



## 2015 GeoCUR Award For Excellence in Student Research

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### Lauren Bane, University of Wisconsin Oshkosh

*Geology, Nominated by: Dr. Eric Hiatt*

I am writing to nominate Lauren Bane for the 2015 GeoCUR Award for Excellence in Student Research. Lauren is one of the brightest and most motivated students we have had in the department. Lauren already has research and field experience, is skilled at preparing thin sections, doing scanning electron microscope (SEM) petrography, and has excellent overall research and organizational skills. She did an excellent job on her first small research project, and she won one of the two highly competitive awards for her presentation at last year's Celebration of Scholarship. Completing this small project allowed Lauren to learn how to "do research". She knows how to ask insightful research questions, formulate methods to address the questions. She has the proven ability to do the work, and knows how to present results.

Currently, Lauren is doing a research project with me for her Honor's thesis on the biochemical mineral paragenetic relationships in sediments deposited under the Pleistocene Peru margin upwelling system. Lauren has outlined an ambitious schedule for this coming summer and fall, but she is determined to complete an Honor's thesis (May 2016) that will be publishable in a major peer-reviewed scientific journal. She is very dedicated and focused, will complete the project--and will do an excellent Honor's thesis based on this work.

Based on her academic excellence, dedication, and her career interests in Geology and in pursuing a professional career in Geology, and possibly an academic career, I wholeheartedly recommend Lauren Bane. I cannot think of a better candidate to represent GeoCUR.

### Bryce Barney, Brigham Young University - Idaho

*Geology, Nominated by: Dr. Dan Moore*

During the 2014 summer break Bryce Barney and AJ Jernigan mapped the Heise Cliffs area. Bryce led the effort. Detailed preliminary mapping was completed in the 1970's and 80's by Dave Doherty and others. This mapping formed the foundation for Bryce and AJs work. Based on observations made while mapping, Bryce, AJ, and I interpreted the following: the geologic history of the area, the nature of the southern boundary of the Blacktail caldera, and the structure of the Heise step-over (between the Grand Valley and Rexburg fault

segments). Bryce demonstrated the ability to identify units with multiple facies, differentiate units with similar characteristics, map a large area in a relatively short time, and create a professional-grade map using GIS. He also demonstrated the ability to think four-dimensionally, form hypotheses, identify observations that could be used to test the hypotheses, then make those observations and modify the hypotheses. The map we created will be published as an IGS Technical Report and will become part of the Rexburg 1:100k map. Bryce has yet to take Field Camp. He is in the top 10% of students I have mentored over the last 8 years (n=30).

## Sarah Bender, The College of Wooster

*Geology, Nominated by: Dr. Meagen Pollock*

The College of Wooster Geology Department would like to recognize Sarah Bender for her excellence in researching the resilience of endangered acroporid-dominated coral reefs. Sarah participated in a Keck Geology project in the summer of 2014 in which she and her teammates investigated ecosystem dynamics in Coral Gardens, off the southern tip of Ambergris Caye in Belize. Sarah's research entailed collecting data on live coral abundance, estimating coral growth rates, and quantifying bioerosion by grazing fish and sea urchins. Her work adds to the growing body of knowledge on reef accretion based on branching coral growth and makes an important contribution to coral reef conservation and protection efforts.

## Angela Boney, Daytona State College

*School of Biological and Physical Sciences, Institute of Marine and Environmental Studies,  
Nominated by: Dr. Debra Woodall*

The Institute of Marine and Environmental Studies (IMES) at Daytona State College (DSC) would like to recognize Ms. Angela Boney for her outstanding accomplishments while researching ocean plastics associated with Florida's coastlines. Ms. Boney exhibited extraordinary talent when designing and conducting her research and continues to develop her knowledge of and experience with her research topic. While researching Florida's ocean plastics, Angela showed a willingness to go beyond what was required by visiting numerous beaches around the state for sample collection. She then identified methods to chemically analyze her samples; methods that had not been used at DSC prior to Angela's research. Throughout her time at DSC, Angela has shown that she is a goal-oriented student with an ability to work independently, efficiently and effectively and is, overall, one of IMES finest, most well-rounded undergraduates. In addition to her undergraduate-research skills, Angela has shown her commitment to furthering the discipline of science by serving as mentor to incoming undergraduate students. When mentoring these students, her comments and suggestions are well thought out and clearly communicated. By all accounts, she has been inspiring to these students and has helped each of them to cultivate their individual scientific skills. Overall, Ms. Boney has exhibited the professional maturity that is certain to allow her to accomplish her academic and career goals. It is, therefore, with great honor that I strongly recommend Ms. Angela Boney for GeoCUR Award for Excellence in Student Research.

## Kimberly Bowen, Penn State Brandywine

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

As a sophomore with a passion for the Earth sciences, Kimberly Bowen has demonstrated exceptional dedication and a strong work ethic towards undergraduate research. Kimmie was seeking a research experience during the summer following her freshman year at Penn State Brandywine. In the summer and throughout her sophomore year, she established the citizen science Picture Post project at four locations on campus to begin collecting data (specifically digital photographs) for an environmental baseline of the campus landscape. This baseline is critical to have before major construction projects begin and to track the impact climate is having on the timing of seasonal changes over the years. Kimmie actively shares her work with others on campus and presented some of her early results on the campus greenness index in a poster session on citizen science at the American Geophysical Union Fall Meeting in San Francisco in December 2014. AGU also featured Kimmie as part of their Postcards From the Field 2015 Calendar. Although Kimmie will be transferring to another campus to complete her degree, she is determined to make sure another student researcher will be fully committed to continue collecting data, and that the entire campus community and beyond attends information sessions and views videos to be able to take their own digital photographs to contribute to the project. Kimmie has done an outstanding job being an ambassador for undergraduate research, citizen science, and for establishing the first Picture Posts in the entire state of Pennsylvania.

## Christopher DeFelice, Norwich University

*Earth and Environmental Sciences, Nominated by: Dr. Chris Koteas*

Christopher DeFelice has conducted an exemplary senior research project as part of his degree requirement for a BS in Geology in the Department of Earth and Environmental Sciences at Norwich University. Chris' work involved detailed bedrock geologic mapping across a complex, ancient fault zone in central Vermont. Geologists have debated the nature and origin of this structure since the early 20th century, and Chris' research makes a notable contribution to the discussion by integrating field mapping with whole-rock geochemical studies and microstructural data. Not only did Chris collect, prepare, and analyze all of his own samples for this project, he used a robust quantitative and qualitative data set to make comparisons with other, better understood fault systems to create a clearer understanding for the tectonic context of his study area. Chris has shown that he has the capacity to produce graduate-quality research as an undergraduate student. He has used the skills learned during four years of coursework to think across several sub-disciplines of geology to produce a research project with aspects of structural geology, metamorphic and igneous petrology, mineralogy, and tectonics. As a department we believe Christopher DeFelice is a creative and driven young geoscientist who has produced an undergraduate research project worthy of a GeoCUR Award for Excellence in Student Research.

## Jenna Forte, Georgia College and State University

*Biological and Environmental Sciences, Nominated by: Dr. Samuel Mutiti*

Jenna has been a great research student who has been conducting research in my research lab. She worked and completed one project that was assessing the impacts of a coal power plant on a local lake. On this project she took ownership and worked as the main researcher with another student, Alyssa Thomson. She was always walking into my office with ideas on how to improve and advance the work. She is currently researching how far plant hyper accumulators can translocate metals from contaminated soils. She has been very creative and innovative on how to conduct the research. I have been very impressed with her work ethics, resourcefulness and willingness to create time to work on the project. They have already presented some of their results at the national Geological Society of America (GSA) in Vancouver and will be presenting new findings at regional GSA. She just received travel awards from the department and GSA to cover her conference expenses. Her hard has also been recognized by the department and has, therefore, been nominated for one of the departmental annual outstanding undergraduate student award. She is also planning to share her findings by publishing her work in a publicly accessible journal and is, therefore, working on her first draft of a paper. Jenna has also emerged as a leader among her peers both in the lab and in the program, and has shown great potential as a researcher. She is also our undergraduate student (teaching) assistant for Physical Geology. To continue her research, Jenna is planning to continue working in the field of Hydrology and is going to graduate school next fall. I believe Jenna represents the interdisciplinary, hardworking, collaborative and well-rounded nature of our program and is the ideal representative for this award.

## Jeff Girts, Fort Lewis College

*Geosciences, Nominated by: Dr. Kimberly Hannula*

This is a well-written thesis that communicates the complex structural reconstructions of faults near Silverton, Colorado. Jeff used 3D modeling software in a way that's new to this department to first, recognize a fault that was difficult to find in the field because of exposure, and second, to determine throw on faults by reconstructing their 3D movement.

## Daniela Goldsberry, University of San Diego

*Environmental and Ocean Sciences, Nominated by: Dr. Beth O'Shea*

The Environmental and Ocean Sciences (EOS) department at USD supervises more than a dozen undergraduate projects each year. Therefore, a student truly needs to excel in their research experience in order to rise above the rest. Daniela Goldsberry does just that. As an avid biologist, Daniela wanted to combine her love of biology with geology in a project that also included her interest in coastal San Diego. Her research, "The influence of sediment geochemistry on the distribution of invasive sea lavender in a coastal sand marsh" developed through a collaboration Daniela cultivated with the San Diego River Park Foundation. At low tides and during high surf conditions Daniela could be found counting plant species and collecting sediment samples. Her diligent work in the lab shows Daniela

to be meticulous and thorough, and her results have led to a greater collaboration with local researchers, produced additional and ongoing student research projects (which Daniela is now co-supervising) and added scientific data to a largely unanswered research question. Overall, Daniela embodies a truly independent, motivated, and successful undergraduate researcher and we are proud to call her an EOS student and USD Torero!

## David McLennan, Indiana State University

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

David McLennan (Mac) is a senior majoring in environmental geosciences at Indiana State University. Mac is a model student and remarkable researcher. Since becoming part of the Biogeochemistry Laboratory Group at ISU, Mac has contributed to at least 5 different research projects, and he serves as an example and mentor to new members of our research group and students throughout the department. Mac presented an invited talk at GSA in October 2014 over his research in the South Pacific Ocean, studying phosphorus accumulation in hydrothermal and eolian settings over the last 31 million years. He is currently preparing a manuscript based on this research. At AGU in December 2014, he presented a poster describing his Holocene record of lake sediment geochemistry from the Beartooth Mountains. In April 2015, he will present the findings from yet another research project that evaluates heavy metal accumulation in a local fishing lake impacted by acid mine drainage at NCUR. Mac has an unwavering thirst for knowledge, and an unparalleled work ethic. In addition to his academic achievements and his tremendous potential as a research scientist, he also routinely volunteers to help other students complete their lab and field work. For these reasons he was selected for this award.

## Isaac Moening-Swanson, Pacific Lutheran University

*Geosciences, Nominated by: Dr. Claire Todd*

Given the strengths he exhibited in class, I recruited Isaac to apply to my glacial geologic research program in Mount Rainier National Park. In his first summer, Isaac mapped boulder bars in proglacial areas as a possible indication of outburst floods. It was a difficult project from the start. With so many geomorphic processes at work in these areas, Isaac had to develop his own criteria for distinguishing fluvial deposits from debris flows – a challenge for even a trained geomorphologist! Unsatisfied with simply descriptive results, Isaac worked to calculate potential outburst flood volumes based on his field findings. Throughout his first summer of research, Isaac was reliably on task, team-oriented, and incredibly hard working. His patience and doggedness in the face of a challenging field project was impressive. All the more so because I was overcommitted that summer and had little time or expertise to offer him.

Based on so many things - relaxed demeanor, reliability, maturity, positive attitude, physical and mental perseverance, and experience with detailed analyses, I asked Isaac to join me on a two-month field research expedition to Antarctica this winter. He spent summer 2014 preparing for this project by immersing himself in the appropriate literature, and making preliminary maps using satellite imagery. After extensive preparations, Isaac

successfully engaged in a challenging glacial geologic mapping project in an extremely remote, rugged environment with a small and isolated team.

## Zachary Perzan, Middlebury College

*Geology, Nominated by: Dr. Patricia Manley*

The Middlebury College Geology Department would like to nominate Zach Perzan for the CUR Award for Excellence in Research. Zach has participated in research with 4 out of 7 members of our department and has made remarkable contributions to every project he has worked on. He has worked on projects ranging from geophysical surveys of Lake Champlain, to cave sedimentology and stratigraphy, to optically stimulated luminescence dating. In addition to an untiring work ethic, Zach brings a sense of curiosity to all of his projects. Each of his mentors can recount a time that they have discussed something with Zach, only to return the next day to find he has located and read several articles on the topic. At times it feels like we are learning as much from Zach as he is learning from us. Zach is also a very strong problem solver, which will serve him well in his future research. Where most students hit a snag and wait for their advisor to intervene, Zach has been known to write his own software, create new lab tools, and always keep things moving forward. We are proud to nominate Zach for this award as he is truly one of the most talented students we have encountered at Middlebury.

## Krista Rasmussen, Chapman University

*School of Earth and Environmental Sciences, Nominated by: Dr. Chris Kim*

It is my pleasure to recommend Krista Rasmussen for the 2015 Council on Undergraduate Research Geoscience Division Award for Excellence in Student Research. Krista is currently a senior at Chapman University, a primarily undergraduate institution in southern California where she has conducted research in the atmospheric sciences. Much of her work has explored the possible correlations between haboob events (large dust storms over Arizona) and climate patterns in the same region. Her research involved a number of computational tools and focused on connecting 10 years of remote-sensing satellite data on atmospheric aerosol concentrations with precipitation data over the same time period. This work was facilitated through Krista's receipt of a highly competitive Summer Undergraduate Research Fellowship at Chapman University in 2013. The results of her research have been presented at multiple on-campus poster sessions and were also presented by Krista at the 2014 European Geophysical Union meeting in Vienna, Austria (Rasmussen and El-Askary, 2014: A trend analysis of aerosol related parameters and their relation to precipitation variability in Arizona). Presenting the results of an undergraduate research project at an international conference speaks to the quality of her work. Perhaps the most unique aspect of Krista's research experience, however, is the fact that she is a double major in Education and Spanish (with an environmental science minor). Working on advanced research problems as a non-science major is truly a testament to Krista's passion for scientific research and has made her stand out among her peers. She is most deserving of this award.

## Darren Seidel, Angelo State University

*Physics and Geosciences, Nominated by: Dr. Heather Lehto*

Darren is the student we all dream of having. Darren consistently goes above and beyond what is needed for anything he does. He is the most hard working and personable young man I have ever known. Darren is a double major in both geoscience and agriculture and has worked on research projects in both areas.

Darren's research in geoscience is a study of the E.coli in the Concho River which runs through town. The E.coli levels have been anecdotally attributed to birds which nest on bridge overpasses. Darren's project is meant to determine, scientifically, what the source of the E.coli is. He collects water samples at sites along the river every week, incubates and counts the number of E.coli, and will be sending some samples to a lab to sequence the DNA to determine the source (e.g., birds, humans, etc.). In the field Darren takes meticulous notes about the area being sampled in the most organized and neatly written field book I have ever seen. It is also obvious that he is passionate about his subject. In addition, he has been interviewed for the local newspaper for a story about his research. It was obvious from the article that the reporter was impressed by Darren's attention to detail and work ethic.

What impresses me most about Darren is that in many ways I already see him as a colleague and not just as an undergraduate. His maturity and work ethic far surpass any of his peers.

## Leanne Stepchinski, Trinity University

*Geosciences, Nominated by: Dr. Daniel Lehrmann*

Leanne Stepchinski is one of the top students in the Geoscience department at Trinity University. She has done an excellent job in her geoscience coursework. Leanne has been very engaged in our department having contributed in numerous service activities and in serving as president of the Geology Club. Leanne has completed an independent research project titled "Triassic stage boundary definition using an integrated biostratigraphy, magnetostratigraphy, chemostratigraphy and geochronology in marine strata of Guandao section, Nanpanjiang Basin, south China" and has presented the results of her work at GSA. She is co-author on a journal publication resulting from this research. Leanne is currently conducting an Honors Thesis research project titled "Controls on Carbonate Factories in the Transition from Ramp to Reef-Rimmed Platform in the Hongyan Section of the Triassic Yangtze Platform" which has included field work in south China, thin section petrography, elemental geochemistry and synthesis. She has done an excellent job on the research and will present this spring at the regional GSA and national AAPG meetings.

## Chad Wood, University of Tennessee at Chattanooga

*Physics, Geology and Astronomy, Nominated by: Dr. Amy Brock-Hon*

Chad Wood is one of the most accomplished students in our geology program. Chad is very much a self-starter and a team player in our geology department. His military experience has given him maturity and a much-admired ability to focus, conduct and complete

independent research, requiring little direct supervision. He has tackled undergraduate research projects as an individual and in a group. He currently is comparing his own recently gathered grain-size distribution and topography data from the Gulf Islands National Seashore to data collected in 2004 along Santa Rosa Island by a UTC stratigraphy class. He is presenting this senior-thesis research at the Southeastern GSA meeting in 2015.

The group project involves Summer 2014 data collection on Man Head Cay off the north tip of San Salvador Island, The Bahamas. This cohort presented its early research results to 2 departments (biology and geology) after returning from San Salvador, then refined their interpretations and presented their research at the Tennessee Academy of Science meeting in 2014, winning 2nd place for undergraduate oral presentations – Chad was the presenter, representing the other 3 team members. The team is also revising their initial conclusions and are presenting via a poster session at the upcoming Southeastern GSA meeting.