

April 2017 News Notes

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Alumni Change Lives

Kelsey Danner is a PhD student working with Prof Audrey Sawyer. Here he describes how Friends of Orton Hall helped further her studies. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page ([link](#)).

Harmful algal blooms (HABs) have become more prevalent within Lake Erie in recent years due to high nutrient loads within the watershed and warm, rainy weather in early summer. Toledo pulls public drinking water from Lake Erie and has been significantly affected by HABs because it is located on the western shore, which has the shallowest (therefore warmest) water and receives high nutrient loads from the Maumee River. Toledo has previously suspended usage of potable water due to large summertime blooms of microcystin, a liver toxin, that were detected at higher concentrations than the drinking water guideline. Microcystin is one of the most common and harmful toxins associated with HABs, but little is known about microcystin attenuation and fate in the environment. Mechanisms of algal toxin attenuation include dispersion, biodegradation, adsorption to sediment, and photodegradation. Algal toxin behavior in coastal environments is particularly important because it affects drinking water and recreational activities of local communities.

This project utilized lab tank experiments to determine whether wave-driven benthic exchange may accelerate the attenuation of microcystin in shallow coastal waters. Benthic exchange, defined as circulation of surface and pore water within sediment, transports microcystin into coastal sediment and greatly enhances removal from the water column due to biodegradation and adsorption. Algal toxin concentration was reduced by 70% over the course of the wave tank experiment. 1D effective diffusion modeling represented tank behavior very well and estimated total toxin reduction of 79% within the tank. A sensitivity study was performed for sediment types, water depths, and wave heights commonly found within Lake Erie. This study suggests that there is a high potential for microcystin removal from the water column due to adsorption and biodegradation within coastal Lake Erie sediments. Financial support from Friends of Orton Hall allowed me to travel to the University of Guelph (Ontario, Canada) where I presented this research at the International Association of Great Lakes Research 2016 Conference. I received beneficial feedback on how to make my model more robust and great tips for effectively communicating applications of scientific results. I also attended many conference sessions on HAB research and nutrient loading issues within the Great Lakes region, which gave me new ideas on how to approach the problems I hope to solve with my dissertation research.



Kelsey in January 2016 while attending a watershed modeling course at the University of Arizona's Biosphere 2 research facility.

Congratulations to SES Award Winners

The SES end-of-year banquet was held at the Faculty Club on April 18th. The following awards were presented at the banquet. Congratulations to all SES award winners!

Undergraduate Scholarship Winners

Buschman: Prescott Vayda
Alex Unger
Nick Reineck

Lieberman: Cole Bradley
Caje Kindred

Rector: Allyson Brady
Rebecca Anderson

Shipley: Zuri Brooks
Cassiopeia Webb

Echols: Kain Lager-Lowe
Ben Kasik
Kira Eaton
Chandler Amandaitis

Spieker: Rebecca Anderson
Matthew Bell
Casey Clark
Peter Gordineer
Elizabeth Lester
Harrison Love
Landon Keith Mason
Henry "Gus" Wulsin
James Ross

SES Field School:

Rebecca Anderson	Harrison Love
Matthew Bell	Landon Keith Mason
Cole Bradley	Jasper Mitchin
Casey Clark	Nicholas Reineck
Daniel Gilbert	James Ross
Peter Gordineer	Kathryn Smart
Aaron Hutchison	Prescott Vayda
Laura Keister	James H. R. White
Cody Kessler	Qinting Wu
Elizabeth Lester	Henry "Gus" Wulsin

Undergraduate Book Awards

R. Alan Mason
Seth Bryson

Graduate Students in Earth Sciences Awards

*Distinguished 1st Year Graduate Student
"Estwing Award":*

Caroline Robinson

Distinguished Teaching Award:

Myles Moore
Max Wheeler

Best senior PhD Student "Spieker Book Award"

Urmi Majumdar

Graduate Students in Geodetic Sciences Awards

Spieker Book Award-Best Senior PhD:

Yuanyuan Jia

*Distinguished 1st Year Graduate Student
"Estwing Award":*

Zhiyuan Cai

Heiskanen Award:

Dr. Myoung-jong Noh

Junior Heiskanen Award:

Jinmei Pan

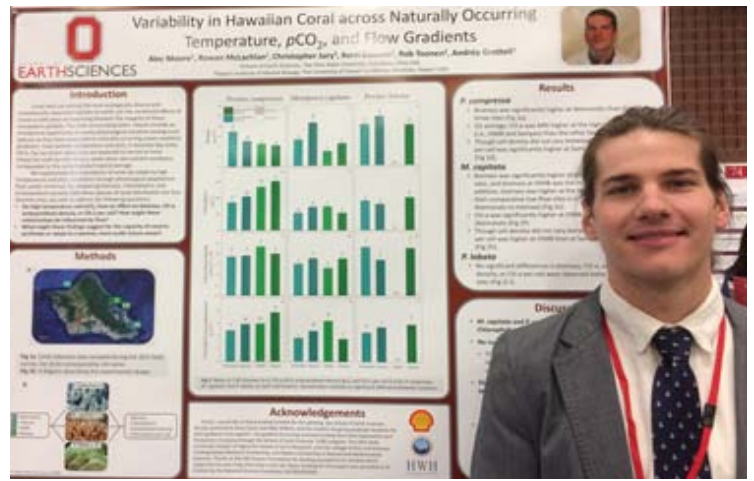
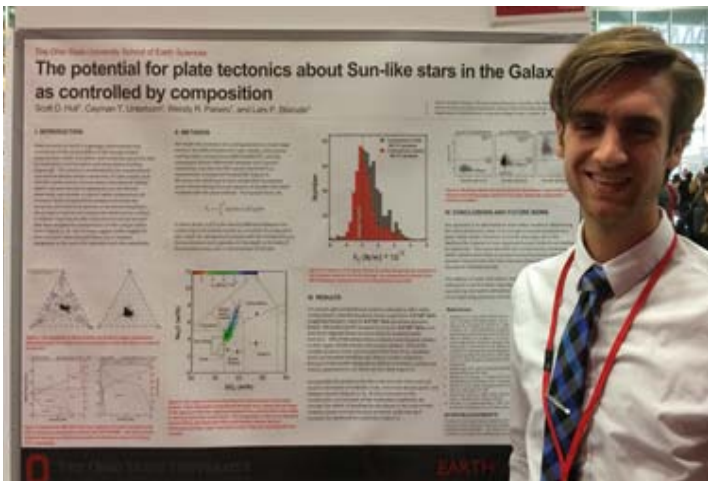
New Fossil Found in WWI-Era Rocks

When soldiers in the first World War were digging trenches in the Austrian Alps, they had no idea that they were uncovering remnants of the Earth's earliest animals. A new study in *Geologica Acta* co-authored by Prof Emeritus William Ausich shows that the distant ancestor of today's sea lilies dwelled in the ocean that once overtook the mountain, giving insight on how the species survived and evolved over millions of years of climate change. This story was picked up by several news outlets ([link](#)). Congratulations, Prof Ausich!



Earth Sciences Undergraduates Present Research on Campus

On Wednesday, March 29, 15 Earth Sciences undergraduates presented their research at the 22nd annual Denman Undergraduate Research Forum held at the Recreational and Physical Activity Center. Scott Hull and Alec Moore both won third place in the Earth and Planets division among the 35 presentations in that division. This was the largest Denman ever, with almost 700 students presenting.



Students presenting at the Denman forum, their advisors, and research topics, were:

Ally Brady, advised by Frank Schwartz, presented “Serendipity in events leading to groundwater contamination at Elkhart, Indiana.”

Shelby Brewster, advised by Berry Lyons and Sue Welch, presented “Mineralogical and geochemical analysis comparing the weathering of Permian and modern Antarctic proglacial lake sediments.”

Scott Hull, advised by Wendy Panero, presented “The potential for plate tectonics about sun-like stars in the galaxy as controlled by composition.”

Christina Jauregui, advised by Dave Cole and Sue Welch, presented “Geochemical evaluation of hydraulic fracturing fluids and shales: tracing the evolution of $\delta^{13}\text{C}$ through method development of wet chemical oxidation.”

Brandi Lenz, advised by Derek Sawyer, presented “Shear strength of seafloor sediments offshore southern Alaska: implications for submarine landslides and tsunami hazards.”

Yuyu Li, advised by Mike Barton, presented on “Petrological constraints on magma plumbing systems beneath Hawaiian volcanoes.”

Harry Love, advised by Mike Barton, presented on “Modeling magma crystallization along the East Pacific Rise.”

Stephen Maldonado, advised by Berry Lyons and David Bromwich, presented on “Surface atmospheric conditions during the 2007 and 2012 record arctic sea ice minima resolved by the Arctic system reanalysis.”

Alan Mason, advised by Derek Sawyer, presented on “Seafloor brine lake impacted by submarine landsliding: an example from the Orca basin, Walker Ridge, Gulf of Mexico continental slope.”

Alec Moore, advised by Andréa Grottoli, presented on “Variability in Hawaiian coral across a natural range of temperature, pH and flow gradients.”

Sean Newby, advised by Matt Saltzman, presented on “Refining the geologic history of the Middle Ordovician (~465 Mya) in central Virginia using the seawater 87Sr/86Sr curve.”

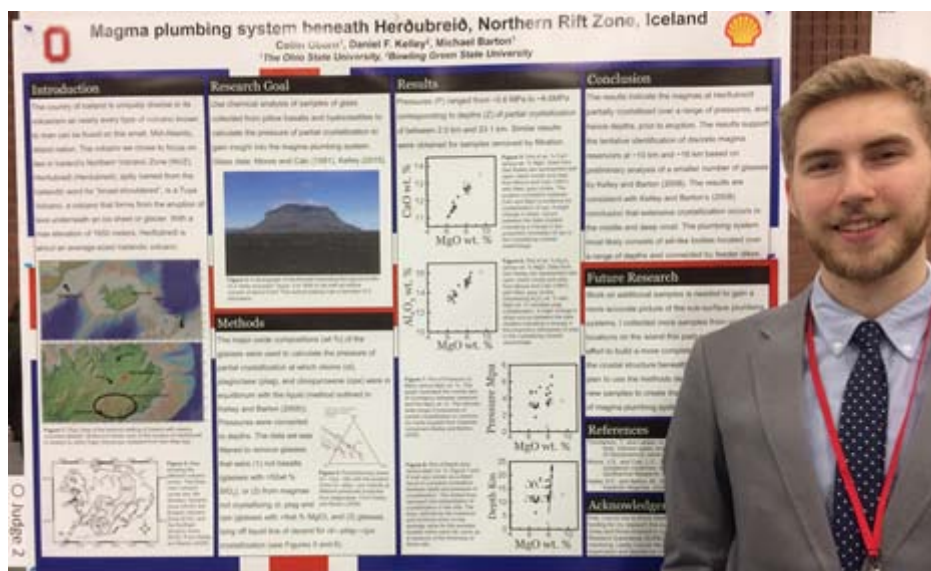
Collin Oborn, advised by Mike Barton, presented on “Magma plumbing system beneath Herðubreið, Northern Rift Zone, Iceland.”

Nick Rodgers, advised by Derek Sawyer, presented on “A numerical simulation of a submarine landslide as the source of the 1918 Puerto Rico tsunami.”

Elsa Saelens, advised by Berry Lyons, presented on “Minor cations within Antarctic stream water: determining the role of the hyporheic zone.”

Rachel Schultz, advised by Mike Barton, presented on “Modeling crystallization of basalt magmas along the Reykjanes Ridge.”

At the April 10, 2017 Natural and Mathematical Sciences Undergraduate Research Forum, Yuyu Li, Alec Moore and Collin Oborn presented their research again. Collin won first prize for his presentation on “Magma plumbing system beneath Herðubreið, Northern Rift Zone, Iceland.”



Congratulations to all the students for their fine presentations at both events.

Amin Amooie Wins SPE Regional Paper Contest

On April 22nd, OSU hosted the 2017 Eastern North America Regional Paper Contest of the Society of Petroleum Engineers (SPE), in which students from 26 US states compete.

SES students Amin Amooie and Fengyang Xiong participated and Amin took home the Gold. The award is publication of his paper and travel funds to attend the SPE Annual Technical Conference and Exhibition in San Antonio this Fall. There he will also represent SES in the final International Paper Contest. His presentation skills greatly benefited from generous FOH funding to attend numerous conferences in the past few years.



Brevium

Dr. Sue Welch has received the University Lab Safety Committee - Excellence in Safety Award. She was recognized as a university staff member who has made a considerable contribution to improving laboratory safety on the Ohio State campus. We congratulate Dr. Welch for her outstanding commitment to laboratory safety, as well as student education and training.