

November 2014 News Notes

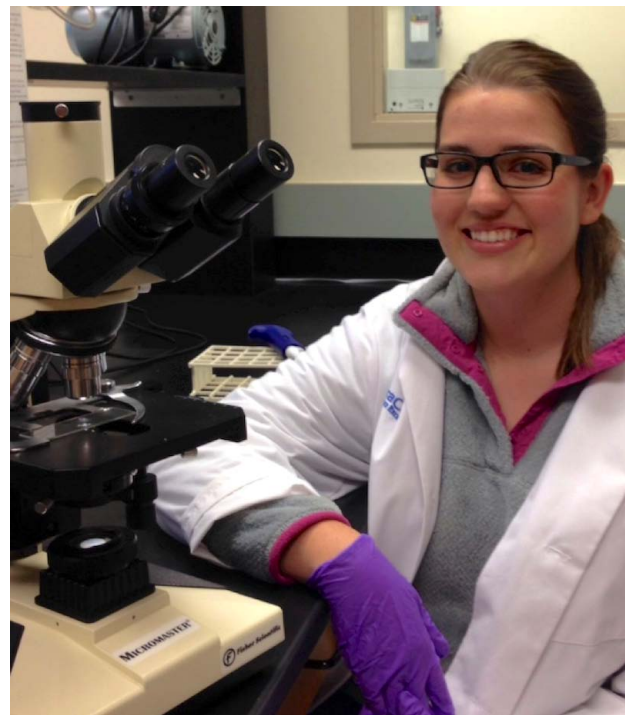
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Alumni Change Lives

Casey Saup is an undergraduate student in SES working with Professor Andréa Grottoli. Here she explains how funding from the Friends of Orton Hall fund helped to further her undergraduate studies.

I'm a senior undergraduate student currently studying coral physiology and biogeochemistry under Prof Grottoli. My senior thesis, which I will defend in the spring, is a study of the physiologic and isotopic responses of the coral species *Stylophora pistillata* to future coastal ocean conditions. As climate continues to change, corals are increasingly at risk of bleaching and bleaching-induced mortality due to rising sea temperatures. However, there is evidence to suggest that environments with increased feeding opportunity and less intense light may offset some of the damage caused by increased temperatures. I measured the individual and interactive effects of temperature, light, nutrition (fed brine shrimp, vs not fed brine shrimp) on the physiology and biogeochemistry of one particular coral species, *stylophora pistillata*. Calcification, feeding

rates, photosynthesis, and respiration were measured as well as the nitrogen ($\delta^{15}\text{N}$), and carbon ($\delta^{13}\text{C}$) isotopic compositions of the whole coral tissue, the host, and the algal endosymbiont. My results indicated that less intense light and increased feeding did not appear to mediate the negative effects of elevated temperature as was hypothesized, leading me to the conclusion that environments with these conditions may not provide refuge for this species in a warming world. The Friends of Orton Hall (FOH) fund provided support for me to present the results of my research at the 2014 GSA meeting in Vancouver, BC. In attending this meeting I was able to improve my presentation skills, network with professionals and experts in my field, and explore potential graduate school options. I am very grateful for the support provided by FOH, without which my GSA travels would not have been possible.



Cook and Sawyer Part of \$58 Million Hydrate Grant

Originally run at the College of Arts and Sciences ([link](#)).

SES professors Ann Cook and Derek Sawyer are part of a research team led by the University of Texas, Austin that has been awarded approximately \$58 million to analyze deposits of frozen methane under the Gulf of Mexico. The four year grant will allow researchers to advance scientific understanding of methane hydrate, a substance found in abundance beneath the ocean floor and under Arctic permafrost. It has enormous potential to increase the world's energy supply. Ohio State's piece of that funding is \$1,025,949.

Cook and Sawyer and their research team will be analyzing the geophysical data (seismic and well log) from the Gulf of Mexico to pick the best sites to drill for methane hydrate with the object of recovering methane hydrate samples. Recovering methane hydrate is a difficult challenge. Currently, only a few samples were recovered from the Gulf of Mexico in the 1980's. "I think we have the best job, personally," Cook said. "Other people have to worry about all of the logistics, money and contracting, but we get to do the science! We also will be a part of the drilling cruise, which will probably happen in 2017." Sawyer explains that gas hydrate looks like ice, but is really a combination of H₂O and methane where the H₂O forms a lattice structure around the methane.



"Solid gas hydrate forms under certain conditions of temperature and pressure that are found in sediments below the ocean floor, generally much shallower in the sediment column than where we drill for traditional oil and gas deposits.

Cook notes that "Gas hydrate could be a future source of economic methane — we know there is a lot of it on the planet—but we still don't understand many things about it. For example: I say 'a lot' of gas hydrate on the planet, because the best estimates for the total amount of gas hydrate vary by several orders of magnitude.

"One reason for this is we are still learning how best to identify gas hydrate using geophysics. Another issue is we don't know how gas migrates through a zone where it is commonly 'frozen' or solidified into hydrate."

Cook is delighted to be helping hunt for answers and hopes that other Ohio State researchers may be allowed to join in.

"Right now, we have money for a student and a postdoc to work on the project with us, but we would love to talk with any other interested students and postdocs. Also, many more scientists—such as microbiologists, chemists and geologists— still need to be contracted through the grant. Basically, there is a lot of opportunity for additional Ohio State researchers to get involved!"

AAPG Chapter Update

Monthly Chapter Meeting

On November 4th, chapter members attended an informative talk presented by SES's Dr. Thomas Darrah. Students learned and were exposed to the several different black shale geochemistry applications in the oil & gas industry. The meeting also entailed following fall events, ideas for the next semester, and a preliminary discussion about AAPG ACE 2015.



Baker Hughes Presentation & PBJ Fundraiser

On November 13th, chapter members hosted OSU alumnus Nick Leeper from Baker Hughes. Students were able to learn about the various different aspects of the oilfield service industry. From wire line and mud engineering to directional drill engineering, students were exposed to diverse opportunities at Baker Hughes. Following the Baker Hughes presentation, several members attended the Pizza, Beer, & Jokes Fundraiser at Pizza Rustica. Local comedians entertained our guest from Baker Hughes and members as we raised chapter funds. A big thanks to everyone who came out, especially our guest Nick Leeper.

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 [here](#).

Stayed Tuned & Go Bucks!!!

How to support SES funds

There are a number of funds at Ohio State that are dedicated to supporting SES students and SES research, helping the School to fulfill its mission in a time of university-wide budget cuts and increasing student interest in the Earth Sciences. Many of you donate to these funds, for which we are very grateful. For a list of funds, click [here](#).

Susan Solomon visits SES for 71st Bownocker Lecture

Professor Susan Solomon was the SES Bownocker Distinguished Lecturer for 2014. Prof Solomon is the Ellen Swallon Richards Professor of Atmospheric Chemistry and Climate Science at MIT, and is known for her pioneering work on understanding the cause of depleted ozone in the atmosphere above Antarctica, otherwise known as the “ozone hole.” The Bownocker lectures have been presented since 1937. The Bownocker fund was established by a bequeath from the estate of John Adams Bownocker (1865–1928), Professor and Chairman of the Department of Geology and State Geologist of Ohio. Previous recipients include Arthur Day, Harold Urey, J. Tuzo Wilson, Cesare Emiliani, John Rodgers, Luna Leopold, Ian Dalziel, Wallace Broecker, Roberta Rudnick, and Louis Kellog. Pictured at right: SES director Berry Lyons presents the 2014 Bownocker Medal to Dr. Susan Solomon.



During her two days on campus in mid-October, the 71st Bownocker lecturer, Professor Susan Solomon of MIT, spent several hours meeting with and advising women students, undergraduate and graduate both, in informal sessions over lunch and coffee. Dr. Solomon had lunch with 19 women graduate students on October 15 and she enjoyed conversation and coffee and pastries with a dozen undergraduate Earth Sciences majors on October 16. Topics discussed at both meetings included how to choose a research topic, graduate schools, careers in the sciences, and negotiating the issue of how to handle a difficult question you don't want to answer. “With humor” was Dr. Solomon's advice.



Pictured at right are Doctor Solomon and undergraduate majors in Earth Sciences. From left to right are Erin Lathrop, Lindsey White, Casey Saup, Susan Solomon, Amber Huston, Mackenzie Scharenberg, and Prof Anne Carey.

Alumni Profile: Craig Rawlinson

After graduating from OSU in 1983, I took a couple quarters off from my academic pursuits to work on highway construction projects in the Cleveland area. Many of the construction projects I worked on dealt with slope stability and/or erosion issues associated with embankments cut in shale slopes. These projects gave me an appreciation for the practical ways that geology influenced infrastructure that was used every day by thousands of commuters. I decided to pursue a Master of Science degree in engineering geology, because I wanted a career that combined my love of geology with my interest in large construction projects. My MS degree from the University of Akron combined a curriculum that was based in geology/hydrogeology as well as the civil and geotechnical engineering. My consulting career began in 1986 at Warzyn Engineering in Madison, Wisconsin. I spent most of the first year investigating former coal gasification facilities located throughout Illinois before becoming the field manager and hydrogeologist for the Remedial Investigation of the City of Wausau Well Field, Superfund site. The project required the supervision of several drilling rigs, a soil gas collection team, and a mobile laboratory. This project introduced me to the world of real time forensic hydrogeology where the investigation scope was continually refined in the field as additional data became available. This approach was invaluable in defining three previously unidentified chlorinated solvent plumes (including one which flowed under the Wisconsin River) impacting the City well field.



In 1991 I accepted a position with STS Consultants at their Chicago area office. STS had a world renowned reputation for designing and constructing deep foundations for some of the world's tallest buildings. My move to STS provided opportunities to manage several mining and tunneling projects including the groundwater control system design of the Chicago Deep Tunnel storm water reservoir at McCook, Illinois. The 300 foot deep reservoir constructed within the dolomite bedrock provides approximately 2,100 acre feet of storage for effluent from the combined sewer system in the Chicagoland area, making it one of the largest flood control projects in the country. I also managed the geologic and hydrogeologic characterization of the NUMI particle launch tunnel at the Fermi High Energy Physics Laboratory in Batavia, Illinois. This tunnel was used to shoot subatomic particles through the bedrock to detectors located in a half mile deep iron ore mine located in Minnesota.

In 2007 STS Consultants was acquired by AECOM a large international consulting firm. I left AECOM in 2009 to launch my own consulting firm. We recently celebrated our 5 year anniversary. The company has primarily focused on providing permitting and compliance reporting services to the solid waste disposal industry. The company has also assisted with several methane migration corrective action projects. We have also assisted several municipalities with groundwater planning and environmental issues. Next year my wife Diane and I will celebrate our 30th wedding anniversary in the Mediterranean. We have two sons, Brent 24 and Kyle 21 who are in the process of launching careers and finishing college, respectively. We enjoy traveling, camping and getting together with family and friends. Last year my son and I completed a 5 day hike along the Teton Crest Trail. Contact info: craig@csgeologic.com (847) 804-6064.

Oceanography students visit Columbus Zoo and Aquarium

Advanced Oceanography (EARTHSCI 5206) students, led by Professor Andrea Grottoli, visited the Columbus Zoo and Aquarium (<https://www.columbuszoo.org/>) as well as the Reef Systems Coral Farm (<http://www.reefsystems.com/>) this weekend to get a closer look at marine organisms. Students had the opportunity to learn about polar bears, penguins, manatees, and coral reefs as well as get a tour of the behind-the-scenes activities in the coral reef exhibit at the zoo. At the coral farm, students got a chance to see a coral mariculture facility in action and talk to the owner, Todd Melmann, about how he got into the business and what it takes to be a coral farmer. Pictured below at right: Amber Huston holding a serpent star at the Reef Systems Coral Farm. At left is a group photo at the polar bear sculpture at the Columbus Zoo and Aquarium.



Brevia

SES undergraduate Michael Rutana's research with Prof Loren Babcock on digestive tracts in trilobites is featured on sciencenews.org ([link](#)). Michael presented his research at the annual GSA meeting last month in Vancouver. Congratulations, Michael!

SES Geodetic Science PhD student Ben Vander Jagt working with Prof Michael Durand won the Institute of Navigation (ION) Graduate Student award. Congratulations Ben! More about the award [here](#).

SES graduate students Lena Cole and Davey Wright, along with SES alumnus Jeff Thompson (USC graduate student), advisees of Prof Bill Ausich organized and convened a session on Echinoderm Paleobiology at the Vancouver GSA.

Dale Gnidovech is the Orton Museum collection manager, and frequently gives tours and lectures to visiting school groups at OSU. He recently gave a talk at a local school that features some wonderful photos of Dale in action. The photos are public and are posted [here](#). Check them out!