

Distinguished Teaching Award in Geodetic Science

Jacob Heck

Distinguished PhD student in Geodetic Science "Johnson Award"

Yuanyuan Jia

Heiskanen Award in Geodetic Science

Prof. Wenbin Shen (Wuhan University)

Junior Heiskanen Award in Geodetic Science

Chunli Dai
Kun Shang

Royce Receives Outstanding Staff Award

At the Arts and Sciences Outstanding Staff Award Luncheon, Karen Royce received one of the Outstanding Staff Awards for 2015 in recognition of her valuable contributions to the college. As one of her nominators said, "Among her many contributions to SES, Karen's diligence in keeping abreast of our students' progress is admirable and has in a short time become essential to the smooth operation of the rapidly growing Earth Sciences undergraduate educational programs." No doubt all of the undergraduates can echo that sentiment. Karen is an important part of our students' successes in Earth Sciences. Congratulations, Karen!

Brevia

Sam Perry has received an Undergraduate Research Scholarship to work on his research supervised by Prof Wedny Panero. Perry's proposal was entitled: "Radioactive Cation Substitution in Calcium Silicate Perovskite." Congratulations, Sam!

Prof Wendy Panero's research was featured in the 10 April edition of Eos Research Spotlight (link). Congratulations, Wendy!

Jeffrey Pigott (adviser: Prof Wendy Panero) has received an NSF Postdoc Fellowship Award. Jeff will defend his PhD in June. He will do his postdoc at Case Western University; the title of the fellowship proposal is "Diffusion anisotropy in Earth's inner core". Congratulations, Jeff!

Melissa Wrzesien (adviser: Prof Michael Durand) has won the Toracinta Graduate Fellowship in Atmospheric Science (link). The Toracinta Fellowship is awarded biennially to a graduate student studying atmospheric science, broadly defined, at The Ohio State University. Congratulations, Melissa!

Professor Andrea Grottoli (link) will be hosting a tour of the Hawaii Institute of Marine Biology (link) and talk about her ongoing research (link) at the institute to OSU-Alumni Club of Hawaii (link) on 27 July 2015. Boat pick-up will be at the Lillipuna Drive dock in Kaneohe, HI in the early afternoon. For details, contact Professor Grottoli at grottoli.1@osu.edu.

In the most recent AAPG Explorer, it was announced that Anita Harris (PhD 1970) will be receiving a posthumous award at AAPG (link). A long article on her career is included. See also an article on Anita in the August 2014 News (link).