

# Geo-Bing

## NEWSLETTER 2018



*Students walk by the fountain at Harpur Quad  
Photo: Jonathan Cohen*

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# A (Final) letter from the (soon-to-be-ex) chair



Chair: Bob Demicco

This will be my last letter as chair of the Department, and my last newsletter contribution. I have been in the department 35 years or so and I have loved every minute of it; but it is time to move on. I have been in on the hiring of every current member of the department and am proud of the faculty we have assembled. The current geological sciences faculty is a solid group of earth scientists and the department is well positioned to train undergraduate and graduate students for careers in geology and environmental science in the 21<sup>st</sup> century. I am proud of the part I played in getting to this cast of characters.

My personal career has been pretty sweet as well. I have continued to suck up knowledge like a sponge right up to this minute. I have learned a tremendous amount from my colleagues, especially Tim Lowenstein, John Bridge, Dave Jenkins and their graduate students. I also learned much from my own PhD students (Beth Gierlowski-Kordes, Kelly Cloyd, Qingjun Yao, Joe Janick, and Kuwana Dyer-Pietras), and from the 20 or so master's and undergraduate students I have mentored over the years. Sometimes I wonder if it has been a fair exchange of ideas with all these colleagues, students and friends. I have participated in, or lead, innumerable field trips, from local hour-long jaunts to week-long Bartle Fund-sponsored odysseys to Florida, Big Bend National Park and the closed-basins of the American West. I owe special debts to my advisor, the late Lawrence Hardie from Johns Hopkins University, John Bridge and the late George Klir, from the Watson School here at Binghamton University I had the great fortune to coauthor books about sediments and sedimentary rocks with Lawrie and John, and co-edit a book on the

uses of Fuzzy Logic in geology with George. The royalties from these enterprises paid for much of the time I spent at the Ale House - time spent with many of the people mentioned above and a number of you.

My personal life has had some ups and downs, but, on balance has had way more ups than downs. My wife Karen has been in my corner metaphorically performing all the duties of a boxing-coach in an old movie. When I reeled back to my corner after a particularly bad round with the administration she would be ready with whatever was called for and, on those occasions I won a round with the administration or signed a book deal or brought home a grant, she would be there to share the exultation. I could not have done this without her. My boys, Edward and David, now in their 30s, have more or less settled. Ed is a dealer/floor in a casino whereas David is enrolled in the computer science department here at Binghamton University. As many of you know, I have spent the last six years or so as a part-time musician playing in a classic rock band in local bars. The band is actually Matt Telfer's old high school band that he called one night when he and I were at Thirsty's and, after 30 some odd years of minimal communication with them, literally said: "we're putting the band back together."

So, for some last, semi-profound thoughts: I have been fortunate to know most of you and you have had a big hand making me who I am. Although I would like to tell you about hard work and its correlation with success, many of the really good things that befell me were, like the incident with Matt and the band, or meeting Karen, happy accidents. I will miss all of my colleagues, the current students and you past students that comprise our alumni. Cheers.

## Geo-Bing Newsletter

Editor: David M. Jenkins

Geo-Bing is published periodically by the Department of Geological Sciences and Environmental Studies at Binghamton University.



# Freshman Research Immersion program

The Freshman Research Immersion (FRI) program was started in fall 2016, by inviting selected freshman to begin working on research projects from the very beginning of their college enrollment. Two of the programs involving faculty in geology include the Environmental Visualization and Biogeochemistry research “streams.” These programs are overseen by Timothy de Smet and Jonathan Schmitkoms, respectively. What is described here are some of the students and the projects they have been working on over the past two years.

## Environmental Visualization - Timothy de Smet

The Freshman Research Immersion Environmental Visualization (nee Geospatial Remote Sensing) research stream is winding up its fourth semester in the department and is thriving. Jasper Baur from the first cohort has been featured on the University webpage, in the *Pipe Dream* and was named a finalist in the National Geographic Chasing Genius Challenge grant opportunity for our research on the detection of the PFM-1 plastic landmine with drone-based aerial thermal imaging. Although Jasper and Will Frazer, junior geophysics major and undergraduate peer mentor for the research stream, ultimately came in second place out of 5,000 submissions for the \$25,000 prize, they brought great awareness to a pressing world health concern. Our students have presented five posters at three conferences, the American Geophysical Union Fall Meeting in New Orleans in December 2017, the Geological Society of America Northeastern Sectional Meeting in Burlington Vermont in March 2018, and recently at the Society for American Archaeology Annual Meeting this past April in Washington, D.C. This research on landmine detection, forensics detection and archaeology at the Poverty Point UNESCO World Heritage Site was well received and is helping students personal and professional development in the discipline. Alex Nikulin and I recently published the first paper from the new and growing Geophysics and Remote Sensing Laboratory. The paper, entitled “Catching butterflies in the morning: A new methodology for rapid detection of aerially deployed plastic land mines from UAVs” will appear in *The Leading Edge* this May (de Smet and Nikulin 2018: 306-310). We are continuing this research and will be conducting field trials in the Mojave soon. The second cohort is currently proposing research to be conducted next semester, which includes: induced seismicity, forensics detection, archaeological remote sensing at the Archaeological Conservancy-owned Queen Esther’s site in Pennsylvania, detection of uncapped oil and gas wells with experimental magnetometers, and detection of the hemlock woolly adelgid with aerial multispectral imaging. We look forward to sharing the results of all this exciting research with you soon. Cheers, Tim.



*The first cohort of biogeochemistry students completed FRI in fall 2017.*



*FRI – Environmental Visualization Lab (Photo: D. Tuttle)*

## Biogeochemistry - Jonathan Schmitkons

In fall 2016, Binghamton University's three-year-old Freshman Research Immersion (FRI) program established a biogeochemistry stream. This stream is designed as a three-semester sequence taken primarily by incoming biology, geology, chemistry and environmental science majors but is open to any interested freshman student. Many of those who enroll in the program come with only vague notions of what at first glance seems to be the made-up, compound term "biogeochemistry." However, they soon develop the understanding that they will be studying the intricate cycling of chemical compounds through both the living (bio) and non-living (geo) components of the environment. This program is not designed to replace established major requirements. Instead, FRI supplements and reinforces important concepts encountered in other courses. Unique aspects of the FRI program such as heightened project ownership and the joy of discovery encourage students to persist in what may sometimes feel like dry, introductory STEM courses. Traditionally only a select few students are able to participate in undergraduate research and then only in their final semester or two. The projects chosen and developed by our first two cohorts of biogeochemistry FRI students are as varied as the definition of biogeochemistry is broad.

One group was encouraged to develop a research question dealing with any issue within the realm of nitrogen cycling. They identified the emerging concern of untreated antibiotics and created a project exploring the potential effects of a common antibiotic (sulfamethoxazole) on rates of denitrification. They theorized that the increased use of antibiotics may affect the ability of naturally occurring microorganisms to convert nitrogen pollution in the form of nitrates ( $\text{NO}_3^-$ ) into atmospheric nitrogen gas ( $\text{N}_2$ ). Not only did their experiments demonstrate reduced rates of denitrification, but these decreases occurred at concentrations of sulfamethoxazole similar to those reported in streams across the country. Two students from this project presented their findings at the 2018 meeting of the Mid-Atlantic Chapter of the Ecological Society of America. Although they were the only sophomores to present, they were awarded second place out of all undergraduate posters.

Two groups of students worked on projects that were presented at the 2018 Geological Society of America Northeast Section Meeting. One group focused on biogeochemical cycling in Green Lake located in Fayetteville, N.Y. This unique lake is renowned for being permanently stratified, exhibiting seasonal whiting events and having plentiful bioherms. This



Biogeochemistry FRI lab (Photo: D. Tuttle)



## UNDERGRADUATE RESEARCH HIGHLIGHTS



*From Left- Diana Knoell, Benjamin Dolowich, Jasper Baur, and Olivia Lopez collect water samples from Green Lake in the summer of 2017. (Photo: J. Schmitkons)*

group conducted seasonal water sampling, measured ion concentrations using ion chromatography (IC) and inductively coupled plasma-atomic emission spectroscopy (ICP-AES), and compared their geochemical results with previously published data. They went on to analyze thin-sections of the lake's bioherms and run geochemical models of the lake's whiting events based on the data they collected. The second group's project explored microbial reduction of arsenic (As) and antimony (Sb). While it is well established that some microbes from extreme environments (deep ocean vents, geothermal springs and mine tailings ponds) can respire using As or Sb as an electron donor, they wanted to explore how ubiquitous this property may be. Using microbes collected from the University Nature Preserve, they were able to observe a small amount of reduction by microbes in these non-extreme environments.

Our second cohort of biogeochemistry students has been busy developing projects, many of which build on the research from the first cohort, and are currently in the early stages of data collection. One group is continuing to explore the effects of antibiotics on rates of denitrification and hopes to compare the impact from antibiotics to similar effects caused by deicers. Green Lake proved to be an ideal site to observe biogeochemical cycling. Three research teams from this second cohort are working on projects related to the seasonality and driving force behind whiting events, bioherm formation and sulfur oxidizing bacteria living at the boundary between upper and lower layers of the lake.

A strong emphasis on fieldwork and the fact that many of our projects include a seasonality component mark biogeochemistry as unique among the various

FRI streams. In order to help meet these challenges, the stream was awarded an NSF-Geopath grant that allowed us to provide summer stipends for up to eight students in the summers of 2017, 2018, and 2019. This unprecedented opportunity for students entering their sophomore year encourages biogeochemistry teams to design and complete more robust projects than would otherwise be possible.

The NSF-Geopath grant has also allowed the biogeochemistry stream a unique opportunity to partner with local high schools. Last summer, we designed and ran our first Watershed Research Experience (WRE) for earth science high school teachers along with two to three students from eight local school districts. This one-day workshop was partially designed and run by our summer researchers. It included a guided tour of our campus watershed where we discussed factors controlling water quality. Afternoon demonstrations explained more challenges in assessing watershed quality and demonstrated the instrumentation used for measuring water chemistry. We extended our partnership beyond a single day by providing the teachers with equipment and instructions that allowed some of their classes to sample their own drinking water. FRI biogeochemistry students analyzed the samples and returned the results along with a guide for interpretation that the teachers could integrate into their own lessons. Our goals in these collaborations are the same as those for our overall program. We hope they cultivate an interest in biogeochemistry through authentic research experiences using cutting-edge instrumentation early in students' academic careers.

# Albert Chan, David M. Jenkins and M. Darby Dyar - Hawley Medal recipients

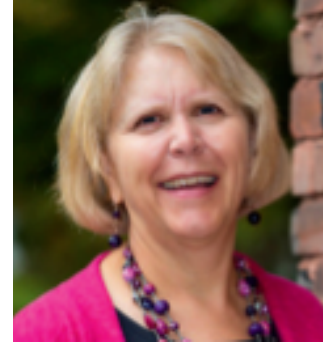
Each year the Mineralogical Association of Canada awards the Hawley Medal, established to honor the distinguished professor of mineralogy J.E. Hawley (1897–1965) of Queen’s University, to the authors of the best paper of the year in the *Canadian Mineralogist*. The article “Partitioning of chlorine between NaCl brines and ferro-pargasite: implications for the formation of chlorine rich amphiboles in mafic rocks,” which appeared in Volume 54, pages 337-351, was chosen as the best paper of 2016. Al Chan, a former undergraduate at Binghamton University, was the lead author while Darby Dyar (Mount Holyoke College, Mass.) helped immensely with the characterization of the ferric iron content of the amphibole (ferro-pargasite) investigated in this study. We are all delighted at receiving this honor.



*Albert Chan*



*David Jenkins*



*M. Darby Dyar*



*Kuwanna Dyer-Pietras at Anvil Points section, Rifle, Co. (Photo: K. Dyer-Pietras)*

- Dave Jenkins



*Biogeochemistry researchers collect water samples from a row boat in Green Lake, Fayetteville, N.Y. in the foreground Note the bioherms of “Deadman’s Point” extending 10-15m into the lake.*



## Joseph Graney

Joe Graney reports that the plans for the Living Building in the Nuthatch Hollow portion of Bunn Hill Creek adjacent to the Binghamton University campus are progressing. He is in charge of the “water-related components” for the project. Undergraduate students Hannah Kloiber and Tara Grogan worked on baseline water quality and quantity assessments needed for water use and recycling calculations for the project as a part of their independent study projects. Joe hopes to use the Living Building lab and classroom spaces for his Environmental Hydrology and Environmental Measurements courses in future years. MS student David Saba will defend his work on evaluating hydrologic responses using water quality monitoring sensors in the Fuller Hollow Creek watershed this spring. Recent PhD Jon Schmitkons continues in his role as the research educator for the Biogeochemistry Freshman Research Immersion (FRI) Program (in its second year) at Binghamton University. Funds received from the NSF award for this project were used to sponsor a “Watersheds and Wetlands” workshop for high school educators and their students at Binghamton University last summer. Joe had a chance to catch up with Jason Johnson at the sectional meeting of the Geological Society of America in Burlington, Vt. this spring. Jason gave an interesting presentation about the groundwater contamination projects he is working on for the NYS DEC. MS student Tyler Rust (co-advised by Joe and Jeff Pietras) also gave a well-received presentation at the meeting. Tyler’s presentation concerned the use of positive matrix factorization (PMF) to explore XRF results from drill cores to unravel the Utica basin depositional history. Joe also reports that the laser ablation system on the new ICP-MS in the trace metal lab on the second floor of Science 1 has been very busy analyzing fluid inclusions over the past year.

On the home front, Dawn (Joe’s wife) recently received a Chancellor’s Award for Excellence in Teaching for her online and in-classroom courses in the Health Information Technology Program at SUNY-Broome. Dawn and Joe made several trips to the mid-west in fall and spring in support of their nephews’ efforts on college baseball and football teams.



## Dave Jenkins

Research in the Hydrothermal Lab continues on several fronts. Nanfei Cheng (PhD) is finishing up a study on several reactions that model the transition of blueschist- to eclogite-facies rocks. One of the reactions he has investigated in the chemically simple system  $MgO-Al_2O_3-SiO_2$  is the lower-pressure stability of the magnesium-rich garnet pyrope in the presence of quartz. This type of very basic research serves as the “backbone” for understanding the stability of more chemically complex garnets in quartz-bearing eclogites, and has gotten the attention of Tim Holland at the University of Cambridge, who incorporates these types of data in his widely used thermochemical database. Nanfei presented this study at the fall 2017 AGU meeting in New Orleans. Jared Matteucci (MS) is finishing a study on the relative stability of chlorine- versus hydroxyl-bearing potassic hastingsite, an iron-rich amphibole that has been found to incorporate a hefty amount of chlorine. His results to date indicate that chlorine lowers the thermal-stability of this amphibole, something that has not been established experimentally prior to this work. Jonathan Schneider is completing an undergraduate research project on the formation of sodalite by the reaction of nepheline and NaCl and finding that sodalite is bit like a NaCl “sponge,” in that it forms by soaking up NaCl even when it is present at low concentrations. Jonathan presented these results at the Northeast GSA Sectional meeting in Burlington, Vt. this past March.

This spring I managed to fall and break my kneecap while out for my weekend jog. The fracture was fairly simple and nothing was displaced, so I am keeping a knee immobilizer on and hobbling around the department with a cane. Jean continues to work at Lourdes as the librarian. William works as a programmer for a local company here in Binghamton. Ken and Liz are currently living in Pasadena, Calif. while Andrew is finishing up his final year at RIT.



## Peter Knuepfer

After a four-year “sabbatical” as president of the SUNY-wide University Faculty Senate (UFS) and member of SUNY’s Board of Trustees, I returned full-time to the department last summer. I resumed teaching the surface processes class, expanded a course in geological hazards into a gen-ed lab course, and have been developing a course in climate change science and policy for environmental studies. I also took over as undergraduate director for the department upon Jeff Barker’s retirement. I’m working on a self-study for the environmental studies program. And I’ve been co-chair of a task force on transdisciplinary and interdisciplinary work for Binghamton University’s Provost and Faculty Senate. My involvement at the SUNY-wide level also continues, albeit at a much lower lever, as I serve the UFS as immediate past president and member of the UFS executive committee. I’m also re-establishing my research portfolio, something that was largely shelved during the last four years. I’m investigating the degree to which the potential for large floods has been changing, first in New York and then more broadly in the Northeast (and ultimately elsewhere) by computing changes in flood frequency from river gage data. Undergraduate Elizabeth Skaggs is working with me to examine changes in Esopus Creek, upstream of New York City’s Ashokan Reservoir, as a result of major floods in the last decade or so; this updates Nic Miller’s master’s work from 2009. I’ve got a number of other unfinished projects that I hope to focus on in the next few years, so you’ll likely hear more about this in the future.



## Thomas Kulp

I continue to research the microbiological cycling of toxic metalloids in the environment with a primary focus on the elements arsenic (As) and antimony (Sb). My main projects include an NSF-funded investigation of biological fractionation of Sb stable isotopes during bacterially mediated reduction and oxidation (redox) reactions as well as an investigation of microbial processes responsible for the release of As and Sb to groundwater in highly contaminated aquifers of West Bengal, India. My PhD student, Jishnu Adhikari, is currently in West Bengal completing the drilling and sample collection for that study. In addition to Jishnu, I also currently advise three MS students who are working on these and related topics.

This past year I was awarded tenure in the department and my wife, Leigh, completed her master’s degree in public administration here at Binghamton University. She is now working as a transportation planner with Broome County. Our daughter Paige is attending fourth grade and our son Gabe is in kindergarten in the Binghamton School District, and both are doing great!



## Tim Lowenstein

On the research side, our group is tracking ancient seawater chemistry with the new Laser Ablation ICP-MS. It is a sweet instrument that can analyze trace and minor elements in fluid inclusions in halite, gypsum, and we hope, calcite (Mebrahtu Weldeghebriel, PhD student and Gene Doyle, MS student). We are working on the core we drilled in Searles Lake, Calif. in 2017, and linking the paleoenvironmental history to Death Valley, and the core we drilled there in 1993 (Kristian Olson, PhD student). Kennie Leet (PhD student) has discovered that some of the Magadi cherts formed from soft gooey gels. Emma McNulty received her MS degree for her work on the Magadi cores taken through the Hominin Sites and Paleolakes Drilling Project



## FACULTY NEWS

(HSPDP). Finally, Solvay Minerals has donated their complete core through the Green River Formation for research. MS student Liz Klonowski is beginning this massive project. In May, I will visit the Dead Sea to collaborate with Nadav Lensky (Geological Survey of Israel).

Family news: Maggie got married to Nick Royston in Philadelphia in September 2017. She is an MD working on her fellowship at the University of Pennsylvania. Scott quit his job of seven years with Global Strategy Group and enrolled in the MBA program at Stanford. Kirby, now in Scranton, has begun her career as an artist — her company is called Lion Stone Press after our last name. Check out her stuff at: [lionstonepress.com/](http://lionstonepress.com/) or [etsy.com/shop/LionStonePress](http://etsy.com/shop/LionStonePress).

Sally and I are hanging with the cats and Lucy, who just celebrated her 15th birthday. She is beyond canine dementia, but still comes to school when she feels like it. Keep in touch!



## Dick Naslund

It has been an interesting year. My old student Ramon Aguirre returned to finish his long-dormant PhD on iron ore deposits in the Chilean Coast Range, and another student, James Haddad, is finishing a PhD comparing the basal olivine zones in some Proterozoic sills we sampled in the Canadian Arctic with the basal olivine zone in the Palisades sill, just a few miles from where he grew up. I visited Spain, Portugal, Andorra, and Ireland last year to see the geology, the culture and to sample the food! The kids and I took a family vacation last summer to Ecuador and the Galapagos, where we saw great geology and great wildlife. The kids were most impressed with the wildlife, I think. The state of New York, in its infinite wisdom, is closing all the sheltered workshops, so Sterling is now in a job-training program. Neelam continues to work as a teacher's aide in the Oak Tree Program for autistic children, which she enjoys very much. Both Neelam and Sterling skied with me most Saturdays at Greek Peak during the past winter. Skye is finishing up her PhD program in medical geography at the University of Washington, and Cambria just started a PhD program in sociology at Princeton. Kalindi taught English in Spain last year, and started a new job teaching Spanish in Vestal High School this past fall. Melanie remains in Boston with her husband and children. I continue to teach and do research on the differentiation of igneous sills, and the formation of magmatic ore deposits. Both of these areas are like gifts that keep on giving. New data generate new ideas, and there seems to be a never-ending influx of new scientific papers to either refute or support. I am planning trips this summer to the Platinum Conference in South Africa, and the Goldschmidt Conference in Boston. If you are going to either, I would love to get together for lunch or a beer. I am always happy to hear from you, or answer any petrology-related questions that you may have. Email to [Naslund@binghamton.edu](mailto:Naslund@binghamton.edu).



## Alex Nikulin

It has been a great year for our geophysics program here at the department. Our newly remodeled lab space has been wonderful and students are getting a chance to field test a variety of geophysical techniques, including a new seismic survey, a GPR unit and a magnetometer array. And drones! We have plenty of drones to carry new infrared and magnetic sensors that are revolutionizing the fields of near-surface geophysics and remote sensing.

Our students have also had a great year! We had both undergraduate and graduate students present first-author posters at the American Geophysical Union conference in New Orleans in December and a number

of papers will be emerging out of the Science I basement in the coming months! Graduate student Tricia Martone defended her MS Thesis focused on seismic activity induced by hydraulic fracturing in Pennsylvania and will go on to join the Bureau of Economic Geology of Texas as a seismic analyst. Undergraduate student William Frazer was accepted into a highly competitive IRIS internship program – a second Binghamton student to advance in three years. Another undergraduate student, Jasper Baur, advanced to second place of the National Geographic Chasing Genius Competition – his project focuses on using remote IR sensors to detect abandoned plastic landmines in post-conflict countries, a project that brings together scientific inquiry and humanitarian concern.

In geo family news, my wife Ania and I are happy to announce the arrival of our daughter Taia, who was born right around the time of the last newsletter! She is active, curious and loves to taste rocks to assess their physical and chemical properties – a young geologist in the making!



## Molly Patterson

It has been a busy year with much to look forward to in the coming years. Still house hunting, but feel more and more settled here in upstate New York. In the past year, I sailed down to the Ross Sea sector of the Southern Ocean as a sedimentologist with the International Ocean Discovery Program (IODP) Expedition 374. The primary objective of our research cruise was to investigate the relationship between climatic/oceanic change and the evolution of the West Antarctic Ice Sheet through the Neogene and Quaternary. Previous studies combining geological data and numerical models indicate that this region is highly sensitive to changes in ocean heat flux and sea level, making it a key target to understand past ice sheet variability under a range of climatic forcings. The recovery of continuous and high resolution Pliocene and Pleistocene records will keep my lab group busy for the next five years.

This past spring Bethany Royce (MS student and Roux Scholarship holder) presented her preliminary research from the southwest Pacific Ocean at the Past Antarctic Ice Sheet Dynamics (PAIS) conference in Trieste, Italy as part of the teleconnections and far-field response focus group. Her work is part of a larger-scale effort with collaborators to understand the downstream influence of the Antarctic's ice sheet on processes occurring in the Pacific Ocean. At that conference, a workshop between U.S. and international colleagues, Drilling Beneath Antarctica's Ice Shelves, was held where I promoted the effort of drilling ice rises of the Ross Ice Shelf along the Siple Coast in order to compliment the ship-based drilling carried out this past season (Exp. 374). Shawn Taylor (MS student) started working in our lab group this past year with a project focusing on Pleistocene sediments recovered in the northwest Pacific Ocean sector in order to assess teleconnections between ocean-atmospheric scale changes with terrestrial climate records recovered in the Siberian-Arctic region.

It has been an absolute pleasure getting to know and work with the undergraduate majors. Currently, I have five students (Joseph Mastro '18; Kaitlyn Horisk '19; Harold Jones '19; Brian Racaniello '19; William Frazer '19) working on active projects, some of which are deeply engaged with our graduate students while others are carrying out solid, stand-alone research projects. This past summer I advised William as part of the Summer Scholars and Artists Program on a study assessing proxy-based sea surface temperature reconstructions with direct measurements taken seasonally over a 10-year period from a number of offshore sites recovered from the California Borderlands region of the eastern Pacific Ocean. He presented his findings at Binghamton's Research Days this spring as well at the annual 2018 AGU fall meeting. His findings will be included in a manuscript submitted to the journal *Geochimica et Cosmochimica Acta*.

The Past Global Changes (PAGES) Pliocene climate variability over glacial-interglacial timescale synthesis group that I am currently a part of is wrapping up and our synthesis report should be available within the year. These research efforts aim to understand the Earth's past environment in order to better predict future climate and environmental conditions that aid to inform strategies for sustainability. Within this past year I have been invited to join another PAGES working group focused on Southern Ocean changes during the Holocene. This will serve as a great platform to promote research initiatives in the Southeast Indian Ocean I hope to carry out in collaboration with Alex Nikulin.





## Jeff Pietras

It has been another busy year for my research group. Daniel Miserendino (MS '17) and Ryan Brems (MS '17) both successfully defended their thesis last summer. Dan joined the Binghamton mafia at Roux Associates, and Ryan is the newest earth science teacher at Vestal High School. It is nice having Ryan in town, and hopefully he will send us some talented undergrads over the years. Tyler Rust (MS expected '17) and I just traveled to Burlington, Vt. to present talks on the Utica Shale that were very well received by the community. I will be at the AAPG convention in Salt Lake City in May talking about Re and Os isotopes, and how they can be used to directly date and correlate organic-rich mudstones. Hope to see some of you at the meeting. I also welcomed in two new graduate students this year. Abby Dennett (MS expected '19) will be working on the Re-Os project with me, and Andrew Jacobus (MS expected '19) will continue work on the Utica Shale. They both have hit the ground running having already collected much of their primary data. Abby also was one of the co-founders of the first AAPG Student Chapter here at Binghamton. Alignment with the AAPG provides increased opportunities for interaction with industry experts and funding for field trips. Abby, Andrew, Jim Bourke (BS '16, MS expected '18), William Frazer (BS expected '19), and Jasper Baur (BS expected '20) are competing in this year's AAPG Imperial Barrel Award Program. This is a national competition between universities. They were given access to several industry standard software packages to interpret a dataset of 3D seismic and well logs, and were given six weeks to complete a full prospect analysis of a real hydrocarbon producing basin. Win or lose, they have gained valuable real world experience.

The girls love going to school together now. Abby holds Erin's hand as they walk across the road to get on the bus. Abby is doing great in third grade and loves running, singing and dancing. Erin is a happy kindergartener. She loves to tinker and craft. The house is always filled with her forts, crafting scraps and wonderful creations. We just need her to work on her picking-up ability now! Kuwana continues unraveling the mysteries of the Green River Formation in the Piceance Creek Basin. We look forward to completion of her PhD next year.



## Jishnu Adhikari— RISE Internship Award

Jishnu Adhikari received the Research Internships in Science and Engineering (RISE) internship award from the Indo-US Science and Technology Forum (IUSSTF). It is a fully funded, three-month research internship program in India. The internship was under the direction of Prof. Debashis Chatterjee of the University of Kalyani, India. The topic of his research was geomicrobiology of arsenic mobilization in West Bengal, India. Jishnu's advisor is Tom Kulp.



*Drilling hand-pump technique, West Bengal, India (Photo: J. Adhikari)*

## Kennie Leet – Art of Science Award

We congratulate graduate student Kennie Leet (PhD) for winning Best of Show at the first “The Art of Science” competition. This event happened in April 2017, just after the 2017 Geobing newsletter went to press. Shown here is Kennie (right) next to the color-enhanced scanning electron microscope (SEM) image of a heart-shaped feldspar grain, occurring with halite efflorescence from pore fluids, found in laminated sediments in a drill core from Lake Magadi, Kenya. Her advisor, Tim Lowenstein, is on the left.



*Tim Lowenstein and Kennie Leet*

## Bethany Royce - Roux Scholarship recipient

Bethany Royce was the Roux Scholarship recipient this academic year. We are extremely grateful for the financial support from Roux Associates, Inc., for its ongoing support for our graduate program.



*Roux scholarship recipient Bethany Royce with Roux Associates representative Sin Senh '97, MA '05. (Photo: B. Royce)*

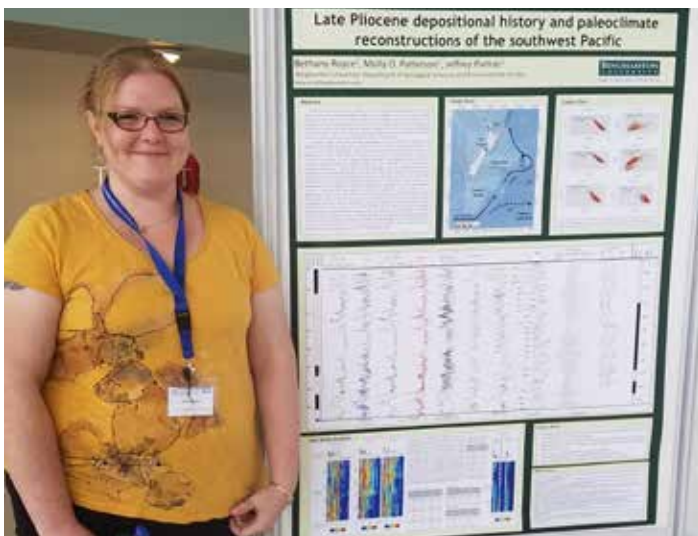




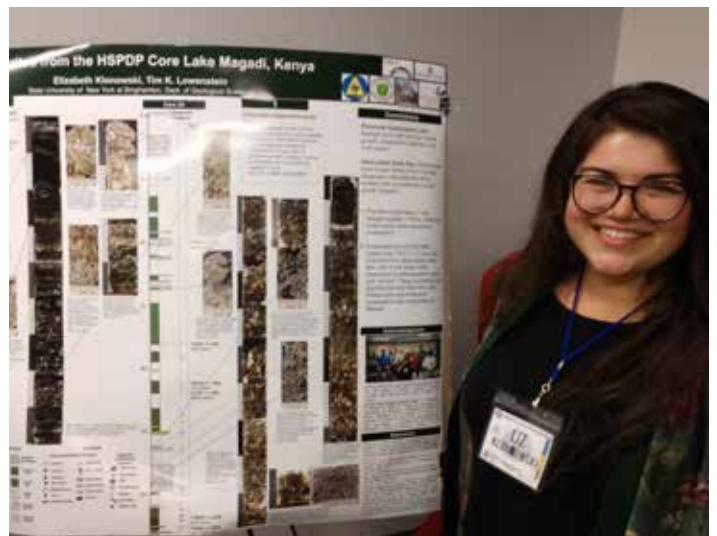
Field geologists relaxing after a hard day. From left to right, Ed Baltzer MA '89, Betty Baltzer, Deandra De Los Santos, and Kuwana Dyer-Pietras. (Photo: K. Dyer-Pietras)

## Graduate students attend special meetings and workshops

During the 2017 calendar year, Jessica Domino (PhD) attended the Cooperative Institute for Dynamic Earth Research (CIDER) 2017 Workshop called "Subduction Zone Dynamics" at University of California, Berkeley, for four weeks. There she started an interdisciplinary research group focused on the existence of melange diapirs. The preliminary results were presented at the Fall AGU meeting in New Orleans. She also attended a PhD course at Aarhus University in Denmark, "Forging the links between geophysics and petrology" for two weeks. Her research is being advised by Alex Nikulin and Dick Naslund.



Bethany Royce – In September 2017, Bethany Royce (MS) presented a poster at the Past Antarctica Ice Sheet Dynamics (PAIS) Conference in Trieste, Italy. Her research advisor is Molly Patterson. (Photo: B. Royce)



Liz Klonowski and Kennie Leet – In January 2018, Liz Klonowski (in photo) and Kennie Leet attended the HSPDP (Hominin Sites and Paleolakes Drilling Project) meeting held at Rutgers University. Their research is being advised by Tim Lowenstein. (Photo: K. Leet)

# Graduate degree completions

We congratulate the following graduate students who completed their degrees in 2017:

**Ryan G. Brembs (MS)** Cyclostratigraphy and Chemostratigraphy in the Parachute Creek Member of the Eocene Green River Formation, Eastern Uinta Basin, Utah

**Emma P. McNulty (MS)** Lake Magadi and the Soda Lake Cycle: A study of the Modern Sodium Carbonates and on Late Pleistocene and Holocene Lacustrine Core Sediments

**Daniel R. Miserendino (MS)** Detailed Sedimentology and Inorganic Geochemistry of the Utica Shale and Dolgeville Formation of the Central Mohawk Valley, NY

## Donors to Geological Sciences accounts

**The department gratefully acknowledges the following individuals and corporations who have contributed to departmental accounts over the past year.**

Please note that this list was compiled from information provided by the Binghamton University Foundation based on its records of January 1 through December 31, 2017. We sincerely apologize for any errors, omissions or inaccuracies!

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# In memorium – Stephen Goozovat – 1964-2018

We are saddened to report the passing of Stephen Goozovat, PhD 2001, on Jan 24, 2018. Stephen was a student of Prof. Steve Dickman, who has provided the following comments. “His dissertation was on one of the most theoretically advanced topics I have ever thought about dealing with -- electromagnetic coupling between the core and mantle. In addition to meeting frequently in person about it, we sent a lot of emails back and forth; and even though this was in the early days of emailing (when it seemed more like sending a letter), we necessarily had to shorten the salutations, so it quickly devolved to “Steve1” and “Steve2.” At some point we needed advice about solving esoteric equations and started emailing with a professor from the math department -- whose name was; Steve also, so he became “Steve3.” We never did get to “Steve4” though....

Steve was a pleasure to work with, with a mild manner that counteracted how intimidatingly high-level his work was. He was a dedicated teacher at SUNY-Broome (aka BCC) for the nearly two decades since graduating. His death is a shocking loss that many people will feel.”

## Alumni in the News

### Bruce F. Molnia, BS 1967

Bruce Molnia gave an invited lecture during Homecoming Weekend on Oct 6, 2017, on Alaskan glacial behavior and landscape evolution titled “Baked Alaska: Post-Little-Ice-Age behavior of Alaskan Glaciers.”

### Denise Mruk Cox, BS 1980

We congratulate Denise on becoming the president-elect of the American Association of Petroleum Geologists (AAPG). Denise received her BS with honors in 1980, went on to receive her MS in 1985 at the University of Colorado Boulder, and has worked in the private sector since 1985. She has served on many committees and has received many honors and awards from AAPG. We congratulate her as she continues to serve this global organization at the highest level.

### Morgan Schaller, BA 2005

We are delighted to report that Morgan Schaller is the 2018 Houtermans Award Medallist. Morgan completed his BA in geology and biology in 2005, and went on to Rutgers University to earn an MS in hydrogeology and a PhD in geochemistry in 2012. The Houtermans Award is given by the European Association of Geochemistry to early-career scientists in recognition of “a single exceptional contribution to geochemistry, published as a single paper or a series of papers on a single topic.” Morgan’s award stems from his PhD research reported in a series of three articles which demonstrated an increase in CO<sub>2</sub> during the Triassic arising from the Central Atlantic Magmatic Province volcanism, and subsequent decrease owing to chemical weathering and continental drifting of Pangea into Earth’s tropical belt. He has been an assistant professor at Rensselaer Polytechnic Institute since 2014.



*Bruce F. Molnia (Photo: D. Jenkins)*



*Tim Lowenstein and colleagues, Death Valley, Calif. (Photo: K. Leet)*

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# Ways of giving to the department

Donations can be made to a number of accounts that can benefit the various educational and outreach efforts in this department, as reviewed in detail in the 2014 Geobing newsletter (available at <http://www.binghamton.edu/geology/>). The one account that provides the most support for the operations of the department is the Geology Fund (account 10796), which helps with such activities as funding the welcoming luncheon for incoming graduate students, supporting our visiting seminar speakers, helping us host alumni reunions on campus and at national meetings, etc. A complete list of the accounts that support the Geological Sciences is at right. We are extremely grateful for your generous support throughout the years.

**Contributions can be made online:**  
[www.giving.binghamton.edu/giving/](http://www.giving.binghamton.edu/giving/)

(please select "Other" for the account, and specify the account number or account name) or it can be sent to the Binghamton University Foundation, PO Box 6005, Binghamton, NY, 13902-6005.

## Accounts supporting the Geological Sciences:

- 10796 - Geology**
- 10391 - John S. Bridge Energy Res. Chair - Geology**
- 11034 - Herman Roberson Memorial Award**
- 11087 - Roux Scholarship in Geology**
- 20640 - Helen & Wendelin Bernhard Memorial Fund**
- 20617 - Dr. Marie Morisawa Memorial Scholarship**
- 20898 - Bartle Professorship**
- 20638 - Geology Endowment**
- 20639 - Genevieve Bemis Loan Fund**

*Minerva, N.Y., in Adirondack Mountains. (Photo credit: N. Cheng)*