THE OHIO STATE UNIVERSITY

SCHOOL OF
# EARTHSCIENCES

# July 2018 News Notes

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## Alumni Change Lives

*Christopher Conwell is a graduate student working with Dr. Matthew Saltzman. Here he describes how the Friends of Orton Hall fund helped further his graduate studies. If you are interested in giving to support the Friends of Orton Hall or other funds, please visit our giving page (link).*

The funding I received from Friends of Orton Hall covered the cost of supplies and travel for my field work this summer in the Antelope Range of central NV. The Mid-Late Ordovician strata at this locality preserve a period of global cooling throughout this time period, and their study is critical to the completion of my dissertation work.

The processes that could drive a period of Ordovician cooling lasting several tens of millions of years remain uncertain. Analysis of strontium and neodymium isotopes in the samples collected will test the hypothesis that the Taconic Orogeny was key in the sequestration of atmospheric CO2 that ultimately produced this cooling trend. Changes in ratio values of these isotopic systems serve as proxy evidence for the timing of changes in the composition of weathering sources, thus allowing us to see how the timing of this mountain building event aligns with transitions in paleotemperature proxy data. SES graduate student Datu Adiatma and I sampled over 200 meters of section at high stratigraphic resolution, allowing us to really "zoom in" on changes in Ordovician earth systems and figure out how these systems were interacting.

This was a first experience in planning and executing my own field excursion (with guidance from my advisor, Matt Saltzman). As with most learning in graduate school, there is no substitute for developing your own plan and making your own mistakes, and thus the influence of this opportunity on a young scientist cannot be understated. I am tremendously thankful for the funds afforded by Friends of Orton Hall, and I plan to share the results of this work at GSA 2018 and topical Ordovician conferences later on.

# Noble Gas Geochemistry Group paper receives Dal Swaine Award

*Lead Author Dr. Jennie Harkness.*

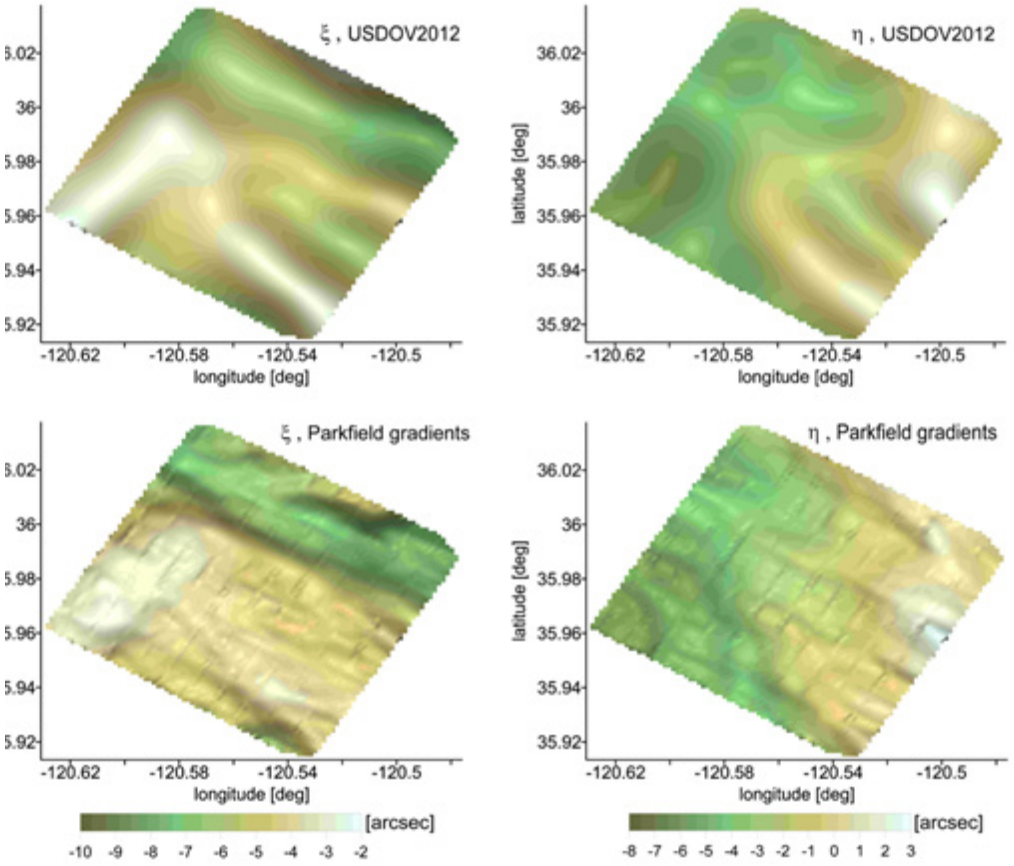
Dr. Jennie Harkness, a postdoctoral scientist at Ohio State, Colin Whyte and Myles Moore, both graduate students, and Professor Tom Darrah from the School of Earth Sciences have received the prestigious Dal Swaine Award from the Society for Organic Petrology. The award is presented to the authors of the paper judged to be the best for the year in coal and hydrocarbon source rock geochemistry. The paper, entitled "The geochemistry of naturally occurring methane and saline groundwater in an area of unconventional shale gas development," was published last year in Geochimica et Cosmochimica Acta and highlighted in articles by NPR's State Impact, Energy & Environment News, and Fox News.


*Water sample collection.*

The study investigated the chemistry of private drinking water wells in West Virginia over a three-year period during which hydraulic fracturing of the Marcellus Shale was initiated. This study was the first to report a broadly integrated use of geochemical techniques, including isotope and noble gas tracers, in studying groundwater contamination before and after the installation and fracking of shale gas wells. The results reveal that saline, methane-rich water has naturally migrated over time into the shallow aquifers. While the study did not find any evidence for groundwater contamination from fracking during the first three years, it did present evidence that accidental spills of wastewater pose a threat to surface water quality in the region. In addition to establishing baseline groundwater quality in an area of unconventional natural gas production, the noble gas geochemistry provides exciting new insights into the subsurface gas geochemistry of the Northern Appalachian Basin.

# Prof. Jekeli publishes new paper in Journal of Geodesy

Professor Christopher Jekeli's new paper in the Journal of Geodesy focuses on the Deflection of the Vertical (DOV), which is the angle of the gravity vector relative to a geometrically defined vertical. The paper shows how airborne gravity gradiometry can improve our models of the DOV (east, h, and north, x, components) compared to existing models, such as the USDOV2012 produced by the National Geodetic Survey. The gradient-derived DOV maps in the Parkfield area of the San Andreas Fault include some remaining artifacts from the airborne gradient survey tracks. DOVs can be used to interpret subsurface geology and geophysics and are important for precision inertial navigation.




# Prof. Grottoli Receives Voyager Award

Dr. Andrea G. Grottoli, Professor in the School of Earth Sciences, has been recognized with the Voyager Award from the American Geophysical Union's Ocean Sciences Section in recognition for her contributions to, and understanding of, coral bleaching, biogeochemistry, and skeletal chemistry (link). Established in 2016, the Ocean Sciences Voyager Award is given to mid-career scientist (10 to 20 years post-degree) in recognition of significant contributions and expanding leadership in ocean sciences. The American Geophysical Union (AGU) is an international non-profit scientific association with 60,000 members in 137 countries. Many congratulations to Prof. Grottoli.

*ALUMNI SPOTLIGHT*

# SEAN O'BRIEN

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> *Seek opportunities to develop and practice your communication skills. Pursue the topic areas that interest you.*

## WHERE HAS YOUR DEGREE TAKEN YOU?

After earning my undergraduate degree, I worked for an oilfield services company on exploration drilling platforms in the Gulf of Mexico. I got my hands dirty, worked from midnight to noon, and made some great friends – this was right in the middle of the industry price downturn. My employer laid off thousands of people, which started my "forced vacation" as Dr. Krissek called it.

I found myself interested in market dynamics, commodity economics, geopolitical risk, and industry fundamentals. I moved to Washington to work for the Energy Information Administration, the federal agency responsible for analyzing and disseminating energy data and information. Drawing on industry knowledge gained at Ohio State, I manage a team of data analysts who publish information about oil and gas production in the United States. This information is used by everyone from United States policymakers to integrated oil and gas companies to global energy agencies.

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

I went to three AAPG Meetings while completing my degree and the opportunity to interact with industry employees and academics provided me a birds-eye view of the industry that I found invaluable – a big thanks to everyone who made those trips possible. The Shell Drilling Camp (Robert, LA) and the Shell Undergraduate Research experience were also two touchpoints that helped me better understand my long-term interests and how those aligned with my career goals.

## MOST MEMORABLE EXPERIENCE?

Visiting Big Cottonwood Canyon and the Wasatch Plateau. Eating two meals a day at the Satisfied Ewe.