

# UMASS AMHERST geosciences

AUTUMN 2016



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## THE COLLEGE OF NATURAL SCIENCES



### GREETINGS FROM DEPARTMENT HEAD JULIE BRIGHAM-GRETTE

Greetings to all alumni and friends of the Department of Geosciences! It's been three years since becoming chair and nearly that since our last newsletter. I am happy to report on the continuing success of our faculty, students and alums and also about the exciting transformations we have in place. Throughout this newsletter you will find updates on changes to the faculty, research activities, and upgrades to the spaces we occupy. Moreover, thoughtful strategic planning at both the national and campus level has provided us with the impetus for making important changes moving forward in our curriculum, learning goals and alumni interactions leading to more effective career paths for both undergraduate and graduate students alike.

We have three new faculty members joining us. **Toby Applegate** is now entering his third year with us teaching human and world geography, with a specialty in human migrations. **Isaac Larson** joined us one year ago and is ramping up his research and teaching program in geomorphology and surface processes. Lastly, starting this September we welcome **Forrest Bowlick** who will lead our new one-year masters program in GIS with a research interest in cyberGIS.

We are also excited about acquiring some new space in Morrill because of some renovations in Biology and the move of some biology activities to a new building. We moved our **introductory geology laboratory** from Hasbrouck the first week of classes and scramble to get it set up for next week's classes. Over the coming months, this new space will be outfitted with new hands-on benchtop models encompassing a range of the geosciences thanks to the generous donations from our alumni. At the same time the **Morrill Courtyard** makeover by UMass Physical Plant will feature outstanding rock specimens and seating areas that will anchor the Trail of Time we have planned as a garland within and around the campus grounds.



Department head **Julie Brigham-Grette** meets with Chancellor **Kumble Subbaswamy** in the Rausch Mineral Gallery

All of this transition is capped by the establishment of a new **School of Earth and Sustainability**, within our same College of Natural Sciences. This new school, founded in partnership with Environmental Conservation and the Stockbridge School of Agriculture, allows us to remain an independent department, but provides a means of marketing the breadth of research and instruction we do in basic earth sciences and human geography, leading to a sustainable planet. This visibility will emphasize the new curriculum and research we offer leading to careers as diverse as environmental geography to seismic hazards related to the recycling and integrity of lithospheric plates. With this we also plan to grow our 1-year masters program in Hydrogeology and launch a new 1-year Masters program in GIS along with an undergraduate certificate program in GIS. Within this partnership we remain strong in our traditional fields concerning earth dynamics, paleoclimate, water systems and human geography.

We thank you for supporting the Department of Geosciences. We couldn't do this without you! Best wishes, **Julie Brigham-Grette**, Department Head

## M. LEE ALLISON (1948-2016) REMEMBERED

by Steve Mabee

**Lee Allison** (Ph.D. Geology, 1985), State Geologist and Director of the Arizona Geological Survey, passed away Tuesday, August 16, after suffering a critical head injury from a fall at his home.

The UMass Geoscience Department recognized Lee's scientific and organizational achievements with its Distinguished Alumni Award in 2009. That award unofficially recognized his influence on a delightfully unorthodox generation of graduate students. His talented mix of imaginative science, solid field-based common sense, social responsibility, and ability to organize almost anything large or small was obvious along with a wickedly funny sense of humor. Tales of that era's pranks with him as one of several ringleaders continue to circulate Morrill's hallowed halls. That talented mixture combined with his ability to bring diverse people and organizations into new, imaginative programs continued through his career. His passing is a tragic loss to his family, the profession, society, and to his numerous friends and colleagues, many from this department.

Lee received his B.A. from the University of California Riverside and M.S. from San Diego State University. He earned his doctorate at the University of Massachusetts Amherst in 1986 working in the Bighorn Basin in Wyoming with **Don Wise**.

Lee was the State Geologist of Utah from 1989 to 1999, was State Geologist of Kansas from 1999 to 2005, and then was named State Geologist of Arizona in 2005.

During his tenure at the Arizona Survey Lee managed to double the agency's personnel and secure more external funding despite a 45% drop in state support during his nearly 11-year tenure. This summer, the Arizona legislature and governor moved the Survey to the University of Arizona in space that was one quarter the size of their previous office and promised no financial support beyond summer 2017. This forced the Survey to reduce staff and close its Phoenix office, two libraries and the Survey's retail store. Lee was working with the legislature and others to restore funding when he passed away.

Lee gained national and international recognition during his career. He was a member of the National Science Foundation Advisory Committee for Cyberinfrastructure, the North American member on the OneGeology Board of Directors, chair of the National Data Repositories Working Group and chair of the Geoinformatics Division of the Geological Society of America. He also secured National Science Foundation funding for the early development of the EarthCube project. He was instrumental in developing the National Geothermal Data System that not only provided

an accessible data base of geothermal information but created the model for melding massive amounts of data into a usable format for researchers.

Lee also received national awards that included the Public Service Award of the American Association of Petroleum Geologists, the Tanya Atwater "Encourage" Award from the Association for Women Geoscientists and the John T. Galey Jr. Award for Public Service.

Lee was a visionary leader with entrepreneurial instincts that seemed to be one step ahead of the curve. He was keenly interested in science and how it interfaces with society. He was committed to science in public service and strived to make a difference. In that spirit, Ann Becker, Lee's wife, has asked that the Geoscience Department establish the Lee Allison Memorial Fund. This fund will be used to support graduate students that demonstrate solid research acumen, leadership potential, an entrepreneurial spirit and an interest in science for public service.

Donations addressed to the Lee Allison Memorial Fund can be sent to:

Department of Geosciences  
611 North Pleasant Street  
University of Massachusetts  
Amherst, MA 01003

Online donations can be made by going to: <http://www.geo.umass.edu/lee-allison-memorial-fund>

Write "Lee Allison Memorial Fund" in the "Special gift Instructions" box.

If you have questions, please email [office@geo.umass.edu](mailto:office@geo.umass.edu) or call 413-545-2286.



## AARON BELTZER

by Sheila Seaman



**Aaron Beltzer** was near completion of his M.S. when he passed away on April 27, 2016. He was 26 years old. The loss of Aaron was a terrible shock and is a continuing heartbreak in our department. When people pass on, we always talk about their best traits. All of Aaron's traits were the best. His warmth and

kindness were phenomenal. There was, we have all agreed, nobody whom Aaron did not seem to like. He was a tall, reddish haired guy with a sweet smile. Regardless of the situation—whether it was bad weather on a field trip, a tough deadline, or an intractable geologic problem, Aaron was sure it would all turn out OK and that there was a joke to be found in it somewhere. It was easy to like Aaron. While we adjust to this loss, we realize that our pain cannot compare to that of his wonderful parents and brothers. Our thoughts are with them.

I was Aaron's advisor. He arrived at UMass in Fall 2014 to begin his graduate program. Prior to that, Aaron and I spent a day in the field in northeastern Massachusetts, shopping around for a good field-based thesis problem. From that day, Aaron was in love with the Cape Ann pluton. As he leapt from rock to rock pointing out magma interaction textures, I realized that working with him was going to be a joy, and it was. Aaron brought a combination of relentless enthusiasm and petrologic sophistication to his research. His geologic background and his raw ability were outstanding, causing him to shine in the classroom as well as in the field. I joined Aaron and his also-delightful field assistant, geology major **Paul Southard**, in the field in the Cape Ann pluton during the summer of 2015. Aaron and Paul had done excellent geologic mapping of shoreline exposures of the many facies of the Cape Ann pluton near Gloucester. By the time I left them, I felt that I could identify those facies for the first time ever, thanks to their work. I'm glad I told Aaron that. We stayed in the campground where Aaron and Paul had been camping all summer. The lady who ran the place seemed to regard them as her sons. The days were sunny and filled with geologic highlights, and there was a lot to laugh about. I'm grateful for the memory.

Just a few weeks before he passed away, Aaron gave an outstanding talk on his work on aspects of the Cape Ann pluton at the northeast section meeting of the Geologic Society of America in Albany. He put the talk together like a pro and showed promising ability in terms of presenting his work. His dad was present at the talk, making the occasion all the happier.

Today I'm sitting in a lab at the University of New Hampshire with another fine grad student, collecting data. There were supposed to be three of us, not two, on this trip. The day is good but we both know that it would be a whole lot better if Aaron were here with us, saying "isn't this great?!" every few minutes. The department, and the geologic world have lost a treasure. We will never forget him.

A fund has been established in memory of Aaron's enthusiasm and love for geology. It will be used to support student research.

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Department of Geosciences  
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University of Massachusetts  
Amherst, MA 01003

Online donations can be made by going to: <https://www.geo.umass.edu/aaron-beltzer-memorial-fund>

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## REMEMBRANCE OF JOSEPH I. GOLDSTEIN

by Mike Jercinovic



This year marked the tragic passing of **Joe Goldstein**, a great friend, colleague, and supporter of the Department of Geosciences. Joe's scientific contributions substantially shaped our present understanding of solar system planetary accretion processes and the formation of planetary systems from early condensates to Earth-like planets in general. He also contributed immensely to the fields of electron beam microanalysis and metallurgy. Joe was very active in the Department of Geosciences Electron Microprobe / SEM Facility the last ten years, mostly pursuing his study of meteoritic metals, and also helping to support the facility while promoting interdepartmental alliances. Joe's early academic career led him into the study of meteoritics and planetary geology in the 1960s where he became deeply involved in studies of not only meteorites, but also lunar samples returned from the manned Apollo missions, and unmanned Luna missions. In eventually making his way to UMass, he joined other active planetary geoscientists (**Steve Haggerty, Mike Rhodes, Don Wise, George McGill, Chris Condit**) and continued the very rich tradition of the UMass/ NASA connection.

Joe was former Dean of the College of Engineering at UMass, and was an active UMass Distinguished Professor in Mechanical and Industrial Engineering. He was the recipient of many university, national, and international honors, including the Chancellor's Medal (UMass 2007), Outstanding Accomplishments in Research and Creative Activity (UMass 2011), the International Metallographic Society's Henry Clifton Sorby Award (1999), the Honor Society of Phi Kappa Phi award for distinguished service (UMass 2008), the Duncomb Award for Excellence in Microanalysis, an award from the Microbeam Analysis Society for Exceptional Science, Service, and Education to the Microanalysis Community (2008), the Leonard Medal (the highest honor of the Meteoritical Society, 2005), Fellow of the Microscopy Society of America "for his leadership in quantitative SEM and AEM x-ray microanalysis, in application of these tools to materials science, and in the education of generations of microscopists" (2010), and Fellow of the American Society of Metals. Joe's scientific contributions earned him the distinction of having an asteroid named in his honor (4989 Joegoldstein).

Joe completed his Doctorate in Metallurgy at MIT in 1964 under the supervision of Robert Ogilvie, where he contributed substantially to the early development of Electron Probe Microanalysis (EPMA). It was also at MIT that he and Ogilvie determined the Fe-Ni phase diagram and applied Ni-Fe diffusion theory to the study of metallic meteorites. This work furthered the development of metallographic cooling rate theory and its application to parent body formation and planetary accretion models which facilitated our understanding development of the early solar system.

After time at NASA's Goddard Space Flight Center as an Aerospace Technologist, he accepted a faculty position at Lehigh in 1968, where he remained until being appointed Dean of the College of Engineering at UMass in 1994. While at Lehigh, Joe established the summer Lehigh Microscopy School, a series of short courses covering a wide variety of techniques and applications. The summer school, which Joe continued to teach throughout his career, has seen over 6000 participants. Joe is known to many as the lead

author of the exceptional text "Scanning Electron Microscopy and X-Ray Microanalysis". Published over three editions, it remains the present standard in the field. The Lehigh Microscopy School, along with this classic textbook, will remain enduring legacies.

Joe's passionate study of meteorites continued throughout his career, and has included the application of metallographic cooling rates to all metal-bearing meteorites, the study of carbide and sulfide phases, and the development of Widmanstatten pattern. As fondly recalled by Steve Haggerty, Joe established the phase chemistry-based science behind the ability to distinguish indigenous lunar metals from impacted meteoritic contaminants. His most recent work included a revisiting and refining of the cooling histories in metallic meteorites with new microanalytical techniques (with J. Yang and E. Scott, *Nature* 2007) which resulted in a new theory of a protoplanetary-collision based accretion model for the early solar system. Joe overarching synthesis of phase chemistry (from theory, experimental results, and microanalytical measurements), and isotope geochemistry has suggested that iron meteorites actually were derived from many distinct parent bodies that accreted prior to chondrites in the early inner solar system and not the asteroid belt as previously believed. Subsequent disruption by impacts and scattering from protoplanets moved many of them to the present asteroid belt. His exquisite work on cooling rates, planetary accretion, and early solar system development has been truly paradigm shifting.

In honor of his research legacy, the Microanalysis Society has added a new group of awards in Joe's name. The Joseph Goldstein Scholar Award is intended to promote career advancement for early career members of the Microanalysis Society, increase interactions of junior and established microanalysts, and to advance the state-of-the-art in microanalysis measurements. It is co-sponsored by the Meteoritical Society.

Joe was active in the Geosciences Electron Microprobe/ SEM Facility until his passing, investing many hours in sample preparation and analysis. Joe's research group included a number of outstanding students and post-docs, and each year he enthusiastically participated in providing summer research opportunities for undergraduates. We already miss his lively scientific engagement here in Geosciences, always curious, and always the lifelong student of science. Joe Goldstein was a truly exceptional scientist of the highest caliber and a great supporter of the Earth and planetary sciences here at UMass. In the words of **Steve Haggerty** "... Joe was a great colleague, an engineer who should have been a geologist!" He will be fondly remembered, and sorely missed.



## IN MEMORY: DR. NEIL TIBERT (1966-2015)

by Mark Leckie

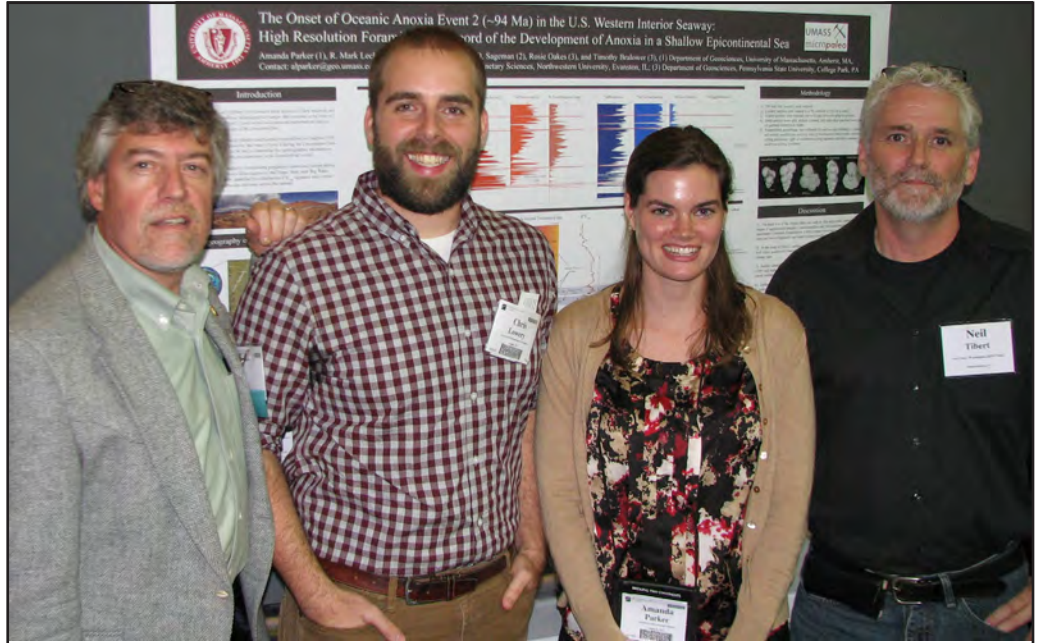
On December 20, 2015, **Neil Tibert** passed away after a short battle with sarcoma, a soft-tissue cancer that invaded his abdomen; he was 49. We had just seen Neil at the GSA meeting in Baltimore in early November and he looked fit as a fiddle. He grew up on Long Island, Nova Scotia, along the shores of the Bay of Fundy. Neil did his BS and MS at Dalhousie University in Halifax before coming to UMass in 1996. He finished his PhD in 2002 and moved on to a tenure track position at Mary Washington University in Fredericksburg VA in 2003 where he was an Associate Professor.

Neil was a field geologist, and a darn good one. Whether taking sediment cores, digging in the mud, or chopping at mudrocks and shale, Neil loved being in the field or on the water. Neil's doctoral research

focused on Upper Cretaceous marginal marine depositional systems of the Western Interior Seaway. We collected many stratigraphic sections across the Colorado Plateau. On a 5-College Geology cruise down the Hudson River to NY City and into Long Island Sound, Neil made the striking observation that the organisms (foraminifera and ostracods) inhabiting modern day estuarine and coastal environments are much the same as their ancient ancestors. This has huge implications for reconstructing the ancient environments where these organisms are found.

He used microfossils to tell a geologic story – to reconstruct ancient environments and interpret Earth history. Teasing out the dynamic history of our planet requires an open mind, hard work, and attention to detail. Neil excelled at these! He was a stratigraphic micropaleontologist; he did not focus on a narrow window of geologic time. Rather, Neil's research spanned some 300 million years of Earth history. He had international collaborations. His contributions were significant and enduring. His absence is already keenly felt.

Neil and I had a blast working together and our collaboration continued long after he left UMass. We learned a lot from each other. I was blessed to have had the opportunity to work with him. A special issue of *Micropaleontology* dedicated to Neil is currently in the works, featuring papers from some of his former students. We hope this presents a fitting tribute to our good friend and colleague.



Mark Leckie, Chris Lowery, Amanda Parker, and alum Neil Tibert (PhD 2001) at 2015 GSA in Baltimore. Neil passed away in December following a short illness. Neil was a Professor at Mary Washington University.



A blast from the past: Tammy Rittenour, Amy Patrick, David Korejwo, Neil Tibert, and Mark Besonen in Mark Leckie's marine geology class in 1997.

## HOMININ SITES AND PALEOLAKES DRILLING PROJECT (HSPDP)

by Isla S. Castañeda

The Hominin Sites and Paleolakes Drilling Project (HSPDP) is an international research collaboration involving over 40 senior scientists from 8 countries. The overall goal of this project is to study ancient lake sediments for paleoclimate and paleoenvironmental reconstruction in the East African Rift Valley, which are located in close proximity to some of the world's most important fossil hominin and artifact sites. Currently much of our knowledge of East African climate at the time our human ancestors lived comes from marine records located far away from the sites where hominin fossils and artifacts are found. The new drill cores allow for paleoenvironmental conditions to be examined at the sites where our human ancestors were living and also will be used to address a number of outstanding questions and hypotheses regarding the role of local, regional and global environmental variability in hominin evolutionary history. In 2013 to 2014, drill coring from a truck mounted drill rig collected approximately 2000 m of ancient lake sediments through time intervals of the same age as the hominin fossils from 5 key localities in Ethiopia (Northern Awash River and Chew Bahir areas) and Kenya (West Turkana, Tugen Hills and Lake Magadi; see Figure 1). Currently, geologists and anthropologists, representing a wide variety of sub-disciplines, are analyzing the drill core samples.

Here at the UMass Biogeochemistry Laboratory, Isla

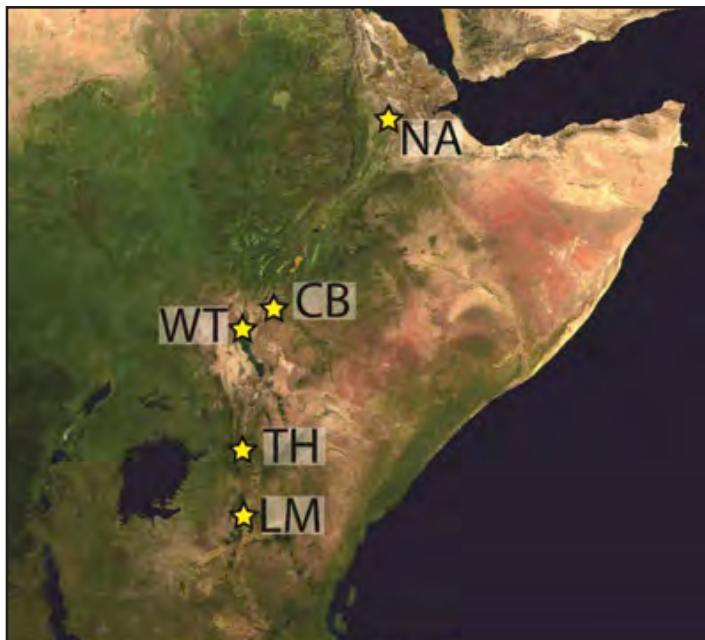


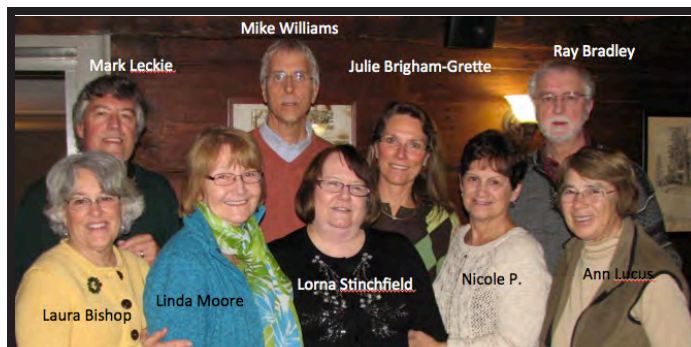
Figure 1: Locations of the Northern Awash (NA), Chew Bahir (CB) West Turkana (WT), Tugen Hills (TH) and Lake Magadi (LM) drill sites in East Africa. The approximate age ranges of sediments covered by each site are also indicated.

**Castañeda** and undergraduates **Megan Thompson-Munson** (dual Geology and Environmental Science major) and **Geoffrey Small** (Chemical Engineering major) are currently examining the organic geochemistry of sediments from the West Turkana and Northern Awash River sites. UMass is one of the organic geochemistry laboratories involved in this project and we are working in close collaboration with organic geochemists at Brown University and the University of Pittsburgh on these samples. The N. Awash Basin contains abundant early hominin fossils and the lakebeds of the Hadar Formation (~3.6 to ~2.9 Ma) will provide a record of climate variability during the Pliocene, prior to the intensification of Northern Hemisphere glaciation (~2.7 Ma). The lakebeds of the Turkana Basin are Early Pleistocene in age (~2.3 to ~1.4 Ma). This time interval includes some of the earliest fossils of *Homo rudolfensis* and *H. ergaster/erectus*. At both sites we are reconstructing past temperature using a novel method based on membrane lipids (branched glycerol dialkyl glycerol tetraethers) produced by soil bacteria. We are also examining the carbon isotopic composition of plant leaf waxes, which provides information on the dominant photosynthetic pathway utilized (C3 versus C4 photosynthesis). In this region of East Africa, C4 plants (warm season grasses and sedges) are commonly found in tropical savannas and are drought adapted in comparison to C3 plants (trees, cool season grasses). By examining the carbon isotopic composition of ancient leaf waxes preserved in lacustrine sediments, we will investigate vegetation changes through time, from which it can be inferred when conditions were relatively wet or arid.

The HSPDP is currently funded by the U.S. National Science Foundation (NSF), the International Continental Scientific Drilling Program (ICDP), the Deutsche Forschungsgemeinschaft (DFG), and the National Environmental Research Council (NERC). More information can be found at <http://hspdp.asu.edu/> and at <https://www.facebook.com/HSPDP>.



Figure 2: Middle Pliocene laminated diatomites from a paleolake of the Northern Awash Basin in Ethiopia. Photo from <http://hspdp.asu.edu/>.



### OFFICE STAFF UPDATES

Lorna Stinchfield retired in January 2015 after 20 years of service to Geosciences (25 to UMass). She served as Department Head Secretary under 4 department heads!

The department welcomed the hiring of Eugenie Harvey for travel and research expenditures at the same time Laura Bishop move up to the Dept Head secretary position.

Both Laura and Jen Nikonczyk have since left the department, but we are happy to still have Linda Moore and Marsha Howe with us!

## HYDROGEOLOGY OF LITHIUM BRINES IN NEVADA AND CHILE

by David Boutt

**David Boutt** has been working on lithium brines in Clayton Valley, Nevada, USA and the Salar de Atacama, Chile for the last few years. Lithium is a key element for inclusion in electronic components and Li-ion batteries used in most hybrid vehicles. These brines are interesting resources since they are mobile (unlike a traditional ore deposit) and they regenerate (potentially at human time scales). Our work in these systems has identified a key set of important criteria in the genesis and maintenance of these brines. One of the key factors is the existence of a closed topographic system which is critical for trapping precipitation and evaporating in a brine hosted salt aquifer assuming an initial source of lithium in the system (e.g. volcanic activity). See a recent survey paper in *Economic Geology* – Munk et al., 2016. Our hydrogeology team has made some important discoveries with respect to the hydrogeologic conditions of groundwater in these challenging (dry and high) environments. Former MS student **Lilly Corenthal** has been element in the success of the Atacama project and has put some first constraints on the source of water to the brine aquifer and how regional groundwater flow contributes to the hydrologic balance (See Corenthal GRL, 2016). Her results have important implications for assessing hydrologic balance in some of the driest deserts of the world.



MS Student **Lilly Corenthal** (MS 2016) taking a break while sampling deep groundwater from a well with a bailer (depth to water ~285 meters!) on the Altiplano-Puna Plateau in Northern Chile, elevation 4200 m asl.

## NEWS FROM THE MICROPALAEONTOLOGY LABORATORY

by Mark Leckie

Collectively, the micropaleo crew has been working on many different projects from across the globe and spanning the Cretaceous, Paleogene and Neogene. Our research involves studies from the deep-sea and the Cretaceous Western Interior Sea, such as the paleoceanography of mid-Cretaceous Oceanic Anoxic Events (OAEs), including the Eagle Ford Shale of Texas and the Niobrara Formation, Maastrichtian climate change leading up to the K/Pg mass extinction in the tropical Pacific, evolution of the Brazilian continental margin during the Paleogene, glaciation events of the Antarctic, including the brief Oligocene-Miocene glacial event, evolution of Neogene circulation in the North Pacific and foram paleobiogeography, and Pliocene paleoceanography of the Caribbean. It's been exciting to have had several international students who were either sponsored by their government (**Khalifa Elderbak** from Libya - PhD 2014) or their oil company employer (**Renata Moura De Mello** from Brazil - PhD 2016; **Ali Alibrahim** from Saudi Arabia - MS 2016). In addition to our international crew, the following students have recently completed graduate degrees: **Serena Dameron** - MS 2015; **Chris Lowery** - PhD 2015; **Amanda Parker** - MS 2015; and **Andy Fraass** - PhD 2016. Andy is currently a post-doc at the Smithsonian in Washington DC, Chris is a post-doc at the Institute for Geophysics at the University of Texas at Austin, and Amanda is a middle school science teacher on the Cape. Renata is back at Petrobras in Rio, Ali returned to Saudi Aramco, and Serena is staying on to pursue a PhD. Newcomers to the lab are **Adriane Lam** who is pursuing a PhD and **Raquel Bryant** (a **Randolph and Cecile Bromery** Graduate Fellow) is

pursuing a MS/PhD. Raquel, Adriane, and I did field work in New Mexico in summer 2016 in support of Raquel's thesis. Despite the huge downturn in the hydrocarbon industry the past couple of years, **Kendra Clark** (MS 2012) and **Emily Browning** (PhD 2012) are leading the micropaleontology team at BP in Houston, and **Khalifa Elderbak** is a biostratigrapher with ALS-Ellington. Several of the team have applied to sail in upcoming Integrated Ocean Discovery Program expeditions, and I am a co-proponent on a drilling proposal in the South Atlantic. Lots of cool stuff going on!



Micropaleo Lab October 2015: **Raquel Bryant**, **Adriane Lam**, **Ali Alibrahim**, **Renata Mello**, **Andy Fraass**, **Amanda Parker**, **Serena Dameron**, and **Mark Leckie**

## DEPARTMENT WELCOMES NEW FACULTY MEMBERS

by Julie Brigham-Grette and Piper Gaubatz

We are welcoming three new faculty members to the department of geosciences.

### Toby Applegate

The geography program welcomed Dr. **Toby Applegate** as lecturer in 2014-15 and 2015-16 to teach in the geography program. Dr. Applegate teaches Geography 102 the Human Landscape, Geography 220 World Regional Geography, and Geography 360 Economic Geography. Dr. Applegate is a recent Ph.D. in geography from Rutgers. His research in Slovenia has included MS degree fieldwork on rural and urban landscape change and Ph.D. political and social geographical research analyzing the economic and social situations and human, political and legal rights issues of a minority population in the country of Slovenia who have been “erased” of their citizenship in the process of state formation. In order to carry out this research, Dr. Applegate learned the Slovenian language and spent more than 4 years in the Slovenia. He has also engaged with research and publication on urban economy in Slovenia, the political geographic impacts of cyclonic storms in South and Southeast Asia, changing human landscapes in the Dominican Republic, and AIDS and children in Botswana. His interest in European themes beyond his Slovenian research led him to serve for two years on the executive board of the European Specialty Group of the Association of American Geographers. Dr. Applegate’s extensive and successful teaching is complemented by his having contributed to the writing of one of the main textbooks used for teaching world regional geography in the U.S.

### Isaac Larsen

Isaac joins us to expand the field of Earth surface dynamics, geomorphology and landscape evolution. He received his Ph.D. from the University of Washington in 2013, and arrived one year

ago after serving in a 2-year position as the Texaco Prize Postdoctoral Fellow in Geology at the California Institute of Technology. Specifically he studies quantitative landscape evolution, examining how erosion, tectonics and climate interact to shape mountain topography, which goes to the very heart of fundamental issues in earth surface dynamics and geomorphology. His work on issues of landscape sustainability and human impact on the environment highlight natural connections within the Department of Geosciences and across the campus. He has worked in New Zealand, the Rocky Mountains, SE Tibet, NE India, and the mid-west.

Isaac’s research involves the use of surface exposure dating using Beryllium -10. Our department is now home to one of the most advanced cosmogenic isotope clean labs in the country! The applications are endless including new research he is launching into agricultural soil erosion across the mid-west.

### Forrest Bowlick

Forrest is just starting with us as a lecturer who will greatly expand our ability to develop a master’s program in Geographical Information system technology. Having just finished his Ph. D at Texas A&M, he brings us outstanding expertise in cyberGIS – that is the expansion of GIS from the desktop to the web making full use of the cyber infrastructure, GIS software and spatial analysis and modeling. With so much now on web and cloud computing, we are excited about the expertise Forrest brings to our program in this expanding area.

The development of a growing GIS project in the department and on campus provides the impetus for us to expand our classroom infrastructure, especially as we grown with the new School of Earth and Sustainability.

## CONGRATS TO AWARD WINNERS

**Ray Bradley:** Roy J. Zuckerberg Endowed Leadership Prize 2014-16; Honorary degrees from Bern Switzerland and Queens University Canada.

**Michele Cooke:** Elected, Board of Directors Southern California Earthquake Center.

**Julie Brigham-Grette:** Elected AGU Fellow 2016; recent UMass Conti Fellow.

**Chris Condit:** continues as NASA Astronaut Candidate Field Geology Training Instructor.

**Rob DeConto:** Tinker-Muse Prize 2016, For Science and Policy in Antarctica; recent UMass Conti Fellow.

**Piper Gaubatz:** elected Fellow 2015-16 UMass Interdisciplinary Studies Institute.

**Mike Jercinovic:** Microanalysis Society Presidential Science Award 2016

**Sheila Seaman:** College Outstanding Teacher award 2013

**John Sweeney:** College Outstanding Staff Award, 2013.

**Mike Rawlins:** 2015-15 UMass Public Engagement Faculty Fellow.

**Jon Woodruff:** 2016 Fulbright Fellow in Japan

**Richard Yuretich:** College Outstanding Outreach and Service award 2013





## 5-COLLEGE FIELD TRIP TO THE RIO GRANDE RIFT

by David Boutt

During 8 days in May 2014 UMass-Amherst Professors **David Boutt**, **Michael Williams**, and **Sheila Seaman** along with Amherst Professor **Tekla Harms** and Mt Holyoke Professor **Steve Dunn** led a group of 35 undergraduates and graduate students from the 5-colleges. The faculty and students participated in a weekly seminar during the spring semester to assemble a field trip guide that toured us across central and northern New Mexico to witness the incredible geology of the region. Our base camp was located at Bandelier National Monument outside of Santa Fe with a short stay at the guest lodging at the Seviellita National Wildlife Refuge. Highlights of the trip included visits to the Precambrian rocks of the Ortega Mountains, a tour of the now closed Questa Mine, a day with Dr. **Peter Mozley** looking at faults and fluid in the Socorro area, a tremendous inside peak at Valles Caldera with gracious host **Bob Parmenter**. A day spent with Dr. **Neila Dunbar** (NM Bureau and Mt. Holyoke grad) looking at Ash Fall tuffs and ignimbrites around the Jemez Mountains, and a delicious soak at Ojo Caliente. We even had a nice chance to visit with UMass Geoscience Alum **Tom Mcrory** at the campsite one evening.



From top to bottom, left to right: Students and faculty enjoying outcrops of Alluvial fan deposits associated with the development of the Rio Grande Rift.



A scenic lunch break amongst the glorious ponderosa pines of the Valles Caldera.

A photo of the group learning about stream restoration in the Valles Caldera in Northern, NM.

Group photo of all Rio Grande rift field trip participants at the Questa mine, Questa, NM.



## RAUSCH MINERAL GALLERY UPDATE

The Marvin Rausch Mineral Gallery continues to be a gem dazzling the halls of the Geosciences. Visitors come by the dozens each day and its becoming rather to routine to hear non-majors expletives such as “wow, how does this #\*%# grow!”. The addition of a new UV-light cabinet for fluorescent minerals has campus members and the general public coming back for more. Please check out our new website at <http://www.geo.umass.edu/rauschmineralgallery/>. We were even surprised and joyously shocked when a wedding suddenly occurred last February just before Valentine’s weekend! We have yet to learn the names of this fine couple.



## LAURIE BROWN RETIRES AFTER 40 YEARS

by Sheila Seaman



**Laurie Brown** may have retired from teaching in spring, 2014, but, luckily for us all, she is still working away on her research projects every day, in her new lab in the basement of Morrill. Laurie started teaching at UMass in 1974. She had received her B.S. in Math from Middlebury College, where, during her senior year, she took a geology course that convinced her that geology was her career path. Her M.S. research at the University of Wyoming involved gravity modeling in the Rocky Mountains. She went on to Oregon State for her

Ph.D., where she worked on geophysics and oceanography. She received her Ph.D. in 1974, and in the same year started her university career as an assistant professor at UMass. Her first office in the department was one of the tiny offices off of room 254. Her office furniture was reportedly procured by grad students who made nocturnal Robin Hood-style raids on offices of the over-privileged.

Laurie very rapidly became a keystone member of the department, taking on the job of Graduate Program Director for many years, and, after **Bill Bromery** left the department, becoming the sole geophysicist in the department. With her trusty chain saws converted to drills, she collected paleomag samples that targeted a range of geologic problems. She built a paleomag lab that occupied various spaces in Morrill, eventually ending up in **Don Wise's** former office on the second floor. Laurie authored some landmark publications in the late 1970's and 1980's with graduate students whose names have become legendary, including **Sue Soloyanis, Colleen Barton, Bill Kelly, Matt Golombek, Joyce Castro, and Art Goldstein**. Laurie's research program grew and she became involved in projects that included tectonic rotations in the Rio Grande Rift, secular variation of lava flows from Easter Island, correlations of ash flow tuffs in Colorado, and tracking the latest magnetic field reversal in volcanoes in Chile. In the early 1990's Laurie worked with **Suzanne McEnroe**, a Ph.D. student. Their collaboration has continued to the present, and has produced a string of publications focusing on topics from aeromagnetic anomalies in the Adirondacks, paleomagnetic features of Jurassic redbeds of Massachusetts, an Earth analog for Martian magnetic anomalies in Rogaland, Norway, anorthsites of Norway, and the micro-mineral level structural characteristics of magnetic minerals. Laurie's work on lava flows and tuffs in Tatara San Pedro, Chile documented the magnetic subtleties of the Matuyama-Brunhes reversal. Laurie's

current research is concentrated in two large areas – secular variation of Earth's magnetic field over the past 5 million

years, and the investigation of strongly magnetized ancient rocks as analogs for magnetic anomalies on Mars.

During her 40 years as a faculty member at UMass, Laurie has served for many years as Graduate Program Director, and as a proactive Associate Department Head, during which she began the tradition of producing a department calendar, and started the information sessions for majors applying to graduate school, looking for a job, and searching for summer internships. Laurie established an Environmental Geology course in the department, and taught the Oceanography, Geophysics, and Paleomagnetism courses to thousands of students. Her skilled teaching earned her the Association of Women Geoscientists' premier award, the Outstanding Educator Award, in 1991. Laurie did stints as the acting Department Head, and she was an always diplomatic chair of the Department Space Committee. In recognition of Laurie's world-class research, outstanding teaching, and major service contributions, Laurie was invited to deliver the Distinguished Faculty Lecture on March 11, 2013, and was awarded the Chancellor's Medal, the "highest award the University gives to an individual". In 2014, she was elected President of the Geomagnetism and Paleomagnetism Section of the American Geophysical Union, an office that she continues to hold. Congratulations, Laurie, on a brilliant career, and good wishes for all of the great research yet to come.



### RIVERSMART COMMUNITIES IN NEW ENGLAND

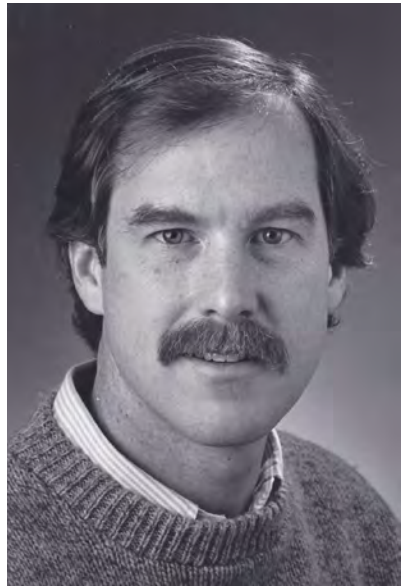
The RiverSmart series of projects are integrated research (both river science and social science) and extension projects that aim to support ecologically restorative and community-sustaining river flood prevention and mitigation in New England. Principal investigators are Geosciences Professors political-environmental geographer **Eve Vogel** and hydrogeologist-extension professor **Christine Hatch**. The original project was funded for 2012-15 and sponsored by the University of Massachusetts Center for Agriculture, Food and the Environment. Subsequent grants came from the US Department of Agriculture (NIFA program) and the US Army Corps of Engineers Institute for Water Resources. In summer and fall 2015 the team is producing some of its first major products and outreach efforts including a plan for a fluvial geomorphic assessment system in the Commonwealth of Massachusetts, a report of key policies to advance river flood resilience in New England, and a mini-report of successful institutional models. See <https://extension.umass.edu/riversmart/> for on-going updates.



## CELEBRATING BILL MCCOY'S RETIREMENT

by Piper Gaubatz

Professor **William McCoy**, long-time undergraduate advisor for geography, retired in fall 2014. **William McCoy's** primary research concerns Quaternary geomorphology and stratigraphy. He has worked on the chronology of alpine glaciation and lake-level changes in the western United States. Much of the lake-level work focused on the application of aminostratigraphic methods to Quaternary deposits of closed-basin lakes. That work resulted in an aminostratigraphic framework for the exposed records of Lakes Bonneville and Lahontan. Research has also been conducted on the determination of Quaternary paleotemperatures (based on rates of isoleucine epimerization in fossil mollusk shells) in the



Great Basin and the investigation of the paleoclimates and paleohydrology that supported the greatly expanded Pleistocene glaciers and lakes of that region. Recently he has been involved in research projects concerning the aminostratigraphy of Pleistocene loess deposits of the midwestern U.S., China, and central Europe. In collaboration with **Eric A. Ochse**, an aminostratigraphic framework has been developed for a region including the Czech Republic, Slovakia, Hungary, and Austria. Most recently,

work is being conducted on loess aminostratigraphy and paleothermometry across Europe from Belgium to Ukraine, including Germany, Czech Republic, Austria, Hungary, Serbia, and Romania.

The geography program will miss Professor McCoy's contributions not only to research but also to teaching Geomorphology, quantitative methods, and global environmental change and advising our undergraduate majors.



## NE CLIMATE SCIENCE CENTER NEWS

by Addie Rose Holland

The Northeast Climate Science Center (NE CSC), based in UMass Amherst, is part of a network of eight climate science centers that provide actionable results and tools to natural and cultural resources managers to adapt to a changing climate. Most of the NE CSC university and USGS staff, about half of the NE CSC Graduate Fellows, and several PIs, including **Ray Bradley**, are based in the Climate System Research Center in the Morrill Science Center. The NE CSC, managed by the USGS's National Climate Change and Wildlife Science Center, serves 21 states from Maine to Minnesota and works with seven Landscape Conservation Cooperatives, state agencies, Tribal governments, community organizations and federal resource managers. UMass, as host institution, is among seven consortium members spread out throughout the northeast and mid-west.

Managers, conservationists and communities struggle to make the results of climate projections and ecological studies relevant for immediate implementation as well as for long-term strategic planning needs. Designed to

meet a growing need for on-the-ground decision makers to have access to climate science as it relates to wildlife, renewable resources, community resilience, restoration and traditional land-use, the NE CSC bridges a gap between knowledge and application. Visit the NE CSC's website ([necsc.umass.edu](http://necsc.umass.edu)) to see more about the great projects folks in geosciences are working on, such as **Ray Bradley** and **Ambarish Karmalkar's** state-by-state climate projections, or Ray and **Dan Miller's** NE CSC-funded project "Assessment of paleoclimate resources for studies of climate extremes". The NE CSC also hosts a webinar series in the semester. Visit [necsc.umass.edu/webinars](http://necsc.umass.edu/webinars) for a schedule (TBD), and don't forget to sign up to the mailing list!



## RICHARD YURETICH RETIRES

by Mark Leckie



**Richard Yuretich** retired in 2014 after 34 years of service to the Department of Geosciences; his retirement was celebrated at the Alumni Reunion held at UMass in October 2014. Here are some things that you may or may not have known about Richard, and his many contributions to our department and our students, and to UMass. After earning a BA at New York University in 1971, he went on to Princeton University for a M.A.

and PhD in 1976 where he studied the sedimentology and geochemistry of modern sediments from Lake Turkana in the eastern Rift Valley of Kenya. Richard began his professional career as a geochemist with Gulf Oil in Pittsburgh. He decided that his heart was really in academia and teaching so he accepted an Assistant Professorship at SUNY Oneonta in 1977. Richard moved over to UMass in 1980 where he quickly became a very active and productive faculty member in the Department of Geology and Geography (later Geosciences) until his retirement. Richard had a diverse array of research projects including late Neogene climate change recorded in Lake Baikal (southeastern Siberia) and clay mineralogy and paleoceanography of the Cretaceous Western Interior Sea, to environmental problems such as groundwater contamination associated acid mine drainage. Richard was THE driving force behind innovative changes in pedagogy and student-active learning. He led a major NSF-funded initiative called STEMTEC (1997-2002) that brought together UMass, 5-College, and regional high school science teachers to explore ways to improve STEM education. This was really a revolutionary sea change in how we teach at the college and university level. Under Richard's leadership, he exposed many of us in the department to new and better ways to think about how best to teach our science and more actively engage students in learning by doing. This was definitely a transformative time in my early career and I owe much of my own success in teaching to Richard's influence and tutelage. Richard



regularly taught our large-enrollment Gen Ed Oceanography course, as well as Field Methods, Introduction to Geochemistry, Sedimentary Geochemistry,

Aqueous and Environmental Geochemistry, and Clay Petrology. He was honored with a College of Natural Sciences and Mathematics Outstanding Teaching Award in 1996. During his tenure at UMass, Richard supervised 7 PhDs, 35 MS students, and 9 Senior or Honors theses.

Richard was also actively engaged in service to his department, university, and profession. For example, he twice served as Associate Department Head and Geology Graduate Program Director. At the University level, he served on the Research Council, Faculty



Senate, and Massachusetts Society of Professors Executive Board (twice). In recent years, Richard served as the Co-Director of the two-department Environmental Science undergraduate program. He served on the editorial boards of *American Mineralogist*, *Journal of Sedimentary Research*, and *Sedimentology*. Perhaps most noteworthy are his many local and national teaching and outreach projects since 1990, including Facilitator and Co-Convenor of 'On the Cutting Edge' Workshops for Early Career Faculty (2003-2014). More than 500 early career faculty participated in this highly successful and highly rated program. In 2013, Richard received the College of Natural Sciences Outstanding Outreach/Service

Award in recognition of his national leadership with the 'On the Cutting Edge' professional development program.

Richard is currently serving as a Program Director at the National Science Foundation; he and Linda are enjoying life in Washington DC. We salute Richard Yuretich's many years of enduring contributions to the Department of Geosciences and to the University of Massachusetts. Thank you, Richard!



## FACULTY NEWS

**Toby Applegate**

I received my PhD from Rutgers and came to UMass to teach World Regional Geography and Human Landscapes. The former is a new offering at UMass, which I taught previously at the University of Tennessee. My research is on internal displacement and forced migration and I do my field work in Slovenia and Croatia. In 2016, as a Sustainability Fellow at UMass I have adjusted my course offerings to reflect Geosciences' membership in the School of the Earth and Sustainability. My partner, Julianne, my kids, (Chloe, Bella, and Brach), and I are all happy to be here in Amherst!

**David Boutt**

The Hydrogeology group at UMass-Amherst is alive and well with many exciting projects in the US (e.g. Northeast US, Nevada) and abroad (recently Chile and Trinidad and Tobago). The groups' continued focus is on regional scale groundwater flow and transport utilizing physical, geochemical, geophysical, and geologic data to address important questions regarding the nature, occurrence, and water quality ground waters. We continue to have a diversity of students in the group including undergraduates (**Anna Campbell** – BS Geology 2017 and **Kayla Cox** – BS Geology 2017), graduate students (**Carrie Glauner** - MS 2017, **Brendan Moran** - MS 2017 with **Alison Cole** – MS 2018 and **Sarah McKnight** – PhD 2020 starting in the fall of 2016). Congratulations to undergraduates **Mark Settembrino** –BS Env. Sci, 2016 and **Orion Hatch** –BS Geology, 2016 who just graduated working on projects in Tobago and Chile respectively. Mark is continuing to work with our group during the summer of 2016. Ms. **Lilly Corenthal** – MS Geosciences Feb.

2016 defended her MS to a standing ovation in December of 2015 and is now at Sanborn-Head in New Hampshire. Lilly's MS thesis represents some exciting work investigating groundwater flow in the Chilean Alti-Plano. **Amy Hudson** – PhD Geosciences May 2016 successfully defended her PhD investigating transport mechanisms of fractured rock aquifers. Dr. Hudson is continuing heading up a group at Tetra-Tech. Post-docs **Paulo Antunes** recently said goodbye to our team after many years running the Picarro Water Isotope Analyzer. Research associate **Amber Bonarigo** (BS Hampshire, 2015) was with our group from May –Nov. 2015 and is now at TerraTherm. **Liam Bevan** (MS 2015) finished up his MS and is now at AECOM in Rocky Hill, CT. **Erin Bradley** finished her MS in 2013 and is a staff scientist at New England Research in White River Junction, VT. **Danielle Hare** (MS 2015) finished her thesis work focused on understanding spring formation and discharge patterns in a former cranberry farm at Tidmarsh Farms in Manomet, MA (See writeup from 2013 newsletter). We wish Danielle the most success at her new position is also at AECOM

in Rocky Hill, CT. Dr. **Evan Earnest** (PhD 2014) wrapped up his dissertation in late 2013 focused on hydromechanical controls on fractured rock permeability (see Hydrogeology Journal Article, Earnest and Boutt, 2014). Evan is now a scientist in the fractured rock group at Chevron in Houston. MS student **Mitch Isaacson** is in the process of wrapping up his thesis and is with Tetra-Tech in Denver, Colorado. **Brian Yellen** (MS 2012 – now a PhD student with **Jon Woodruff**) recently published his MS work (Hydrological Processes, Yellen and Boutt, 2015) focused on the hydrological impacts of dam releases and storage in the Deerfield River, Mass. Work based on the MS thesis of **Kathleen Plourde** (MS, 2010 – now at Exxon-Mobil) was recently published in Geofluids (Boutt, et al. 2015).



Finally, we are happy to congratulate recent Professional MS students who graduated through the Applied hydrogeology program over the last few years – **Alex Schwartz** (BS, 2015; MS 2016) and **Elly Schrang** (MS 2016), **Leah Santangelo** (BS, 2013; MS, 2015; now at Haley and Ward, Maynard, MA), **Seth Oliver** (MS, 2015), **Matt Winslow** (MS, 2014; Cardno ATC, West Springfield, MA). Best of luck in your new positions.

Also of note: **Professor Boutt** is now a co-director of the undergraduate Environmental Sciences program on campus, which Geosciences co-runs with ECO and Stockbridge. He is also an editor for the Wiley journal Hydrological Processes which ranks 8th out of the 41 journals based on impact factor in the field of Water Resources. Professor Boutt recently assisted the UMass Chapter of **Engineers without Borders** on a project in the Saviefe-Demme, Volta Region, Ghana characterizing the hydrogeology of the village region for the

siting of a new borehole.

**Ray Bradley**

**Ray Bradley** received two NSF grants in 2016—both for somewhat new areas of research on the impact of early settlers (Norse/Vikings) on islands of the North Atlantic (Faroës, southern Greenland). The Faroës work builds on Zuckerberg Foundation and National Geographic Society funding, the latter obtained with Billy D'Andrea at Columbia University, and archeologist Tom McGovern at CUNY. The southern Greenland research is a collaboration with the Dept's organic geochemist, **Isla Castañeda**, and builds on previous crowd-sourced funding raised by PhD student **Greg de Wet**, and NSF geography funding for his PhD dissertation research. In both projects, the goal is to reconstruct climate during the time that settlers first arrived in the regions, and the environmental impact that they and their animals had on the landscape. Ray also continued his research on climate change and its impact in the Northeast, with post-doc **Ambarish Karmalkar** and PhD student **Dan Miller**.

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Ray will complete his term on the Science Leadership Council of the Mountain Research Initiative (Bern, Switzerland) in 2016, and join the Scientific Advisory Board of the German Paleoclimate Modeling Initiative (PALMOD). In the last year he gave invited talks at Waseda University (Tokyo), the Research Institute for Humanity and Nature in Kyoto, at the Xudan Forum in Nanjing, and at the Mountains of the Future Earth Conference in Perth, Scotland. He also gave the annual Horizon lecture at the University of Bergen, Norway and addressed the Massachusetts Senate Oversight Hearing on Climate Change Resiliency.

#### Laurie Brown

It has been two years (yikes!) since my retirement in May 2014. I have been enjoying my basement digs in Morrill and come in most days to work on numerous research projects. My last student, **Jeff Webber** (shared with **Mike Williams**) has just defended and will start as an Assistant Professor at Stockton University in southern New Jersey, where he will take over teaching Structure and Geophysics from **Mike Hozik**, a UMass PhD from 1980. I am continuing research into various magnetic studies, trying to complete some of those unfinished projects, from ancient paleomagnetism in the Lofoten Island of northern Norway to secular variation in the Chilean Andes. Presently I am President-Elect of the Geomagnetism, Paleomagnetism & Electromagnetism section of AGU so will keep my hand in everything magnetic for a few more years. Hope to see many of you at GSA or AGU or here in Amherst!

#### Steve Burns

My research continues to focus on using geochemical analyses of speleothems (calcium carbonate cave deposits) to study changes in tropical climate. I am working in the Yucatan Peninsula of Mexico together with Dr. **Martin Medina** (formerly of Amherst College, now at Auburn University) studying how and why rainfall in the area varied in the past. We are particularly interested in the relationship between climate change and the rise and fall of the Mayan civilization. We have conducted field work in the 'Mayan Riviera', between Palya del Carmen and Tulum, over the past several years and this summer were working in the western Yucatan, near Campeche. Near Playa del Carmen, we are working closely with the 'Rio Secreto' Nature Reserve where we have a weather station and guides for the reserve collect water samples for us on weekly basis. If you are in the area I highly recommend taking a tour!

I am also studying changes in climate and landscape evolution in Madagascar. I traveled to Madagascar twice in the past year, in November and again in May. There we are working with anthropologists, including Prof. **Laurie Godfrey** of UMass, in caves that are mainly now underwater. Scuba divers collect fossils for the anthropological and stalagmites for our paleoclimate work. The endemic megafauna of Madagascar disappeared over the past few thousand years and we hope to learn whether the loss of these unique animals was due to human activity or climate. Our work in northern Madagascar has shown that the introduction of cattle and the use of fire to clear the land and promote the growth of grass to feed the cattle completely transformed the landscape from open woodland to a grassland 1000 years ago. That transformation would have greatly reduced the size and connectivity of forest habitat that many of the megafauna needed to live.

Photo from **Martin Medina**.



#### Isla Castañeda

In April 2014, members of the Biogeochemistry Laboratory (**Isla Castañeda** and PhD students **Greg de Wet**, **Ben Keisling** and **Helen Habicht** attended the GDGT 2014 Workshop in The Netherlands. In August 2014, Castañeda, Keisling, Habicht, and de Wet, along with PhD student **James Kocis** and postdoc **Jeff Salacup** attended the Gordon Research Conference on Organic Geochemistry. In winter 2015, a new GC-preparative fraction collector was installed in the Biogeochemistry Laboratory. This instrument allows for the collection and purification of individual compounds (for radiocarbon dating). In March 2014, postdoc **Elizabeth Thomas** joined the Biogeochem group; Elizabeth received her PhD from Brown University and is investigating early Holocene records of terrestrial climate in the Baffin Bay region using organic geochemical techniques. Recently **Ben Keisling**, **Helen Habicht** and **Dan Miller** successfully defended their master's theses; all three will continue on in the PhD program here at UMass. Summer 2015 has been busy in the Biogeochemistry Laboratory with undergraduates **Thomas Barrasso**, **Megan Thompson-Munson**, **Geoffrey Small** and **Kevin Nguyen** working on samples from lakes in Kyrgyzstan, Greenland, East Africa and Baffin Island. With so many samples being extracted, we are excited to have recently acquired a second accelerated solvent extractor (used from EBay). The Lake El'gygytyn drilling project is a current major research focus with graduates Habicht, de Wet, Keisling, and undergraduates **Stephen Lukas**, **Victoria Phu** (class of 2015), **Joanne Johnson** (class of 2015) and **Ben Urann** (class of 2014) all working on different parts of this 3.6 Ma long climate record. In Fall 2014, postdoc **Jeff Salacup** was hired as the manager of the UMass Biogeochemistry and Stable Isotope Laboratories; Jeff also continues to be involved with research on the Lake El'gygytyn project. In September 2015 de Wet and Salacup will represent the Biogeochemistry Laboratory at the 27th International Meeting on Organic Geochemistry in Prague. Other members of the group will present at the GSA and AGU fall meetings. To stay up to date with the latest news and photos from the Biogeochemistry Lab, check out our Facebook page <https://www.facebook.com/UMassBiogeochem> or our blog site <http://blogs.umass.edu/biogeochem/>.

#### Bill Clement

I am a Near-surface Geophysicist using ground penetrating radar, electrical resistivity, and seismic methods to image the subsurface. I have looked at seismic reflection data to help map the

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transition from the shore to the deeper water off-shore environment along Cape Cod. Along with **Steve Mabee**, the Massachusetts State Geologist, I have been using GPR to help homeowners understand the origin of mysterious holes on their property. I am also interested in signal processing; that is, analyzing data acquired over time to enhance the information in the data. I worked with a graduate student in Civil Engineering using the Continuous Wavelet Transform to find anomalous ballast regions along an experimental railroad track. In the past several years, I have taught the “Shake and Bake” course, Geo101, Environmental Geophysics, and a course intended to help students better understand the application of math and physics in Geology. I enjoy the challenge of explaining geological concepts to non-scientists.

**Chris Condit**

With the possibility that Chris might retire after the fall 2016 semester, his office was moved from Rm 246 to Rm 245A, the small office on the north-east side of the Digital Mapping Lab. It unfortunately has no door directly to the hall. If a class is in session in the DML when you visit, and you want to see Chris, try his office phone at 545-0245, and if he’s in, he’ll sneak out to see you. Meanwhile, as of today (7/28/2016) Chris is three weeks into growing into his new right Total Shoulder Replacement, so hopefully next summer **Laurie** will not be asked to chip or sample those lovely basalt outcrops that Chris is so attached to in the Springerville volcanic field, like she did (mostly) cheerfully this May. She has been doubling down on saint hood with her kind care of Chris just now – shoulders are much less fun to heal up from than knees and hips, although days that start with a four mile walk, like this morning’s did, help, too.

If you read Chris’ contribution for last newsletter, you’ll know that for the last eight years Chris has been part of the NASA Desert Research And Technology Studies group (DRATS), which provided geologic training to the in-coming Astronaut Candidate (ASCAN) classes of 2009 and 2013. NASA is in the process of selecting the Astronaut Class of 2017 from over 18,000 applicants; up from 6300 for the class of 2013, suggesting America is still very excited by manned space exploration. In anticipation of on-going training, the DRATS group is now engaged in writing a comprehensive volume (probably a NASA Special Paper) detailing our efforts of the last 8 years, partly to have some kind of permanent record and partly to inform the geologic community of what has been done to move geologic training forward. A brief paper will be appearing in the GSA Today Groundworks column in August that informs the GSA community of our work and outlines what we have done to date.

For those who didn’t read last year’s letter, in April 2014, at JSC\* in Houston, Chris taught the 2013 ASCANs a class that included “everything you need to understand why some lava flows are lumpy and gooey and others are smooth and flat-lying” - all in one afternoon (whew!). We applied this to their ISS\*-based photo geologic maps of the area we “ground truthed” in July around Taos, NM – closing the circle “from outcrop to orbit”. Working with these astronauts is a great privilege, and a pleasure, albeit a bit stressful, as one has to bring your “A-game” to each and every class or exercise - these folks don’t forget anything, so you better get it right the first time! Evening campfires with them, on the other hand, were a pure pleasure – most interesting folks. (\*NASA-speak:

JSC=Johnson Space Center, ISS- International Space Station).



Chris with NASA Astronaut Class of 2013, after instructing in a field geology training exercise near Taos NM: July 2014  
Top, from left: Nick (Tyler) Hague, Drew Morgan, Jessica Meir, Christine Hammock, Chris Condit, Nicole Aunapu Mann, Anne McClain, Josh Cassada, and Victor Glover. Front: Apollo 17 astronaut Jack (Harrison) Schmitt and astronaut Mike Fossum.

**Alan Condron**

**Alan Condron** and **Raymond Bradley** were awarded a 3-year (~\$596,000) NSF grant to study whether extremely thick, ‘paleocrystic’ sea-ice in the Arctic triggered the Younger Dryas cold episode. **Alan Condron** has also been awarded grants from both the NSF and the U.S. Department of Energy to assess whether a collapse of



Just a few of the many icebergs that floated up the coast near the Arctic Station every day.



Basecamp during the 2-day trek up Disko Island’s Blaesedalen Valley or “Valley of the Winds”.

the West Antarctic Ice Sheet will alter ocean circulation and climate in the next 50-300 years. This grant supports UMass Geoscience PhD candidate **Shaina Rogstad** (who started in Fall 2015), who comes to us with a Master’s degree in Applied Mathematics (also from UMass Amherst).

**Alan Condron** and **Jenna Hill** published a fascinating paper in *Nature Geoscience* (Nov 2014) showing that during the last deglaciation (21,000 – 6,000 years) massive icebergs (up to 300 m thick) drifted along the coast of Florida. These icebergs were carried as far south as Miami by melt-water floods released from glacial lakes located along the southern edge of the Laurentide Ice Sheet.

PhD candidate **Anthony Coletti** (advisor **Alan Condron**) was successful in gaining a place on the highly sought-after ACDC (Advanced Climate Dynamics Course) summer school held



Participants of the August 2014 ACDC summer school (Coletti sitting front-row second from right) on the steps of the Arctic Research Station in Qeqertarsuaq, Disko Island, Western Greenland.

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on Disko Island, Greenland, in August 2014. The 2-week school focused on changes to the Greenland ice sheet, and included a series of lectures, a challenging multiday trek, and two days at sea taking sediment cores from near Jakobshavn Glacier. Anthony was one of the main speakers in a short documentary produced by the school about Arctic climate change (<https://vimeo.com/108883495>). Undergraduate Mathematics Major, **Radha Dutta**, who is developing an educational game with **Alan Condron** to teach students about iceberg dynamics, participated in a 10 week REU at the Center for Multiscale Modeling of Atmospheric Processes (CMMAP) at Colorado State University.

#### Michele Cooke

My students and I continue to investigate faults using innovative approaches with both numerical models and physical experiments. PhD candidate, **Jess McBeck**, has developed a code that assesses fault growth by optimizing work of the fault system. Former post-doc, **Betsy Madden**, has been working with Jess to test and apply this code to different fault systems. Within the laboratory, MS candidate **Kevin Teonenboehn** has got our new stereo-pair imaging system up and running as well as cool new in-situ force measurements. With these data and digital image correlation we are one of the few labs in the world that can capture the evolution of 3D deformation within the experiments. MS candidate **Aviel Stern** and PhD candidate **Jenn Beyer** are working with me to continue our investigations of three-dimensional deformation associated with active faulting in southern California. My involvement in the Southern California Earthquake Center now includes serving on the Board of Directors of the joint NSF/USGS science center. Over the past year our group also included two visiting students from the University of Pavia in Italy. Our current collaborations include folks in California, Australia, France, Germany and now Italy with abundant opportunities for travel and exciting science.



Photos from the analog modeling workshop (left to right) Morill hallway served as a poster venue for the workshop. **Ryan Shackleton** (PhD UMass) demonstrates hydrofracturing within gelatin using a bicycle pump. MS candidate **Kevin Toeneboehn** demonstrates the claybox experiment to a packed room in the physical modeling laboratory.

#### Haiying Gao

The Seismology Research group has been working on a variety of topics related to the deep Earth structure, ranging from the tectonically active western United States to the passive eastern margin, with the use of seismological methods. Lately **Haiying Gao** has expanded her research interests into understanding fundamental subduction dynamics by investigating multiple subduction zones in a comparative and systematic way. In January 2016, **Cong Li** joined the seismology group as a PhD graduate student.

Cong has been working on a project to examine the three-dimensional lithospheric structure and temporal evolution of the northern Appalachians (New York and New England) with teleseismic receiver functions.

Moreover, NSF recently awarded the PI for two projects; one is to construct a model from the spreading centers to backarc in Cascadia to resolve geophysical characteristics of along-strike variation; the other one is to integrate air-gun shots with short period ambient noise data in the waveform inversion for improvement of shallow crustal structure. Both projects will provide supports for undergraduate work students and graduate students.

#### Piper Gaubatz

**Piper Gaubatz** continues to center her research and writing on the intersections of public space, urban form and environmental planning in China. She gave invited talks on this subject at Harvard University, Yale University, The Ohio State University, and the New School for Social Research. Her new book analyzing the historical and contemporary development of cities in China -- *The Chinese City*, by **Weiping Wu** and **Piper Gaubatz** (Routledge) was published in Fall 2013. She also began a multi-year appointment to the Research Grants Council of Hong Kong, which provides ongoing research funding in exchange for yearly trips to Hong Kong to evaluate approximately 260 new NSF-style faculty research grant proposals per year, to review research progress reports, to evaluate and adjust research budgets, and to perform external reviews of colleges and universities in Hong Kong. She continues to serve on the UMass Academic Priorities Council. She was named to the UMass Interdisciplinary Studies Institute 2015-2016 Faculty Forum: Secrecy, Publicity, Privacy, Security for a project entitled "Public Space in Chinese Cities: Reshaping Chinese Civilization." Gaubatz also plays an active role in building the undergraduate geography program. She serves as faculty adviser for the geography club and for Gamma Theta Upsilon, a newly-founded UMass chapter of the International Geography Honor Society.

**Piper Gaubatz** spent the 2015-2016 academic year as a fellow of UMass' Interdisciplinary Studies Institute. The Institute's theme for the year -- "Secrecy, Publicity, Privacy, Security" -- fit well with her evolving research on the intersection between environmental planning and the changing nature of public space in Chinese cities. She is following the ways in which large urban squares developed (on the model of Tian'anmen Square) to host patriotic demonstrations during the Maoist era are evolving as public and environmental space in the 21st century. Her current project focuses on squares in fifteen case-study cities distributed throughout China, and synthesizes analysis of urban planning and archival materials with site analyses of general public space characteristics (ownership, control, physical configuration, animation/activities, and civility) and site analyses of environmental features such as green area, water features, pavement, open space, surrounding building density, and accessibility. She traveled to Harbin, Dalian, Urumqi, and Xining in summer 2016 for this project.

At the same time, she has carried on with ongoing work on urbanization in western and interior Chinas work was recognized in 2015-16 with invitations to present two keynote addresses: "Secondary Globalization in Chinese Urban Centers: Lessons for Local Response and Adaptation" at the U.N. Habitat International Conference on China and Africa Sustainable Urbanism in October



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2015 in Ottawa, Canada and What happens next? The diffusion of urban planning and design strategies to Western China in the context of public space” at the International Conference on Urbanization and Land Development in China’s Interior & Frontier Regions, Hong Kong Baptist University, December 14-15, 2015.

**Christine Hatch**

My research groups have been very busy and growing over the last two years. Our first project related to fluvial geomorphology, RiverSmart Communities is nearing a close, and MS student **Noah Slovin** successfully defended his MS thesis using GIS and remote sensing (LiDAR) to better assess many stream miles in a cost-effective manner. Ultimately, these and other tools allow us to assess Massachusetts rivers and streams, and potential vulnerability to inundation and erosion during flood events, and manage the land around them in a more ecologically restorative and resilient way. Together with **Eve Vogel**, the RiverSmart Communities and Federal Collaborators project, which specifically targets federal agencies’ role in river management and post-disaster recovery, is also finishing up. The products from this work, including the hot-off-the-press report “Supporting New England Communities to Become River-Smart: Policies and Programs That Can Help New England Towns Thrive Despite River Floods” will continue to be offered as part of my ongoing outreach and extension activities, and through the project website ([geo.umass.edu/riversmart](http://geo.umass.edu/riversmart)) in the form of reports, factsheets and other educational materials and guidance. Keep your eyes out for an upcoming profile of this work in UMass’ Research Next magazine! As part of the Farms, Floods and Fluvial Geomorphology: Making the most of our natural resources project our research group has expanded to include two postdoctoral researchers: **Benjamin Warner** and **John Gartner**, and undergraduate assistants **Stephen Lukas** and **Alex Schwartz** (who also completed our new Geohydrology MS program). Together with MA Geologist **Steve Mabee** we formed an FGM Task Force to define the Massachusetts River Corridor and establish a protocol for delineating it, a project that is well underway after our fourth multi-state, multi-agency meeting. We’ve recently acquired two new grants in support of this work: River Corridor Assessment for the North Atlantic Region supported by the North Atlantic Landscape Conservation Cooperative, and Predicting Rates of Geomorphic and Habitat Response to River Channelization and Flood Events supported by NCEd/ NSF (PI= postdoc Gartner, co-advisor= new faculty colleague **Isaac Larsen**). Managing rivers requires cognizance of complex interactions between fluvial geomorphology, surface water and groundwater (SW-GW), ecology and human activities. **Johnathan Reeves** successfully defended his MS Thesis, and is nearing publication of a manuscript examining three dimensional SW-GW interactions, an early investigation in support of a large-scale SW-GW laboratory system to be established at UMass in the coming months. At the Tidmarsh Farms restoration site in Plymouth, MA, Ecohydrology is also gaining notice as the on-the-ground restoration work is nearly complete. Whether the restoration approach (raising the water table and removing barriers) is successful will ultimately be a function of whether appropriate habitat conditions are present (persistent moisture, cool, ponded water, connectivity, shade) and if the desired wetland plant and animal communities thrive. A new Experiment station grant will support study some of the main drivers of these ecohydrologic

systems (soil type, moisture, properties) and their respective thermal regimes to observe the restoration process in real time. Finally, I’ve taken on two new supervisory roles: MA Liaison for the USDA Northeast Climate Hub, and coordinator for the EUREKA! Program that hosts Holyoke girls inc. At UMass for a month every summer.

**John Hubert**

Between drinking coffee and reading the comic strip “Rhymes with Orange” in the Student Common Room, I have written two books that might interest our Alums. They are “An Informal History of Geosciences at UMass Amherst” (2016) and “Listening to the Rocks: a geologist’s life with Mary Alice” (2013), available at Amazon.com for 10.50 each. See page 23.

**Michael Jercinovic**

I direct the Electron Microprobe/SEM facility here in the Department of Geosciences. My research is collaborative and diverse, with the major emphasis being on the theory, development and application of trace element electron probe micro-analysis (EPMA), particularly as it relates to geochronology. The facility has evolved into a pioneering center for this sort of analytical work, and has worldwide impact as we continue to refine and otherwise improve high spatial resolution, high sensitivity micro-analysis. This year we began mapping and analyzing trace elements in zircon, garnet and kyanite from UHP terranes as new applications (with **David Snoeyenbos** and **Emily Peterman**). The uniquely capable Cameca SX-Ultrachron offers not only amazing performance for trace element analysis, but also unique opportunities for high efficiency, high throughput analysis in other areas, for example in analyzing key elements in lengthy drill core sections of sea floor basalts (the Harvard Langmuir group).

The number of facility users continues to expand (72 microprobe users last year alone), especially as EPMA is being recognized as an essential part of the geochronologic evaluation of complex tectonic problems. Not only can EPMA access micron, or even sub-micron regions, exceeding any other geochronologic tool, but the in-situ mapping-based methods developed here emphasize the full compositional evaluation of the sample in textural context. This allows direct dating of the reactions involved in the growth or breakdown of phases involved in petrologic evolution.

**Tom Johnson**

When I retired from the University of Minnesota Duluth in May 2015, I told my wife, Kate, that I would follow her anywhere. She had spent her young adult years in western Massachusetts and always wanted to return. So here we are, renovating a tired old house in Shelburne Falls, hiking in the nearby hills, and kayaking the local rivers and ponds. The Geoscience Department graciously offered me an Adjunct Professorship, which enables me to keep a toe dipped in the academic waters, taking in departmental seminars and interacting with the great faculty and students here. I am currently finishing up 4 papers with former students and colleagues: (1) A 1.3 million year history of climate in southern East Africa, based on cores from the Lake Malawi Drilling Project, (2) the carbonate history of deposition in Lake Kivu, East Africa and its tie to geothermal input to the lake, (3) the discovery of the Mazama ash (~7.5 ka) in two cores from Lake Superior, and (4) an overview of the paleoclimate of East Africa for an upcoming Oxford Encyclopedia of African Climate. I am looking forward to

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future interactions with colleagues here at U Mass, especially once our house is renovated and I have more time for geo tinkering!

**Isaac Larsen**

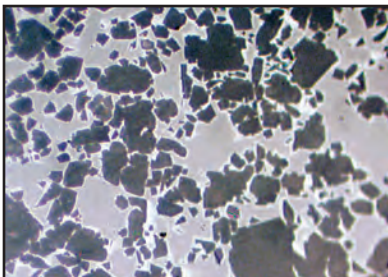
I've just wrapped up my first year in the department, having arrived at UMass after finishing a post-doc at Caltech and a PhD at the University of Washington. I taught Geomorphology to a great group of students this spring, using a lot of GIS examples and visits to local rivers for field work, avoiding the snow when possible. Much time and energy was devoted to overseeing the construction of the new UMass Cosmogenic Nuclide Laboratory, which will be a state-of-the-art sample preparation facility for using rare nuclides to measure millennial-scale erosion rates and exposure dating of landforms. A main focus of my current research is centered on understanding the history of canyon incision in the Channeled Scablands of eastern Washington by combining numerical flood simulations with exposure dating. I've also been pleased to work with **Derek Berman**, one of our undergraduates who is separating ilmenite from bedrock, ultimately with the hope of calibrating new minerals for cosmogenic nuclide analysis.

**Tony Morse**

**Tony Morse** continues to be graced by the presence of neat grad students in Room 12, who form a coalition that livens the Petrology Seminars (and rouses him to attend if he is immersed in confusion!). He also enjoys the Geophysics seminar where the faculty:student ratio can run as high as 6:4! We should also mention our new Room 12 roles as apprentice steam-fitters as Morrill 4 gets brought into the 21st century.

Four papers published in 2013 (well, three plus a guidebook to the Kiglapait Intrusion for the wonderful 23-soul field trip in 2013). Two papers in 2014; one with gifted Post-doc **Julien Allaz**, now at Boulder, and one in Am. Min. on plagioclase fractionation in troctolitic magma, an interesting revelation! Then three papers on 2015: one as second author among 17 complaining about a stubborn colleague's strange work, one an invited Centennial Review on Linear Partitioning in Binary Solutions (Am. Min.), and one a Chapter on the Kiglapait Intrusion in a big book edited by Charlier and others for Springer.

There are three more in the works, submitted; one on the Kiglapait feldspars, which is revolutionary because unique at the end of crystallization; one experimental with **John Brady**



An experimental run that shows 50% melt looks like: pale is melt, black is plagioclase. Width of image 1/3 mm.

on the system Fayalite-Anorthite-Albite at 5 kbar, in which it is shown that with fayalite saturation you can go from pure An to pure Ab in 17 degrees C! And another with John on the thermal history of the Kiglapait Upper Zone, determined by the solidus of adcumulate rocks which have finished solidi-

fying isothermally because they have unzoned plagioclase. That story goes back to a paper in 1980.

I am also revising "Basalts and Phase Diagrams" for Springer-Verlag. Fun!

**Rud Platt**

**Rud Platt** continues to pursue his role as self-appointed advocate and publicist for the most important American woman that most people have barely heard of--the remarkable **Jane Addams** (1860-1935). She co-founded Chicago's Hull House in 1889 which became the hub of the American settlement movement and in tandem with the University of Chicago a center of intellectual ferment and social reform. She was a world-famous humanitarian, civil rights pioneer, and advocate for international peace who was the first American woman awarded the Nobel Peace Prize (in 1931). Rud has developed a network of Addams scholars and devotees and is seeking support for a conference and/or oral history project as a stimulus to an eventual documentary film. Stay tuned!

**Mike Rawlins**

**Mike Rawlins** was recently promoted to Extension Associate Professor. He recently wrapped up work on a NASA-funded project focused on the carbon cycle of Northern Eurasia with two papers published in the journal Biogeosciences and several related outreach products. Last year Mike led a team of over two dozen climate modelers from major international centers in a study, published in July 2015, which focused on exchanges of CO<sub>2</sub> between the atmosphere and terrestrial ecosystem of Northern Eurasia. The group used remote sensing measurements, in situ observations, and land-surface models to document a slight weakening of the region's CO<sub>2</sub> sink over recent decades. The second paper, led by post-doc **Pawlok Dass** (now at UC-Davis), examined air temperature and precipitation controls on the observed greening of Northern Eurasia. Mike then turned his attention to a study focused on likely future changes in freezing days across North America, currently in press in the Journal of Climate. That research suggests that parts of North America will see declines of as much as 90 freezing days annually by mid-century, and a contraction of approximately 6% in the total area currently experiencing freezing conditions. Mike has also been involved in a state-funded project characterizing future vulnerabilities to road culverts across the Deerfield River watershed from extreme flooding events, in collaboration with State Geologist **Steve Mabee** and other UMass faculty. Last year he served as collaborating member of Arctic-COLORS (Arctic-COastal Land Ocean inteRactions), a proposed field campaign seeking to improve understanding and prediction of land-ocean interactions across coastal northern Alaska. Mike continues to keep the Climate System Research Center running smoothly as its Manager in the shared space with the Northeast Climate Science Center, teach Climatology each fall, and engage in outreach with local and regional print, radio, and television outlets.

**Mike Rhodes**

First, to paraphrase Mark Twain, the rumors that I am dead or retired are greatly exaggerated. Far from it, I seem to be busier than ever. The DOE-funded geothermal project with **Steve Mabee**, to evaluate the geothermal potential of Massachusetts is now complete and the data and maps are publicly accessible at [www.stategeothermaldata.org](http://www.stategeothermaldata.org). We now have a small follow up grant from the State to measure heat flow and obtain additional

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heat production and thermal conductivity data from a few key areas, of which the Fitchburg granite is the most promising.

In 2014 a few of us (**Mike Garcia** (Univ. Hawaii), myself, **Bruce Watson** (Rensselaer) and **Rosemary Hickey-Vargas** (Florida International)) successfully nominated **Fred Frey** (MIT) for the Distinguished Career Award of the Petrology, Volcanology, Geochemistry section of GSA. The award was presented at the Annual Meeting in Vancouver, where I gave the eulogy. We also organized a successful special session honoring Fred aptly named "Magmas and their Sources". This in turn led to organizing a special issue of *Geochemica Cosmochimica Acta* on the same theme. It contains 27 excellent papers dedicated to Fred and has just been published (*Geochemica Cosmochimica Acta* 185, July 2016).

Work on Hawaiian volcanoes is going well with two published papers; one (Rhodes, 2015, AGU Monograph 208) examines the approximately 600 ka magmatic history of Mauna Loa volcano, drawing conclusions about magma production and the source lithology (peridotite vs pyroxenite); the other (Rhodes, 2016, *GCA* 185) draws attention to the conundrum that all Hawaiian shield-stage volcanoes (1839 analyses) have essentially the same  $Al_2O_3$  content at a given MgO value despite significant differences in other elements and isotopic ratios. The only satisfactory solution is that these magmas were formed at depth (>120 Km) from melting garnet peridotite, a conclusion at odds with a lot of current thinking.



At the rig.

In 2014 I was invited to participate in a workshop in Heimaey, Iceland to plan a project to drill right through the Surtsey volcano (erupted 1963 - 1967) to the ocean floor. The major objectives are to understand this classic type of phreatomagmatic, explosive type of volcanism, and to document the effects, and rates, of hydrothermal sea-water alteration over 50 years. The good news is that the drilling aspect of the

project has been funded by the International Continental Drilling Program (ICDP). The bad news is that, because of logistical problems, we had to postpone drilling this year until August - September of 2017 (we are only allowed to drill at this time because of nesting seabirds and pupping seals - they know better than to be on Surtsey in September!). On another interesting front the US military (bless their hearts!) have just drilled and cored two 2 Km deep holes on Mauna Kea volcano in the saddle region between Mauna Kea and Mauna Loa. Why, you might ask? Well, this is a training area for soldiers, tanks, airplanes, and other military vehicles that like to blow things up, so they need water. Well (no pun intended) they have water, some of it at 110 °C!. So they are happy, and we are happy because it provides us with core to study the gradual demise of a volcano, from shield-stage to post-shield volcanism, as it moves away from the Hawaiian mantle plume.

#### Peter Robinson

Retirement usually means there is time to devote to research matters that have long lain fallow, and that has certainly been the case with me, as indicated in the following brief outline. I am working through a series of unpaid projects with **Steve Ma-**

**bee** and colleagues in the Geological Survey of Massachusetts, that involves preparation of color geologic maps and cross sections based on my earlier work, and that of students, in central Massachusetts. Related to that, I was involved in the NEGSA Meeting at Bretton Woods, New Hampshire, March 2013 (Figures A, B) including participation in symposia honoring the late **J. B. Thompson**, as well as (much alive) **Chris Hepburn** of Boston University. This also involved several former students including



A) Geologic field excursion near Littleton, N. H., March 2013. My long-time friend **Doug Rankin** (died Feb. 2015) is explaining his new geologic interpretation while I hold his map and try to ward off the cold.

**John Schumacher**, **Peter Thompson** and **Kurt Hollocher**. I was back there in March 2015, again in symposia also involving **Peter Thompson**, **Bob Tucker**, **Ginny Peterson**, **Kurt Hollocher** and **Greg Walsh**, but also to give a 60-minute talk about the life and times of New England geologists, in celebration of the 50th anniversary of the founding of the section (see related Figure C).



B) With my old friend **Jack Schmitt** at Bretton Woods, March 2013. Jack and I defended Ph. D. theses in consecutive hours at Harvard in June 1963. Here we celebrate 50 years later. Later he became the only geologist to land on the moon and Senator from New Mexico (we agreed on much but not politics!). He came to Bretton Woods to celebrate the legacy of our mutual mentor, Prof. **J. B. Thompson, Jr.** (Dartmouth Class of 1942) and talk about his study of eclogites (high pressure rocks) in Norway, a subject of my own studies beginning 1990.

I also have arranged with the Geological Survey of New Zealand to provide detailed maps of the work done on Chatham Island (800 km east of Christchurch but continental crust) in 1968-69. I am also engaged with the Geological

Survey of Norway to provide similar results of mapping by me and my last Ph. D. student, **Mike Terry**, and have published a number of cooperative papers on the geological evolution of western Norway. I recently came back from five days in the field with Canadian collaborators from Dalhousie University trying to understand how rocks can get down to 120 km below the surface and then back up to where we can see them today. In August 2015 I will conduct the Norwegian part of a transect excursion across the Caledonides for 30 participants out of Uppsala University, Sweden.

Cooperative work with **Suzanne McEnroe**, and others including **Laurie Brown**, has involved interpretation of magnetic maps, making ground-magnetic surveys, and collecting samples and making studies of magnetic properties and mineralogical features including mineral chemistry of rocks with unusual properties. In 2002 we published a paper in *Nature* on a new form of magnetism called "lamellar magnetism" which is caused by the interfaces between two rhombohedral oxides in nanoscale intergrowths. We are also heavily engaged in a property called magnetic exchange bias, where this property is stronger in a natural sample than has been achieved in anything synthetic. In July 2014 we both participated in a symposium at Geological Society of Australia Meeting in Newcastle, NSW, followed by a short tour of New

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Zealand to visit friends and collaborators. In September we attended “The Castle Meeting” on related subjects, this time for the first time in a medieval town in Portugal. At a Symposium at the Geological Society of America Meeting in Vancouver in October 2014 we presented our story about a magnetic anomaly in South Norway that still defies explanation – I call it the Mt. Everest of rock magnetism.

While looking through old color slides I found the one now labeled C from the 1970’s with an interesting assortment of alums. Yes, in those days, even students studying coastal processes learned how to use the petrographic microscope! By 1976, **Mike Page** had become a geologist with

Western Mining in Kalgoorlie, Western Australia and I was able to visit him there for several days in connection with the International Geological Congress in Sydney.

A few of you may remember our daughter Sandra, who was even on the scene in a few of my classes in the 90’s. In 2011 she was awarded a merit-based fellowship to study chemistry at, of all places, U Mass. In June 2015 she completed her fourth year as a Chemistry major, but is staying on next year to also complete a major in Math! This summer she got a summer fellowship to the Misasa Institute in western Japan, where, right now, she is doing analyses of an enstatite chondrite!

Addendum July 18, 2016: The text above gives a fairly accurate story of the state of things one year ago and things have changed only in minor ways since then. We were back at U. Mass. for Sandra’s graduation with degrees in both Chemistry and Math. Also Steve Mabee talked me into running a Quabbin Reservoir Field Trip for the Massachusetts Geological Society. This turned out to be a fun affair, with a large group of Department Alums in attendance, including **Kurt Hollocher**, who provided superb photomicrographs of many of the rocks. I was very impressed with the enthusiasm for rock specimens of a generally older group of geologists, and grateful for the opportunity. I was also dismayed to see how little can be seen compared to our original work mainly in the 1960’s and 70’s. I provide an additional photograph used on the Guidebook cover. This was taken by the late **Jon Boothroyd** in September 1966 on an isolated island composed of Monson Gneiss only exposed when the water was near its lowest level of ~35 feet. A few days ago we returned from two weeks in the Norwegian Arctic, where Suzanne and her three PhD students made magnetic surveys and collected magnetic samples in two large areas of Precambrian basement rocks.



C) Bretton Woods, New Hampshire, March 2015. **Al Hine** (left, then a Dartmouth undergraduate) and **John Boothroyd** (right, an older student from Laconia, N. H.) both worked as field assistants for me and other students in Massachusetts in summer 1966, and later became students of coastal processes with Miles Hayes. Both went on to research in coastal and glacial processes, Boothroyd as Professor at University of Rhode Island and Hine as Professor and later Dean at University of South Florida. Hine recently published a superb layman’s book about the geology of Florida. Hine and I established something of a record in August 1966 by mapping 53 stations in one day. We even did 43 ‘before lunch’ as we told Boothroyd, but not telling him we delayed lunch until 4:30 P.M. so we could eat away from the mosquitos on the shore of Quabbin Reservoir. Boothroyd’s research was honored at a Symposium at Bretton Woods in March 2015. Sadly Jon died in October the same year, a great loss to Rhode Island and coastal geology in general, as well as to his many friends.

**Jeff Salacup**

My work focuses on the application of certain organic molecules, called biomarkers, to questions of past climates and ecosystems using marine, coastal, and lacustrine sediments. I am the Manager of the Stable Isotope and Biogeochemistry Laboratories and together with **Isla Castañeda** and **Steven Burns** I was involved in training and mentoring 2 post-docs, 4 PhD students, and over 10 undergraduates over the past two years. Keeping the Labs humming along has been exciting and rewarding. In 2014, I brought the gas chromatograph-isotope ratio mass spectrometer online (GC-irMS). This sophisticated instrument has been put to work measuring the ratios of hydrogen to deuterium in the epicuticular waxes of plant leaves (a paleo-proxy for temperature and hydrology) in samples from all over the globe and from the Holocene to the Pliocene. In 2015, our gas chromatograph-preparative fraction collector (GC-PFC) was delivered and installed. This instrument allows us to collect individual organic biomarkers from many natural samples and concentrate them into one larger sample for subsequent sample-heavy analyses like NMR or radiocarbon. I also installed two new gas generators which produce ultra-high purity hydrogen and air for 4 of our analytical instruments, saving the labs hundreds of dollars a year in cylinder rental costs. I went to Barcelona, Spain to participate in a working group on Pliocene climate variability (PlioVar) and to Prague, Czech Rep. to present results at the International Meeting of Organic Geochemistry (IMOG). In April, I was awarded a UMass Faculty Research Grant (FRG) to investigate Holocene land and sea temperature variability in the Gulf of Maine, a region of the world that is warming faster than 99% of the Earth.

**Sheila Seaman**

**Sheila Seaman** has been working in Iceland, northern Saskatchewan, and coastal Maine, on projects that broadly involve the role of volatiles in volcanic eruptions and in the evolution of granitic magmas that produce continental crust. She runs the infrared spectroscopy lab in the department. She’s enjoying working with a great crew of grad students, including **Amanda Van Lankvelt** (volatiles in lower crustal rocks, Saskatoon), **Marissa Mnich** (basaltic volcanism in Iceland), **Christine Burrill** (lower crustal contributions to shallow volcanics), and **Carver Lee** (volatiles in Icelandic basalts). Sheila continues to have fun teaching mineralogy and petrology to the great UMass geology majors!

**Stan Stevens**

Geographer **Stan Stevens** continues his international research, policy work, and advocacy on conservation and social justice. He is one of the officers and steering committee members of the ICCA (Indigenous peoples’ and community conserved territories and areas) Consortium, a global alliance based in Switzerland that supports conservation by indigenous peoples and local communities in more than fifty countries. He has also been working on policy and guidance development for the IUCN (International Union for Conservation of Nature) and the Parties to the Convention on Biological Diversity. In 2014 Stevens organized a policy workshop and was a member of the organizing and Congress outcome recommendations committees for the IUCN World Parks Congress in Sydney, Australia, a once in a decade event. He also was the lead on the development of new IUCN policy on protected areas, indigenous peoples and local communities to be adopted at

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the World Conservation Congress 2016 in Honolulu. In 2015 he attended a high-profile meeting on collective tenure rights in Bern, Switzerland, gave the keynote presentation at the first international conference of the Centre for Indigenous Conservation and Development Alternatives (based at McGill University, Montreal), and an invited talk at the Weissberg Human Rights Conference (Beloit College). At the grassroots level he made three recent trips to the Mt. Everest region to assist a Sherpa indigenous people's organization in cultural and environmental conservation work, including documenting and mapping community forests, rangelands, and sacred places for inclusion in the UNEP's ICCA Registry. Recent publications include *Indigenous Peoples, National Parks, and Protected Areas: a New Paradigm Linking Conservation, Culture, and Rights* (University of Arizona Press) and a policy monograph on protected areas and ICCAs. Stevens is the Geography Graduate Program Director and teaches courses on political ecology and conservation, including new course on the political ecology of climate change.

#### Eve Vogel

Political-environmental geographer **Eve Vogel** focuses on the politics, history and policy of rivers and of ecological river management, as well as electric power systems in relation to hydropower. She continues her work on long-term policy and environmental change in large-scale rivers, publishing comparisons of the Columbia, Tennessee and Connecticut Rivers in two book chapters. She has also expanded – or perhaps magnified might be the better term – the objects of her focus, interrogating the management of small New England rivers prone to flood. This has been the integrated RiverSmart series of projects, undertaken in collaboration with **Christine Hatch** and an interdisciplinary team of undergraduate, graduate and postdoc assistants (see p. 10). For the 2015-16 year she will be on sabbatical, working to complete a book on the recurring public political participation in the development of the Pacific Northwest electric power system, a positive example of civic participation in shaping socio-technical systems to benefit a wide range of people while mitigating environmental harm.

#### Richard Wilkie

My most important news is that **Leo Hwang** defended his PhD dissertation in December--Rethinking the Creative Economy: Participatory Action Research with Artists and Artisans in the Greater Franklin County--and that I had the honor of hooding him at the May UMass Graduation. (see photo) Leo is Dean of Humanities at Greenfield Community College.

My wife Jane and I traveled throughout Myanmar (Burma) in January with colleague friends, mostly on back roads with our own vehicle and driver. We also spent time in Hanoi and a trip into the dramatic island landscapes of Ha Long Bay. Most recently, I have been working on photos and a chapter for *The Sage Encyclopedia of Travel and Tourism*.

#### Mike Williams

**Mike Williams** and his students are continuing to investigate the tectonic history of North America, especially the Precambrian history of the continent. Calvin Mako completed an excellent M.S. Thesis studying the history of Proterozoic rocks in the Four Peaks area, Arizona. A broad variety of research is on-going in the Athabasca Granulite Terrane (AGT), in northern Saskatchewan, one of Earth's best exposures of lower crustal rocks. **Sean Regan**

completed his PhD last year focusing on structural geology, petrology, and tectonics of the AGT. He is now a full-time geologist with the USGS and is mapping mainly in the Adirondack Mountains. **Jeff Webber** just completed his PhD with **Laurie Brown**, **Sheila Seaman**, and **Mike Williams**, focusing on large-scale magnetic anomalies and the relationship to tectonic history in the AGT. Jeff will be starting a new job as an Assistant Professor at Stockton University (Richard Stockton College) in New Jersey. **Amanda Van Lankvelt** is investigating the role of water in the deep crustal rocks of the AGT as part of her PhD research with **Sheila Seaman** and **Mike Williams**. Recently, Mike has been involved with several projects in the Adirondack Mountains. He has been working to understand the late, possibly collapse-related, structures in the eastern Adirondacks. **Claire Pless** is in the second year of her PhD, studying the deformation and metamorphic history of the eastern Adirondacks. In addition, **Phil Geer** will soon complete his MS focusing on the tectonic setting of Fe and REE mineral deposits in the eastern Adirondacks, and **Meghan Toft** is finishing her first year of MS work on the tectonic history and Magnetite/REE mineralization there. Meanwhile, Mike is continuing to work with **Mike Jercinovic** to refine their techniques for dating minerals such as monazite and xenotime using the Ultrachron microprobe in the Department of Geosciences. The technique is providing a new means of constraining the age of deformation and metamorphic events and it is providing much-needed age constraints in each of the above studies.



#### Don Wise

I continue occupancy of **Marie Litterer's** old drafting room adjacent to Room 254, Geo-student study area/ lounge/ coffee room, lunch room, etc., and hub of much departmental activity. It is a wonderful location for interactions with ongoing flow of individuals, exchanges about current research or scientific findings, talking with everybody, giving bad advice or exchanging even worse jokes, all while participating in several seminars each semester.

Last summer **Steve Mabee** and I did a major rework of the Berkshire field trip for his International Highway Geology Conference. It now replaces our outdated 101field trip guide with new figures, new lies, **Chris Condit** air photos, and major new color cross sections, all on line as a general resource.

My decade-long planetary-style photogeologic battle about Antarctic snow megadunes is on temporary hold, the major manuscript was rejected courtesy of stinging reviews by "experts". It presented unmistakable photo-geologic evidence of pervasive megadune burial beneath most modern snows, an outrageous challenge to the universally accepted "expert" interpretation of them as modern phenomena, supported by drill data that rejected the unconformity with claims that mere photo-geologic evidence is an unreliable planetary tool not appropriate for terrestrial constraints. Bah!

Current efforts are a return to fission origin of the Moon, an update of that model supported by lots of new data and ideas.

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Chief new idea is a proposed model for enigmatic sinuous rilles now universally believed to form by lava tube collapse but fatally flawed by absence of any drained lava. An alternative origin by hot gas melting of a permafrost layer requires a different, wet Moon of fission origin, not- giant impact, one more outrageous hypothesis.

Sometimes I feel like Don Quijote in search of a few more windmills and other times like the kid who specialized in poking sticks into hornets' nests.

**Jon Woodruff**

**Jon Woodruff's** sedimentology lab has a number of highlights to report. **Christine Brandon** successfully defended her PhD in March of 2015, with three peer-reviewed publications including reconstructions of extreme flooding in the New York City region following Hurricane Sandy and impacts of oyster reef destruction in New York Harbor. Christine is now teaching as an Assistant Professor at Bridgewater State University. **Hannah Baranes** successfully defended her master's thesis in the summer of 2015 and has submitted her first manuscript on Japan reconstructions of tsunami occurrences from the Bungo Channel for publication. Hannah is currently working at AIR worldwide doing catastrophe risk modeling for the insurance industry, with plans to return to UMass in January of 2017 to pursue her PhD after successfully obtaining a NASA Earth and Space Science Fellowship. **Brian Yellen** defended his PhD in December of 2015. His thesis includes two publications describing the impact of Hurricane Irene on the Connecticut River watershed and a third in review publication on sediment trapping within the Connecticut River estuary. Brian is now spinning up his own business to train professionals on the hydrology and geology of the region while also working as an Adjunct Professor in the department with pending support from NOAA and NSF. **Zach Stromer** will be defending his masters thesis in August of 2016 with research that provides a much needed historical and sedi-



Senior **Jen Jurnack** and Prof. **Jon Woodruff** doing a winter beach and dune surveys on Nantucket over 2015 spring break. Photo by **Margot Mansfield**.



Graduate student **Hannah Baranes** in Kyushu, Japan during coring of coastal ponds to assess tsunami risk for the region.

**Qian Yu**

The GIS/Remote Sensing group continues the research on monitoring water biogeochemistry in aquatic ecosystems using geospatial techniques. **Qian Yu** joined a NASA working group in coastal and inland water hyperspectral remote sensing to identify and assess candidate aquatic remote sensing data products for the first global hyperspectral sensor HypSPIRI mission. Over and after her first sabbatical leave, she has also worked with a few other

colleagues on campus to develop Geographic Information Science/Technology proposals for new GIS programs on campus. Recently, a new GIST certificate was approved open to all majors on campus and a 1-year GIST concentration in Geography MS is under review by university. PhD candidate **Jiwei Li** has been working on the new algorithm to retrieve colored dissolved organic carbon in shallow waters from hyperspectral imagery. He conducted fieldtrips in Lake Michigan and Lake Huron to validate his algorithms. He received a scholarship to attend the International Ocean Color Coordinating Group Summer Lecture Series held in France in summer 2014.

**Richard Yuretich**

Since my "retirement" in September 2014, I have become accustomed to the rhythm of life in and around the nation's capital. Last year we moved into a small place in the Watergate (yes, that one) and thereby acquired some people as neighbors who you wouldn't normally see roaming around Amherst, such as **Bob Dole** and **Ruth Bader Ginsburg**. I have a feeling their accommodations might be slightly more luxurious! We are a stone's throw from the Potomac River, which still has its charms and is a magnet for people on sunny, pleasant days. Kennedy Center is literally across the street and has almost become our second home in DC, going to many performances of the National Symphony Orchestra, three-fourths of Wagner's Ring cycle, not to mention "Matilda" and "Kinky Boots!" It is also great to go to the various museums of the Smithsonian at a leisurely pace; no need to rush through them like a tourist. Oh yes, I am still working at the National Science Foundation, which has also been a stimulating change of pace. I read a LOT of research proposals, many of them really exciting and dealing with topics that I would not have encountered during my own research career. There are more lectures, workshops, and symposia going on around NSF than at many universities, so there is always the opportunity to expand horizons even further; I even (tried to) learn something about gravity waves. NSF gives the scientific staff the opportunity to engage in independent research and development (affectionately known by its acronym IR/D) and this has allowed me to return to UMass periodically to finish up the research projects that I was pursuing when I retired. These involve mostly writing, and there really are many good spots around UMass, even in Morrill, where there is enough quiet to get things done and the countryside of the Valley is a pleasant counterpoint to the urban energy of DMV (that's District-Maryland-Virginia, another common abbreviation). I expect to continue this pattern for the immediate future. I miss the abundance of unstructured time during the summer, of which the earlier half is now occupied by meeting the deadlines of the Federal fiscal year, but the upside is that we can take our real vacations in September and October, when the weather is great for traveling and the crowds have thinned out. I'm also looking forward to watching the forthcoming elections from our vantage point "inside the Beltway!" Stay tuned....



Graduate student **Hannah Baranes**, alumna **Kinuyo Kanamaru**, and Japanese interns arriving at Japanese study site with field gear.

## DEPARTMENT IN THE NEWS

The department's faculty engage in a broad range of outreach activities. In early 2015 **Mike Rawlins** was selected as one of nine faculty of the UMass Public Engagement Project. This project, made possible by generous support from the Deans of the College of Natural Resources and the College of Social and Behavioral Sciences, supports and trains faculty members to use their research to contribute to social change, inform public policy, and enrich public debate. Since the start of the year Mike has participated in over a dozen print, radio, and television interviews on topics such as the strengthening El Nino, the use of geoengineering to mitigate climate change, and the recent record cold across the Northeast US. In March **Ray Bradley** spoke at a State House forum on climate change and resiliency. **Julie Brigham-Grette** and **Isla Castañeda**, along with **Rob DeConto** and **Stephen Burns**, recently led an annual week long Geosciences teacher workshop, which helps to bring cutting-edge climate research into middle and high school classrooms. Other outreach activities include participation in the Eureka! Science Summer Camp at UMass (see below).

**Rob DeConto** gave a series of public and academic lectures in New Zealand, sponsored by the S.T. Lee Lecture series on Antarctic Studies. The topic of Rob's lectures was Antarctica's climatic future, the possible fate of its ice sheets, and future sea level rise.

**Piper Gaubatz** offers Workshops for K-12 teachers on teaching about Asia through the 5 College Center for East Asian Studies

**Stan Stevens** has been working with Sherpa leaders and a Sherpa indigenous people's organization in the Mt. Everest region of Nepal to organize and fund a series of community actions in support of community-based conservation. Recent activities include elders-youth dialogues, school presentations, elders and youth culture and conservation treks to regional community forests, sacred sites and other conserved areas, and participatory GIS. He was a member of the organizing committee for part of the IUCN World Parks Congress 2014 in Sydney, Australia, organized a workshop at the Congress, and helped draft the recommendations in its output document, the Promise of Sydney. He also helped organize and participated in a gathering of First Nations in the territory of the Tla-o-qui-aht First Nation in British Columbia to discuss conservation initiatives and issues. He gave invited presentations on indigenous rights and conservation at the 10th World Wilderness Congress in Salamanca, Spain, IUCN's World Parks Congress 2014 in Sydney, Australia, and the 2015 Weissberg Conference on the Rights of Indigenous Peoples, Beloit College. Stevens continues to serve as treasurer and steering committee member of the ICCA Consortium, a global conservation and rights organization. He is a member of the ICCA Consortium's working group on law and policy and has been leading the development of policy on appropriate recognition of Indigenous peoples' and local communities' rights and conservation practices in cases when protected areas overlap their traditional territories -- the situation for most national parks and other protected areas worldwide.

## EUREKA!

by Christine Hatch & Michele Cooke

Girls Inc. Eureka! is a five year program that brings girls, many who will be first generation college applicants, onto local college/ university campuses for an intensive summer program. As Eureka! continues through the school year, cohorts of 30 girls stay together throughout the course of the program, sharing hands-on, minds-on, untimed and ungraded opportunities for guided exploration and skill and knowledge building. Girls test themselves mentally and physically and discover that they are capable of far more than they had ever thought possible. And, perhaps most important, participants and their families, many for the first time, are introduced to the requirements and resources that will make higher education and interesting employment that pays a living wage possible.

**Isla Castañeda**, along with postdocs **Molly Patterson** and **Elizabeth Thomas**, graduate student **Helen Habicht** and undergraduate **Megan Thompson-Munson** recently developed and lead a forensic geology workshop for 8th grade girls at part of the Eureka! Science Summer Camp at UMass. The participants used geology to figure out who had committed a crime.

**Michele Cooke** hosted a two-hour workshop on July 16,

2015, which is titled "Earthquakes!: Traveling Through the Earth" to 13 girls. The workshop included short movies, small-group discussions, blackboard drawing, and hand-on experiments (using Earth models, slinky and human waves) to show how seismic waves travel through the Earth. At the end, we also had a tour of the Department Mineral Gallery.

**Christine Hatch** led a group of about 15 girls in an activity called "In a Dinosaur's shoes" at the Beneski Natural History Museum at Amherst College. First we measured our own foot length, total height, hip height and stride length, both running and walking, to establish our baseline metrics. Then, we went inside and measured dinosaur trackways, and used these to infer dinosaur size and speed, and calculate whether we thought we could outrun them (nope). The girls got in the mood with curator **Fred Venn's** introduction to valley geology, and had so much fun making and measuring tracks and strides, they barely realized their own: we collected and analyzed data, took averages, made estimates, inferred relationships and made measurements, all while looking at and thinking about one of the world's best dinosaur footprint collections.



## GEOGRAPHY PROGRAM UPDATES

### Curriculum development

The faculty in geography have been building the undergraduate geography curriculum. Over the course of the past two years we have established a concentration in Environmental Geography in the BA degree and secured faculty senate approval for three new undergraduate courses: Geography 220 World Regional Geography (see below), Geography 450 Indigenous Peoples and Conservation, and Geography 470 The Chinese City. Another new undergraduate course, Climate Crisis, (see below) will be offered for the first time in Fall 2015 and we have also added a new experimental course on Protected Areas and Indigenous Peoples. The geography faculty were also successful in securing approval for a revised version of Geography 486 Field Methods in Geography, taught by **Piper Gaubatz**, as a general education integrative experience course. A major change has been the successful conversion of the designation of geography courses in the university's online registration system from GEOSCI to GEOG. This enables students to search for and enroll in geography courses in the online registration system for the first time.

### World Regional Geography

In 2014, **Stan Stevens** led an effort to secure approval for a new general education course (social-behavioral and global diversity) in geography. This course, World Regional Geography, is a survey of world physical and human geography, highlighting continuing regional diversity amidst globalization processes and outcomes. It introduces geographical theories, concepts, and methods while exploring nine major world regions. The course contributes to campus-wide efforts to enhance internationalization. In addition to developing the course proposal for faculty senate review and two different proposals for general education status, Stevens also requested funding to support the teaching assistants for this course from the provost's office. All four proposals were successful. World Regional Geography was first offered in fall 2015, taught by **Toby Applegate**. The class proved a huge success and is fully enrolled for fall 2015.

### Climate Crisis

The geography program is introducing a new undergraduate course in fall 2015 to complement the existing teaching on climate and climate change in Geosciences, Environmental Conservation, Landscape Architecture and Regional Planning, and Civil Engineering. This course, designed by **Stan Stevens**, is an introduction to the political ecology of climate change and response. It provides an opportunity for students to engage in human geography-grounded critical reading and discussion about the great moral, political, economic, and environmental challenge of our time. It explores climate crisis discourses and narratives; climate justice; adaptation and mitigation issues; policy and social/economic reform debates; and climate activism. Reading will range from work

by **Bill McKibben**, **Naomi Klein**, and Indigenous activists to IPCC and World Bank reports and publications by human geographers.

### Geography Club activities

The UMass Geography club was established as a registered student organization in 2013-2014. Club activities have ranged from weekend fieldtrips to competition entries. In 2013-2014, the club made a long weekend fieldtrip to Montreal, and competed in the World Geography Bowl. (see below) and the "Where in the World" (see below) competitions. In 2014-2015, club activities included competing in the World Geography Bowl (see below), hosting a Geography trivia night, and taking field trips to Rhode Island's Cliff Walk and the Boston Mapparium. As club leaders **Dan Riecker** and **Spencer Weinstein** explain, "The 2014-15 academic year brought many positive changes to the Geography Club. In October, the Geography Club traveled to the University of New Hampshire to compete in the NESTVAL World Geography Bowl. We competed against teams from across the northeast, and after many rounds of competition, brought home the trophy. To keep up on our trivia, the Club held a Geography Trivia Night in the spring. Members who did not attend the NESTVAL competition were able to participate in this event, and based on the positive feedback from all who participated, we plan to hold this event every semester in the future.

Also in the spring semester, the Club enjoyed a day trip to Boston. We celebrated the arrival of spring with a visit to the Mary Baker Eddy library for its famous Mapparium, followed by the Prudential Center observation deck, the Boston Common, and the North End. Within the group in attendance, both the Boston natives and the first-time visitors alike appreciated the opportunity to think geographically about the city, its design, and its cultural enclaves. With the experiences that we have now had, we are excited to continue to grow the Club in the coming year."

Meanwhile, the 2015-2016 geography club, led by **Spencer Weinstein** and **Ronan Lucey**, organized study nights, movie nights, trivia nights and field trips throughout the year.

### Geography bowl

UMass geography majors have been very successful at the NESTVAL (Association of American Geographers New England-Saint Lawrence Valley Division) World Geography Bowl competition. In fall 2013, although the UMass team (**Steve Bailey**, **Haley O'Neill**, **Elise Quebec**, **Dan Riecker** and **Chloe Meckanik**) did not win the regional competition, **Steve Bailey** was chosen to join the New England team at the national competition in Tampa, Florida. In fall 2014, a team of 6 undergraduate UMass geography majors (**Steve Bailey**, **Will Kostick**, **Ronan Lucey**, **Tyler Maren**, **Vitya Romanov** and **Spencer Weinstein**) came home with the championship trophy. Geography club president **Dan Riecker**, though unable to attend, was instrumental in organizing the team





## GEOGRAPHY PROGRAM UPDATES

and running practice sessions. This year's competition, held at the University of New Hampshire in Durham, NH, involved 11 teams from universities such as the University of Connecticut, Clark University, the University of Maine and the University of New Hampshire. UMass entered the final round against Plymouth State University after winning four of six preliminary rounds. The UMass team swept the final round with correct answers to questions on topics—from erosion to ebola, Mars missions to migration—which demonstrated their command of the breadth of the field of geography as it spans from the natural sciences to the social sciences. Team member **Ronan Lucey** was chosen to join the New England team at the 2015 national competition in Chicago.

2015-2016 - UMass geography sent another excellent team to the American Association of Geographers' New England-St. Lawrence Valley (NESTVAL) Division of the World Geography Bowl. This year UMass made it past stiff competition to the final round, and brought home the second-place trophy to add to our trophy case in Hasbrouck 236 (The geography teaching lab). Soon we'll need a larger case! The team included geography majors **Owen Bragdon**, **Ronan Lucey**, **Tyler Maren**, and **Spencer Weinstein**, and was driven by honorary geographer **Aaron Beltzer**. **Owen Bragdon**, **Ronan Lucey** and **Tyler Maren** all qualified to represent NESTVAL at the national competition in the spring. **Tyler Maren** was able to join the regional team for an exciting competition at the American Association of Geographers' Annual Meeting in San Francisco. This was the third year in a row a UMass geography student has been a member of the NESTVAL team at the national competition.

### "Where in the World" Challenge

In Spring 2014, UMass was one of seven universities competing in the nationwide "Where in the World Challenge." A competition sponsored by the National Geospatial-Intelligence Agency. The challenge is designed to develop anticipatory spatiotemporal analytic skills to create and report "from the future" on the five best and five worst places to live on earth in the year 2025. University teams each chose one of the following criteria: water resources, energy resources, food security, The UMass Geography club chose to analyze the best and worst places for water resources in the year 2025. Members participating on the team including **Spencer Weinstein**, **Stephen Bailey**, **Ronan Lucey**, **Chloe Meckaniuk**, and **Daniel Riecker**, prepared both a written and a video report on their analysis.

### International Geography Honor Society

In Spring 2015, UMass was granted a charter for new chapter of Gamma Theta Upsilon (GTU), the International Geography Honor Society. Members who joined this year are considered "charter members" - their names appear on the official charter (certificate) which is framed on the wall of the Geography Teaching Lab (Hasbrouck 236, the "Round Room"). Charter members include **Steve Bailey**, **Morgan Coles**, **Zandra Davis**, **Tom Holahan**, **Ronan Lucey**, **Tyler Maren**, **Dan Riecker**, **Vitya Romanov** and

**Spencer Weinstein**. Membership requires a GPA of at least 3.3 (on a 4.0 scale) in geography courses, rank in the top 35% of their class, completion of a minimum of 3 geography courses, and completion of at least 3 semesters of full-time college course work. Faculty and students celebrated the founding of the Mu Alpha chapter of GTU with a lunch on April 15, 2015. At graduation, **Steve Bailey**, **Morgan Coles** and **Tom Holahan** wore GTU's distinctive blue, brown and gold honors' cords in recognition of their achievement.

### Geography Program Affiliate Faculty

In fall 2013, the Geography Program held a campus-wide meeting of faculty from other UMass departments interested in supporting the geography program. The result was the establishment of a network of 19 faculty from 9 departments in the colleges of Natural Sciences, Social and Behavioral Sciences, Engineering, and Humanities and Fine Arts who participate in the UMass Geography community, serve on student advising and examination committees, and facilitate Geography students' enrollment in their courses when appropriate. This broad multidisciplinary support base highlights geography's cross-cutting contributions to UMass' campus-wide initiatives, especially in the areas of environment/sustainability and internationalization.

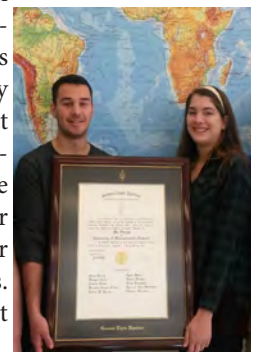
### GIST initiatives

Geography faculty members **Qian Yu**, **Stan Stevens** and **Piper Gaubatz** have been involved in a number of different 5 college and UMass initiatives to build research and teaching in Geographic Information Science and Technology. These include the development of proposals for

undergraduate and graduate certificate programs, a one-year professional Master's degree program, new research and teaching facilities, and new faculty positions. One of the new faculty members is **Forrest Bowlick**, a recent Geography PhD recipient from Texas A&M, who will be joining the geography faculty in Fall 2016 as a GIS lecturer and director of a new professional MS program in GIS. We welcome Forrest not only for his expertise in GIS but also for his specialization in the field of geographic education.

### Geography Teaching Lab

The Geography Program completed its' second full year in the newly renovated Geography Teaching Lab (the "Round Room," Hasbrouck 236) in Spring 2015 with the permanent displays of the framed Gamma Theta Upsilon charter and the 2014 NESTVAL World Geography Bowl championship trophy. This remarkable multi purpose space is not only heavily used for Geography teaching, but also serves as meeting space for the Geography club and Geography faculty, the site of MS and PhD exams, research space for faculty research projects, and venue for public lectures and other program events. Students and faculty alike now consider it UMass Geography's home.



## NEWS FROM THE STATE GEOLOGIST

September 2016 marks the start of the Survey's 15th year of operation since becoming part of the Department of Geosciences. **Joe Kopera** begins his 14th year with the Survey and continues to coordinate all bedrock mapping efforts in the Commonwealth. He also maintains the webpage and provides extensive help with out-

reach. Joe also keeps our presence known on social media by posting photos and updates on Twitter, Facebook, Instagram and Flickr. The success of the Survey is due in large part to Joe's commitment and hard work. Dr. **Nick Venti** is beginning a third year with the Survey as a post-doctoral fellow. Nick has been a great addition to the Survey. He has been instrumental in managing several of our larger projects and keeping our staff busy. At one point during spring 2016 we had 10 undergraduates or recent graduates working for the Survey. Thanks are extended to **Jen Jurnack, Paul Southard, Miranda Cashman, Sarah Osgood, Catherine Trehwella, Becky Gariss, Alycia DiTroia, Nadine Doiron** and **Christ Romero**. Their support is much appreciated. Thanks are also due to **Doug Beach**, who has been funded on the beach study for the last year. He has helped with field work and done an excellent job keeping all the students organized as we have undertaken the Herculean task of processing 899 sediment samples in the sed lab. Funding is now available to keep Doug on for another year as part of the Phase 2 work on the beach study. The Survey continues to benefit from the help of other individuals over the last few years including **Bill Clement** and **Don Sluter**. In other news, the Survey has taken over responsibility for maintaining the ESRI site licenses at UMass and other campuses across the state. This effort is being led by **Joe Kopera**.

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

- Mapping with funding from the USGS National Cooperative Geologic Mapping STATEMAP program continues. In 2015, we collaborated with **Meg Thompson**, professor emerita at Wellesley College, to complete and submit her bedrock geologic map of the Newton quadrangle, submitted an updated version of the Ayer quadrangle, and worked with **Peter Robinson** to publish the bedrock geologic map of the Belchertown quadrangle. This

year we are working again with **Peter Robinson** to complete the bedrock geologic map of the Winsor Dam quadrangle and we are collaborating with **Chris Hepburn**, professor emeritus at Boston College, to complete the eastern third of the Sterling quadrangle. We secured a 14th year of STATEMAP funding to do two projects in FY17. In the first project,

we will work with **Peter Robinson** to publish the Quabbin Reservoir quadrangle with help from **Kurt Hollocher** who will perform new geochemical analyses. For the second project, we will collaborate again with **Mark Borrelli** at the Center for Coastal Studies to prepare a seamless onshore-offshore surficial geologic map of the Wellfleet quadrangle on Cape Cod. **Brian Yellen** will assist us with coring in Wellfleet Harbor.

- With funding from the Bureau of Ocean Energy Management (BOEM), the Survey is nearing completion of an initial 2-year project, with **Jon Woodruff**, to conduct winter and summer profiles and sediment sampling on 18 beaches in Massachusetts that are experiencing erosion, placing critical infrastructure at risk. In addition, graduate student **Zack Stromer** is nearing completion of his MS degree. He is examining vibracores in back barrier ponds along the eastern Massachusetts coast to examine the frequency of large storm events. All this work is part of an effort to match beach characteristics with offshore sand resources for possible beach nourishment projects. We just received \$200,000 of additional funding from BOEM to examine sand resources at five sites off the Massachusetts coast. This project will fund a graduate student for 2 years and will fund **Doug Beach** for another year. We will work with **Bill Clement** to process all the bathymetric and side-scan sonar data,



**Don Wise** at the Eastern Summit overlook in the Berkshires explaining the tectonic evolution of the northern Appalachians during the Highway Geology Symposium field trip September 16, 2015.



**Margot Mansfield** (from the Massachusetts Office of Coastal Zone Management), **Nick Venti** and **Steve Mabee**, from left to right (both from the Massachusetts Geological Survey) take a break from surveying while waiting for low tide at Sylvia State Beach, Martha's Vineyard, winter 2015.

210 km of seismic reflection data, 8 vibracores and 7 grab samples.

- The Survey, working with **Paula Rees** from the Water Resources Research Center and **Scott Jackson** from UMass Extension, is nearing completion of a major project to examine culvert vulnerability with funding from the Massachusetts Department of Transportation (MassDOT). The purpose of the project is to develop a decision support tool to help MADOT identify culverts in need up upgrading and/or replacement. Culverts will not only be evaluated on the basis of hydraulic vulnerability but also eval-

## NEWS FROM THE STATE GEOLOGIST

uated from geomorphic and ecological services perspectives as well as the disruption to emergency services. Climate change at mid-century and end of century will also be incorporated into the analysis. Geomorphic vulnerability is based on estimates of specific stream power, channel alignment with the crossing structure, field evidence of channel erosion or aggradation and the ratio of the crossing width to bankfull channel width. These parameters were calibrated against known damage to stream crossings during tropical storm Irene. This is a collaborative project with the UMass Water Resources Center, Environmental Conservation, Civil and Environmental Engineering, Computer Science, as well as the Northeast Science Climate Center, Trout Unlimited, and Milone and MacBroom, Inc.

- The Shear Wave Velocity study that we started last year is continuing. This project is funded by FEMA. The goal of this project is to collect shear wave velocity data in different surficial materials to improve the data used to assess ground motion and loss estimates from various earthquakes scenarios. Loss estimates are determined using FEMA's HAZUS-MH software. This software is used extensively by planners for emergency preparedness and response planning. The shear wave velocity data has been collected and we are now beginning the evaluation of earthquake losses in different soil types with HAZUS-MH.

- We just received funding from the Massachusetts De-

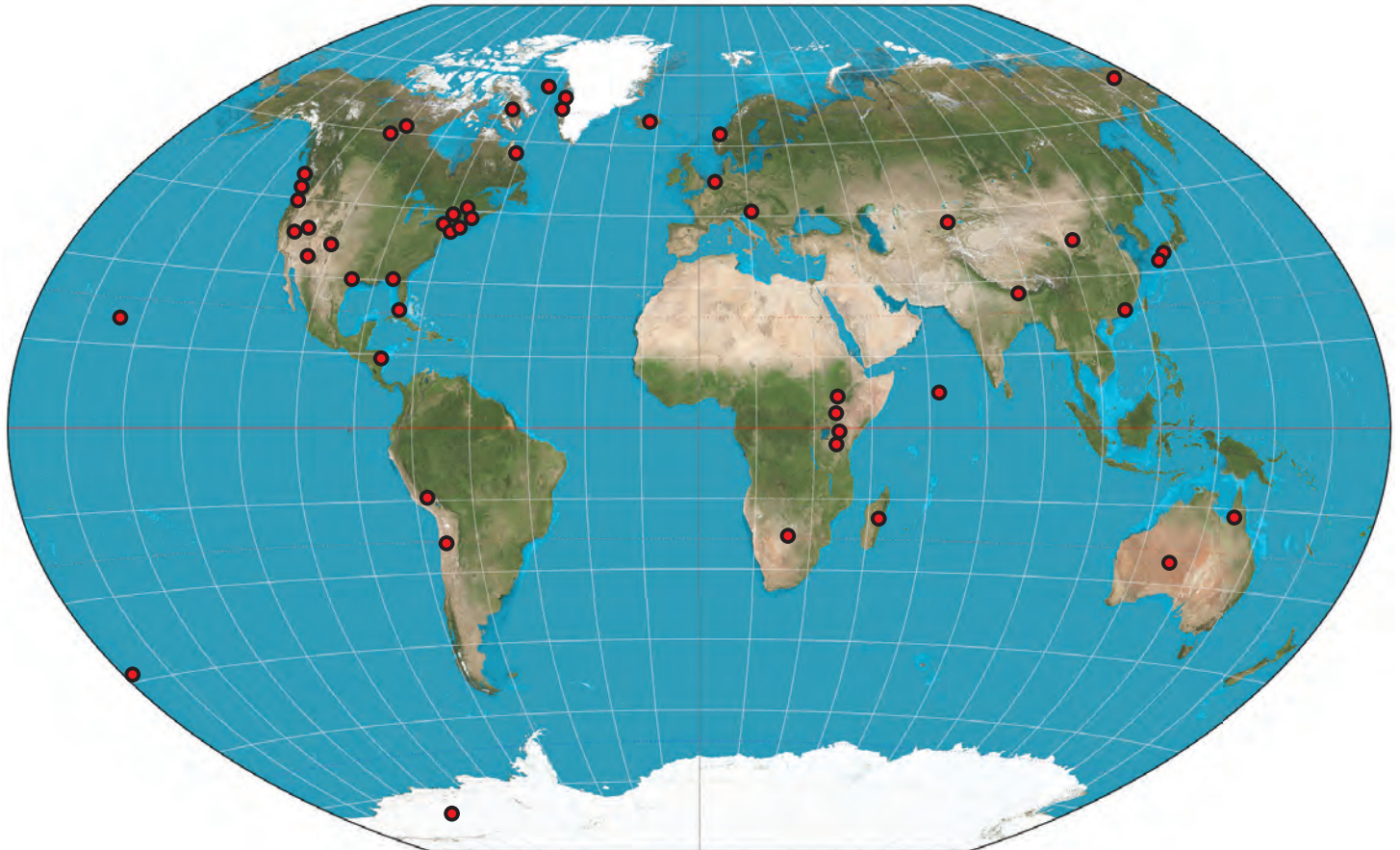
partment of Energy Resources to continue exploring geothermal energy potential of Massachusetts granites. This project is a collaboration with **Mike Rhodes** and will measure temperature gradients in wells of opportunity in areas of the state that have shown promising heat generation potential. This study builds on earlier work that was funded by DOE.

- During the summer of 2015 **Don Wise**, **Chris Condit** and **Steve Mabee** prepared a field trip guidebook and led a field trip to the Berkshires for the Highway Geology Symposium national meeting September 15-17, 2015. The all day field trip had 138 participants on three coach buses representing 27 states and four countries. It was a great trip with exquisite weather.

- The Massachusetts Geological Society sponsored a special field trip into the Quabbin Reservoir on May 14, 2016. The field trip was led by **Peter Robinson** and **Kurt Hollocher**. There were 62 participants and we had spectacular weather. Thanks to **Jack Ridge** (Tufts) and **Steve Dunn** (Mount Holyoke) for providing vans for the field trip. Thanks are also due to DCR and the staff at Quabbin Headquarters for letting us take our vans through the back roads of the Reservation. If you want a copy of the field trip guidebook, we are selling them for \$10. Please contact Steve Mabee at: [sbmabee@geo.umass.edu](mailto:sbmabee@geo.umass.edu) if you would like a copy. For more information on the Massachusetts Geological Society please visit: [www.massgeosociety.org](http://www.massgeosociety.org)

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## WHERE IN THE WORLD IS THE UMASS GEO DEPARTMENT?



**Locations where folks in the department have been conducting research**

## NEWS FROM THE CLIMATE SYSTEM RESEARCH CENTER

- **Ray Bradley's** book *Paleoclimatology* 3rd edition was among the 2015 Textbook Excellence Award Winners (College) by The Text and Academic Authors Association. It was one of seven textbooks receiving the 2015 Textbook Excellence Award which recognizes excellence in current textbook and learning materials in their 2nd edition or later. Ray was one of many authors on a paper, published in *Nature Climate Change* in 2015, highlighting "elevation-dependent warming", whereby high mountains of the world may be warming more than areas at lower elevations.

- **Julie Brigham-Grette** delivered the 2015 Tyndall Lecture at the American Geophysical Union's Fall Meeting in San Francisco this past December. Tyndall lectures are by invitation from AGU's Global Environmental Change Focus Group. In January Julie served as co-master of ceremonies for a free public program, "Arctic Matters Day," at the National Academy of Sciences headquarters in Washington, D.C. and delivered the inaugural public webinar in an Arctic research seminar series hosted by the Arctic Research Consortium of the United States. She is a coauthor on several recent papers by CSRC members focused on the Lake E records.

- **Rob DeConto** is the 2016 recipient of the Tinker-Muse Prize for Antarctic Science and Policy, the top international award for Antarctic science. The \$100,000 award recognizes demonstrated potential for sustained and significant contributions that will enhance the understanding and/or preservation of Antarctica. Rob has also been selected to serve on the Intergovernmental Panel on Climate Change (IPCC) Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways. In March he and collaborator **Dave Pollard** at Penn State published a study in the journal *Nature* that suggests that recent estimates by the IPCC for future sea-level rise over the next 100 years could be too low by almost a factor of two. To do so they developed and applied a new ice sheet-climate model that includes previously under-appreciated processes which emphasize the importance of future atmospheric warming around Antarctica.

- **Isla Castañeda** was one of the organic geochemists on IODP Expedition 356, which sailed from Freemantle to Darwin, Australia from July 31 to Sept. 30, 2015. The goal of the cruise was to investigate the history of the Indonesian Throughflow and Australian Monsoon during the Plio-Pleistocene period. She and **Ray Bradley** recently received an award from the National Science Foundation (NSF) to study past climate changes across southern Greenland during the time that Norse settlers occupied the region.

- **Alan Condron** published a widely-cited paper with Jenna Hill (Coastal Carolina University), in *Nature Geosciences*, showing evidence that massive icebergs reached Key West Florida during glacial times. Alan has also been awarded a Department of Energy grant to assess whether a collapse of the West Antarctic Ice Sheet will alter ocean circulation and climate in the next 50-300 years.

- **Mike Rawlins** led an international team of more than two climate modelers in publishing a synthesis study in July 2015 that described a weakening of the land CO<sub>2</sub> sink across Northern Eur-

asia over recent decades. The study, supported by a 3-year grant from NASA, also documented key uncertainties and knowledge gaps in the cycling of carbon across northern Eurasia. The article appeared in the journal *Biogeosciences*.

- **Doug Hardy** was profiled in a video clip on The Guardian website in which he described the satellite-linked meteorological stations on top of the Quelccaya Ice Cap that he has operated since 2003. Doug also maintains a station on Kilimanjaro's summit glacier, in Tanzania. These records now constitute the longest, highest meteorological records in the world, providing unique insights into high elevation mountain climates on glaciers in the tropics.

- **Tom Johnson**, Emeritus Professor, University of Michigan, Duluth (Large Lakes Observatory) has joined the Department as an Adjunct Professor and is enjoying the opportunity to continue his research alongside others in the Climate Center.



- **Kinuyo Kanamaru** will soon start an appointment for the 2016 - 2017 academic year as Visiting Assistant Professor at Amherst College and will continue her research in reconstruction of prehistoric climate change along with identification of past natural disasters including tropical storms, earthquakes, volcanic eruptions, and tsunamis in Japan and Korea.

- **Ambarish Karmalkar** has rejoined the CSRC following a postdoctoral fellowship at the University of Oxford in the United Kingdom.

- **Ed Gasson**, **Rob DeConto** and colleagues published a study in the *Proceedings of the National Academy of Sciences* which examined advance and retreat of the Antarctic ice sheet during the Miocene. Earlier in 2016, Ed, Rob, and colleague **Dave Pollard** authored a study in *Geophysical Research Letters* that described how uncertainties in bedrock topography influence model simulation estimates of Antarctica's ice sheet dynamics.

- **Liang Ning** is now an Associate Professor in the School of Geography Science, Nanjing Normal University in China. He and **Ray Bradley** published several papers in 2015 and 2016 which characterized recent and potential future climate changes across the Northeast US.

- **Molly Patterson** will soon begin an appointment as Assistant Professor at State University of New York-Binghamton where she will teach and continue her research in collaboration with Isla Castañeda in developing multi-proxy North Pacific paleoceanographic reconstruction spanning Super Interglacials. In February Molly and former UMass PhD student **Chris Lowery** participated in the University-National Oceanographic Laboratory (UNOLS) Chief Scientist Training Workshop. The workshop spanned 10 days at sea where Molly gained experience as a chief scientist and collected sea surface sediment samples off the coast of San Diego California in order to test the utility of organic geochemical sea surface temperature proxies.

- **Elizabeth Thomas**, whose parents are alums of the department, was a recipient of an NSF Postdoctoral Fellowship for her proposal "Developing early Holocene records of terrestrial climate in Baffin Bay to understand ice sheet response time to climate

## NEWS FROM THE CLIMATE SYSTEM RESEARCH CENTER

change". She recently published a study in *Geophysical Research Letters* that identified increased snowfall on western Greenland during the middle Holocene, based on samples analyzed in the Biogeochemistry Laboratory at UMass. Elizabeth will begin a faculty appointment at the University at Buffalo this fall.

- **Nick Scroxton** joined the CSRC as a postdoctoral research scholar to work with **Stephen Burns**. He is researching past variability of southern hemisphere monsoonal rainfall using stalagmites from Madagascar. Nick arrives from his PhD at Australian National University where he studied stalagmites from Indonesia and the impact of past climates on the hominin *Homo floresiensis*.

- **Greg DeWet, Isla Castañeda, Rob DeConto, and Julie Brigham-Grette** recently published a study in *Earth and Planetary Science Letters* describing a new mid-Pleistocene temperature record from Lake El'gygytyn. Greg was also awarded a Doctoral Dissertation Research Improvement (DDRI) award from the Geography program at NSF for his proposal "Reconstruction of Climate and Human Occupancy at the Eastern Settlement of the Norse in Greenland Over the Last Two Millennia". He spent the first half of 2015 at the University of Bergen, Norway on a Fulbright Fellowship, working with Dr. **Jostein Bakke**. The results of that work on Holocene lake sediments from Svalbard are described in a paper recently submitted to *Quaternary Science Reviews*.

- **Ben Keisling** is currently pursuing a Ph.D. under the supervision of **Rob DeConto**. He is using an ice sheet model to study the history of the Greenland ice sheet. Ben recently received an NSF GROW fellowship to visit Dr. **Christine Hvidberg's** group at

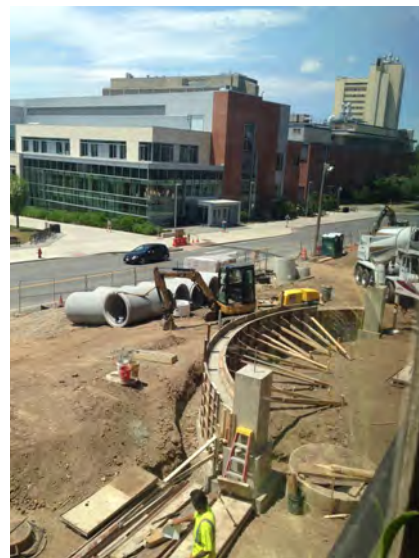
the Center for Ice and Climate at University of Copenhagen for 9 months to learn more about ice-core data and collaborate with other researchers studying the Greenland ice sheet.

- **Helen Habicht** is pursuing her PhD with continued work on the Lake El'gygytyn record. Her research utilizes organic biomarkers and sedimentological analyses to reconstruct climatic and environmental changes in the Arctic. Helen will be attending the Drilling and Coring Summer Institute at LacCore in August. Helen has received a College of Natural Sciences Teaching fellowship for Fall 2016. She is looking forward to exploring some of the most exciting and interesting aspects of climate and geoscience with her first-year students!

- **Dan Miller** attended the 2015 Swiss Climate Summer School on Extreme Events and Climate Change in Ascona, Switzerland in August of 2015. His PhD research involves the use biomarkers and sedimentological analyses of sediments from Basin Pond, Maine to assess changes in extreme climate events over recent centuries.



MORRILL COURTYARD RENOVATIONS



CONGRATS GRADUATES!



## ALUMNI UPDATES

Dr. **Bandana Purkayastha** (MS '85) is Professor and Head, Department of Sociology at the University of Connecticut and the outgoing President of the Sociologists for Women in Society. She has numerous publications, and was awarded a number of UConn teaching awards.

Dr. **Christopher Gaffney** (MS '02) has a University of Zurich geography position with the Space and Organization group comparing planning and impacts of upcoming sports mega-events in Russia and Brazil. He is the in-coming Editor of the Journal of Latin American Geography.

**Joe Kopera** (MS '03): Joe is starting his 13th as a bedrock geologic mapper, GIS specialist, and associate State Geologist at the Massachusetts Geologic Survey with **Steve Mabee**.

Dr. **Alan Marcus** (MS '04; PhD '08) was promoted to Associate Professor with tenure in the Dept of Geography and En-

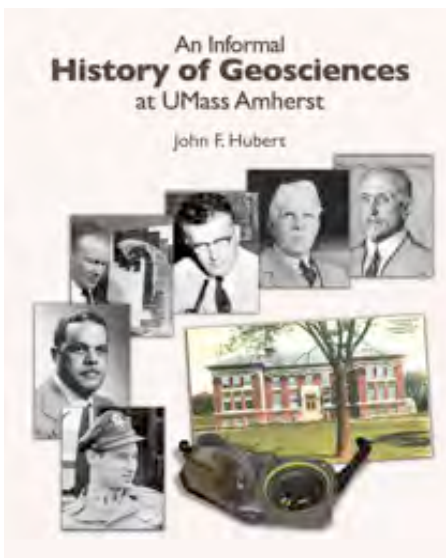
vironmental Planning at Towson University in Maryland. Since 2008 he has published 9 journal articles, 4 book chapters, and a text book *Toward Rethinking Brazil*.

**Keith Bevan** (BS '11; MEd '12): After graduating from the Geo program, I went on to get a Masters in Education. This will be my 4th year teaching 7th and 8th grade science at Ralph C Mahar in Orange. Besides the glaring issues in K-12 education, it is the best job I could have hoped for. Geology is taught at length in my classroom (despite what the state says) and the kids love it. Hopefully you will have a couple of new students to the program in a couple of years.

**Want to see your news here? E-mail alumni updates to Julie Brigham-Grette ([juliebg@geo.umass.edu](mailto:juliebg@geo.umass.edu))**

## FACULTY BOOKS

John Hubert has just come out with a second, expanded edition of *An Informal History of Geosciences at UMass Amherst* (2016). John's charm, humor, and personal recollections show through these very readable and richly illustrated 231 pages that proceed from opening of Massachusetts Agricultural College in 1864 and hiring of Professor Richard Lull as its first professor of Geology in 1894 to a final section that recalls some of the more memorable (and more repeatable) parties and related events of later years. It describes the evolution of a small aggie college into a major university and within it, the evolution of a minor appendage of the Zoology department into a modern geoscience department with integrated reach into history, mechanisms, and social aspects of every corner part of our planet and beyond, from slide rules to computers, from LeRoy lettering sets and hand-drawn art work to computer graphics. Most of all it deals with people. It has short histories of a long line of impressive faculty down through the years, people like Bill Bromery, Joe Hartshorn, and Lynn Margulis as well as colorful recipients of the Alumni Award, Charles Groat, Gail Ashley, Lee Allison, Art Goldstein, Al Hine, Sue Solyanis, and Matt Golombek. Very tactfully it stops short of descriptions of current faculty, recent events, and younger alumni. The underlying spirit and good humor of students and faculty through the years come through again and again, from field trip problems, pranks of many types, spoofs, roach populations in Morrill, and near-blackmail photos of the likes of Peter Robinson about to sledge a giant crystal and Steve Haggerty dressed in African regalia. It is a valuable record of events and people who shaped a great modern department while it helped shape them. It is a nostalgic walk down memory lane, well worth at least twice its \$10.50 price through Amazon-books.



Other books:

*Paleoclimatology*, **Ray Bradley** (Academic Press/Elsevier, 2014)  
*Indigenous Peoples, National Parks, and Protected Areas: A New Paradigm Linking Conservation, Culture, and Rights*, **Stan Stevens**, ed. (University of Arizona Press, 2014)

*The Chinese City*, Weiping Wu and **Piper Gaubatz** (Routledge Press, 2013)

*IODP Smear Slide Digital Reference for Sediment Analysis of Marine Mud. Part 2: Methodology and Atlas of Biogenic Components*, Kathleen Marsaglia, Kitty Milliken, **R. Mark Leckie**, Daniel Tentori, Linda Doran (International Ocean Discovery Program, 2015)

*Listening to the Rocks: A Geologist's Life with Mary Alice*, **John Hubert** (Create Space Independent Publishing Platform, 2013)

*Too Far North for Architects: Stories From a New Hampshire Farm and Beyond*, **Stearns A. Morse** (Off the Commons Books, 2013)

*Reclaiming American Cities: The Struggle for People, Place, and Nature since 1900*, **Rutherford Platt** (University of Massachusetts Press, 2013)

## APPEAL TO DONORS

Help us outfit our new Introductory Laboratory with polished rock tabletops. Our goal is \$25k and we are currently approaching 20% of that mark. Any amount helps and \$200 will get your name on a table of the rock type of your choice. Give at <https://www.geo.umass.edu/contribute>, go to online donations and put "Intro tables" and your favorite rock top in the special instructions box.







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### KEEP US IN THE FIELD AND THE LAB

We are seeking increased funding in support of undergraduate and graduate research opportunities and field-based experiences. Please consider making a donation to one of our memorial fellowships, or our general departmental fund to support field trips and student travel to meetings. As you are well aware, these hands-on, problem-solving activities enrich the geosciences experience and better prepare our students for diverse careers.

Please contact the Department of Geosciences if you have any questions or comments about this newsletter. We plan to publish this on a regular basis so please let us know if you have suggestions for improvement. We would love to hear from you. Please send updates to [head@geo.umass.edu](mailto:head@geo.umass.edu)

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