

April 2019 News Notes

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Alumni Change Lives

Trevor Browning is a PhD student at Ohio State working with Dr. Derek Sawyer. Below, he describes how the Friends of Orton Hall fund allowed him to conduct research on the coastal systems of St. John island. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page ([link](#)).

This past May, I traveled to two locations to collect data and pursue funding opportunities regarding my PhD dissertation. I first met with collaborators in St. Petersburg, FL, which has since led to a fledgling proposal for NSF funding on the island of St. John, US Virgin Islands. I then traveled to St. John to continue my ongoing research of its coastal system.

My overall objective on the island is to ascertain the impact of development on the terrestrial and marine environments and use this knowledge to develop an index for coastal sustainability. In the first stage, I intend to accomplish this by profiling the terrestrial and marine environments of two embayments (one developed and one pristine) and tracking their sediments from ‘source to sink’. While on this particular excursion, I mapped many of the sediment transport pathways, roads, and mitigation structures, and sampled throughout two large embayments for mineralogy and grain size analysis. This data led to a publication currently in review and has already answered pressing questions I had about the region.

All in all, it was an extremely successful trip that would not have been possible without the funding of the Friends of Orton Hall.



Trevor Browning sampling in Otter Creek, St. John, US Virgin Islands

Congratulations to SES Award Winners!

The SES end-of-year banquet was held at the Faculty Club on April 15th. The following awards were presented at the banquet. Congratulations to all SES award winners!

Undergraduate Scholarship Winners

Buschman: Kira Harris

Lieberman: Nicole Wahlstrohm

Rector: Mason Harris
Erica Scarpitti

Shipley: Dang-Huy Nguyen

Echols: Molly Hunt

Newhart: Caje Kindred

Spieker: Dang-Huy Nguyen

SES Field School:

Alex Brown

Nick Keating

Lillian Rose Kleban

Kelly Helen Lang

Ian Richard Lybarger

Danny Nguyen

Nicole Piergallini

Samuel Schneider

Nicole Wahlstrohm

Wenbo Zhan

Graduate Students in Earth Sciences Awards

Distinguished 1st Year Graduate Student
"Estwing Award":

Brittan Wogsland
Joe Schulze

Distinguished Teaching Award:

Max Wheeler
Ken Peterman
Erica Maletic

Best senior PhD Student "Spieker Book Award"

Myles Moore
Apoorva Shastry

Outstanding Service Award:

Casey Saup

"Michael Johnson" Graduate Award:

Billy Eymold
Michalea King

Graduate Students in Geodetic Sciences
Awards

Spieker Book Award-Best Senior PhD:

Ting-Yi Yang

Distinguished 1st Year Graduate Student
"Estwing Award":

Jason Otero-Torres
Xuechen Yang

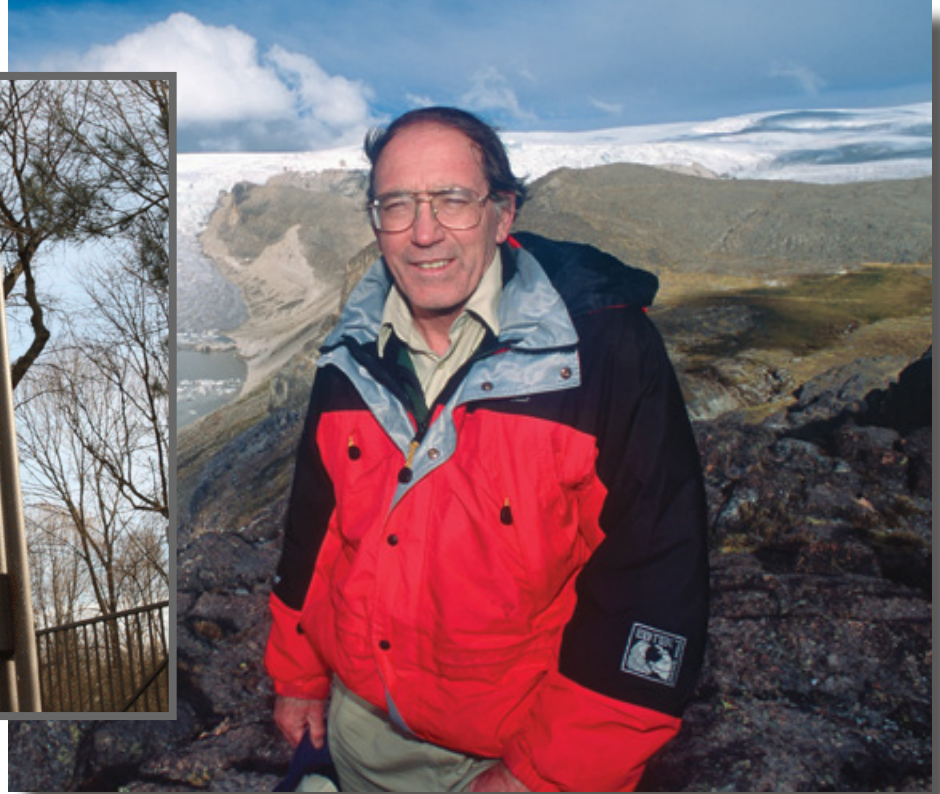
Junior Heiskanen Award:

Chaoyang Zhang

"Michael Johnson" Graduate Award:

Guanyu Xu

Professor Lonnie Thompson Elected to American Academy of Arts and Sciences



Left: Entrance to the American Academy of Arts and Sciences. Right: SES Professor Lonnie G. Thompson in Peru

Congratulations are in order for Dr. Lonnie G. Thompson, Distinguished University Professor in the School of Earth Sciences and Research Scientist with the Byrd Polar Research Center, who was recently elected to the American Academy of Arts and Sciences!

According to the AAAS website, such a recognition is awarded to “world leaders in the arts and sciences, business, philanthropy, and public affairs,” so that they may collectively work to “explore challenges facing society, identify solutions, and promote nonpartisan recommendations that advance the public good.” Founded in 1780, AAAS is one of the oldest learned societies in America, and as an organization, works to advance studies and publications which inform public policy and serve the public at large. David Oxtoby, president of the academy, says of the newly elected body of members: “We are pleased to recognize the excellence of our new members, celebrate their compelling accomplishments, and invite them to join the Academy and contribute to its work.”

Dr. Thompson is one of the foremost leaders in the field of paleoclimatology, and his work has been instrumental in propelling the field out of the Polar Regions and into the highest tropical and sub-tropical ice fields. Additionally, his observations of glacier retreat over the last three decades have confirmed that glaciers around the world are melting, and provide clear evidence that the warming of the last 50 years is now outside the range of climate variability for several millennia, if not longer. This crucial work has led to Dr. Thompson’s recognition with many other honors and awards, including the National Medal of Science and the Tyler Prize (the World Prize for Environmental Achievement).

Once again, congratulations to Dr. Thompson on his election to the American Academy of Arts and Sciences!

Professor Carey Wins Slovene Exchange Fellowship



The [Slovene Research Initiative \(SRI\)](#) of the [Center for Slavic and East European Studies](#) has recently announced the results of its 2019 Faculty Exchange Program. This year, SRI will send four scholars to Slovenia, including SES Professor Anne Carey. The Faculty Exchange Program is made possible through a partnership with the [Research Centre of the Slovenian Academy of Sciences and Arts](#) (more on this story can be found [here](#)).

Professor Carey will continue field work started in 2017 with collaborators Dr. W. Berry Lyons, also of the OSU School of Earth Sciences, and Matija Zorn and Blaž Komac (both of the Anton Melik Geographic Institute, Research Centre of Slovenian Academy of Sciences and Arts). During her time in Slovenia, Dr. Carey will obtain ice core samples from cave ice within the Paradana Cave, as well as ice from the Triglav glacieret. These samples will then be brought back to Ohio State to be analyzed in SES labs. Tests will analyze oxygen isotopic ratios that will help to reveal a climate record linked to sea surface temperatures over the time that the ice was deposited.

There have been few detailed investigations of cave ice to date, making this research of the Paradana Cave and Triglav glacieret an important contribution to the understanding of Central European climate changes in the past two millennia. Results of the 2017 research have already been presented at conferences and are part of several published and forthcoming publications.

Congratulations, Professor Carey!

SES Alumnus Describes the “King of Mammalian Carnivores”

In the latest issue of the [Journal of Vertebrate Paleontology](#), SES Alumnus Matthew Borths (B.S. 2008) describes the largest carnivorous mammal currently known to man. In a coincidence that somewhat parallels the discovery of *Cryolophosaurus* by Professor David Elliot, Dr. Borths was working on primates at the National Museums of Kenya when he opened a drawer and found the remains of an undescribed, enormous, extinct mammalian carnivore – the T. rex of its day. At the time, Dr. Borths was working as a postdoctoral researcher at Ohio University with Dr. Nancy Stevens of the Department of Biomedical Sciences at OU. His publication has been widely reported upon in the news media. For example, take a look at [this story from CNN](#).

The extinct creature was dubbed Simbakubwa kutokaafrika, Swahili for “big lion coming from Africa.” However, it is not believed that Simbakubwa was a close relative of modern lions, instead belonging to the extinct hyaenodon family. The animal is believed to have lived about twenty-two million years ago, and was the first mammalian carnivore in Africa. It would have been a deadly predator, weighing over 3,000 pounds with large canine teeth and molars. The teeth on the specimen located by Dr. Borths are in good condition and show little weathering, indicating that the animal was relatively young at the time of its death.

After completion of his B.S. at OSU (with a senior thesis titled “Crinoids in Lilliput: Morphological Change in Class Crinoidea across the Ordovician-Silurian Boundary”), Matt completed his Ph.D. at Stony Brook University and is currently the Curator of the Division of Fossil Primates at the Duke Lemur Center at Duke University. The research was funded by grants from the National Science Foundation (EAR/IF-0933619; BCS-1127164; BCS-1313679; EAR-1349825; BCS-1638796; DBI-1612062), The Leakey Foundation, National Geographic Society (CRE), Ohio University Research Council, Ohio University Heritage College of Osteopathic Medicine, SICB and The Explorers Club.



Left: Dr. Matthew Borths, OSU alumnus, holds the fossilized jaw of Simbakubwa kutokaafrika.

Below: Simbakubwa as it may have appeared in life. The carnivore's skull is comparable in size to that of a modern-day rhinoceros!



New Publication from Dr. Jill Leonard-Pingel

Dr. Jill Leonard-Pingel has published a new paper in this month's issue of Marine Ecology Progress Series entitled "Gauging benthic recovery from 20th century pollution on the southern California continental shelf using bivalves from sediment cores" ([link](#)). Human populations exert strong pressures on coastal marine ecosystems. Although many of these areas are now being protected or remediated, the full extent of degradation is often underappreciated, making setting recovery goals and assessing the success of remediation efforts difficult. Paleoecological analysis of the marine communities preserved in sediment cores can provide a powerful source of information about community states before human impact. Sediment cores from lakes, estuaries, lagoons, and back reef areas have already been used in many areas, but sediment cores from open shelf environments have not been widely used for this purpose because of the perceived difficulties and potential biases in these environments.

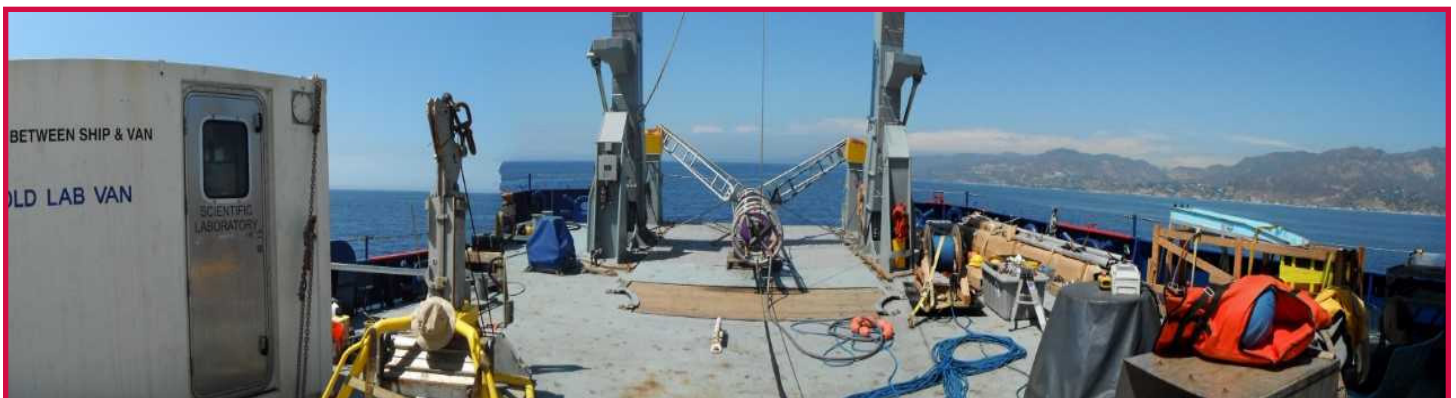
Leonard-Pingel and collaborators tested the fidelity of sediment cores collected from the southern California shelf and compared them to historical live-collected collections made by the L.A. County Sanitation District since the early 1970s. They found that despite low sediment rates and significant bioturbation on the shelf, sediment cores are able to capture broad outlines of community change that were recorded from living assemblages. Furthermore, marine communities recorded in sediment cores also provide information about pre-impact communities, and show a general trend of recovery on this highly-impacted shelf.



Far left: Deployment of the box core.

Left: Dr. Leonard-Pingel (right) and co-author Dr. Susan Kidwell (left) examine a subsampled box core.

Below: A view from the deck of the R/V Melville.



Notice: Request for Geoprobe Services

The new Mirror Lake Water Science Learning Lab is up and running, with a 120-foot well and sensors in both the well and lake!

It is hoped that a network of water table wells will be installed to give students practice with surveying and mapping the water table. However, attempts at hand augering were met with resistance from a hard layer, around 4-feet deep, stretching across the South Oval (despite the valiant efforts of ES 5651 Hydrogeology students).

It is thought that the use of a geoprobe will ease the drilling process. If you have access to a geoprobe, or would like to make a financial or material contribution towards the shallow well network, please contact SES Professor Audrey Sawyer at sawyer.143@osu.edu.

Thank you!



Students in ES 5651 conduct a slug test in the 120-foot groundwater well.

Brevia

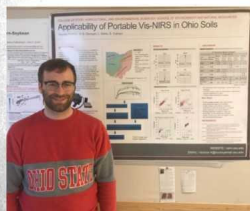
Last month, on the 28th of March, the OSU School of Environmental and Natural Resources (SENR) hosted a Soil Science Symposium at Kottman Hall. The goal of the symposium was to promote soil science and to increase awareness of its importance.

A grad student poster competition was held, and our very own SES student, Devin Smith, tied for second place.

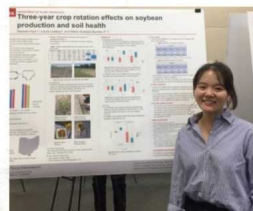
Congratulations, Devin!

WINNERS OF THE OHIO STATE SOIL SCIENCE SYMPOSIUM Graduate Student Competition

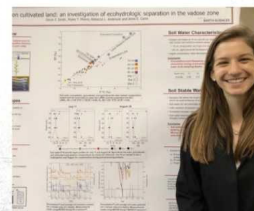
1st Place:
Thomas Doohan
(SENR)



2nd Place (tied):
Daowen Huo
(Plant Pathology)



2nd Place (tied):
Devin Smith
(Earth Sciences)



Brevia (Continued)

Professor David Cole's group has been hard at work the last several months, publishing a total of five different papers! These can be found at the links below:

- 1.) [Effects of Hydration on Fractures and Shale Permeability Under Different Confining Pressures: An Experimental Study](#)
- 2.) [Analysis of the Pore Structures of Shale Using Neutron and X-Ray Small Angle Scattering: Subsurface Seals and Caprock Integrity](#)
- 3.) [Sorption, Structure and Dynamics of CO₂ and Ethane in Silicalite at High Pressure: A Combined Monte Carlo and Molecular Dynamics Simulation Study](#)
- 4.) [Assessing Geochemical Reactions During CO₂ Injection Into an Oil-Bearing Reef in the Northern Michigan Basin](#)
- 5.) [Water Adsorption on Olivine\(010\) Surfaces: Effect of Alkali and Transition Metal Cation Doping](#)

Additionally, Professor Cole delivered two invited talks at the American Chemical Society Conference in Orlando earlier this month:

- 1.) Cole, R. R and Striolo, A. (2019) Reactivity of C-O-H fluids in nanoporous systems. Amer. Chem. Soc. Confer. Orland, FL, April 4, 2019
- 2.) Cole, R. R and Striolo, A. (2019) Impact of nanoporosity on the behavior of water and aqueous solutions. Amer. Chem. Soc. Confer. Orland, FL, April 3, 2019

RICHARD ALLEY

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WHERE HAS YOUR DEGREE TAKEN YOU?

While at Ohio State, I went to Antarctica with David Elliot, and worked extensively with Ian Whillans as he advised both degrees. He also advised me in writing a proposal to NSF that funded my PhD at Wisconsin, working on the transformation of snow to ice on polar ice sheets. My first attempt at a PhD was complicated a bit when the NSF contractor melted my samples on the way home (NOT a good morning when your long-awaited Antarctic ice cores are destroyed). That led to some rapid changes of plans that involved a trip to Greenland, another trip to the Antarctic, additional studies and pursuit of new topics... and now, 30-odd-years later, I've had an amazing range of adventures, including being elected a member of the US National Academy of Sciences and a Foreign Member of the Royal Society.

HOW DID YOUR EXPERIENCE AS AN SES STUDENT PREPARE YOU FOR THE FUTURE?

Outstandingly well. The Institute of Polar Studies (now the Byrd Center) as well as the Department were world-leaders in my field, and Ian Whillans and David Elliot in particular, along with many others, really got me going in the right direction.

MOST MEMORABLE EXPERIENCE AS AN SES STUDENT?

Well, the biggest was meeting and then marrying fellow Geology student Cindy Richardson Alley—we've been happily married for 37 years now, with two great daughters (Janet is teaching middle-school science outside Seattle, and Karen is teaching geology up at the College of Wooster). But, after that, spending my sophomore winter poking around the Antarctic Peninsula, with penguins and seals and whales and fantastic geology and great people, was a big highlight.

Our field is
*wonderfully rich,
diverse, and important,*
as well as a
whole lot of fun,
if you really commit to it.



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