

Bucknell Geology Newsletter, Summer 2010

From the Chair

Hi All. We have lots of news to share from the department and from alums. Chris Daniel has stepped down as chair after his much appreciated four-year term. Mary Beth Gray is summer chair, and I'll take over in the fall semester. We've graduated a number of fine BA and BS Geology students with a diverse range of interests and accomplishments. We've welcomed back Rob Jacob ('97) as our tenure-track geophysicist. Visiting faculty continue to enliven and enrich our ranks. Emily Finzel (Purdue University) joined us for a one-semester visiting instructor appointment in the fall of '08, and Kaustubh Patwardhan (Johns Hopkins University) was a visiting professor from Spring '09 to Spring '10. This fall, we'll be joined by Laurel Mutti (Johns Hopkins University) as a visiting instructor, and Kaustubh will be with us again in the spring.

We've taken several exciting extended field trips, developed some new courses, gotten the flume installed and made operational and done some interesting team teaching. This fall semester will see the arrival of three declared first year BS Geology majors and two BA's— we're not sure, but this may be a record, as we usually pick up most of our majors into their first or second year after they take a Geology course and get fired up about our science.

We lost two friends of the department this year. Florence Pyle was former Bucknell registrar and long-time friend of the department. Florence donated a marvelous gemstone display that is in a display case of the lower level of O'Leary. She was 94 years young. We were very saddened to learn of the loss of Nicole Bailey '98. A tribute to Nicole can be found in the class notes section of this newsletter.

Keep in touch and come see us, Carl Kirby

Extended Field Trips:



Arizona (2007 and 2010) Chris Daniel, Carl Kirby, and Jeff Trop led groups of students to the Mohawk Mountains south of Yuma, AZ, followed by visits to Meteor Crater National Monument and Grand Canyon National Park.



Central Utah (2008) Jeff Trop, Mary Beth Gray and Ellen Herman led a trip to the San Raphael Swell and Arches National Park. We camped at the Green River Campground and within the Arches National Park. We mapped some interesting stratigraphy and structures, visited the historic Henry Mountain laccolith during a combined trip with Purdue University students and faculty.



Death Valley (2009) Mary Beth Gray, Carl Kirby and Kaustubh Patwardhan led a group of 15 students to Death Valley National Park. We camped at the aptly named Furnace Creek Campground and had fantastic learning experiences exploring Titus Canyon, Mosaic Canyon, Racetrack Playa and many other famous geologic destinations in and around the park.

We'll let you decide whether the rocks to the right were coming from the field contingent or the cinder cone in Crater Flat, near Yucca Mountain, NV.



Outer Banks Craig Kochel and Jeff Trop continue to lead annual trips to the VA-NC Outer Banks with their sedimentology and geomorphology course groups. During these trips they examine barrier island stratigraphy, depositional processes and erosion rates. They also tour and stay at Duke University Marine Lab and tour the nearby US Army Corps of Engineers lab.

New Jersey Highlands Structural Geology course groups make the annual pilgrimage to the New Jersey Highlands and the Gray family cabin on Fairview Lake to gain experience interpreting structures in metamorphic rocks. It's always a great learning experience and lots of fun.

Eileen Belfield '10 collects structural data from folds in Ordovician Martinsburg Fm slates in New Jersey.



Recent Graduates

2007	Amanda Forsburg Adam Kahler	Daniel Heuer Amanda Schroeder (Nickelsen Prize)	Ty Hoffman	Aubri Jenson John Witmer (Nickelsen Prize)
2008	Krista Bressler Matt Palmer	Anya Hess (Nickelsen Prize) Steve Smith (Nickelsen Prize)		Dallas Mellott
2009	Edward Bauer Kaitlin Fleming Christine Kassab Josh Linthicum	Christina Butera (Geology TA award) (Nickelsen Prize; Geology TA award) Paul Majeski	Violeta Castro Daniel Hubacz Calvin Manning	Cara Porteus
2010	Eileen Belfield Lauren Hall Eric Lynch (Nickelsen Prize; Miller Prize for Best Honors Thesis; Geology TA award) Ben Ramseyer	Josh Gornto Eva Lipiec Anne Strader	Kristi Grandy (Geology TA award) Molly Pritz (Nickelsen Prize) Matt Traver (Geology TA award)	

Brad Jordan Wins Geiger Award



We have the hardest working and best (in our humble opinion) Lab Director on campus. Brad finally received university-wide recognition at the annual campus picnic for his outstanding work in keeping the department going smoothly and effectively. Brad supervises lab and field trip prep, manages map, rock and mineral collections, the seismograph, the X-ray diffractometer, repairs and purchases equipment, trains students on instruments, and completes many other tasks.

The Walter C. Geiger Award, named in honor of a former Director of the Physical Plant, recognizes a member of the administrative staff who demonstrates consistent excellence in the conduct of their administrative responsibilities. Recipients exemplify the outstanding contributions made by many administrative staff over the course of their careers at Bucknell.

Jeff Trop Wins Boger Teaching Award

Associate Professor of Geology Jeff Trop was awarded the William Pierce Boger Jr. M.D. Award for Excellence in Teaching in the Natural Sciences. Jeff came to Bucknell in 2000. He teaches courses in the evolution of the earth, global change, paleontology and has participated as a Senior Fellow in the Environmental Residential College. Jeff has received high praise for the excellence of his teaching in the classroom, laboratory and field, as well as his advising and supervision of student research. He regularly teaches students through field work analyzing the geology of Central Pennsylvania, New Mexico, North Carolina, Utah and Alaska.

Jeff has been called patient, proactive, dedicated and trustworthy. He gladly mentors students conducting research and routinely assists students with graduate school applications and job searches.



The Sediment Flume – At long last!

We've been seeking a large scale sediment flume for a wide range of experiments and class demonstrations for several years, and it's finally a 40' X 8' reality. The O'Leary Center was built with space for the flume, and it took some years to get the funding, primarily from the Raymond Foundation (which also supported other instrumentation like the XRD and SEM) and from Bucknell administration.



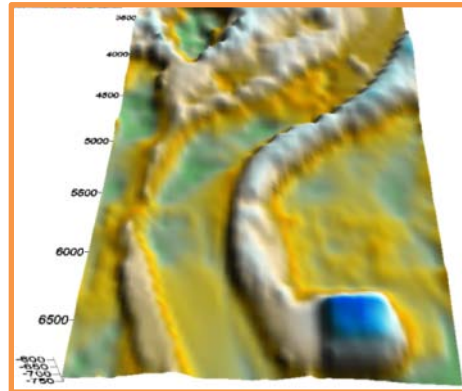
The first load of sediment in September.



Manual labor spreading the sediment.



The instrument carriage maps a meandering stream created in the flume.



A map of the channel to the left that the laser mapper created.

The flume has already been used in Geomorph class, for a sapping experiment, and to produce conditions for conduit flow through an artificial cave. Craig Kochel and others worked long and hard to make this valuable teaching and research tool a reality. It is showcased in Admissions tours.

What are we teaching these days? Current course offerings:

Intro Courses:

GEOL 103: Dynamic Earth

GEOL 106 Environmental Geology

GEOL 110: Geology of Alaska – A Wilderness

Environment (Summer Session)

GEOL 104: Evolution of the Earth

GEOL 107: Global Change – Past and Present

GEOL 150: Engineering Geology

Foundation Seminars:

Exploring Earthquakes, King Coal, When Rocks Attack, Cadillac Desert, Sixth Extinction

What are we teaching these days? continued...

Upper-level:

GEOL 201: Structural Geology*

GEOL 207: Environmental Geohazards

GEOL 213: Paleontology

GEOL 217: Crystallography-Mineralogy

GEOL 298: Stream Restoration

GEOL 301: Geophysics*

GEOL 312: Igneous and Metamorphic Petrology

GEOL 321/322: Special Topics (most recently Tectonic Petrology)

GEOL 329/430: Senior Program I and II

GEOL 205: Introduction to Geochemistry

GEOL 210: Geomorphology

GEOL 214: Physical Sedimentology and Stratigraphy

GEOL 230: Environmental GIS

GEOL 299: Watershed Systems Science

GEOL 310: Applied Environmental Geomorphology

GEOL 319/320: Undergraduate Research

GEOL 324: Hydrogeology*

*Courses also offered for graduate credit for engineering students.



Watershed Systems Science Course (Fall 2008) Craig Kochel and Carl Kirby team-taught this course with Matt McTammany (Biology), focusing on the Roaring Creek Watershed (just north of Shamokin/Mt. Carmel, PA, to students with a wide range of backgrounds.

Semester on the Susquehanna courses: Craig Kochel is team-teaching Fall 2010:

ENST 291 - Watershed Science and Natural History

ENST 292 - Land Use Planning and Social Processes

ENST 293 – Human Dimension and Environmental History

ENST 319 – Directed Research

Faculty and Staff News

Chris Daniel

I was quite happy to relinquish my position as department chair in May and spent much of the summer following up on new research on the zero fault mylonite with Mary Beth and continuing research in New Mexico and analyzing samples that I had previously collected in Bhutan. My colleague Jamey Jones from the University of Arkansas in Little Rock and I have made some interesting discoveries about the timing of deposition of the Precambrian Marquenas formation, New Mexico. For those of you who have participated in a northern New Mexico field trip, this is the spectacular metamorphosed boulder conglomerate that we visit in the Picuris Mountains. Detrital zircon work shows that the conglomerate was deposited at about 1.45 Ga.... some 150 Ma younger than previously thought. As the unit is metamorphosed and deformed, this lends support to the idea of

Chris Daniel continued....a ca. 1.4 Ga orogenic event. A manuscript with our results is currently in review, and we will be presenting our data at GSA this fall. I will be teaching mineralogy and a foundation seminar this fall and will also be involved with the Environmental Residential College. Marcey, Maggie and Alan are doing well. Maggie is 10 and Alan is 7. They keep us busy with school, dance and sports. We wish you all the best and please stay in touch. Best regards.

Mary Beth Gray

Working at Bucknell has always been a thrill for me, and I find working with students and my wonderful colleagues in the geology department deeply rewarding. The students seem to be capable of more each year and as the demographics of classes change, it's fun to retool courses I've taught before in new and interesting ways. The structural geology course I will teach this fall has fifteen students enrolled, four of which are geology majors, the rest are civil engineering undergraduates, and there is one graduate student. It will be fun to teach the course from a more applied standpoint.

My current research program is entirely East Coast at the moment. I have discontinued doing Yucca Mountain research as the licensing process is in Washington, D.C., and going nowhere fast. I continue to conduct research on the Appalachian plateau and have begun doing some collaborative work with Chris Daniel on the development of lattice-preferred orientations in a dolomitic ultramylonite in the Franklin Marble in New Jersey. It's been fun to work with such high temperature rocks and at such a small scale! We're finding some exciting things and we look forward to sharing our findings at an upcoming meeting soon. I am helping with some of the department chair responsibilities over the summer and during the upcoming years and am sitting on a major university personnel review committee for the next three years.

My family has continued to blossom as my children are now 9, 14, and 15 years old and getting taller every day. All in all, my days are very full and it's a great stage of life! It is always exciting to hear from former students and classmates when they are in town or by a quick email. All the best and stay in touch.

Ellen Herman

It's hard to believe I've been at Bucknell for four years now. Since moving to tenure track in 2007, I've been expanding my research to explore neglected questions of karst system development. My work to assess how storms pass through and affect karst systems continues, and I'm developing experimental methods in the flume to mimic the systems I monitor in the field. The recent installation of the large-scale sediment-recirculating flume in O'Leary will transform how my students and I approach a fascinating fundamental question - How much does sediment traveling through a developed conduit increase the conduit diameter? After decades of focus on dissolution, karst scientists are just starting to acknowledge that sediment may change the system as much or more than the system alters the sediment.

This fall I'll return to teaching after a spring semester on leave. I continue to enjoy introducing a variety of students to the geological wonders of Central Pennsylvania in GEOL 103 & 106. My students in hydrogeology continue to suffer through pounds of equations to arrive at the conclusion that water flows downhill except under pressure. Professor Jacob and I are developing a course that examines popular depictions of disasters in media for geologic plausibility. Our working title is "When rocks attack," and the first version will debut in Spring 2011. I hope you are well and will find yourselves in Lewisburg for a visit in the near future. For those of you who will be at GSA in Denver in October, I hope we'll have a chance to catch up.

Rob Jacob

Hi All. It is a great pleasure to be back at our alma-mater teaching and conducting research. To catch you up since I graduated in 1997, I got married to Eustacia Muir, another Bucknellian (1997); worked as an environmental consultant conducting geophysical, hydrogeologic and geologic investigations (1997-2001); got a PhD from Brown (2001-2006); had a daughter (Alanna, 9-3-06); was a post-doc at Brown and adjunct professor at Rhode Island School of Design (2006-2008); returned to Bucknell (2008-present) and finally had a

Rob Jacob continued.... son (Colby, 5-29-09). So now that you are caught up with my whereabouts since graduation, I am sure that the number one question you have is – what were you teaching at an Art School? In my PhD dissertation I showed that it is possible to non-invasively observe water migrating through the unsaturated zone of the subsurface and to link these geophysical observations using ground penetrating radar (GPR) to hydrologic models for soil water movement. With significant contributions from research students, I have continued this research here in Lewisburg, specifically at the nearby Montandon research site. I had the pleasure of working with two research students through the summer of 2009 and have been enjoying teaching Geophysics, Environmental GIS, Environmental Geology, Engineering Geology, and a Foundation Seminar – When Rocks Attack. In general, I conduct research using all geophysical methods but focus on electrical methods for its sensitivity to water. Future local research will include applying geophysical techniques to geomorphic and archeological questions in collaboration with other Bucknell professors, as well as continuing to exploit the entire GPR signal. However, in the more immediate future, this summer I am travelling to Germany to work with a colleague for over a month and to Italy for a one-week GPR conference; and, yes, my family is coming also as they wouldn't let me go without them. Please do not hesitate to stop by anytime you are back on campus or contact me via email or phone.

Brad Jordan, Director of Laboratories

I was having trouble starting my blurb for the newsletter so I took a look back to see what I wrote last time and found that, for the most part, life has simply been moving on with few “ridges and valleys.” The faculty and students have been keeping me busy with their teaching and research requests, and this summer has been no exception. In just the last month or so, I have been helping Craig and Jeff get ready for their projects in New Zealand and Alaska; assisting Ellen with emptying, cleaning and modifying the flume for her cave-related research; and helping Carl's students with equipment needed for their projects in AMD and Buffalo Creek. Add a dash of end-of-the-year ordering and the days move by pretty fast.

The biggest change by far last year was the addition of the Sediment Flume to my list of lab duties. It is a great piece of equipment, but often frustrating because it is so large, and the flume lab is so small. Getting sediment and equipment in or out of the flume or even just moving things about the room can be a challenge and has to be well thought out. I am working hard to maintain a good relationship with our Facilities folks as I often call on them to help with the labor. We are still very much in the learning stages, and I look forward to learning more and working with the flume's automap system that was recently installed.

Another major challenge in the past couple of years has been bringing our labs into compliance with EPA regulations. All Pennsylvania colleges must now meet EPA requirements (they used to just focus on industry) and are subject to inspections at any time. Bucknell may feel small; but with the variety of teaching and research that goes on here, we are actually classified as a large-scale hazardous waste generator, which makes us a high profile target for surprise inspections. Fortunately, we have a great Safety Services Department and they provide us with a lot of support. Many of you may remember working with our X-Ray Diffractometer, and it has been seeing a lot of use these days - but surprisingly, a lot of the use is from folks in the Engineering Departments. I have been training a lot of Chemical Engineering students, and the XRD gives them valuable information on their nano-scale projects that use mixtures of bentonite, graphite and polypropylene. It is also being used for phase analysis and quality control in Professor Gross' research with fuel cell anodes. It's not exactly geology, but having instruments like the XRD and SEM used by other departments helps to foster inter-departmental relationships which is one thing that I value at Bucknell.

On the personal side, on June 28, Sallie and I will celebrate our 30th wedding anniversary! Sallie has changed jobs, from working as a home health nurse to working in the IT Department at Evangelical Hospital. She is using her nursing experience to tailor the Hospital's software to specific staff needs. She enjoys her new role as a “nerd” and is working close to an 8-hour day for once. We still work our dogs in AKC obedience and last year I earned my Rally Obedience Excellent title with my German Shorthaired Pointer “Sam,” earning first place ribbons in each of our three title legs. We still do nursing home therapy visits several times a month. We have

Brad Jordan continued...added the Minersville, PA, Federal Correctional Facility (medium security prison) to our list of regular visits, which has been both interesting and rewarding for us. I just finished a two-year stint as president of our local Dog Training Club; and I am pleased to report that while I didn't do any major damage, it's not a role I want to repeat for a long time to come!

Lastly, you may have read earlier that I was one of two administrative staff honored with the Walter F. Geiger Award. For those who are unfamiliar with this, it is basically a very competitive "employee-of-the-year" type of award; and the only way you can win it is by being nominated by your department and peers who submit letters of support. I was surprised, honored and humbled to have been nominated, as all of you know how many great staff Bucknell has, many of whom I rely on to do my job. I feel very fortunate to work for faculty who think so highly of my efforts. So I guess the pressure's on to keep it up!

Carl Kirby

Hi all! Since the last newsletter, I had the pleasure to teach Watershed Systems Science with Craig and with Matt McTammany (BIOL) this fall. I'm also enjoying teaching Dynamic Earth (103), Environmental Geology (106), and Intro Geochemistry (205). I really enjoyed getting to teach Environmental GIS – the first time for Rob Jacob ('97) and me to teach together and to teach this course.

Last summer I supervised Sherry Finkel's (ENST '10) research on separating the geochemical signatures of mine drainage and acid precipitation in the Alleghany and Pottsville Formation in the Appalachian Plateau. Rebekah Morris ('11) is following up on Danielle Monteverde's research on manganese oxidation rates. I recently had papers published on acid precipitation with Missy Turner '03 and Brian McInerney '06 and on iron oxidation rates with Adam Dennis '06 and Adam Kahler '06. Molly Pritz ('10) and Luke Swenson ('11) worked last summer on the hottest economic and environmental topic in Pennsylvania and New York – the very saline waters associated with booming hydrofracturing of the Marcellus Shale for natural gas. Molly ended up giving five talks on the topic. Scott Lunde ('12) and Garyn Tate (ENST '12) are working on more Marcellus research this summer. I've become the director of the Marcellus Shale Initiative at BU – this involves seeking funding and planning for a website. Although exciting, it is kind of taking over my life. I'm writing proposals, answering questions, giving talks, and writing for publication.

Reluctantly, I sold my 1982 VW "Yellow Boy" camper painted with mine drainage sediments to make room for a much newer VW camper – I got tired of wondering if I was going to get where I planned to go on music and sampling trips. I'm working with the Shamokin Creek Restoration Alliance, although things have slowed down somewhat. The Buffalo Creek Watershed Alliance in Union County has installed an acid rain treatment system, and Erin Donaghy ('12) will be studying it this summer. I co-led my first extended western field trip to the Mohawk Mountains near Yuma, AZ, two years ago. Mary Beth, Kaustubh, and I took 14 students to Death Valley for a fabulous trip all around – great and varied geology, great weather, and great students.

I still play a few music gigs each year with four bands, and I still make my annual pilgrimage to the Galax Virginia Fiddlers Convention to play swing and jazz for a week. I play racquetball as long as my knees and back hold up. Sabrina and I took a fly-fishing trip to Colorado, and we both had a blast in Basalt and near Rocky Mtn. National Park. Cheers!

Craig Kochel

Greetings to everyone! The past year or so has been extremely busy and exciting. As you probably saw on the website, our new sediment flume has arrived and is running. It's a wonderful facility that promises to provide us with countless opportunities for studying the evolution of rivers and hill slopes for years to come. Weighing in with 15 tons of sand contained in a 40' x 8' channel, the Bucknell flume is the largest in the Patriot League. Check out my website for GEOL 210 (Geomorphology) if you want to see some images of students using the flume last winter. Jerry Miller (WCU), Ben Hayes (BU) and I will be running some experiments testing river restoration structures during the coming year.

Craig Koche continued...After nearly 4 years, I was finally relieved as Co-Director of the Environmental Center. During my time there we managed to get the center off to a running start with several interdisciplinary initiatives, the largest focusing on the Susquehanna River. The center now has a fleet of kayaks available for river sojourns that will soon be able to be launched from Bucknell's very own riverfront landing. We are also progressing on plans to have a dedicated Native American reflection site along the river to help with a program to reconnect with the indigenous cultures that lived along the river.

Teaching the past few years has been somewhat of a rollout marathon with new interdisciplinary geo-environmental courses founded by a grant to the Environmental Center from the Luce Foundation. The first of these, offered fall 2008, was Watershed Systems Science – co-taught by Carl Kirby, Matt McTammany (Biology) and myself. Many of the labs for the class were held at our new Roaring Creek Field Station for Watershed Studies (a partnership with PA-DCNR) where we can house students and faculty in a forested, linear, trellised watershed. Currently we have 4 gauging stations and a large weather station operating at the site and are just opening it up to the campus for long-term research and teaching. The Field Station will be a chance for undergraduates to study a forested ecosystem and watershed and to monitor the impacts forest activities similar to the big graduate instrumented watersheds like Coweeta, Hubbard Brook, and Andrews have. The Luce Grant and a grant from the US Department of Education outfitted the station with 100k in field equipment and facilities for students and faculty. The second new class was Stream Restoration (co-taught by Matt McTammany and myself). We used BU's own Miller Run as the poster child for abused streams and developed a plan for its restoration. Numerous meetings have spun off of this project with PA-DEP exploring ways to fund the restoration, including the possibility of partnering with the Lewisburg Area Sewer Authority to help reduce their nutrient loading to the Susquehanna in exchange for wetland-treated effluent recharge to Miller Run – a novel green approach that just might take hold. We affectionately refer to the concept as 'turds to trout' 😊.

The culminating new course will run this fall as Bucknell on the Susquehanna (BotS). Matt McTammany, Peter Wilshusen (Environmental Studies) and I will team up to offer this immersion course as a 'domestic semester abroad.' Planning has been underway for a year already – the experiential course will be an awesome experience for students and faculty – with several day river kayaking sojourns, research at Roaring Creek, extended trips to the Chesapeake Bay, to the Onondaga Nation and Susquehanna headwaters region, and several weeks in the Pacific Northwest comparing watershed environmental issues with the Susquehanna. We are hopeful that these 3 courses will be the beginning of many opportunities for interdisciplinary experiential learning involving Geology and the environment. Research has also been busy with the completion and publication of more than 10 years of local geomorphic mapping on the unique catastrophic jokulhlaups (thanks to the Iceland volcano now they are household words).

Jeff and I are moving forward with our work on avalanches in the deglaciating site in the Wrangell Mountains of Alaska as analogs to Mars polar regions. National Geographic is funding our placement of a time-lapse camera at the site near McCarthy this summer. Discovery of similar icy debris fans in New Zealand's Southern Alps near Mt. Cook/Aoraki during my sabbatical there last Fall have expanded our studies of these interesting processes and landforms internationally. Jeff and I leave in early June for a reconnaissance trip to LaPerouse and Mueller Glaciers near Mt. Cook/Aoraki before flying to Alaska to install the McCarthy avalanche camera.

My son Travis, who is finishing up a 2-year tour of tough duty in New Zealand, will join us in the field next month before he returns to the USA. Travis has been self employed as a graphic artist in NZ and has recently been specializing in developing new font typefaces. Kasei just returned from a tough tour of duty in Florence, Italy, for a semester. I just had to visit her over Spring Break to drag her away from all the paintings and sculptures to visit Vesuvius and see some geological sculpting. She is entering her senior year at Penn State already – time does fly. Speaking of time, I just completed 20 years at Bucknell, and my 30th overall in academia...yikes! I hope this finds you and your loved ones all well and having fun. Please keep in touch and stop by. Best wishes.

Linda Mertz, Academic Assistant

Geology is not 'just rocks'! How many times I feel like saying that to someone who looks at me strangely when I tell them I like my job. You are one of the reasons why. The camaraderie you all share, not just within your own graduating class, but all of you as a group, remains unchanged and invaluable. I've now seen many times over the transitions that occur in you from freshmen to seniors, both physically and in the mental leaps and bounds you make. You grow up together here, make lifelong friends, and find careers. One of my most rewarding accomplishments in the last few years has been an alumni map (take a look on Geology's website) entitled "Where Are They Now." It is posted in the department and garners quite a bit of student interest. Managing to learn enough about Adobe Illustrator to do it and keeping it current and growing are ongoing. Although being primarily a behind-the-scenes person (ask any faculty member), I recently helped organize Bucknell's Arts & Sciences academic assistants into a group that now meets monthly and promises to be a very interactive and constructive forum of sharing that will ultimately benefit our respective departments. I continue to enjoy working with everyone in the department, with the broad variety of responsibilities I have from day to day, and tackling the ongoing changes and challenges of remaining intimately familiar with what's necessary to help maintain a viable, well functioning academic department. Geology is not 'just rocks'! ☺

Laurel Mutti

I am delighted to be joining the faculty this fall to teach Geology 103. In several senses, although I am new here, teaching at Bucknell represents a homecoming for me: I grew up in the Pennsylvania Valley and Ridge (near Huntingdon), and I got hooked on geology as an undergraduate at Smith College, in a department with similar strengths in field-based learning and student research. I did my graduate work at Johns Hopkins in metamorphic petrology, focusing on the role of reactive water-rich fluids in driving the metamorphism of banded iron formations, a project that allowed me to combine interests in aqueous geochemistry, mineralogy, early Earth history and resource geology. While in the Baltimore area, I taught geology at Towson University and most recently astronomy (new to me, so challenging but fun) at the Community College of Baltimore County. I'm thrilled to be returning to geology and especially looking forward to the exceptional opportunities here for exploring rocks and landscapes in the field along with my students. I am also already enjoying life in Lewisburg, discovering opportunities for hiking, birdwatching and picking mandolin at local music sessions (along with a few other geologists!), and hoping to get involved in the Buffalo Creek Watershed Association. It is great to be reunited with - and recently married to - Kaustubh Patwardhan, with whom I am sharing the visiting position this year. Many thanks to my colleagues for their help and support this semester!

Kaustubh Patwardhan

Greetings! My teaching appointment at Bucknell began in Spring 2009 as Visiting Assistant Professor, and it was right on the heels of my doctoral thesis presentation in January at Johns Hopkins University. I had signed on to teach two intro classes (Dynamic Earth and Evolution of the Earth) with labs and not having any prior experience with organizing and managing classes this turned out to be the busiest four months of my life. Yes, even busier than getting my PhD thesis together! That semester I truly understood the meaning of the American expression TGIF. I am particularly fortunate that my new colleagues at the Geology department were extremely helpful and encouraging, and without their support this would have been an impossible task; a special thanks to Brad Jordan for helping with lab set up. In addition to teaching courses over the past three semesters, I have had an enjoyable and educational experience interacting more closely with fellow faculty and students on Spring Break field trips to Death Valley (2009), and SW Arizona and the Grand Canyon (2010). I am impressed by the thoroughness of the Geology program at Bucknell and by the excellence of its students.

My research is focused on the physical aspects of magmatic processes such as solidification and crystallization, differentiation, and magma mingling. My PhD thesis investigated the dynamics of the interactions between mafic and silicic magma in the Isle au Haut Igneous Complex in Maine and during this past year I worked on a

Kaustubh Patwardhan continued...paper (currently in review) based on this project which hopefully will be published soon. Although I am primarily an igneous petrologist, my geologic interests are broad and I have enjoyed the last two years in central PA exploring the magma-free chapters in the geologic history of the Appalachians. Living in Lewisburg has been a pleasant experience for me and I have learnt to appreciate the small pleasures in life, and that there are benefits to not living in a big city! A few unexpected events over the summer have resulted in me taking a break from teaching in Fall 2010, but I will resume in Spring 2011 with two sections of Environmental Geology. Until then, you may see me around O'Leary, or the library, or on some hiking trail or a road cut, or at Puirseil's on Fridays! Best wishes.

Jeff Trop

Hello alumni and friends of Bucknell Geology. I hope you are doing well. We just finished another busy but fun-filled year of teaching and research. In short, life is good! On the teaching front, I'm still teaching historical geology, paleontology, sedimentology, tectonics, and a first-year seminar on mass extinctions. I recently started teaching a new course on past and present global change. Examining ancient examples of global warming provides perspective on the current global rise in temperatures and associated changes. I hope to offer a new summer travel course in Alaska next year. Teaching introductory courses for non-majors continues to be especially rewarding given that many entering students haven't completed a high-school geology course. Moreover, Central PA remains a splendid location to expose students to diverse geologic processes and features. Working with recent groups of geology majors has been equally rewarding. It's always fun helping geology majors collect data during semester-long projects, conceive and carry out various research projects, and learn during extended field excursions outside PA. Spring Break field trips to the Southwestern US have been especially fun and productive learning opportunities.

My research efforts continue to center on the sedimentary record of convergent margin tectonics in the Northern Pacific. Over the past few years student colleagues and I have focused on the basinal record of second-order subduction processes, including flat-slab subduction of buoyant oceanic crust in the form of spreading ridges and oceanic plateaus. We wrapped up a detailed study of Neogene transtensional basins within the Wrangell volcanic belt of eastern Alaska and Canada. Results of this work provide improved constraints on the timing and impacts of flat-slab subduction of the Yakutat terrain beneath Southern Alaska, which has prompted rapid uplift and exhumation of mountain belts and remarkably high sedimentation rates. Rob Tidmore ('04), Ryan Delaney ('06) and John Witmer ('07) made important contributions to this project. We are now studying the impacts of subduction of a spreading ridge beneath Southern Alaska through basin analyses in the Talkeetna Mountains. For this project, Ed Bauer ('09), Christine Kassab ('09), Cullen Kortyna ('11) and Tyler Szwarc ('11) have contributed geologic mapping and sedimentological studies as well as detrital zircon geochronological analyses. Collaborations with Emily Finzel during her time as a Visiting Professor at Bucknell have led to manuscripts summarizing the dynamics of flat-slab and spreading ridge subduction in Southern Alaska. Over the past few years, I also enjoyed collaborative studies with department colleague Craig Kochel on Holocene sediments along the Atlantic Coast and alluvial sediments in Southern Alaska. Our preliminary work in Alaska characterized alluvial fans that are forming in response to rapidly degrading ice caps along steep escarpments. This summer we'll conduct follow-up studies in New Zealand and Alaska, including deployment of a time-lapse camera to better characterize mass wasting events.

On the home front, Angela continues to help incarcerated youths as a social worker in Central PA. We both enjoy hiking and paddling the many local trails and waterways when we aren't traveling to the Midwest or upstate New York to see family and friends. I truly look forward to hearing from department alumni and friends through email updates, campus visits, or upcoming conferences – please do stay in touch. Or better yet, join us for a field trip. 'Ray Bucknell!

Emeritus Faculty

Jack Allen

When I last wrote to you, in the 2007 newsletter, I mentioned that I hoped to go on the Ultimate Everest Trek sponsored by Wilderness Travel. Fortunately, I was able to participate in that endeavor successfully. That completed my Everest odyssey which consisted of a trek to each of the three sides of Everest, viz., the Kangshung or east side, the north side, and the SW side. The trek to the north side enabled me to reach an elevation of over 21,000 feet, a personal best! These treks made it possible for me to see some beautiful scenery and fantastic geology, as well as learn more about some fascinating cultures.

2008 was not a good year owing to the fact that I had to undergo back surgery that I feared would end my active life in the outdoors. However, thanks to a skilled surgeon, an excellent physical therapist, and sheer determination, I was able to resume my rigorous workouts, including running the steps behind Roberts Hall, and spent a week hiking in the Elk and West Elk Mts. near Crested Butte, CO, in July 2009. After that experience, I felt ready for another trek, and signed up for another Wilderness Travel-sponsored trip to see the volcanoes of southern Italy last October. I enjoyed hiking around Vesuvius, Etna, and the Aeolian Islands of Lipari, Panarea, Vulcano, and Stromboli. The Stromboli hike arrived at its summit at dusk in time to witness the eruption from a close, but safe, distance for a few hours before hiking back down to our hotel by the light of our headlamps. I returned to the Crested Butte area in July for a family reunion and a celebration of Joan's and my 75th birthdays and our 50th wedding anniversary.

Ed Cotter

It is now ten years since I retired from the teaching of geology. I still show up at the Geology Department occasionally, sometimes to attend a lecture, but more often to use the computers and scanner. The computer room is great because once in a while I have the pleasure of discussing something geological with a geology major. For the last year and a half I have been very involved as Director of the Bucknell Institute for Lifelong Learning. I had been proposing this to Bucknell for a number of years, and in 2009 they finally gave their approval. We started in fall 2009 with seven six-week mini-courses, grew to fourteen courses in the spring, and have sixteen new courses in the works for next fall. At the end of the first year we had 216 members. Last fall I led a course on "The Role of Mass Extinctions in the History of Life," and next term I will offer "The Geology of Central Pennsylvania."

Richard Nickelsen

Cindy and I sold our house on Pheasant Ridge Road in 2008 and are living in an apartment at the Riverwoods senior living complex just north of Lewisburg – address: #3, 190 Ridgecrest Circle, Lewisburg 17837; phone: 570-524-9833. In 2009 I published my last paper in the Journal of Structural Geology as part of a special issue: Nickelsen-Groshong, Volume 31, number 9, September 2009. My paper dealt with my mapping and interpretation of the McConnellsburg area in very southern PA - "Overprinted strike-slip deformation in the southern Valley and Ridge in Pennsylvania." I'm still watching birds and trying to learn butterfly species and wild flowers and trees and enjoying visits with daughter Abby in Virginia; Bruce in Upton, MA; and Jill in Durango, CO.

If You Want to Help The Geology Department

Alumni continue to help our department support undergraduate research and develop our program in new and exciting ways.

Geology Designated: This is a catchall fund for research and teaching support of our undergrads and faculty. It is the least restrictive of our special funds and therefore the most useful for broadbased help with equipment, instruments, supplies, analytical expenses, etc. We rely heavily on these funds.

If you Want to Help, continued

Marchand Fund: This fund is specific to supporting undergraduate research in geology. When one of our students needs specific help covering the costs of chemical analyses, time on a microprobe, travel for field research or travel to present their work at a professional conference, this is the fund we draw upon.

Nickelsen Prize: This fund supports a graduation prize for the student who has demonstrated outstanding performance in geology. We typically award this prize to one student but if two students are equally meritorious, we go ahead and split the prize between them. We did that this year. The prize is deeply meaningful and a source of encouragement to our most accomplished students. It also gives them a nice boost in covering the costs they will incur as they move on to grad school or the work world.

Alumni Highlights and News

For the privacy of our alumni, the Alumni Highlights and News section is left off of this web-available version of the newsletter. Alumni can email Linda Mertz (linda.mertz@bucknell.edu) to receive a full version with the Alumni Highlights and News section by email if you haven't already received one.