

# UMass Amherst

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## College of Natural Sciences

### Geosciences

FALL 2019



GREETINGS FROM THE (OUTGOING) DEPARTMENT HEAD

JULIE BRIGHAM-GRETTE

#### **FACULTY NEWS**

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Geologist (Massachusetts  
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#### **DEPARTMENTAL GIFTS**

Award winners  
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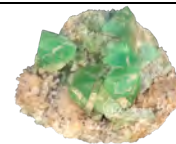
#### ***Department Head Passing of the Torch!***



*As we start another academic year, the Department of Geosciences has much to celebrate! We have created opportunities to broaden our research and teaching mission with the addition of new faculty, renovated old spaces, and new instrumentation needed to drive discovery. In this newsletter you will meet our new faculty and learn about some of the research that feeds our curiosity while also training students with relevant and rigorous tools to tackle local to global challenges in building a sustainable world. As a department that is home to the academic disciplines of geology and geography, we bring diverse perspectives and methods to examining the inter-relationships between the environment and societies, economies, and cultures. We do this traveling the globe! The Earth and its people are our office and classroom. The growth in our Geographic Information Systems program includes a new faculty member teaching at the new UMass-Amherst Mt. Ida campus!*

*We also enter the Fall in mourning as we cope with the untimely passing of Dr. Sheila Seaman in late July. We will miss this outstanding, award-winning professor for her bravery to never give up, and for her heart to always find the best in everyone. Sheila's kindness was without end. We also mourn the passing of several of our dear emeritus faculty – John Hubert, George McGill, and Peter Robinson – on who's shoulders we maintain the strength of the department and their legacies.*

*Our recent Academic External Review gave us time to reflect on our future. The interest and need for Geosciences training and education is accelerating. We continually examine our curriculum and ensure that course content matches and assesses relevant learning goals – always a work in progress. The greatest opportunities for improving our learning outcomes lies less in content and more in providing students with opportunities to better develop professional skills such as technical writing, collaboration, problem solving and project management. Strengthening connections between curriculum and careers, developing clear and concise approaches for fostering students' professional skills, and increasing undergraduate participation in research are important goals. The Department is a founding member of the School of Earth and Sustainability and we are happy to announce the new leadership of the School with shared governance between co-Directors Rob DeConto (Geosciences) and Curt Griffin (Environmental Conservation). It has been a real privilege for me to serve as Department Head for the past 6 years and now it's time to pass the torch to Stephen Burns who will carry us forward. Thank you to the faculty, staff, students, alums, and friends who made my job a joyous one.*



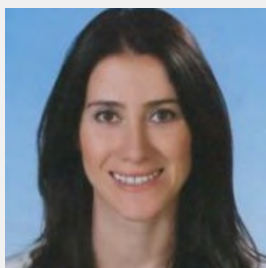
## NEW FACULTY



Dr. Justin Richardson

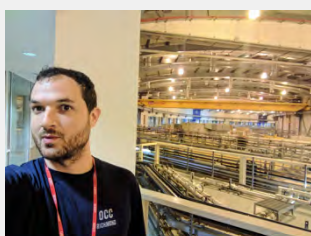
**Dr. Richardson** focuses on the biogeochemistry of metals, because they serve as both essential nutrients and toxins for plants, wildlife, and humans. Due to these dual roles, metals are central to many societal issues. As examples, limitations of inorganic nutrients (calcium, phosphorus) can hinder the health of forest ecosystems in New England and mercury pollution has negatively impacted the human health globally.

In addition to their biological importance, Dr. Richardson uses metals as geochemical tracers of natural processes. Changes and differences in the relative abundance and composition of metals in rocks, minerals, and soils can be used to investigate Earth surface processes like weathering and soil formation and function. At UMass, he will continue his research on the role of the Critical Zone in sequestering natural and human-derived lead and mercury. Secondly, he is working with researchers to develop the use of gallium to understand weathering of aluminosilicate rocks and minerals. Lastly, Dr. Richardson is exploring manganese contamination of soils and groundwater. These issues are important for New Englanders and the global community. You can learn more about him and his research at [soilbiogeochemist.com](http://soilbiogeochemist.com).



Dr. Seda Şalap – Ayça

Joining the faculty this fall is **Dr. Seda Şalap – Ayça**, who will be teaching courses in geographic information science and technology (GIST) at the new Mt. Ida Campus of UMass – Amherst in Newton. Initially, we will offer courses in GIST year-round while making connections with the broader Boston community. Eventually, workshops, short courses, and other outreach events are planned in anticipation of offering new graduate certificates in GIS and extending the one-year MS Geography – GIST degree program to the campus. Dr. Seda Şalap – Ayça earned her PhD in Geography from the joint program at UC Santa Barbara and San Diego State University, and her dissertation focused on spatially explicit uncertainty-sensitivity analysis methods for land-use models.



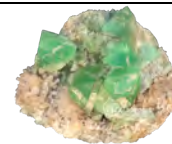
Dr. Stephen Turner

**Dr. Turner** focuses on the geochemistry of volcanic rocks, with an emphasis on understanding elemental cycling through subduction zones. Subduction zones fascinate me because they regulate the chemical fluxes between the mantle and continental crust, as well as the cycling of volatile elements between the deep earth and surface. In order to learn about how volcanism within island and continental arcs has shaped our planet's unique habitability and geology, many of my ongoing projects are collaborations with gas geochemists and microbiologists. My recent field campaigns have been in Central and South America, and Kamchatka, Russia. I think that we are living in a very exciting time for igneous geochemistry, because we have reached near global coverage for many key types of chemical analyses. We now have the tools we need to synthesize this data and use it to develop models that are consistent with both local and global-scale observations. This has led to rapid developments in our thinking about the chemical differentiation of the earth. It also keeps me knee deep in very large geochemical datasets and dubious MATLAB code.



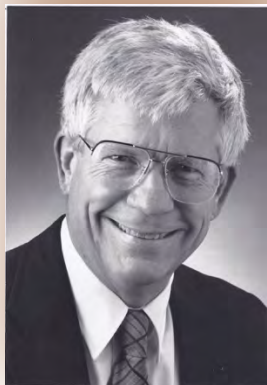
Dr. Matthew Winnick

Dr. Winnick research uses stable isotope geochemistry and reactive transport modeling to investigate how terrestrial water and carbon cycles are coupled in the modern and during key intervals of Earth's history. Current research topics include (1) quantifying links between chemical weathering rates and organic carbon cycling in soils; (2) evolution of the silicate weathering feedback and its relation to climate through Earth history; (3) characterizing the controls of CO<sub>2</sub> fluxes and variability from soils and streams; and (4) using stable isotopes of water to quantify evapotranspiration fluxes in modern- and paleo-terrestrial systems.



## IN MEMORIAM

### George McGill



With his wife Esterica and daughters Kathryn, Sandra, and Edith at his side, George McGill passed quietly on March 13, 2018, at age 86 at the Center for Extended Care at Amherst where George had been in declining health for several years. Growing up on a farm in Iowa during the great depression, George was a hard worker all his life. Majoring in geology and with a minor in biology, George earned his B. A. in 1953 from *Carleton College* located in Northfield, Minnesota. He went on to M. S. (1955) and Ph. D. (1958) degrees in geology at the University of Minnesota and Princeton University. Originally a generalist, he acquired a special interest in structural geology at Princeton, where he did his dissertation work on the thrust belt of Montana. McGill joined the faculty of UMass in 1958, rising from Assistant Professor to Professor. George believed the department should emphasize field work and with Leo Hall, Pete Robinson, and Don Wise he established Field and Structure I and II as a major, required component of the training of our undergraduates. These courses had a reputation among our majors as notoriously rigorous, but years later the students would come back and praise the courses. George regularly taught Geology 100, a non-laboratory, introductory course in physical geology for non-geology majors where his enthusiasm for geology reached hundreds of students. Until 1970, George conducted field research on the structural geology and stratigraphy of the Montana Rockies, and laboratory research involving high-pressure rock deformation. Since 1970, most of his research was in planetary geology, with emphasis on structural geology and crustal evolution of terrestrial planets. Field studies in the extensional rifts of the Canyonlands of Colorado and the Rio Grande Rift were Earth-analogues of similar rifts on Mars. George and Don Wise each mapped one of the 30 quadrangles that comprise the surface of Mars. George retired after 39 years in 1997 as Emeritus Professor, with an office where he continued doing planetary research. George was a member of the Science Steering Group and on the

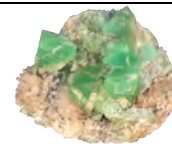
Radar Mapper Team for the Pioneer Venus Project of NASA and compiled major global summaries of the geology and tectonics of Venus as a result of this activity. He also was a Guest Investigator for the Magellan radar mapping mission to Venus from 1990 to 1993. George's contributions to the Department of Geology and Geography and the discipline of Geosciences were many over a long period of time. A fine colleague, his steady presence is missed.

### John Hubert 1930 -2018



Professor Emeritus of Geology at the University of Massachusetts died unexpectedly on August 23, 2018, after a 6-day bout with pneumonia. The week before he was spending his typical day in the department, interacting with students and faculty, getting ready for an expansion of his most recent book as a layman's guide to geologic outcrops in the Connecticut Valley and update the second edition of his book on the Department's history. These are in addition to his 259-page, 2014 autobiography, "Listening to the Rocks: A geologist's life with Mary Alice," source of most of the following information. John attended Harvard (1948) where he contracted an incurable case of geology from famed Professor Kirtley Mather, one that included a summer at the Univ. of Missouri's geology field camp in Wyoming's Wind River Mountains. After that it was on his own to the Univ. of Colorado for an MS thesis mapping the geology of an area in Colorado's Sawatch Range, then on to Penn State and a Ph.D. under the famous sedimentologist, P. D. Krynine, whom John describes as "a singular personality." John met Mary Alice Gorman at a mixer and they were married in 1955. She became his field assistant in the summer of 1956 as he worked on his

Ph.D. thesis on the sedimentology of the Fountain and Lyons Formations in the upturned edge of the Rockies. John describes her in his book as his field companion away from home for 27 field seasons and four sabbatical leaves, raising three children, Ananda (1957), John (1959), and Nancybeth (1965), while keeping the field work going and making it all fun. John and the family arrived in Amherst in 1970 for a 35-year stint at UMass where he taught classes in physical geology, sedimentology, sedimentary petrology, geostatistics, geowriting, and seminars. Summers included field work in Nova Scotia, part of a sabbatical in Newfoundland, Univ. of Nevada in Las Vegas, the Utah Geological Survey in Salt Lake City, and Colorado State University in Fort Collins. Over the years he supervised 58 students. His bibliography includes 60 publications. John will be remembered fondly by a host of individuals: former students, friends, colleagues, co-authors, and geologists scattered throughout the profession and the world, as well as innumerable non-geologists he influenced through his long life, especially his three children. He was a gentle and caring man, of great but unassuming talent, always seeming to be on the cheerful side of issues with a wonderful sense of humor as he followed the one great love of his life accompanied almost all that way by the other.



### Peter Robinson



Peter Robinson died peacefully in Trondheim, Norway on 25 March 2019 attended by his wife Suzanne McEnroe and their daughter Alexandra. He was an exceptionally gifted scientist whose field studies informed the geologic history of Western Massachusetts, Northern New England, Western and Southern Norway, the study of crystals and their geologic history, and petrology, the study of rocks.

He attended Dartmouth College (AB Geology 1954), was a Fulbright Scholar at the University of Otago 1954-56 (MSc Geology 1958), and an NSF Predoctoral Fellow at Harvard University 1958-62 (PhD 1963). He joined the faculty as an instructor at the University of Massachusetts in 1962, then Assistant Professor (63), Associate Professor (69) and Professor (76) until he became emeritus in 1999. From then on until his death he periodically returned to UMASS Geosciences to continue field and theoretical research, and became Consultant-Researcher to the Geological Survey of Norway. Professor Robinson was honored with the Chancellor's Medal at the University of Massachusetts and was Distinguished Faculty Lecturer in 1994. He was elected to the Royal Norwegian Society of Sciences and Letters in December 1995. He was an Honorary Research Associate at Macquarie University, Australia, 2002-2003.

He was a Fellow of the Geological Society of America, and of the Mineralogical Society of America of which he was President 1989-90. In the new century he became intrigued with the very strong remanent magnetism captured as exsolution lamellar intergrowths in minerals hematite-ilmenite and ilmenite-hematite, and thereby founded the new field of

"lamellar magnetism" in collaboration with his wife Suzanne and colleagues in Europe. Peter's 2002 Nature paper on lamellar magnetism in ilmenite-hematite was a characteristic blend of crystallography and crystal chemistry at the nanometer scale ramifying to geological problems at the planetary scale. Professor Robinson authored, and often co-authored with colleagues and former students more than 100 peer-reviewed journal articles ranging in subjects from Earth history to mineral magnetism. His thrill for science was matched by his ability to make it crystal clear to students and colleagues.

### Sheila Seaman



Sheila Seaman passed away at home in Leverett on Saturday, July 27 after a long heroic battle with cancer. She was a beloved teacher and researcher at the University of Massachusetts. She was a volcanologist who studied active and extinct volcanoes in Iceland, Maine, Arizona, New Mexico, and Canada. She was an avid runner, gardener, protector of land, plants, and animals, and a serious Bruce Springsteen fan. Sheila was born in Lewisburg, Pennsylvania to Terry and June Seaman. She attended Lewisburg Area High School and graduated from Bryn Mawr College in 1979. She earned an M.S. from the University of Arizona and a Ph.D. from the University of New Mexico. She was a faculty member at Colgate University for five years and then was an Assistant, Associate, and Full Professor at the University of Massachusetts for 26 years. She was lauded as an enthusiastic teacher of mineralogy and petrology, as an entertaining story-teller, and as a compassionate advisor. She was a great public speaker; her geology talks were crowded with colleagues and students. Sheila was well known for her work on the geology of coastal Maine. She published numerous papers about volcanoes and the evolution of continental crust, the latest of which was submitted from her hospital bed in New York City. Sheila was a passionate gardener who worked to provide natural habitat and colorful flowers, the larger and wilder the better. She was born to be outdoors. She loved all living things from the smallest of insects to the largest backyard bear, but she particularly loved her pet farm pigs, Herb and Gladys, and her many rescued cats. She helped to start the

Homeless Cat Project of western Massachusetts and in her free time, trapped hundreds of feral cats for spay/neuter and resettlement. She rescued dogs, cats, turtles, frogs, and birds of every variety. She was a Board Member of the Rattlesnake Gutter Trust for more than 20 years, having been involved with the preservation of many parcels of land including her beloved East Leverett Meadow. Sheila was also an athlete who ran fifteen marathons and many half marathons. She lost several minutes on her Bay State Marathon time because she had to rescue stranded worms on the marathon route.



## **GEOGRAPHY NEWS**

**MS Geography – GIST** One of the most exciting changes in Geography since the 2017 newsletter is that the new MS Geography with a GIST concentration (Geographic Information Systems and Technology) is not only up and running, but thriving – and multiplying! Together with the Department of Environmental Conservation, we hired Forrest Bowlick in 2016 to start and run the MS Geography – GIST program. It was designed to provide students with much-in-demand job skills within this rapidly changing field, in an intensive, focused, one-year Geography degree. In its first year, 2017-18, the MS Geography – GIST program had 4 students; in 2018-19 it had 12; and in 2019-20 it has another 10. Meanwhile, Forrest wrote a successful proposal to bring a similar program to the new UMass Amherst campus at the former Mt Ida College campus in Newton. See details about the new program and hire, on page 2.

### **An era of leadership comes to a close.**



**Piper Gaubatz**

*Sept 1, 2019, marks momentous news in the Geography Program. Piper Gaubatz, who has been Geography Program Head and Associate Department Head for 10 years, is stepping down. In the last decade, Piper has done multiple people's share of departmental service. Under her leadership, the Geography program has, among other things, added Toby Applegate and Forrest Bowlick as lecturers, educated thousands of UMass students (Toby gets direct credit for much of that total), more than quadrupled the number of Geography majors, built up an active geography club and a local chapter of the Gamma Theta Upsilon international geography honor society, developed a popular and successful set of concentrations (see box to right) as well as a number of very successful new courses, set up the Hasbrouck "Round Room" as a dedicated special geography teaching space, developed a network of affiliated faculty across the university, helped to make Geography a core part of the School of Earth and Sustainability,*

*launched the new MS Geography – GIST program (see below), and, most recently, proposed a new joint 3-year MS with Landscape Architecture and Regional Planning. Stan Stevens has helped with many of these initiatives, especially developing the undergraduate and graduate curriculum and new courses, and UMass Geography's role in the university. Piper has decided she is ready to take a more-than-well-deserved break from such intensive service to devote more time to focus on her own research and teaching. We congratulate Piper on her accomplishments, and look forward to many productive research and teaching years to come! (We'll all still be asking her lots of questions about the Geography program!)*

#### **Geography undergraduate concentrations, 2019:**

**BA:** Human Geography; Environmental Geography & Sustainability; Climate Change & Society; Globalization & International Studies; Geographic Information Science & Technology; Urban Geography.

**BS:** Physical Geography; new ones under proposal  
**Certificate:** GIST.

For more information – put together by UMass Geography majors, see:

<https://www.arcgis.com/apps/MapSeries/index.html?appid=e8c7492059ed4bf09050d44ae16700f0>



**Eve Vogel (left) and Forrest Bowlick** are jointly stepping in to fill Piper's very big shoes as the new Geography Program co-heads

**Geography Talks @ UMass.** This year we are building our efforts to have faculty and students give talks in the department, and to bring external geographers to the department on a regular basis. If you're in the area, let us know if you want to be on the Geography Talks @ UMass list (write Eve at [evv@umass.edu](mailto:evv@umass.edu)), and we'll send you a schedule and invitation! (We can also tell you about Forrest's great Diversity and Inclusion seminar, which regularly features geographers' critical and interdisciplinary insights.)

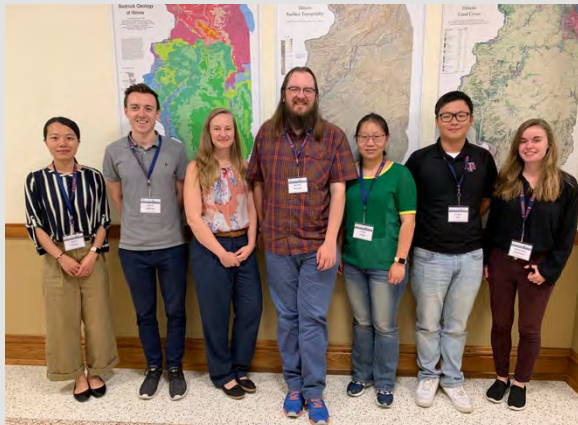


## FACULTY NEWS

Geographer **Stan Stevens** was promoted to Senior Lecturer II in September 2018. His recent work focuses on helping develop and implement international law and policy which advances rights-based conservation, good governance, and equity in protected and conserved areas within the territories, lands, and waters of Indigenous peoples and local communities. These conservation areas are the home of hundreds of millions of people and encompass more than 25% of the terrestrial earth outside of Antarctica (including most protected areas), as well as extensive coastal and marine areas. Stevens serves as International Union for Conservation of Nature (IUCN) Members' focal point for IUCN's policy on the overlap of protected areas and territories and areas conserved by Indigenous peoples and local communities (ICCAs), which he led the development of, and as senior policy advisor for the ICCA Consortium. He is lead author of IUCN's forthcoming best practice guidelines volume on protected areas and ICCAs, to be launched in 2020 at the World Conservation Congress in Marseilles, France and the Convention on Biological Diversity (CBD) COP15 in Kunming, China. Stevens organized and facilitated a workshop and a side-event on the guidelines at CBD COP 14 in Sharm El-Sheikh, Egypt in 2018.

**Piper Gaubatz'** current research centers on the changing characteristics of mass-rally squares in China, which have been repurposed as multi-functional spaces. These squares are being incorporated into a standard Chinese urban model exported throughout Asia and Africa through China's Belt-and-Road initiative. The project combines field research (13 cities to date) with mapping and text analysis. Related recent work includes an article in the *Journal of Urban Affairs* ("New China Square: Chinese public space in developmental, environmental and social contexts"), two book chapters ("Urban Public Space in Comparative Perspective" in *China's Urban Future and the Quest for Stability* and "East Asia" in *Cities of the World*), the new edition of her book, *The Chinese City*, and keynote addresses at the International Association for China Planning Annual Meeting (Chengdu, China) and at the "Making Cities Work for Inclusive Development in China" Conference (Hong Kong). Gaubatz is Associate Department Head, Geography Program Head, and Chief Undergraduate Advisor for Geography, has a continuing appointment with the Research Grants Council of Hong Kong, is serving a 3-year appointment as external examiner for the MA in China Development Studies at the University of Hong Kong, is an associate editor for the journal *Cities*, and serves as emcee for the State Geography Bee.

**Forrest Bowlick** participated in the AAG-UCGIS Summer School 2019 on Reproducible Problem Solving with CyberGIS and Geospatial Data Science. In this summer school, we worked to tackle challenges in geospatial realms using various advance cyberinfrastructure approaches. My group (pictured) was one of two winners with our project on calculating accessibility to food. I also went back to Texas A&M to work on some articles on GIS Education, and also to set up surveys and data collection for three new projects, also in GIS Education.



Summer School work group



Dr. Bowlick in Texas



**Toby Applegate** continues to be the central face of Geography to UMass undergrads as he teaches 400 students each semester in our Intro Human Geography course, “Diversity, Globalization, and Sustainability,” and in World Regional Geography – as well as an always-full upper-level course each semester. Despite his unmatched teaching load, Toby continues an active research program; as this newsletter goes to press, he is “hips deep” finishing up fieldwork in Slovenia on refugees and their integration into Slovene society. He is using a new ethnographic technique using photography to map subtle changes in the urban landscape of Ljubljana in the wake of the European migrant “crisis.” He edited several chapters of a new geography of Slovenia text intended for Erasmus students in Europe. It involved long hours explaining to non-native English-speaking writers that semicolons are rarely used correctly by native English-speaking writers, the passive voice should be used sparingly, and “of course” is never a good way to start a thesis sentence. In 2018-19, he was a Fellow at the Kahn Institute at Smith College participating in an interdisciplinary research project on refugees. He has been appointed as a visiting scholar at the University of Ljubljana for Spring 2021.

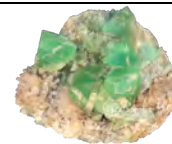


Eve Vogel and interdisciplinary team of faculty and undergraduates, 15 Miles Falls project, Connecticut River

In the last two years, starting with a UMass Sustainability Seed Grant, **Eve Vogel** has launched a large new research project focused on the relationship among changing electric policies and markets in New England, hydropower, and rivers. This is interesting because New England, and Massachusetts in particular, has been at the forefront of a number of electric policy and market changes, including the promotion of energy conservation since the 1980s, restructuring in the 1990s-2000s, and the development of solar, wind and other renewables today. Now, in an era in which electric optimization depends on rapid flexible response, large-scale energy storage, and carbon reduction, hydropower plays a larger role in the region’s electric grid than its low percentage would suggest. And yet, hydropower development and operations

can be harmful for rivers and the people who depend on them. Eve has been working with an active group of undergraduates – now alums! – in research from Quebec to northern Vermont to Boston to Holyoke, and deep into media archives; she plans to build toward more interviews, and more documentary and political-economic analysis. She has also been building interdisciplinary collaborations across campus and the region.

**Qian Yu.** Associate Professor in GIS, Remote Sensing and Environmental Geography, continues her research using aquatic remote sensing to assess the export of riverine carbon to coastal regions and lakes. Her recent paper on co-variations of dissolved organic carbon (DOC) and colored dissolved organic matter (CDOM) in inland waters was published on *JGR-Biogeosciences*, and was highlighted by AGU EOS Research Spotlight. She has been involved in NASA’s Aquatic Studies Groups and Algorithms Working Group for the forthcoming Surface Biology and Geology hyperspectral satellite mission. In the last few years, she has also been working on a GIS project using mobility data collected from a cell phone app to study human responses to hazard alerts, to help build more effective warning systems.



## Student News

### Grad students

Current MS and PhD students are studying topics including pollution havens and environmental justice in Chinese cities (Xin Li,); evaluating the efficacy of employer incentive programs in alternative transportation in Cambridge, MA (Mary Richards); geographic education (Kevin Bean); the mental health of refugees in Massachusetts (Julia Galecki); perceptions of environmental change and restoration in Zion national park (Kavarra Corr); Indigenous peoples, well-being, conservation, and development in Indonesia (Kirk Lange); the impacts of the Appalachian Trail on community development (Jessica Schottanes), and CDOM retrieval algorithms for Arctic lakes (Monica Weisenbach). Mary Richards spent summer 2019 analyzing a green belt and downtown farmer's markets as part of an urban planning internship in Boise, Idaho, while Jessica Schottanes carried out field research in communities along the Appalachian Trail including Monson, Harpers Ferry, Damascus, and Hot Springs. Kavarra Corr has been teaching at Southern Utah State University while carrying out her dissertation research in Zion National Park.

Recent graduates of the MS Geography program include Diana Laurenitis-Bonacci (Feb. 2019) with a project entitled Agriculture: Climate Change, Sustainability and Adaptations which included a set of three papers on "Climate Change and Agriculture: Consequences and Adaptions," "Alaska and Food Security" (based on fieldwork), and "Regenerative Agriculture: an Integrative Solution to Modern Agriculture;" Peter Huntington (Feb. 2018) with a project entitled "Stream Power and Municipal Culverts in Rockport Maine: a GIS Analysis," and Devin Clark (September 2017) with a project entitled "Massachusetts Apiculture: Mapping Beekeeping Services in Massachusetts.

**Undergrad students.** The Geography Club has continued its activity and success, including going on hikes and holding film nights. They have now fielded a team at the fall regional Geography conference, NESTVAL, for five years in a row, coming in first place every year in 2014-2017 and third place in 2018. Natalie Howe served as Geography Club president in 2018; Le Tran became Geography Club president in 2019. With the help of geography major Kelsie Butler, the club now has an Instagram page. Follow them on Instagram at [umassgeographyclub](https://www.instagram.com/umassgeographyclub). In 2019, senior Lily Holland was part of our region's team at the national AAG competition in Washington DC. One of nine graduating seniors in Geography in 2019, Natalie Howe was the Geosciences Department's graduation "chirper" this year and delivered a short speech to a packed crowd in Mullins Center at the CNS Commencement ceremony.



Geography Club Trivia Night

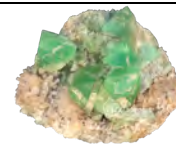


All in a good day's work. Sedimentology Lab in Puerto Rico



Mark Leckie and his Earth History class find an unconformity





## GEOLOGY NEWS

**Dr. David Boutt** spent the calendar year of 2018 lecturing around the world as the 2018 Geological Society of America Birdsall-Dreiss Distinguished lecturer. I gave 56 lectures in 10 countries and 25 US states. It was an amazing experience visiting so many universities colleges, national labs, and research institutes sharing science done here at UMass over the years. Through this experience, I have come to appreciate the character and quality of our UMass Geosciences program despite our less-than modern building. The 3 talks I gave focused on topics ranging from groundwater and climate change to the hydrogeology of endorheic basins in Chile and the Great Basin. Meanwhile, the hydrogeology group continues our focus of working on the physical understanding of how water moves from the land surface into subsurface using cutting edge hydrological, geophysical, and geochemical tools.

(<https://community.geosociety.org/hydrodivision/birdsall/past/about2018>).



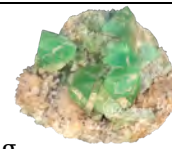
Dr. Boutt (far right) after his Birdsall-Dreiss lecture at the 2018 Geological Society of America in Indianapolis, Indiana. UMass graduate students (from left to right), Brendan Moran, Sarah McKnight, and Alison Cole.



Dr. Boutt hiking into the Grewingk Glacier along the Kenai Peninsula with ACDP system and drone in a new project in collaboration with Dr. LeeAnn Munk (University of Alaska-Anchorage) examining groundwater discharge to streams and Kachemak Bay.

to expand greatly and allow students across the department a richer experience in near surface geosciences.

Students in the lab are working projects in Alaska (MS student Aeon Russo), Argentina (PhD candidate Brendan Moran), Chile (PhD student Sarah McKnight, MS candidate Graham Thomas), New England (Alison Cole), and Trinidad and Tobago (PhD student Marsha Allen). We continue to have students moving into both the public and private sector hydrogeology positions and are seeking to expand our on-going 1-yr MS program. I am particularly excited about the additions of Dr. Justin Richardson and Dr. Matt Winnick to the Department. As they grow their research programs here at UMass, I envision the expansion of course offerings and research experiences in shallow hydrology, hydrogeology, geochemistry and soils



Dr. Burns at a field site (a cave in Madagascar)

**Dr. Stephen J. Burns** - My research has long involved using geochemical proxies in speleothems to study changes in tropical rainfall over the past several glacial cycles. Most recently, together with post-doc Nick Scroxton, I have been investigating climate change in Madagascar and how climate relates to ecosystem change and to the disappearance of Madagascar's megafauna. We have documented a major ecosystem change from open forest to grassland that occurred about 1000 years ago. The change was driven not by climate, but by the introduction of cattle to Madagascar and the use of fire promote the growth of grasses (Burns et al., 2016, *Quaternary Science Reviews* v. 134). This research led colleague Laurie Godfrey to propose a new hypothesis for the disappearance of Madagascar's megafauna - that is was mainly the result of changes in land use associated with beef becoming a major part of the Malagasy diet (Godfrey et al., 2019 *Journal of Human Evolution*. We are finding that Madagascar's climate, and the climate of the western Indian Ocean in general, does not follow expected

patterns. Over the past several thousand years rainfall changes in Madagascar have occurred in phase with Northern Hemisphere rainfall changes (Scroxton et al., 2017, *Quaternary Science Reviews*, v. 164). I will be headed back to Madagascar this fall as our research there continues. In another note, Julie Brigham-Grette is passing the department head baton over to me for at least the next three years. I consider it a privilege to be able to serve my department in this role.



Members of the Biogeochemistry Team recover and re-deploy an interval sediment trap at Basin Pond (ME) in October 2018. From L-R: William Daniels, Thivanka Ariyaratna, Daniel Miller, Boyang Zhao, Helen Habicht and Benjamin Keisling. Samples from this study, which were collected at 2-week intervals, will help us better develop a technique for reconstructing past temperature from lake sediments using bacterial membrane lipids.

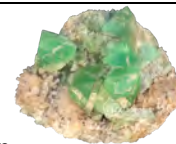
**Dr. Isla Castañeda** and **Dr. Jeff Salacup**-The Biogeochemistry Lab had an exciting year. **Daniel Miller** defended his dissertation “Wildfires in the Northeastern United States: Evaluating Fire Occurrence and Risk in the Past, Present and Future” in November 2018. He now has a position as Hydrologist for the U.S. Fish and Wildlife Service in MA. **Helen Habicht** defended her thesis “Middle to Late Pleistocene environmental reconstructions from Lake El’gygytgyn, Arctic Russia” in May 2018. She now is a Research Staff Associate at Lamont-Doherty Earth Observatory. Laboratory visiting scientist **Dr. Thivanka Ariyaratna** now has a postdoctoral position at the University of Connecticut in the Department of Marine Sciences. While at UMass, Thivanka applied her expertise in environmental toxicology to investigate the distribution of polycyclic aromatic hydrocarbons (PAHs) in Sebago Lake, ME. She is currently writing these results up for publication.



Recovering a sediment trap at Basin Pond on 23 July, 2019. From left to right: William Daniels, Tobias Schneider, Jeff Salacup, and Boyang Zhao lift the sediment trap out of the water. Samples from this trap will help inform how paleoclimatically relevant biomarkers are produced in the lake.

Turning out in their finest. Starting at bottom left: Isla Castañeda, Kathryn Turner, Rebecca Smith, Jeff Salacup, Kurt Lindburg, and Boyang Zhao. Top left: Tobias Schneider and Courtney Riv





In May 2019, we were pleased to welcome postdoctoral scholar **Dr. Tobias Schneider** to the group. Tobi received a fellowship from the Swiss National Science Foundation to work with Ray Bradley and Isla Castañeda on generating Holocene biomarker records from Greenland lakes. Ph.D. student **Rebecca Smith** recently sailed as Organic Geochemist on IODP Expedition 383 and excelled in this role despite very rough seas in the Southern Ocean. She will be generating new Plio-Pleistocene sea surface temperature records to reconstruct past variability in the Antarctic Circumpolar Current. Ph.D. student **Boyang Zhao** has completed fieldwork in Greenland for the past 3 years and will soon be ready to publish some exciting paleoclimate records with implications for the abrupt abandonment of Norse settlements in southern Greenland around 1450 AD. Postdoctoral Scholar **Dr. William Daniels** has had much academic success in the past year. He has been working on generating Plio-Pleistocene temperature and precipitation records from arctic Lake El'gygytyn (Siberia). Will received two prestigious fellowships:



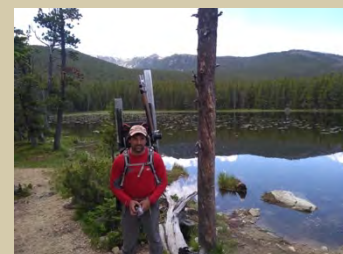
Fieldwork near Igaliku Greenland in July 2018. From L to R: John Daniels (Will's Dad, who came along as a volunteer), Boyang Zhao, William Daniels, and Isla, Castañeda pause for a photo op in front of a calving glacier.

one from the Zuckerman Postdoctoral Scholars Program for his proposal "*Reconstructing Climate and Environments in the Heart of the Bering Strait*" and also an NSF Postdoctoral Fellowship for his proposal "*Biomass burning in the terrestrial Arctic during past warm periods: New insights from organic biomarkers in Lake EL'gygytyn (Siberia)*". We are excited that he will continue to be based at UMass as he pursues these new projects. In the past year, undergraduate **Courtney Bly** has been working with Will Daniels on examining reconstructing past arctic fire history from Lake El'gygytyn while undergraduate **Kurt Lindberg** has been working to reconstruct past temperature. Kurt will pursue an honors thesis on arctic Pleistocene temperature history in the coming academic year. Undergraduate **Kathryn (Katy) Turner** graduated in May 2019 and has moved on to a Master of Science in Business & Analytics from UMass. She contributed to numerous research projects, particularly to the development of Plio-Pleistocene sea surface temperature records from Northwest Australia.

We are looking forward to the arrival of incoming Ph.D. student **Caitlyn Sarno** in the fall. Caitlyn will be working with Castañeda and adjunct Professor Tom Johnson on Pleistocene paleoclimate reconstructions from subtropical Lake Malawi. Johnson and Castañeda recently received a new NSF award to pursue this research. As we write this, several members of the Biogeochemistry Team (Tobi, Boyang, Isla, Will, and Ray) are headed to Greenland for another field season. In other news, Isla Castañeda, Stephen Burns, and Matthew Winnick received NSF funding to purchase a new isotope ratio monitoring mass spectrometer to replace a 17-year old instrument, which was no longer repairable. The addition of this instrument will ensure that the UMass Biogeochemistry and Stable Isotope Laboratories can continue to generate exciting isotopic records from around the world.

**Dr. Tim Cook** - I am delighted to have returned to UMass nearly 10 years after finishing my PhD here. The past year was busy as I spent much of my time at the Harvard Forest where I was a Charles Bullard Fellow in Forest Research for the 2018-2019 academic year. Much of my time at Harvard Forest was devoted to work investigating the impacts of changing timber harvest practices and extreme hydrologic events on erosion within a managed forest in western Maine. That work is part of a larger effort, with colleague Noah Snyder at Boston College, examining the impacts of humans, climate change, and extreme floods on erosion and sediment yield across the New England landscape. Over the past 15 months we have cored 17 lakes in Maine, New Hampshire, Vermont, and Massachusetts to investigate various land use histories and geographic controls on erosion in a variety of settings. I have also

Dr. Cook at his field site  
Beartooth Mountain, MT.





begun similar work in Wyoming and Montana, with the goal of contrasting surface processes in arid landscapes with those occurring in the humid and forested northeast. It has been great to renew collaborations with colleagues within the department, including work on salt marshes in the northeast with Jon Woodruff and Brian Yellen and joining Ray Bradley, post doc Francois Lapoint, and geosciences alum, Mike Retelle for fieldwork in Svalbard.

**Dr. Michele Cooke** - The Geomechanics group continues to investigate 1) active faulting in southern CA, 2) fault evolution by work minimization and 3) scaled experiments of fault system development. The lab upgrade of 2 years ago has really expanded our experimental capacity. The past year saw the publication and submittal of several wonderful restraining bend and transpression experiments by former MS Kevin Toeneboehn (Longmont CO). Current MS/PhD student Hanna Elson has been using experiments to investigate how faults evolve under different strain rates. She also continues the innovative southern San Andreas fault numerical modeling of very recent graduate, Dr Jenn Hatch (nee Beyer).

Meanwhile, PhD candidate, Laura Fattaruso, researches how arrays of flaws link and grow using our code, GROW (developed by Dr. Jess McBeck). Current students are collaborating with former UMass Geomechanicians, Dr. Jess McBeck (U. Olso), Dr. Jenn Hatch (Hotchkiss), Dr. Alex Hatem (now at USGS) and Dr. Scott Marshall (Appalachian State) as well as colleagues at U. California-Riverside, University of Pavia (Italy) and Stanford University. On the service side of things, I'm in my second year of Graduate Program director and enjoying the challenge of effectively training students for successful careers. I also co-coordinate a blog by and for deaf and hard-of-hearing academics: [www.TheMindHears.org](http://www.TheMindHears.org).

UMass geomechanics researchers and collaborators take aim on outstanding and difficult issues of geomechanics.



Dr. Christine Hatch

The RiverSmart Communities Project initiated by **Eve Vogel** and **Christine Hatch** published a report in 2016 detailing five key policy recommendations for how New England Communities could become more resilient to river flooding, especially as these extreme events become more frequent and more severe with climate change (<https://extension.umass.edu/riversmart/policy-report>). This Fall, together with Massachusetts Department of Transportation, Baystate Roads (UMass Transportation Center), and Milone and MacBroom, UMass Research-Extension Liaison **Christine Hatch** (and former graduate student **Noah Slovin**) are delivering on one of the recommendations: providing training to Department of Public Works (DPW) employees ---who are often the first on the scene when a road washes out in a flood--- in fluvial geomorphology, the study of river shape and form in the landscape, allows participants to understand why rivers look and behave the way they do, to predict the shape and response of stream channels over time. With this knowledge, we can design culverts, bridges and roadways that are more resilient to severe precipitation events. Trainees will work through disaster and recovery scenarios involving road and stream crossings on a hands-on stream table, engage with classroom materials and learn to work with the river to provide resilient infrastructure for the commonwealth's transportation network, prioritize culvert replacements and support healthy ecosystems.

**Dr. Mike Rawlins** welcomed Postdoctoral Scholar Shahab Afshari to the Climate System Research Center in January 2019. Dr. Afshari recently graduated with a Ph.D. in Civil Engineering from the City College of New York. His research is focused on understanding the dynamics of river systems using remote sensing



measurements and numerical models. Shahab is leading efforts to quantify the flow of freshwater and carbon from Alaska's North Slope watersheds to the Beaufort Sea coast as part of the NSF-funded Beaufort Lagoons Ecosystems Long-Term Ecological Research (LTER) project. Mike is also the PI on two new projects supported by NASA and DOE to quantify the export of water and dissolved organic carbon from the broader western Arctic region including the larger Yukon and Mackenzie river basins. Closer to home he continues to communicate the impacts and threats from climate change in collaboration with members of the news media and UMass News Office. He and other members of the CSRC and Department were very active last fall with many print, radio, and television outreach engagements as the region experienced one of its wettest years on record.

**Dr. Mark Leckie Micropaleontology Lab** continues to be very active, with ongoing research in the Cretaceous of the U.S. western interior (**Raquel Bryant** PhD), multiple locations in the deep-sea, focused most recently on the Neogene of Shatsky Rise in the NW Pacific (**Adriane Lam** PhD), Middle Jurassic-Early Cretaceous of the western North Atlantic (**Serena Dameron** PhD), and the Neogene of the Ross Sea, Antarctica (**Julia Seidenstein** MS, **Dipa Desai** MS/PhD). I had the opportunity to go to Antarctica several times in the late 1970s while working on my BS and MS at Northern Illinois University, so it was a thrill to return to Antarctica in 2018 aboard the JOIDES Resolution for International Ocean Discovery Program (IODP) Expedition 374. In 2017, Adriane Lam had the opportunity to sail as a shipboard paleontologist during IODP Exp 371 to the Tasman Sea, and Raquel Bryant will sail with IODP Exp 388 next summer focused on the Cretaceous Atlantic equatorial gateway and paleoclimate. Serena Dameron and I submitted a pre-proposal to IODP to redrill some of the earliest sites cored by the Deep Sea Drilling Project in the western North Atlantic, many of which had been spot-cored in the late 1960s; I'm hopeful for more ship-time. The micropaleo lab crew has been very busy publishing our results. I'd like to highlight 3 examples from our alums. **Chris Lowery** (UT Austin) had a paper in Nature in 2018 after participating in an IODP Expedition that cored the Chicxulub impact crater off the northern tip of the Yucatan; Chris teamed up with **Andy Fraass** (Univ. of Bristol) on a paper about the recovery of diversity following mass extinction published in Nature Ecology & Evolution; and **Emily Browning** and **Kendra Clark** (BP Houston) contributed to a new astronomically-tuned Neogene time scale that will likely become the industry standard for the Gulf of Mexico published in GSA Bulletin. PS: check out Adriane Lam's Time Scavengers website and blog - <https://timescavengers.blog>.



Dr. Richardson and undergraduate Brendan Braithwaite (2019) at a field site in Springfield, MA.



Dr. Richardson using portable X-ray Fluorescence (pXRF).

**Dr. Justin Richardson** was awarded a \$77,000 grant from the United States Department of Agriculture's National Resources Conservation Service to study the application of portable X-ray Fluorescence (pXRF) to measure heavy metals in urban gardens and forests. Collecting soils, processing them, and analyzing them by Inductively Couple Plasma Optical Emission Spectrometry is the gold standard method, but can take weeks to

months to complete. pXRF may offer a way to get heavy metal data in urban forests and gardens in seconds! Before this technology can be applied at scale, biases in measurements from rocks, water, human refuse, and particle heterogeneity will be quantified by this project. The research will be completed in collaboration with Dr. Nicholas Perdrial at the University of Vermont.



## News from the State Geologist 8/9/2019



September 2019 marks the start of the Massachusetts Geological Survey's 18<sup>th</sup> year of operation since becoming part of the Department of Geosciences. There have been a few staff changes since the last newsletter in 2016. **Joe Kopera** has left the Survey and is now the ESRI license administrator and helps with web development on campus. He also does freelance GIS/cartography and web mapping services. Joe has been a dedicated geologist with the Survey for 14 years and much of the Survey's success has been due in large part to his contributions. So, thank you Joe. **Nick Venti**, who worked with the Survey for over 3 years, also has moved on to new opportunities. Nick was instrumental in managing many of our larger projects. Thanks go to Nick for his camaraderie and service to the Survey. Thanks, are extended also to **Rachel Lee, Paul Southard and Patrick Scordato**. Their support on various Survey projects is much appreciated.

The biggest news to share is the completion of the statewide surficial materials map for Massachusetts. This represents the culmination of 81 years of effort. In 1938, the state and U.S. Geological Survey (USGS) entered into a cooperative agreement to map all 189, 1:24,000-scale quadrangles in Massachusetts for both surficial geology and bedrock geology. By 1978, when the cooperative agreement officially ended, the entire state was mapped for surficial geology but only half the quadrangles were published. Then there was a 20-year hiatus. When I came on board in 2002, my first action was to resurrect the project. With help from MassGIS and Byron Stone, Janet Stone, and Mary DiGiacomo-Cohen from the USGS, all the published maps were digitized, a uniform stratigraphy was developed and all the unpublished maps were brought to publishable condition. We now have a seamless surficial materials geodatabase for the entire state, individual pdf's of all 189 quadrangles and their associated metadata. The press release for this project and the link to the geodatabase can be found here: <https://www.umass.edu/newsoffice/article/state-geologist-partners-create-new>



Installation of new monitoring well for the climate response network. Well is located in Wakefield along Route 128.

Geologists on the 2019 Friends of the Pleistocene field trip viewing contorted sand beds disrupted by the Cape Cod Bay lobe re-advance. Picture from Cape Cod Aggregates gravel pit in Mashpee, MA.

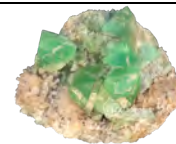




Some of the other recent activities and new initiatives of the Survey are highlighted below.

- With funding from the USGS National Cooperative Geologic Mapping STATEMAP program, we completed the Onshore-Offshore Surficial Geologic Map of the Wellfleet Quadrangle in 2017. This was done in cooperation with Mark Borrelli at the Center for Coastal Studies in Provincetown and Bryan Oakley at Eastern Connecticut State University. In late 2016, we collaborated with **Peter Robinson** to finish publication of the bedrock geologic map of the Winsor Dam quadrangle. We also worked with Chris Hepburn, professor emeritus at Boston College, to complete the bedrock geologic map of the eastern third of the Sterling quadrangle.
- With funding from the Bureau of Ocean Energy Management (BOEM), the Survey completed a 2-year project, with **Jon Woodruff**, collecting winter and summer elevation profiles and sediment samples at 18 beaches in Massachusetts that are experiencing erosion. In late 2016, we received \$200,000 of additional funding from BOEM to examine possible sand resources at six sites off the Massachusetts coast. This second 2-year project was completed in January 2019 and partially supported graduate students **Doug Beach** and **Alycia DiTroia**. Working with **Bill Clement** and **Paul Southard**, we processed bathymetric and side-scan sonar data, 210 km of seismic reflection data, 8 vibracores and 7 grab samples. The purpose of these two projects was to match beach characteristics with offshore sand resources for possible beach nourishment.
- In January 2019, the Survey, working with Paula Rees from the Water Resources Research Center and Scott Jackson from UMass Extension, completed a major project to examine culvert vulnerability in the Deerfield watershed with funding from the Massachusetts Department of Transportation (MassDOT). The project developed a decision support tool to help MassDOT identify culverts in need of upgrading and/or replacement. Culverts were not only evaluated on the basis of hydraulic vulnerability but also evaluated from geomorphic and ecological services perspectives as well as the disruption to emergency services. Projected climate change at mid-century and end-of-century was also incorporated into the analysis. This is a collaborative project with the UMass Water Resources Research Center, Departments of Environmental Conservation, Civil and Environmental Engineering and Computer Science, as well as the Northeast Climate Adaptation Science Center, Trout Unlimited, and Milone and MacBroom, Inc. To view the stream crossings explorer developed for this project go to: <http://sce.ecosheds.org/>
- In June 2017, we completed a Preliminary National Earthquake Hazard Reduction Program (NEHRP) Soil Classification Map of Massachusetts with funding from FEMA. This map identifies the NEHRP soil classification used in various software packages, such as HAZUS-MH, to assess ground motion and loss estimates from various earthquake scenarios. The ground motion in unconsolidated deposits is highly dependent on the shear wave velocity and the thickness of the deposit. This information is used by planners for emergency preparedness and response planning.
- Over the last two years I have replaced 34 ground water monitoring wells that are part of the statewide climate response network. This project was funded by the U.S. Geological Survey through the Massachusetts Department of Conservation and Recreation. Many of the wells were installed in the 1950's and 60's with steel screens that are now collapsing. We are systematically replacing all the older wells with new PVC screens. The data from these wells is used to evaluate the overall health of our aquifers and used by the State Drought Management Task Force to determine when and if water bans are needed.
- In June 2019, the Massachusetts Geological Survey co-sponsored with the Massachusetts Geological Society the 2019 Friends of the Pleistocene Field Trip led by Byron Stone of the U.S. Geological Survey. This 3-day trip was held on Cape Cod and presented new data on the glacial history of the Cape. A 63-page field trip guide was prepared and there were about 90 participants.
- The Survey is currently working with the U.S. Geological Survey to publish the new Quaternary Map of Massachusetts. The scale of the map will be 1:100,000 and differs from the surficial materials map in that it will show ice margin positions, the major morphosequence deposits, meltwater channels, striations and drumlin axes. Also, the map will include structure contours of the bedrock surface in major river valleys and southeastern Massachusetts. In addition, the offshore glacial geology including Cape Cod Bay, Nantucket Sound, Vineyard Sound, Buzzards Bay and Block Island Sound will be included. We hope to have a draft in Fall 2019.
- Finally, we have a proposal pending to build a structure contour map of the bedrock surface across the state. We have begun gathering existing well data and have about 65,000 wells with depth to bedrock information.

If you are in the area visiting, please stop by the Survey office and I can fill you in on all our activities.



## **Geosciences Honors and Awards** **Spring 2018 to Spring 2019**

- Toby Applegate - Kahn Institute Fellow, Smith College 2018-2019
- David Boutt - GSA Fellow 2018, Geological Society of America Birdsall-Dreiss Distinguished Lecturer Award
- Forrest Bowlick - Teaching for Inclusivity, Diversity and Equity Fellow (TEFD), AY 2018-2019.
- Rachel Bryant - PhD student, CNS Award for Diversity and Inclusion, May 2018
- Timothy Cook - Harvard University Charles Bullard Fellow in Forest Research, AY 2018-2019
- Michele Cooke - CNS Outstanding Research Award, May 2018
- Rob DeConto - IPCC Contributing Author, Special Report on Oceans and Cryosphere, 2018-2019
- Haiying Gao - 2018 NSF Career Award
- Piper Gaubatz - American Association of Geographers, China Geography Specialty Group Service Award 2018.
- Christine Hatch - UMass Sustainability Curriculum Fellowship, 2018-2019.
- Mike Jercinovic - Awarded Fellow, Mineralogical Society of America 2019
- Isaac Larsen - NASA Career Award; Fulbright Scholar Award for Research in Austria for Spring 2020
- Stearns A. (Tony) Morse (Emeritus) - Mineralogical Association of Canada's Peacock Medal, its highest award.
- Steve Petsch - ISSR UMass Public Engagement Fellow 2019, Spring 2019
- J. Michael Rhodes - Special Session Celebrating the Career of Michael Rhodes, International Goldschmidt Conference, International Geochemical Society, Boston, 13 August 2018. This session also celebrated his 80th birthday.
- Stan Stevens - CNS Senior Lecturer's Professional Development Fellowship, Spring 2019, To lead the development of a policy volume for the World Commission on Protected Areas of the International Union for Conservation of Nature (IUCN).
- Jon Woodruff - IPCC Contributing Author; Keynote Speaker at Securing Prosperity in the Coastal Zone, Virginia Academy of Science, Engineering and Medicine, Richmond, VI, Nov. 2018

PhD student Marsha Allen  
Awarded \$2200 from the International Association of Geochemistry. And her picture will be featured in the next edition of Elements magazine.

PhD student Karin Lehnigk  
Awarded the GROW-Norway Award to spend Jan-August 2020 in Bergen Norway working on cosmogenic isotope surface dating projects.

PhD student Sarah McKnight  
Awarded the Boren Fellowship to conduct research and improve her Arabic in Palestine/Israel.

### Geological Society of America- Named Awards 2019

PhD candidate Ian Hillenbrand- Marland Pratt Billings and Katherine Fowler-Billings Research Award

PhD Candidate Rebecca Smith - Gretchen L. Blechschmidt Award

PhD Candidate Boyang Zhao - Charles A. and Ruth R.P. Ross Research Award

PhD Candidate Evan Thaler - Quaternary Geology and Geomorphology Division - Peter Birkeland Soil Geomorphology Res. Award

### Geological Society of America -Graduate Student Research Awards 2019

Ian Hillenbrand

Karin Lehnigk

Rebecca Smith

Evan Thaler

Boyang Zhao





Let's play a game! Can you find the error? Cakes created by Atkins Farms



End of year (2019) annual picnic and award ceremony.



Live music at the picnic by Justin Mistikawy, Rylee Wrenner and Dr. Christine Hatch.

Matt Golombek (right) and John Schumacher(left) at GSA 2018



Bill Clement giving pointers on using ground penetrating radar equipment.



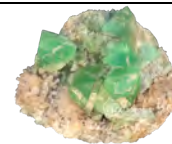
Dedication and thank you for the Hawley Formation Pillow Basalt, a gift from Ashfield Stone, Inc. Fall 2018.



Dr. Jon Woodruff and M.S. graduate Alycia DiTroia.



Graduation 2019



### DEPARTMENT AWARDS

#### **Outstanding Senior Awards**

##### **Geology**

Katy Turner  
Patrick Scordato  
Rudy S. Marek

##### **Earth Systems**

Robert A. Walton

##### **Geography**

Natalie Howe  
Rebecca Feidelson

#### **Outstanding Teaching Assistant Awards**

##### **Geology**

Justin Mistikawy  
Adriane Lam  
Caroline Ladlow

##### **Geography**

Juliet (Julia) Galecki

#### **Geography Alumni Award**

Jessica Ann  
Schottanes  
Mary Richard

### MEMORIAL AWARDS

#### **Gloria Radke**

Alina Lopez  
Boyang Zhao

#### **Leo M. Hall**

Karin Lehnigk  
Graham Thomas  
Hanna Elston  
Ian Hillenbrand

#### **H.T.U. Smith**

Solveig Schilling  
Emma Robertson  
Georgia Bass  
Joshua Huehls

#### **Elinor Fierman**

Rebecca Smith  
Solveign Schilling

#### **Andrew Wise Memorial Scholarship**

Brendan Moran  
Erika Ito  
Solveign Schilling

#### **Joseph Hartshorn Memorial Scholarship**

Cong Li  
Evan Thaler  
Sampath Rathnayaka  
Meng Liu



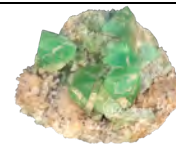
Departmental photo Spring 2019.



Sedimentology class on a field trip fall 2018



Anna Ruth Halberstadt visits McMurdo Dry Valleys, Antarctica to collect a mid-Miocene sedimentary record



## **Thank you to Our Donors!**

Thank you so much for your continuing support of the Geosciences! Your gifts to any one of our named endowments allow us to provide critical funds for field experience, lab work, conference attendance, and workshop participation. Your support also provides the means for us to replace old vans in our small fleet and update field gear. Last year we launched a successful fundraising campaign that raised \$22,000 to purchase rock table tops for our new Introductory Laboratory teaching space. The tables create awe in the students, beauty to the room, and a wonderful source of curiosity for students and the general public who visit. Thank you to those who contributed to this worthwhile fund.

We are pleased to announce two new scholarship funds that will be awarded in Spring 2020. The funds were established in memory of two notable alumni who made significant contributions to our field.

**Lee Allison Memorial Fund** This award will honor the wide reaching legacy of Dr. Lee Allison '86PhD and annually celebrate his extensive impact on the entire science community. The annual award will recognize an outstanding graduate student with a minimum GPA of 3.5, strong research skills, and has demonstrated entrepreneurial leadership in the College of Natural Sciences, greater UMass Amherst campus, or outside the university.

**Garrett G. Hollands Memorial Scholarship** This award will honor Mr. Hollands' '75MS and his 40-year career in environmental consulting. He was highly regarded as a surficial geologist and wetlands scientists who mentored many in critical thinking and field skills. The annual award will provide scholarship support to a rising senior enrolled in Geosciences who demonstrates exceptional interest in environmental geosciences as evidenced by extracurricular activities and who has a GPA of 3.0. Those with military service will be given preference.

No matter how you give, how much you give, or why you give to the Department of Geosciences, your gift changes lives—and changes the world. Thank you!

For information on giving opportunities to fund department scholarships, student research, or student travel grants. Please contact the Stephen Burns (Department Head) at 413-577-2270 or email him at [sburns@geo.umass.edu](mailto:sburns@geo.umass.edu)

### ***Field Geology Experience and Training Fund***

A challenge from Mike Williams and Henry Berry ('89PhD, Geosciences)

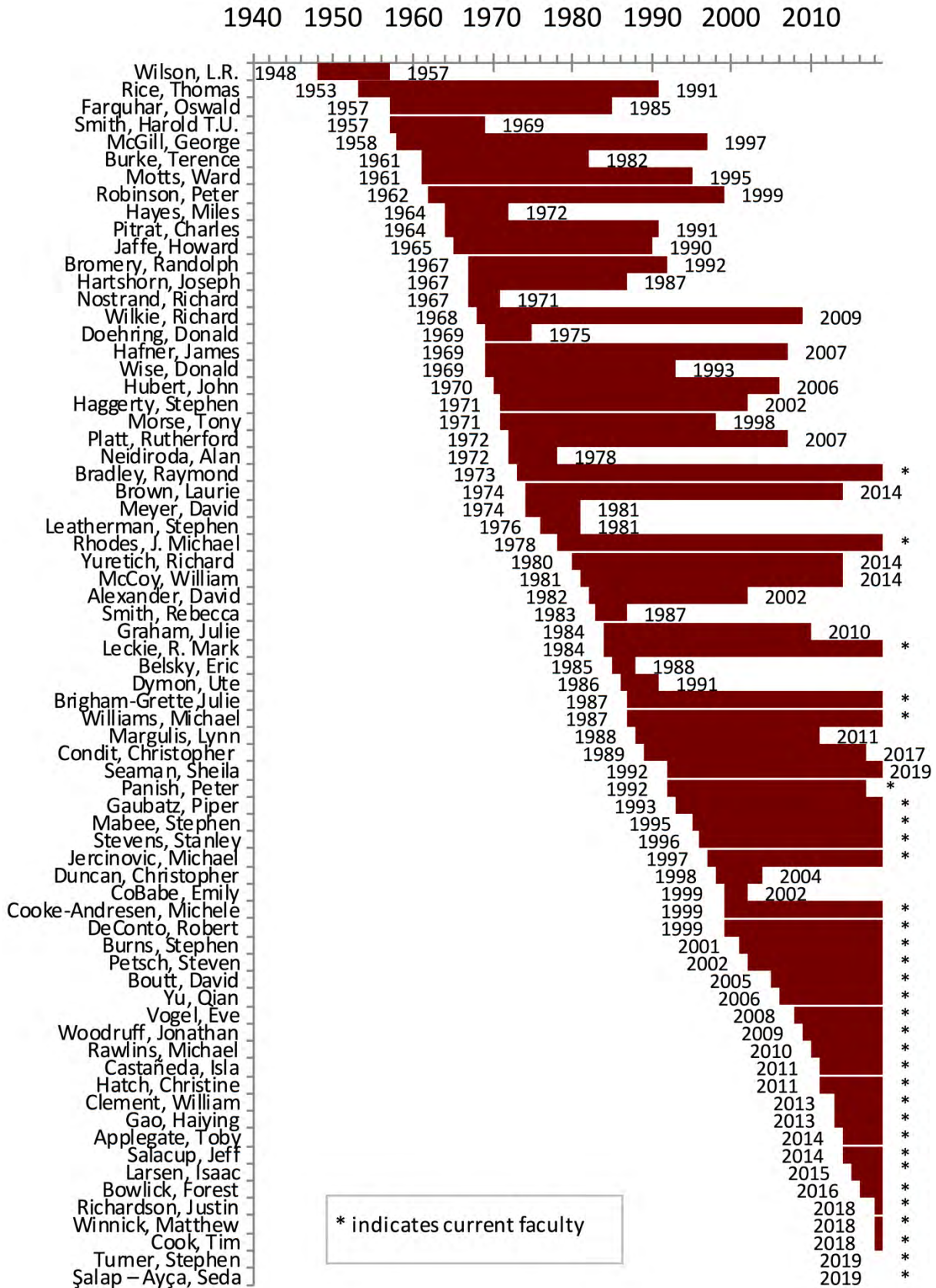
Mike Williams and alumnus Henry Berry have initiated a new fund to support meaningful geologic field experiences for students. Whether one day, one week, or longer, field excursions with experienced geologists can be life-changing for students. Our goal is to provide funding for students to participate in formal or informal field work or field trips and expand their academic learning beyond the classroom. We are particularly eager to provide the means for students to accompany professional or academic geologists into the field. The fund was established with New England field experiences in mind, but support for other destinations will be considered.

***We challenge our friends and colleagues*** from the Geosciences community to join us in contributing to this fund and help to create the next generation of geologists (<http://bit.ly/UMFieldGeology>). Your generosity will have a direct impact on our students as they pursue their education.

***Donate today!***



# Departmental Faculty (1953-2019)



\* indicates current faculty