



Council on Undergraduate Research – Geosciences Division

2017 GeoCUR Award for Excellence in Student Research

Victoria Benson, Pacific Lutheran University

Geosciences, Nominated by: Dr. Claire Todd

Victoria has worked for two summers in Mount Rainier National Park studying glacial meltwater hydrochemistry and what meltwater composition indicates about the subglacial environment. As part of her work, Victoria developed and adapted field and laboratory protocols, making a lasting impact on the research program by designing new approaches and field equipment. Her attention to detail and thorough field notes were assets to the entire research team, and provide a valuable record for future researchers. Backcountry research poses an added layer of challenges to an early-career investigator, but Victoria took remote and challenging conditions in stride, adapting to the environment around her while maintaining safety and focusing on her research goals. Victoria also has a demonstrated record of taking her work to completion, including presenting her research in a poster presentation at the national Geological Society of America meeting in fall of 2016. The Geosciences Department at PLU recommends Victoria Benson for this award in recognition of her extraordinary effort, accomplishment, and potential in geologic research.

Sean Czarnecki, Angelo State University

Physics and Geosciences, Nominated by: Dr. Heather Lehto

This year we had multiple students complete outstanding research projects. However, Sean is unique in this group of high achievers because of the breadth of his research. Sean is a triple major in math, physics, and geosciences and has completed research projects in both physics and geoscience. His work in physics deals with using bremsstrahlung intensities to measure the effective atomic number of a mineral target to help identify the target.

Sean's geology research focused on detailed mapping (1:8000 scale) in the Sand Springs Range in Nevada under the guidance of Dr. Joseph I. Satterfield. Sean's mapping focused on collecting fault kinematic data and orientations of map-scale folds, which he used to construct cross-sections, revise the sequence of events, and correlate deformation events in the study area to nearby areas.

Sean presented his research at numerous conferences including the SWS AAPG meeting, GSA Annual Meeting, and AGU Fall Meeting all in 2016. Sean was awarded the Outstanding Student Paper Award for his presentation at the AGU Fall Meeting in San

Francisco. In addition, Sean has authored two published articles and one article in preparation on his physics research.

Sean has applied to, and been accepted at, multiple graduate schools to study planetary geology. He has not yet decided which school he plans to attend, but we are confident that whichever school he chooses will be greatly awarded by his dedication to science and his unique perspective to blend geology, physics, and math to solve this and other world's problems.

Jack Dingus, Austin Peay State University

Geosciences, Nominated by: Dr. Kallina Dunkle

Jack Dingus has been involved in undergraduate research investigating *Escherichia coli* contamination in streams near Millersville and Goodlettsville, TN for two years. His accomplishments include presentations at two Geological Society of America Annual Meetings and being selected as an Austin Peay State University Presidential Research Scholar. Jack and his research partners were responsible for sampling for *Escherichia coli* and taking measurements including discharge, pH, dissolved oxygen, nitrates, and temperature for three streams. This has required him to work independently or with a small group in the field, often on weekends. Due to his excitement for the project and motivation, Jack routinely recruits students to assist in the field, has encouraged a couple of students to also be involved with analyses, and utilizes a variety of resources to identify other methods that will help the research progress. Jack's excellent communication and leadership skills have allowed him to also train students in proper sampling protocols and lead students in the field. In addition to his outstanding research work, Jack excels in the classroom, tutors students in Physical and Historical Geology courses, and serves as Vice President of our student organization, the Geoclub. Jack is truly deserving of the GeoCUR Award for Excellence in Student Research.

Lonnie Flett, Miami University (OH)

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

Lonnie has had an outstanding undergraduate research career investigating urban pollution which has resulted so far in 1 manuscript submission (Flett et al. 2016) in *Environmental Earth*, and a poster presentation at the 2015 North Central Geological Society of America Meeting at Madison, Wisconsin. She presented another poster on a completely separate research project on gold mineralization at the 2016 North Central Geological Society of America Meeting in Champaign-Urbana. She plans to present a more extensive poster on gold mineralization at the 2017 Joint Northeastern / North Central Geological Society of America Meeting in Pittsburgh. Lonnie's second project on gold mineralization is very different from her first on urban pollution and demonstrates her flexibility and commitment to geoscience research. Lonnie's gold mineralization work grew out of an initial small scale gold exploration project in Kentucky where she worked with a few students to learn exploration techniques. This experience ultimately led to a desire to diversify her geoscience skill set and create an opportunity to collect data using a variety of instrumentation. Lonnie has won a UPA award, and won a \$200 grant from the Miami University regional campuses for presenting her research. Lonnie is a fantastic ambassador for our department, and unquestionably worthy of this recognition.

Sarah McGrath, The College of Wooster

Geology, Nominated by: Dr. Meagen Pollock

The College of Wooster Geology Department recognizes Sarah McGrath for her excellence in paleoclimate research. In 2015, Sarah interned at the Lamont-Doherty Earth Observatory conducting paleoclimate and paleoceanography research on the geochemical signature of *Globigerinoides ruber* chromotypes. *G. ruber* is the most common subtropical to tropical planktonic foraminifer used as a paleoclimate proxy; however, the geochemical differences in the different chromotypes were poorly understood and thus always separated in paleoclimate records. She found no discernable geochemical difference between the chromotypes, signifying that the chromotypes may not need to be differentiated in paleoclimate reconstructions. She presented this research at the 2015 GSA Annual Meeting. Last summer, Sarah was a summer student fellow at Woods Hole Oceanographic Institution conducting paleoclimate research on a tropical marine sediment core, studying abrupt climate events and their hydrologic response during the last glacial interval. She continued this project for her senior thesis at the College of Wooster and presented her senior thesis research at the 2016 AGU Meeting. She is currently writing up this project as first author for publication. Sarah plans to pursue a Ph.D. in paleoclimatology. Her research will contribute to better climate models to understand past phenomena and predict the future. It will add to a body of work that will help decision makers in the public and private sectors to understand the challenges of climate change.

Tyler Mitchell, University of West Florida

Earth and Environmental Sciences, Nominated by: Dr. Jason Ortegren

The Office of Undergraduate Research (OUR) and the Department of Earth and Environmental Sciences at the University of West Florida would like to recognize Tyler Mitchell for his remarkable research accomplishments. Tyler has worked under the mentorship of UWF Associate Professor Dr. Jason Ortegren for the past 18 months, studying Oceanic Precursors to Gulf Coast Tornado Outbreaks. Tyler's comprehension of the relevant peer-reviewed literature, his wide-ranging skill set, and his obvious commitment to continued excellence set him apart from most undergraduate researchers. By participating in the UWF Hal Marcus College of Science and Engineering Summer Undergraduate Research Fellowship (SURP) program, Tyler spent the summer 2016 semester focusing on this research project and presented preliminary findings in a poster at the UWF SURP Symposium. He received an OUR Travel Award to present his research at the annual meeting of the Southeastern Division of the American Association of Geographers in Columbia, SC, in November, 2016. Tyler also will present a poster at the upcoming NCUR conference in Memphis in April, 2017. Additionally, beginning in January, 2017, Tyler is collaborating with Dr. Ortegren on a separate project, a dendroclimatological reconstruction of tropical rainfall in the Escambia Bay Catchment of the Gulf Coast of the U.S.A. Tyler helped develop this project as part of his goal of earning a graduate degree in a high-profile tree-ring laboratory at a research-focused university. This type of planning and commitment exemplifies Tyler's overall research approach, and bodes well for his future as a scientist.

Joshua Pigg, Indiana State University

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

Joshua Pigg is a senior majoring in environmental geology at Indiana State University. Joshua is an excellent student and has distinguished himself as a leader and enthusiastic undergraduate researcher in our department. Joshua participated in ISU's Summer Undergraduate Research Experience for two summers, which involved intensive 10 week summer research opportunities with a faculty mentor. He has researched several issues related to environmental pollution, including water quality of the Wabash River and lead bioavailability in urban soils. In 2016, the abstract Joshua submitted to the Geological Society of America Annual Meeting was selected for an oral presentation, which is quite an accomplishment for an undergraduate student and speaks to the high quality and societal relevance of his research. He will also be presenting this research at NCUR in April 2017. His research on lead bioavailability is very timely, interesting, and will advance our understanding of the behavior of heavy metals in urban soils and the risks these metals pose to human health. Personally I have been very impressed with Joshua's work ethic, his attention to detail, and his enthusiasm for research. He is very deserving of this recognition.

Allison Scavo, Chapman University

School of Life and Environmental Sciences, Nominated by: Dr. Ramesh Singh

Climate change is reflected by the increase of global temperatures, however, changes are not observed uniformly. Allison Scavo has carried out detailed analysis of climatic parameters (sea surface temperature, chlorophyll concentrations, salinity) affecting the US coasts for the periods 2005-2014. Allison has studied the impacts of these parameters on the fish landings along the US coasts. Long-term analysis indicate that different parameters show positive and negative correlations with fish species. These trends allow comparison of the effects of climate change along the US coasts. The comparison of data show the effects of ocean circulation on the parameters of climate change as well as fish catch.

Highlights of Allison studies:

- Landings of different fish species show different correlations to SST, salinity, and chlorophyll-a concentrations.
- Fish species in locations in the west coast were found to be sensitive to SST while in the east coast, fish species were sensitive to salinity.
- In the west, the average SST and the rate of SST increase southward. In the east coast also SST increases southward but the SST rate declines towards the south.
- On the west coast, average salinity and the rate increase, while along the east coast, average salinity increases in the south but the salinity increase rate declines southward.
- Fish species clearly show sensitivity to climate change based on the SST, Salinity and Chlorophyll in the fish landings along the US coasts.

She has published a paper based on her detailed satellite and fish landing data at the international Conferences IGARSS 2016.

Scavo, AN, Singh, RP. Effect of climate change on California fish species. Poster session presented at: IGARSS 2016. 36th International Geoscience and Remote

Sensing Symposium; 2016 Jul 10-15; Beijing, China. p. 6070-6073 in IGARSS proceedings

And also she made poster presentation titled "A comparison of the effects of climate change on American fish species", at the Fall AGU meeting, Dec. 2016.

Michael G. Shahin, College of Charleston

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

Michael Shahin is a superb student and the Geology faculty at the College of Charleston (CofC) wholeheartedly support him for a GeoCUR Excellence in Student Research Award. Starting in Fall 2015 with his first core course and continuing to date, Michael has distinguished himself as an excellent student. He had the highest grade (of 35 students) in Mineralogy class. Michael has joined with multiple faculty on undergraduate research projects; Michael is working with Dr. Chadwick on field and lab methods studying rocks associated with the breakup of Pangaea; Dr. Beckingham on the relationship between turbidity and suspended solids in tidal creeks; and Dr. Ali to develop satellite based bio-optical models to characterize water quality of the coastal waters. Michael traveled to US Virgin Islands for this latter project and worked in multiple water quality labs both at CofC and the U. of Virgin Islands analyzing water samples. These topics are quite different but Michael has a strong curiosity and work ethic, as well as the maturity to recognize good opportunities and make the most of them.

Michael has presented results at CofC's Convocation Day and at the upcoming 2017 GSA Annual Meeting. He will complete his Bachelor of Science degree in Geology in 2018. Michael is also a busy person outside Geology. He has computer programming skills and is in high demand for his expertise. Michael is also one of the nicest people and is an excellent representative of our program and the university.