



Council on Undergraduate Research – Geosciences Division

## 2018 GeoCUR Award for Excellence in Student Research

---

### **Matthew Barley, Indiana State University**

*Earth and Environmental Systems, Nominated by: Dr. Jennifer Latimer*

Matthew Barley has completed multiple research projects during his undergraduate career at Indiana State University in biogeochemistry. Notably, he was a co-author with another undergraduate student on an abstract that was selected for a talk at GSA. This same project was presented at CUR's Posters on the Hill event in 2017. His early research focused on estimating bioavailability of heavy metals in urban soils, the results of which are currently in development as a manuscript. Matt's recent project focuses on the biogeochemistry of wetlands sediments and is essentially an original project that he designed and developed. Matt spent many hours in the field working out the logistics of collecting cores in areas that have limited access. He enlisted the help of his peers and developed plans for learning how to use the coring equipment and collecting his cores. He also explored methods and approaches we do not regularly employ in the lab, and he has diligently collected and analyzed data. Matt has always been a hard working student who is very bright, but he has also developed into a focused, conscientious, and enthusiastic researcher.

### **Sarina A. Basile, Furman University**

*Earth and Environmental Sciences, Nominated by: Dr. William Ranson*

Sarina Basile is an exemplary student and double major in Earth & Environmental Sciences and Spanish. A true liberal arts student, she has studied abroad three times and also to the American southwest in pursuit of her two degrees. Her senior thesis, entitled "Geology and Blue Ridge Escarpment Evolution Along the Thompson River in Northwestern South Carolina and Adjacent North Carolina", examines the Thompson River as a case study in order to understand what processes are influencing river erosion and escarpment retreat. Field studies along the Thompson River examined structural and petrologic features of the bedrock, which were combined with digital elevation models and longitudinal profiles to better understand the migration of prominent knickpoints along the river. Sarina has read over 50 scientific papers to place her research into context and has produced an excellent thesis, which has contributed to our understanding of erosional processes in bedrock rivers and the evolution of the ancient Blue Ridge escarpment. She will present the results of her research in the CUR poster session at the Southeastern Section meeting of the Geological Society of America in Knoxville, TN in April. Sarina is highly motivated, a joy to work with, and a great collaborator with

students and faculty alike. Sarina plans to attend graduate school in hydrogeology and fluvial processes next fall. Congratulations Sarina!

### **Hayley Beitel, The University of Tennessee at Chattanooga**

*Biology, Geology and Environmental Science, Nominated by: Dr. Jonathan Mies*

Hayley Beitel is an accomplished Brock Scholar at The University of Tennessee at Chattanooga and will soon graduate with a BS Geology degree. Her research experiences as an undergraduate student are exceptional. During her second year, she assisted a fellow student in a mineralogical study of petrocalcic soils at Mormon Mesa, Nevada. In her Departmental Honors Thesis, she is attempting to analyze metamorphic index minerals and textures in part of the southern Appalachian Blue Ridge using GIS and digital image processing. In related research she is also using these technologies to assess quartz crystallographic fabric and is exploring the potential of using remote sensing to map well-exposed igneous and metamorphic lithologies. By the time she graduates, Hayley will have presented her research at the Southeastern Section meeting of the Geological Society of America and will have two published abstracts. We are very proud of Hayley and her accomplishments in our program and are excited to nominate her for a GeoCUR Award for Excellence in Student Research.

### **Tynon Briggs, University of West Florida**

*Earth and Environmental Sciences, Nominated by: Dr. Phillip Schmutz*

It is with pleasure I recommend Tynon Briggs for the GeoCUR Award for Excellence in Student Research. Ty has been an active participant in my coastal geomorphology lab for the past two years. He jumped into research feet first that first semester, which is quite impressive for an undergraduate student. Often undergraduate research is focused on augmenting a portion of a professor's research, yet for Ty this was not the case. He recognized an issue and took an initiative to develop an independent project. The quality of Ty's research is top tier. He was funded through the College of Science and Engineering's Summer Undergraduate Research Program and UWF's Office of Undergraduate Research. He has presented at a handful of conferences, receiving high praise from numerous scholars. He was awarded honorable mention for best undergraduate research at the Southeastern Division of the American Association of Geographers conference and won best undergraduate research at the Young Coastal Scientist and Engineers conference. Ty is also in the processes of preparing the output of his research for publication to the Journal of Aeolian Research. To find an undergraduate student with the ability to develop a project that is at such high quality to be awarded at conferences and produce a publication is rare. In summary, Ty is a highly intelligent, reliable and intrinsically motivated student which is rooted in a robust curiosity for geoscience. It is my hope that you give Ty the greatest of consideration for the GeoCUR award. He has my highest recommendation.

### **Adam Cole, Kutztown University**

*Physical Sciences, Nominated by: Dr. Erin Kraal*

Exemplary effort in finding and defining an independent research project, persistence in the face of challenges, demonstrating research team leadership, and presentation at a national conference.

## **J. Ryan Hawsey, College of Charleston**

*Geology and Environmental Geosciences, Nominated by: Dr. Timothy Callahan*

The Geology faculty at the College of Charleston nominate J. Ryan Hawsey for the 2018 GeoCUR Excellence in Student Research Award. He will complete his Bachelor of Science degree in Geology in May 2018. Ryan has maintained excellence in coursework, research, and extracurricular activities. He has been a teaching assistant for Structural Geology laboratory sections for two years, and has consistently been a leader among his fellow students. Ryan has been part of the Benthic Acoustic Mapping and Survey (BEAMS) program since his first year and has conducted and presented three research studies, including a study conducted in 2017 during his Summer Student Fellowship at Woods Hole Oceanographic Institution (WHOI). His research has included a seafloor habitat studies in Ireland, analysis of software programs for shipwreck detection acoustic data, and a study on adjusting navigational data to optimize multibeam sonar seafloor bathymetric maps of the Mid-Atlantic Ridge. Ryan is completing his Bachelor's Essay studying dredged sites within the Charleston Harbor using an autonomous surface vehicle equipped with sidescan sonar tools.

Ryan has presented research results at the American Geophysical Union 2016 Fall Meeting, the 2018 Ocean Sciences Meeting, the US Hydro Annual Conferences in 2015 and 2017 and the 2016 Canadian Hydro Meeting. Locally, he has also presented at the College of Charleston, including Convocation Day and the Sciences and Mathematics Research Poster Session (2016, 2017, and 2018).

Ryan has demonstrated exemplary work in all areas of his academic pursuits, and has extended himself far beyond his peers.

## **Emmet Norris, Middlebury College**

*Geology, Nominated by: Dr. Patricia Manley*

The Middlebury College Geology Department is proud to nominate Emmet Norris for the CUR Award for Excellence in Research. As an active learner, Emmet brings a genuine enthusiasm and a sense of wonder to all of his studies. In addition to his consistent performance in coursework, during three years at Middlebury he has participated in a wide variety of research endeavors. He contributed fundamentally to the success of summer fieldwork in Utah during two consecutive years. He twice traveled to the University of Wisconsin-Madison where he conducted cleanroom chemistry to isolate Sr and Nd from these Utah samples and analyze their isotopic composition with TIMS and MC-ICP-MS. He also spent a summer working jointly with a Middlebury professor and a geologist from the Vermont Geological Survey studying a recently identified groundwater contamination problem in southwestern Vermont, and he has presented results of his research at conferences (e.g. GSA, EGU). His expertise and experience make him an excellent TA for geology courses, a venue where he is able to share his knowledge and experience in laboratory research. Whether through thesis research, independent studies, or summer work, few students in recent memory have conducted such a varied array of successful geological research at Middlebury. Emmet's fascination with geology

also has a strong societal component and he is actively researching opportunities for graduate work at the intersection of earth science and solutions to societal challenges. Through his presence and contributions, Emmet has enriched his classes and the Geology Department at Middlebury over the past three years. We enthusiastically nominate him for this award.

### **Elizabeth O'Brien, Miami University**

*Geology and Environmental Earth Science, Nominated by: Dr. Claire McLeod*

In short, Elizabeth is exactly the type of student that is needed in the STEM fields. She possesses a keen intellect and natural curiosity, and has one of the strongest potentials for a successful scholarly career I have seen in any undergraduate student at Miami University. To date, Elizabeth has received \$3990 of competitive funding in support of her research activities. In the Spring of 2017 Elizabeth received a \$390 Undergraduate Research Grant from the North-Central section of the GSA. In the summer of 2017, Elizabeth was the recipient of an Undergraduate Summer Scholarship (USS) from Miami University. She undertook a research project investigating magma mixing and mingling in granites from the Oslo Rift, Norway, and used her allocated research funds, in conjunction with her GSA grant, to travel to the department of Earth and Environmental Science at the University of Kentucky. Elizabeth successfully carried out a week of analyses on her research samples utilizing an Electron Microprobe and at the end of the USS program, submitted a first author abstract to the GSA meeting in Seattle. Elizabeth's abstract was accepted as a poster presentation and in order to fund her travel to the meeting, Elizabeth applied to GSAs On To the Future (OTF) Program. She received \$600 from the OTF program and enjoyed her experience at GSA immensely. To date, these awards represent clear recognition of Elizabeth's academic potential by experts in her discipline. Elizabeth's growth as an early-career scientist continues to be a joy to see!

### **Holly Pettus, West Virginia University**

*Geology and Geography, Nominated by: Dr. Kenneth Brown*

Holly is a senior geology major at West Virginia University (WVU) in the Department of Geology & Geography. She is a first generation college student that has shown a remarkable commitment to her own academic and professional growth.

As a student, Holly consistently produces quality work that exceeds expectations. Her attention to detail and her ability to make observations is outstanding. During class, she is always receptive and eager to learn new material. If she does not understand something, she takes the initiative to ask questions.

Holly is currently working on an undergraduate research project, which investigates the origin of potassium feldspar (K-feldspar) megacrysts from a small granitoid intrusion in western Nevada. Holly has presented this work at local research symposia and at the annual GSA meeting in Seattle, WA. This spring she will complete her project with the goal of publishing her results in the WVU Mountaineer Undergraduate Research Review. Thus far, she is on her way to become an outstanding researcher with a promising career.

As far as personal qualities, Holly is incredibly honest, reliable, and friendly. These qualities will serve her well when working with a diverse group of geoscientists and will directly impact her role as a future leader in science, a role into which I believe that she will continue to evolve. We are very pleased to have such a bright and talented student in our program.

## **Bethany Rysak, Trinity University**

*Geosciences, Nominated by: Dr. Diane Smith*

I nominate Bethany Rysak for the GeoCUR Award for Excellence in Student Research. A geosciences major at Trinity University, Bethany has demonstrated that she is passionate about field work, skilled in obtaining meticulous and detailed analyses, and highly capable of synthesizing a large and complex data set. She has completed two separate research projects at Trinity. In her first project, she studied trace element geochemistry of zircon occurring in sedimentary rocks from the western forearc of the Sierra Nevada under the mentorship of Dr. Kathleen Surpless and presented her findings at the 2016 GSA annual meeting. Last summer, she began working with me on a project examining olivine phenocrysts occurring in fairly primitive basalts of the Indian volcanic field (southern Washington Cascades). Her SEM EDS and BSE analyses reveal that some of these lavas contain olivine grains that must have been derived from other crystal mushes and/or magmas. After filtering out samples that clearly show evidence of disequilibrium, Bethany utilized basalt chemistry to estimate both eruptive and segregation temperatures and pressures. Her results support other studies that have suggested that different basaltic magma types are derived from different depths and sources in the mantle. Bethany is currently writing her senior thesis; I am confident she will receive Departmental Honors. She will present at the joint Rocky Mountain-Cordilleran GSA section meeting this May. Bethany's dedication to research, impeccable work ethic, and enthusiasm as a student of Earth are impressive. I strongly support Bethany Rysak's receipt of this award.

## **Gabriel Schaefer, Penn State Brandywine**

*Earth Science, Nominated by: Dr. Laura Guertin*

Gabriel Schaefer is an outstanding researcher. It is rare to see a first-year student so eager and ready to jump into undergraduate research. Without hesitation, Gabe took advantage of the opportunity to collect air and surface temperature data before, during, and after the August 2017 solar eclipse. At the end of his first semester freshman year, he presented his research results at the American Geophysical Union Virtual Poster Showcase. I look forward to continuing to mentor Gabe as he pursues his energy engineering degree. He has an incredible work ethic and sense of professionalism that has made this a successful first-year research project.

## **Jesse Scholpp, University of South Florida**

*School of Geosciences, Nominated by: Dr. Jeffrey Ryan*

I would like to nominate Jesse Scholpp, a Senior Geology major at the University of South Florida, for a GeoCUR Student Research Award. Jesse got his first taste of research in my 2016 GLY 3311C (Mineralogy, Petrology, Geochemistry) course at USF, when he participated in class efforts to characterize boninitic volcanic rock samples from IODP Expedition 352. Jesse discovered something in the sample he was assigned – clinopyroxene overgrowths on enstatite phenocrysts, and large core-rim compositional changes in olivines, which he inferred as resulting from the mixing of basaltic melt into a boninitic magma. Jesse examined every

thin section we had from that Expedition and found these textures in several. With a classmate, he did electron microprobe analyses of these assemblages and presented results at the 2017 GSA Northeastern Section meeting.

Jesse's detailed investigations of these rocks turned up other unusual features – specifically spinels enclosed in olivine and enstatite phenocrysts, which he recognized could be used to constrain the pressures and temperatures of their melting and crystallization. He has shared his findings with the 2017 GLY 3311C students, and helped them recognize similar features in several of their class samples. He will present on his P-T results for the Exp. 352 boninites at the 2018 GSA Cordilleran/Rocky Mountain Section meeting - and a research-mate from my 2017 class will be presenting with Jesse on their newly identified open-system textures in these rocks.

### **Fernando Silva, Chapman University**

*Environmental Science & Policy, Nominated by: Dr. Christopher Kim*

For exemplary dedication towards research in environmental geochemistry, spanning a range of scientific projects investigating the transport, adsorption/retention, and bioavailability of potentially toxic metal(loid)s in the environment, Fernando Silva is highly deserving of the GeoCUR Award for Excellence in Student Research. Fernando has conducted independent research for several years in the Kim Environmental Geochemistry (KEG) Lab at Chapman University, and has been involved in material synthesis, benchtop experimentation, X-ray synchrotron research, in vivo animal exposure sample digestions, computational analyses, and more, always bringing a thoughtful, curious perspective to the scientific research environment. His contributions to the work of the KEG Lab are considerable, and his enthusiasm for research has been infectious to his peers in the lab. He is a great example of the excellence in student research that this award seeks to recognize.

### **Brooke Vander Pas, University of Wisconsin Oshkosh**

*Geology, Nominated by: Dr. Eric Hiatt*

I am writing to nominate Brooke Vander Pas for the 2018 GeoCUR Award for Excellence in Student Research. Brooke is bright, hard-working, and motivated, and she has maintained a high G.P.A. in our demanding major while working to pay for her education. This Fall, she will begin her Master's degree and pursue a career in Geology. Brooke is interested in carbonate systems and the inter-relationships between organisms and sedimentation.

I have known Brooke for the last four years as her teacher, and academic and research advisor. She has been doing research projects, for about two years. Brooke is exceptional at detailed work and is skilled at petrography, sample preparation, X-ray diffraction, scanning electron microscopy, and sample preparation for stable isotope analyses and data interpretation.

Brooke is a great person to have in the department because she works seven days per week and is always available to help around the department (proctoring introductory-level exams, tutoring, she has helped other students with their research projects, and many other tasks). She is mature and driven and sets very high standards for herself.

Brooke has excelled in our department as an undergraduate teaching assistant, tutor, and in pursuing her undergraduate research projects. She is a role model to other students

and based on her academic excellence, dedication, and her career interests in following an academic career; I wholeheartedly recommend Brooke Vander Pas--I cannot think of a better candidate to represent GeoCUR.

## **Jory VanEss, Grand Valley State University**

*Geology, Nominated by: Dr. Ginny Peterson*

The Geology Department at Grand Valley State University recognizes Jory VanEss for his research to establish an approach for determining the 3D strain ellipsoid in dunite samples used for Electron Backscatter Diffraction (EBSD) work. 3D shape fabrics, which provide a reference frame for interpretation of EBSD data, were difficult to determine visually in dunite samples collected from the Buck Creek ultramafic body in western North Carolina. Jory was creative in exploring several approaches to this problem. Jory took ownership of the project – continually seeking new approaches and often exploring new software solutions on his own. He developed a protocol for creating stitched images with a new microscope camera, that was the basis for his measurements and became skilled with image processing and ellipse fit programs. This was a conceptually challenging project that involved quite a bit of tedious work along with figuring out new methods and thinking in 3D to convert data from one reference frame to another. Jory will present his research at the GeoCUR-sponsored poster session at the North Central GSA meeting this spring and he is writing up the results for his senior capstone paper. In addition, his research results provide important constraints for our interpretation of olivine EBSD data from the southern Appalachians.