

March 2019 News Notes

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Alumni Change Lives

Kerri Dobson is a graduate student at Ohio State working with Dr. Andrea Grottoli. Below, she describes how the Friends of Orton Hall fund allowed her to present research at the very first Reef Futures conference. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page ([link](#)).

Coral reefs are threatened globally from increasing sea surface temperatures and ocean acidification. However, there is some evidence that moderate levels of nutrients can mitigate the negative effects of these stressors on coral. In Fall 2018, I was fortunate enough to receive a Friends of Orton Hall award, which enabled me to attend the Reef Futures 2018 conference in Key Largo, FL, where I presented my research on the on the physiology and biogeochemistry of two species of Indo-Pacific coral”.



Kerri Dobson presents at the Reef Futures 2018 conference

This was the first conference of its kind and created a way for research, policy, management, and conservation to come together and effectively communicate findings with each other. Conferences are an important aspect of any graduate student experience; I was able to share my findings with many coral scientists from around the world, and learned about novel research and conservation strategies coming from other research labs and field-based organizations, too. Furthermore, I made more professional connections which I hope will aid in my future progression as a scientist. Thank you to Friends of Orton Hall for the funding support and opportunities it brought me.

SES Students Take Class Trip to the Guadalupe Mountains



Class participants in front of El Capitan, western escarpment. From left: Datu Adiatma, Erika Danielsen, Jonathan Bell, Ryan Heber, Chris Waid, Teresa Avila, Dr. Derek Sawyer, Christopher Conwell, and Brent Lary. Photo: Datu Adiatma.

Recently, during Spring Break (March 11-16, 2019), Dr. Derek Sawyer led a field trip of SES students to the Guadalupe Mountains of west Texas and southern New Mexico. The 6-day trip featured visits to classic locations of the Permian Reef Trail, Last Chance, Bone, Shumard, Slaughter, and Walnut Canyons, plus the Carlsbad Caverns and roadside stops at the Castille Evaporites and the Rader Slide.

The Guadalupe Mountains provide outstanding continuous exposures of a wide spectrum of carbonate and siliciclastic environments across a shelf-to-basin transect. Prior to the trip, students paired up to research an outcrop locality of their choosing. In the field, day trips were led by each team and as a group worked together to interpret depositional environments and synthesize observations to infer paleogeographic evolution. The goals of the course were to increase educational field-course opportunities for students and to provide direct experience in mixed carbonate-siliciclastic systems.

Class participants included: SES graduate students Christopher Conwell, Teresa Avila, Ryan Heber, Brent Lary, Datu Adiatma, and Brandi Lenz; SES undergraduate Jonathan Bell; and Ohio Department of Natural Resources geologists Erika Danielsen and Chris Waid.

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Participants in the course offered the following feedback.

“This trip provided an excellent opportunity to see both the stratal geometry and lithological patterns of depositional sequences in one region (and even at single outcrops!), helping expand my understanding of sequence stratigraphy in mixed clastic-carbonate environments.”

“The best part of this trip is simply being able to put my finger on Sequence Boundaries (SBs). It is just spectacular!”

“My favorite part of the trip was in Bone Canyon, where we saw amazing angular unconformities, channel scours, breccias, and deformed sandstones in close proximity.”

“As a professional geologist, continuing to take field courses like this is invaluable to me. The mixed carbonate-siliciclastic deposits exposed in the Guadalupe Mountains provided excellent analogues to rocks that are not as well exposed here in the Midwest. It’s great to bring new knowledge back with me and apply the concepts I studied on this trip to my research in Ohio.”



A large seismic-scale sandy turbidite channel outcropping in Shumard Canyon with El Capitan and the western escarpment in the background. Photo: Derek Sawyer.



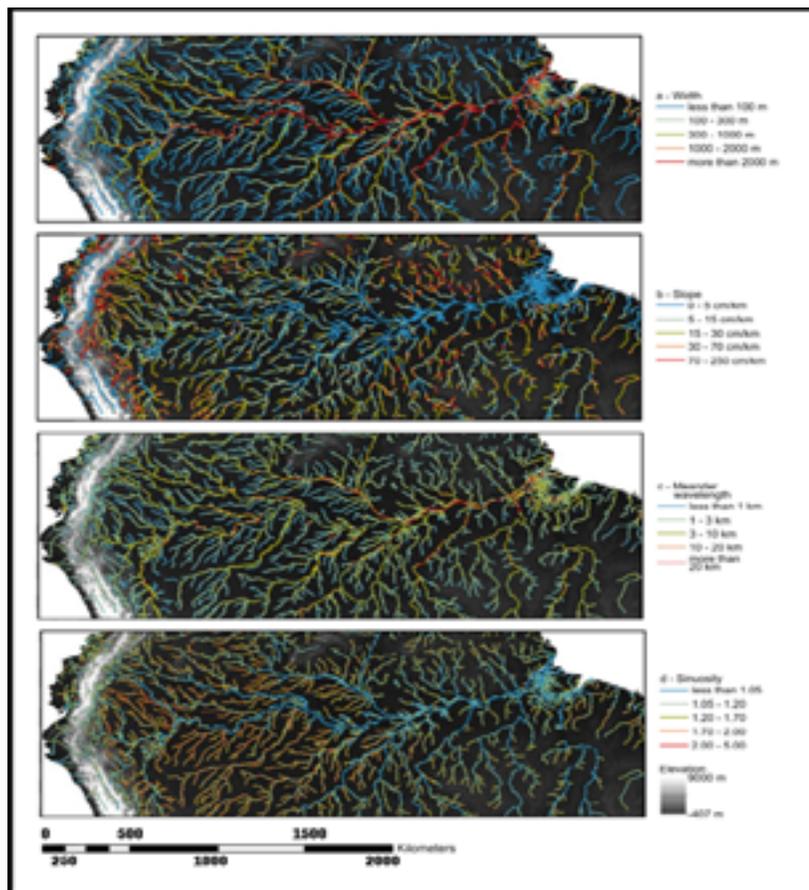
Students examining carbonate slope and basin deposits along the Permian reef trail, McKittrick Canyon. Photo: Derek Sawyer.

The field trip expenses were fully supported by The Ohio State University Center for Energy Research, Training, and Innovation (CERTAIN) Faculty Fellows Program award to Dr. Sawyer.

New Paper from Prof. Durand's Group Explores Global River Geomorphology

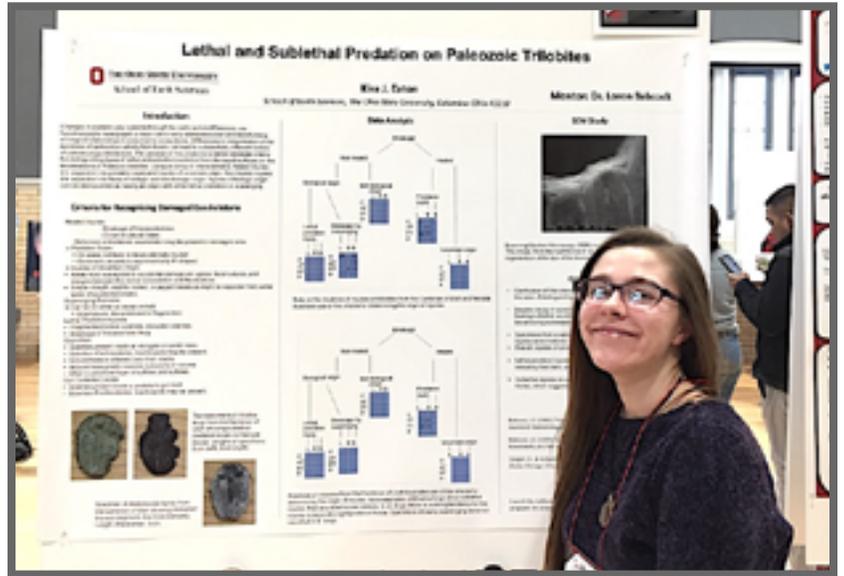
For years, scientists and engineers have been using aerial photography to study the shapes of rivers, how they change over time, and how they relate to other river characteristics, such as river width, the slope of the water surface, and flow. These studies served as the basis for the development of theories describing erosion, sediment transport, the speed at which flood waves travel through a basin, and as guidance for the measurement of river flow. However, such studies were often conducted in person, or done by combining results from other authors, leading to a very limited coverage of world rivers, most of which were in North America. As images of world rivers obtained by satellites became available and adequate computational power became affordable, the SES research group headed by Dr. Durand found that they were able to describe the shape of world-wide rivers and how other properties, such as slope, width, and flow relate to meander characteristics. Among their findings, it was shown that river width is directly associated with the magnitude of meander wavelength and catchment area and that narrower rivers show a larger range of slope and sinuosity values than wider rivers. The group's analysis demonstrated that, although classical geomorphic studies had limited geographical coverage, their results could generally be applied to typical rivers over the world. Finally (and somewhat surprisingly), it was shown that power laws between mean annual discharge and width can predict width typically to -35% to +81%, even when a single relationship is applied across all rivers with discharge ranging from 100 to 50,000 m³/s.

Figure 1. Evolution of the river network properties over the main stem of the Amazon River and surrounding tributaries. Panel A shows river width, B shows slopes, C shows river bends colored according to the meander wavelength, and D sinuosity. The background grayscale represents elevation according to Global 30 Arc-second elevation model.



Brevia

Kira Eaton (pictured to the right, and also on page 4 of the February 2019 edition of the Alumni News Notes) is a graduating senior of the School of Earth Sciences who presented her research last month at the Denman Undergraduate Research Forum. The title of her presentation, “Lethal and Sublethal Predation on Paleozoic Trilobites”, and the name of her faculty advisor, Dr. Loren Babcock, was accidentally omitted from the February 2019 News Notes. Congratulations on your hard work, Kira!



ALUMNI SPOTLIGHT



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WHERE HAS YOUR DEGREE TAKEN YOU?

After graduating from Ohio State, I moved to Baltimore to attend graduate school at Johns Hopkins University. I always assumed that I would complete my Ph.D., but after getting my Masters, I needed a break from school and research. A fellow Ohio State alum had moved to Los Alamos, and after visiting the small town in the mountains of northern New Mexico, I knew it was time for me to move away from the East Coast and try something new! I interviewed and was selected for a Post-Masters position at Los Alamos National Laboratory (LANL). After a 1-year Post-Masters, I was offered a permanent staff member position with the Earth and Environmental Sciences Division at LANL, where I have now been working for eleven years.

Most of my time at LANL is spent studying the role of geology in nuclear test signatures and detection. I am also currently in charge of a project that is studying cliff retreat rates at a low-level radioactive waste disposal facility. I love that I get to spend time doing both field and office work, and it's really fun and exciting to apply geology to real-world problems!

MOST MEMORABLE EXPERIENCE AS AN SES STUDENT?

My favorite memory of my time at Ohio State was being given the opportunity to go to Antarctica with Dr. Berry Lyons and his research group! Field camp is a close "second favorite".

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

My time as a geology student at OSU taught me to have fun while working hard, which is the philosophy that I still apply to my life today!

Volunteer for research projects as often as possible – you never know where they might lead you!