



The Champlain Thrust
News from the
Department of Geology, UVM
2012/2013
Department News



Greetings from the Chair: Greetings from the corner office of Delehanty Hall. I am glad to announce that I have now survived two years as department Chair! As always, it has been a busy and productive year. Below is a very brief summary of our activities, while more details are in the newsletter and on our website. <http://www.uvm.edu/geology/>

Paul Bierman has been traveling all over the world as usual (Brazil, France, and Greenland, just to mention a few locations) and his Cosmogenic Isotope lab and students have been churning out exciting new data non-stop. In addition to that, he's been working very hard on two textbooks, one of which is now completed. Keith Klepeis also had an extremely productive year. He is mentoring numerous undergraduate and graduate students, has organized fieldtrips in New England, and had another successful field season in New Zealand. John Hughes has been keeping himself and his recently acquired single-crystal diffractometer very busy. This month he will take over as President of the Mineralogical Society of America. Congratulations! Char and her graduate student Steven Gohlke had a great time doing fieldwork in Egypt earlier this year. A second field expedition, this time with two courageous undergraduate students, is planned for January 2013. Laura Webb's brand new geochronology facility is coming along well. All the major pieces of equipment have been installed and are in the process of being tested and fine-tuned with the help of lab-maverick Dan Jones. Stephen Wright is on sabbatical leave this fall and coming spring, but he is certainly not slowing down! With a bit of luck one can spot him somewhere in the Killington area mapping and digging, always looking for new and exciting clues related to the glacial history of our region.

We have two new faces in the department this year: Kasey Kathan, from Queens University, Kingston, Ontario is taking over the intro geology and environmental geology teaching responsibilities while Stephen is on sabbatical. Dr. Andrew Schroth is a new Research Assistant Professor. He comes to UVM from the USGS at Woods Hole, MA. Andrew is one of the leaders of the VT EPSCoR RACC ([Research on Adaptation to Climate Change](http://www.uvm.edu/~epscor/new02/?q=node/30s)) <http://www.uvm.edu/~epscor/new02/?q=node/30s> Program. You can learn much more about these two newcomers from their personal statements.

The summer 2012 Regional Geology trip went back to Colorado and was a great success (Stephen must be getting close to qualifying as a Colorado citizen). He and graduate teaching assistant Ben DeJong did an excellent job leading a group of eager undergraduate students on a three week long “tour” of some of the most impressive geological attractions of the state.

Once again Jack has managed to collect all the information needed to put this newsletter together. As usual, not an easy feat! As always, we have Gabriela, Robin and Srebrenka to thank for keeping our small, but buzzing Department running smoothly. There is really never a chance for our support trio to get bored, and without them the place would fall apart pretty quickly!

Last but not least: We are very proud to announce that this past spring the new VT State Bedrock map was unveiled after 30 years of hard work by many professional geologists and students. More information is available on <http://www.uvm.edu/geology/?Page=news/VTbedrock.html>.

On the financial side of Chairing, our budget was especially tight this year. Every donation helps, so please consider making a donation to support the UVM Geology Department. Simply donate at <http://alumni.uvm.edu/foundation/giving/> by choosing "Secure Online Giving Form" and select "other" to write in "Geology Department" for donations directly to the department. If you would like your donation used for a specific purpose then please indicate. All of your funds go directly to students. This really IS a case of “every dollar helps.” On behalf of everyone in the Department, “thank you” for all your support!

New Bedrock Geologic Map of Vermont

In April 2012 the new state geological map was unveiled at the State House, Montpelier, VT. This map represents the culmination of many years’ work by UVM faculty (Rolfe Stanley, Barry Doolan, Char Mehrtens) and many, many UVM Geology alumni (Agnew, Paul C.; Armstrong, Thomas R.; Aubrey, Will M.; Badger, Robert L.; Barton, Thelma (later publications, Thelma B. Thompson); Becker, Laurence (State Geologist); Borre, M.A. ; Brooks, K. ; Carter, Craig; M. Cherichetti, Lars; Condon, Rebecca; Copans, Benjamin; Cua, Athene K.; DelloRusso, Vincent ; Derman, Karen; DiPietro, Joseph A.; Dorsey, Rebecca J.; Earle, Hal; Eiben, David B.; Falta, Christine; Frank, Terry; Frederick, Jeffrey; Gale, Marjorie H. (earlier publication, Marjorie Hollis); Gale, Peter N.; Gillispie, Richard; Goldberg, Jonathan; Hadley, Ann C.H.; Handy, J.; Haydock, Samuel R; Hengstenburg, Carey; Hoar, Robert S.; Holt, Jeffrey; King, Sarah; Krauss, Jerome F.; Lapp, Eric T.; Mallard, Laura D.; Martin, Delbert. C.; McHone, J. Gregory ; Mock, Timothy D.; Montane, Paul; O’Loughlin, Sharon B.; Pascale, Lelia; Prahl, Crispin J.; Pingree, Rodney; Prewitt, J.; Rosencrantz, Eric; Roy, Dana L.; Ryan, Jeremy; Sarkesian, Arthur; Schoonmaker, Adam; Sonenburg, D.; Talcott, J.; Tauvers, Peter R.; Taylor, S.; Thompson, Peter J. Walsh, Gregory; Warren, Marian J.)

Additional information at: <http://www.uvm.edu/geology/?Page=news/VTbedrock.html>
www.anr.state.vt.us/dec/geo/vgs.htm,
stategeologists.blogspot.com/.../ceremonies-for-release-of-vermont.html
www.usgs.gov/newsroom/article.asp?ID=3167

Unveiling the Bedrock Map published as three 76"x52" sheets.



Presentation of VT Bedrock Geologic Map, April 11, 2012, at the State House, Montpelier, VT, Barry Doolan, Char Mehrtens, Marjorie Gale, Larry Becker Gov. Shumlin and Deb Markowitz (plus others), attending

Department Faculty



Andrea Lini, Associate Professor (Stable isotopes, Limnology and Climate Change):

Greetings from the world of stable isotopes, lake mud, and tree rings, and dangerous predators! The UVM Mudslingers have been busy trying to wrap up the project on the trophic history of Lake Champlain. Some of our results appeared in the Journal of Great Lakes Research this past spring (The eutrophication of Lake Champlain's northeastern arm: Insights from paleolimnological analyses. Journal of Great Lakes Research 38 (2012) 35–48). Another manuscript discussing study sites from the Main and South Lake sections will be submitted by the end of the year.

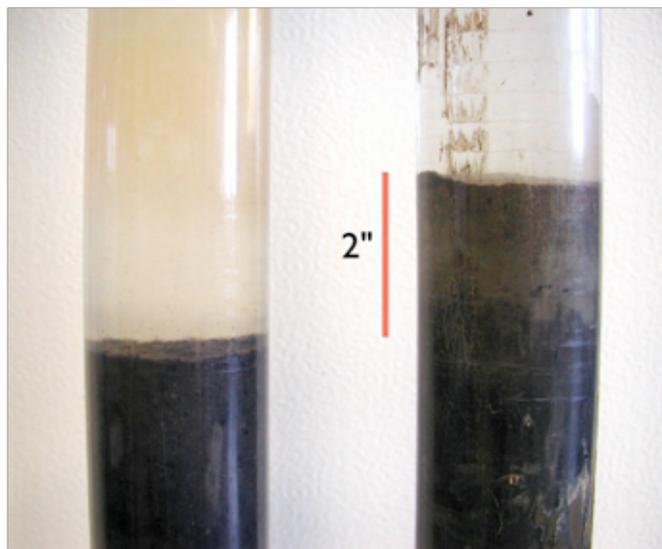
Work on the long sediment cores (up to 10 feet) collected by two of my graduate students in St. Albans and Missisquoi Bays in winter 2010, has been completed. These cores span 9,000 years of Lake Champlain's history and have allowed us to extend our study of the processes that have affected the lake's chemistry, biology, and sedimentary patterns well beyond the European settlement period. Copies of Drew Koff's and Joanna Palmer's MS theses are available on the Geology Department's [web site](http://www.uvm.edu/~geology/?Page=gradresearch.html&SM=oppmenu.htm).

<http://www.uvm.edu/~geology/?Page=gradresearch.html&SM=oppmenu.htm> As soon as the two bays freeze over this winter, I will be collecting even longer cores (15-20 feet) with help from a new graduate student, Ashliegh Kollmer. We hope to be able to hit the Champlain Sea-Lake Champlain transition. Wish us luck!

Tropical Storm Irene, which hit Vermont very hard in August 2011, provided us with the rare opportunity to evaluate the effect of extreme hydrological events on lake sediment records. As part of a study conducted in Lake Rescue, Ludlow, VT we were able to collect sediment cores before and after Irene (see photos). Our preliminary results indicate that a substantial amount of new sediment was delivered to the lake during the storm event.

The dendroclimatological work that Shelly Rayback (UVM Geography) and I have started two years ago is progressing very well. During the past 12 months, dedicated undergraduate students have processed hundreds of tree ring samples. It is a rather time consuming (and painstaking) process, but the results will allow us to reconstruct northern New England climate variability for the past three centuries. Very little is known about past climate in this region from tree rings.

In the previous newsletter I briefly mentioned bear and wolves . . . Well, the hair samples, along with samples from a variety of other critters, have finally arrived to the lab. Although this project has nothing to do with Geology, it is an exciting one and I will be reporting on it in more detail in the next newsletter.



Comparison of pre- and post-Irene sediment in Lake Rescue Ludlow, VT
Two inches of storm-related deposits are clearly visible in the core on the right.



Note manual drill ↗

Collecting a core from frozen Lake Rescue, Ludlow, VT.



Paul Bierman, Professor (Geomorphology, Geohydrology, Isotope Geology Applied to

Landscape Change): It's been a busy year in the lab, in the field, and writing. In May, I travelled to Brazil with Veronica-Sosa Gonzalez (UVM MS, 2012) and Josh Farley (RSENR) to study the effect of agriculture on erosion. Then, soon after went to Greenland with UVM MS Candidate Alice Nelson to collect samples of stream sediment as part of our NSF grant to understand the evolution of the Greenland Ice sheet over the last 5 million years. Soon after returning, I taught for my 17th year in the Governor's Institute, a program for talented Vermont High School youth. Then, in August I travelled to the International Geologic Conference in Brisbane, Australia. In September, I was back in Greenland finish up some survey work that we couldn't get done in June because thick fog grounded our plane. One more trip abroad, to France finished up the fall. These I presented work we did on the basal silty ice of the GISP 2 ice core - we found soil that likely predates ice sheet formation more than 2 million years ago. In terms of publications, there were

several on a variety of topics. The most wide ranging was led by Eric Portenga - a summary and critical evaluation of all extant ^{10}Be data in GSA Today. The data set quantifies the effect of tectonics, climate, and topography on rates of erosion worldwide. I spent many long weekends revising my chapters for the Pipkin et al. Environmental Geology textbook; it should be published by the time you read this. The fun of this revisions was the photos; we were given access to the National Geographic photo archive; they are some truly phenomenal images. I am finally in the home stretch of our new Geomorphology textbook. Dave and I have the first 8 chapters done and with the publisher after an average of a dozen reviews for each chapter. The last 6 chapters are on my desk and should be gone to the publisher by New Years!

Below are some websites related to my activities and recent publications.

<http://www.uvm.edu/cosmolab/?Page=cosmocam.html>

<http://uvm.edu/landscape>

<http://uvm.edu/geomorph/gallery>

<http://uvm.edu/geomorph/textbook>

Email: paul.bierman@uvm.edu

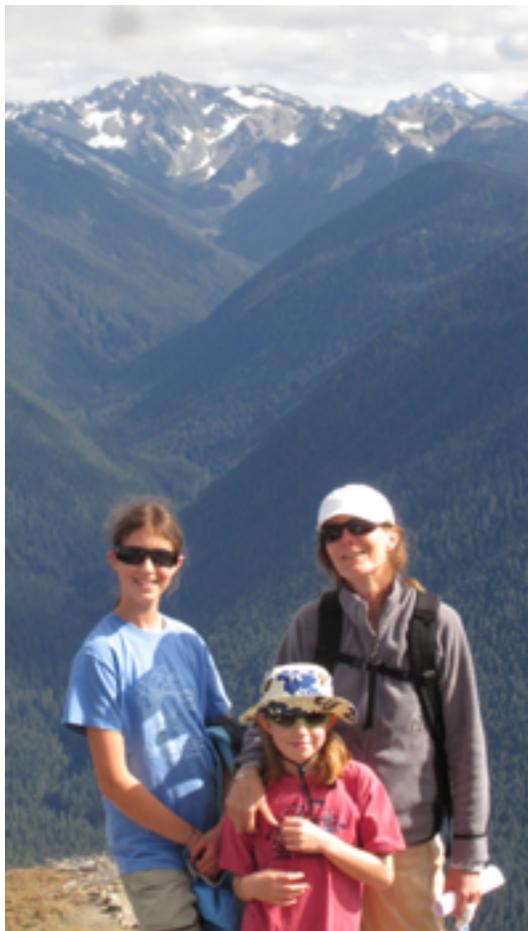
<http://uvm.edu/~pbierman/>



Paul in Kulusuk, East Greenland,
skiing to out crop to collect sample for dating post glacial uplift.



Veronica Sosa-Gonzalez and Brazilian colleagues sampling a stream in Brazil heavily impacted by both debris flows and agriculture.



Marika, Quincy and Christine
Hurricane Ridge,
Olympic National Park, Washington



John M. Hughes, Professor (Mineralogy, Crystallography, Crystal Chemistry):

It has been a wonderful and productive year. First and foremost, Susan and I celebrated the birth of our first grandchild on October 15. Belle Halladay Hughes is a beautiful, curious and active child, and the apple of her Papa's eye. Belle Halladay is named after the schooner her great, great grandfather captained off Cape Cod in the 1800s, the Belle Halladay. Belle Halladay lives in Brooklyn, so it is easy to get to see her.

The rest of the family is doing well, and we get to see them often as Gareth. Amy and Belle Halladay, as well as Rebecca, all live in Brooklyn. Rebecca continues in her work as a developmental economist working for an NGO out of Yale, and gets to travel the world a lot; we are really proud of the work she is doing. Gareth continues at CBS Sports, and the documentary he worked on about the Army-Navy game, *A Game of Honor*, aired on Showtime in December, and he won Emmies #2, 3, and 4 for the show, including Best Documentary; quite the haul! Apparently the custom is to give your parents your first Emmy Award, so it now graces our home in Essex Junction. The entire family got together for almost two weeks this summer at our home in Charleston, SC, and it was delightful to see Belle Halladay take to the beach; never knew sand tasted so good!

My research using the new diffractometer continues, and numerous papers have come out in *Canadian Mineralogist*, *American Mineralogist*, and *European Journal of Mineralogy*. The work continues with new graduate student Jacob Menken, and a lot of exciting experiments are underway. I take over as President of the Mineralogical Society of America in November, which is a humbling and time-consuming task, but one I look forward to greatly. I submitted probably the last proposal of my career this summer, and look forward to even more experiments on apatite. So it has been a busy and extremely rewarding year... stay tuned.



Just getting ready to identify another new mineral



Keith Klepeis, Professor (Structural Geology and Tectonics):

Greetings,

This past year has been a great one for me personally and for Vermont geology. It represents the 12th consecutive year I've supervised student research projects on geological problems in Vermont with colleagues at UVM, the Vermont Geological Survey (VGS), and Middlebury. This year seemed as busy as ever. Undergraduate Abigail Ruksznis (class of 2013) presented the results of her research project relating the bedrock geology of the Plainfield, Vermont to various groundwater problems at Northeast GSA in Hartford. Abi also worked closely with

Jon Kim and Marjorie Gale from VGS, and Laura Webb. At the end of the meeting she decided she wanted to pursue similar topics in graduate school, so we thought the meeting was a success! At the moment I am helping her work on her Honor's thesis for the 2012-13 academic year. While working with Marjorie, Abi discovered a fantastic new outcrop near Route 2 in Essex Junction that promises to reveal how certain types of foliations are related faulting and folding events. She's using some great new methods to study the fabrics, including a *GigapanTM*, which allows her to analyze stitched field photographs using deep zoom techniques.

Another student Eric Weber (class of 2013) also began a new summer a project with the VGS and I on the structure of the southern end of the Hinesburg thrust fault near Bristol. Eric is already making great headway and is cutting up samples and mapping out microstructures. Two other undergraduate students (Doug MacLeod and Jeff Tinklepaugh) also are working with me on Vermont geology theses and two graduate students I've been engaged with and are almost finished (Christine McNiff and Megan Scott).

In addition to mentoring students, we ran a field trip from Lake Champlain across the Champlain and Hinesburg thrusts in August. Larry Becker, Marjorie Gale and Jon Kim (VGS) and Peter Ryan (Middlebury) and I ran a trip for people who work in various state agencies around New England, including the EPA, Health Department, and Water Department (see photo next page). Unlike last year, we finally had superb weather!

I'm also proud to report that one of my graduate students, Jeff Webber, completed a superb Masters thesis on fabric analysis in igneous rocks from coastal Chile. Jeff has just started working on his PhD with Mike Williams at Umass, Amherst. His field area is in a remote part of Canada (the Athabasca granulite terrane of the Canadian Shield), which is perfect for Jeff! I also accepted three more graduate students who are just getting started. With the new State geology map, running field trips, and all the student interest in doing field geology, it's been a great year for geological research in Vermont.

With best wishes,

Keith,

Email: Keith.Klepeis@uvm.edu
<http://www.uvm.edu/~kklepeis/>
<http://geology.uvm.edu/structure/fjordland/fjordland.html>
(802) 656-0247

See Keith in the field ↘



Group photograph on a field trip, led by Larry Becker, Marjorie Gale and Jon Kim (VGS) and Peter Ryan (Middlebury), and Keith Klepeis(UVM) stop at the famous “oven” outcrop in North Ferrisburgh.
Photo by Marjorie Gale.



Char Mehrtens, Professor (Stratigraphy, Sedimentation, Carbonate Petrology):

Hi all! It’s a good thing that Jack agrees to do the newsletter every year as it forces me to sit down and think about what has gone on in the past year. It always makes me feel better to remember what happened (and it’s my annual check on my memory health!). Work things: Along with new grad student Steven Gohlke (from UT Austin) I accompanied Hamilton College colleague Barb Tewksbury and others to southern Egypt to help Barb on a structure project she’s doing involving Cretaceous and Tertiary limestones. Barb needed to confirm that the stratigraphy in the geologic structures she can see on satellite imagery. We spent a week in the western desert at an oasis (Farafra) and rented the locals 4 wheel drive vehicles to take us “off roading” to outcrops of chalk and marl. I got to see (and measure and collect) the K/T boundary there. After a quick return to

Cairo we headed south along the Nile to Aswan, to Steven’s field area south of there. Steven is studying the deformation bands associated with the Seiyal Fault, and using the burial history to help constrain their timing of formation.

The entire experience was unbelievably awesome, from spending time in the Sahara Desert, to working in Cretaceous stratigraphy to meeting and getting to know Egyptians and their culture. A second field season in Egypt is planned for this winter, and this time I’ll be going with two undergrads, Tony Haigh and Jacob Vincent. Things are still a bit dicey in terms of unrest over there, so send positive vibes for political calm! Some abstracts of this work in progress appear somewhere in this newsletter.

New grad student Ryan Brink (SUNY Potsdam) is working with me on a comparison between the newly identified Altona Formation in upstate NY and our local Monkton. Recent fossil finds have identified that a portion of the

sandstone below the Potsdam SS is actually much older and partially age equivalent to the Monkton. Ryan is measuring section and doing petrography to see how similar these units are.

Fun things: Jack and Ruthie Drake continue to be good golf buddies. Occasionally, I torment Barry Doolan with my golf game (Jack can hang in there with “almost a golf pro” Doolan, but not me!). I spent some time at my cabin in the Adirondacks but the summer’s big adventure was a week long paddle in Quetico Provincial Park (north of the Boundary Waters in MN). This was an awesome trip with unbelievably beautiful paddling. The 18 portages, not so much fun.

Please keep sending news of your activities. It is ALWAYS great to hear from everyone.

<http://www.uvm.edu/~cmehrten/>



Steven, Dr. Assiz and Char at work

Char meets the sphinx





Laura Webb, Assistant Professor (Igneous petrology and Geochronology):

Hello UVM Geology alumni and friends:

It's been a busy year and we're now rocketing through another semester. Since our last newsletter, I completed the inaugural run of a new course in our curriculum, Field Methods in Geophysics. With funding from NSF-DUE, we acquired ground penetrating radar and electromagnetic induction profiling equipment. Students in the class focused on using this instrumentation to investigate the bedrock geology and hydrogeology of the Christiansen farm in East Montpelier. We had glorious weather, beautiful fall foliage, and a great time. The project was designed in collaboration with the Vermont Geological Survey and Abi Rukniz (Geology BS student) went on to work in more detail with the class data set and present those findings at the NEGSA meeting.

Last year I also participated in the 2012 UVM Sustainability Faculty Fellows Program. While my research focus is hard rock oriented, I've had growing interests in infusing sustainability concepts in my teaching. I also participated in the Systems, Society, Sustainability and the Geosciences Workshop at Carleton College over the summer. This workshop is part the InTeGrate project, a five-year, NSF-funded STEP Center grant. I had a great time participating in both programs and hope to remain active in collaborative, interdisciplinary curriculum development efforts.

The $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology laboratory is coming along. In the last year we completed construction of the noble gas extraction line and are now under ultrahigh vacuum. We now have a diode laser system built by UVM alumnus Jeremy Hourigan (Assistant Professor, UC Santa Cruz; Santa Cruz Laser Microfurnace). Over the summer we finally took delivery of the Nu Noblesse noble gas mass spectrometer, which was no small feat to get it safely in the building. We're still in the process of commissioning the mass spec, but hope to soon be on our way playing the dating game.

Two of my students defended their MS theses in the last year. Merrill Stypula is now off working for the oil and gas industry and Christine McNiff is pursuing her PhD at University of South Florida. Patrick Dyess is in his second year working with me on the titanium-in-quartz thermobarometer project. He may win my prize for largest number of analytical techniques (and abbreviations) combined into one MS thesis (EMP, CL, SIMS, EBSD, XRF...). I'm still active in research in on the tectonics of Papua New Guinea and Mongolia. Both are the focus of current writing efforts and targets for new research grant proposals in the coming year.

Best regards,
Laura



Delivering the noble gas mass spectrometer through second floor window of Delehanty Hall.
Not pictured: Laura Webb breathing into a paper bag.

Laura, after breathing a huge sigh of relief!



Collage of photos from the 2011 Field Methods in Geophysics class. From left to right across the top and then the bottom: Emily Siegel collects an electromagnetic induction profile. Abi Ruksznis takes location data with the Trimble GeoExplorer. Doug MacLeod pulls the 400 MHz antenna while Abi monitors the ground-penetrating radar data collection. Parker Richmond pulls the antenna while Doug monitors the GPR field computer, and Eric Webber records survey data. Students relieve tension by taking turns being the seismic source for refraction experiments.



Stephen Wright, Senior Lecturer (Glacial geology, Geomorphology, Environmental Geology):

I've been on sabbatical this fall and have spent many nice September field days working in the Killington area trying to better understand ice flow patterns across this part of the Green Mountains. I'm also planning on using the fall to finish several other field projects in northern Vermont as well as to investigate some areas that are normally too far away to work on during the school year.

I spent the first part of the summer mapping the northern half of the Pico Peak quadrangle, a continuation of the mapping in the southern half of the quadrangle I completed last summer. Part of this work involved following an esker system up the Ottauquechee River valley and then down the Tweed River valley. An outgrowth of this mapping was to outline the extent of a small glacial lake that occupied the Tweed River valley between Pittsfield and the Killington golf course. This relatively high-elevation lake (1,350 ft above sea level) was relatively short-lived, but its catastrophic drainage into those parts of Glacial Lake Hitchcock that occupied the northwestern branches of the White River may be responsible for a huge influx of sediment into that part of the lake over the course of several years. I will be leading a Vermont Geological Society field trip to this area during the summer or fall of 2013.

I brought another group of nine students out to Colorado during the first three weeks of August with the help of graduate student Ben DeJong. We had an excellent group that was both academically curious and a great joy to work with and camp with for 3 weeks. We took advantage of the warmer weather and lack of high-elevation snow (I'm usually out there with students in late May through mid-June) to visit areas well above tree line that are normally inaccessible. Our last long hike was into one of the small Front Range glaciers. Several of the students had been in my glacial geology class the previous spring semester and it was exciting to see, albeit on a small scale, evidence of some of the glacial processes we'd worked on in class and labs.

I'll be at the Northeast GSA meeting at the Mount Washington Hotel this coming March and will hope to see at least some of you there. The trails at the Bretton Woods Nordic ski center are wonderful, so bring your skis!

Email: Stephen.Wright@uvm.edu

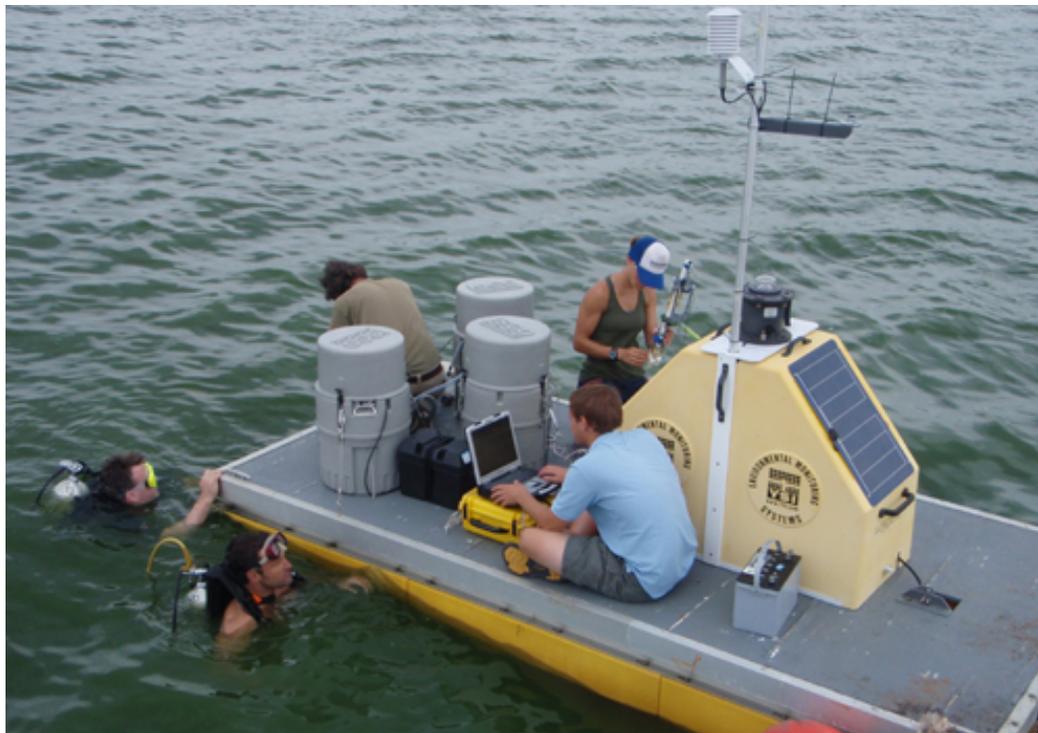
Students descend a large snowfield on their way back to camp. →



Ollie Olliver, Ryan Stredny, Abi Ruksnis, Hank Ainley and Doug MacLeod relax on lower Plaeozoic rocks after ascending a very steep cirque headwall.



Andrew Schroth, Research Assistant Professor (Low Temperature Geochemistry, Limnology and Oceanography): Hello! I am a new Research Assistant Professor, and I am excited to be a part of UVM and the Department of Geology in particular. I come to the department after 5 years at U.S. Geological Survey in Woods Hole, MA, where I was a postdoctoral scholar and then a research geologist. Since I began working within the department this past July, I have felt immediately at home due to the friendly faculty, staff and students here at UVM. My primary area of expertise is in low temperature geochemistry and environmental mineralogy, but I also have teaching and research interests in soil science, hydrology and hydrogeology. I am particularly interested in the transport, fate and speciation of metals in surface waters, soils and sediments. I have come to UVM to lead a team of Vermont-based scientists and students in an NSF EPSCoR-funded research effort that aims to better understand nutrient dynamics and algal blooms in Lake Champlain and its watershed, generally in the context of climate change and adaptive management. Our team has been extremely busy this summer establishing an exciting network of sites for time series sample collection (water, sediment and biomass) and sensor deployment on Lake Champlain's Missisquoi Bay and at select sites within the Missisquoi and Winooski watersheds. Over the next few months, we will be conducting laboratory analyses of these samples as well as processing and interpreting data collected over the field season, while also establishing a winter sampling plan. We will continue to collect data from these sites over the next 4 years in an effort to better characterize and quantify inter and intra annual variability within the system and, more importantly, understand the environmental parameters that control nutrient/algal dynamics within the system. I also have active projects in Alaska studying trace metal speciation and cycling in watersheds, dusts and coastal marine waters that I hope to involve UVM undergraduate and graduate students as soon as possible. In the future, I look forward to developing new projects in the montane watersheds and soils of the nearby Green and Adirondack ranges, as these were the systems that I studied as a graduate and undergraduate student of geochemistry. I am also looking forward to teaching coursework in geochemistry and possibly other subjects through the Department of Geology. I am always keen to meet geologically-inclined alumni and current students! Please do not hesitate to shoot me an e-mail or stop by my office to chat!



Missisquoi Bay Microbiological Sampling Platform



Kasey Kathan, Lecturer (Palaeolimnology, Environmental Geology) I'm very pleased to be joining the department for this coming year and to be teaching Environmental Geology and Geology 001. I'm sure we all remember the introductory course that 'hooked' us on geology, captured and engaged us and ultimately developed our passion. It is this inspirational moment that I hope to share with at least a few of the students here at UVM. So far, the fall term Environmental Geology class is an enthusiastic and keen group of students who have been blessed with nothing but beautiful fall weather on each of our field trips as we explore the region together.

I am coming to the department, most recently, from Queen's University in Ontario where I am completing my PhD. My research interests lie in interpreting sediment archives for climate and hydrologic reconstructions of the recent past. It is only possible to understand the current status of our natural systems if we have some historical context to place them in. I am particularly interested in understanding the linkages between the hydrological system and sediment delivery in the High Arctic. This sensitive environment is known to be changing rapidly in response to climate variability, yet we still need to determine the range in sensitivity on the landscape. My work specifically uses lake and marine sediment cores to perform high resolution geochemistry and sedimentological interpretation over the last several centuries. The ultimate goal is to link my observations in the sedimentary archive to the modern process studies completed during active summer field work programs in the region. My work has ranged across the north from Alaska, Norway and the Canadian High Arctic. This work is inherently interdisciplinary and I look forward to discussing it with the UVM community.

Graduate Students



Ryan Brink: Hello. I am first year graduate student working with Char Mehrrens. We are looking at the newly identified latest early/ middle Cambrian Altona Formation in Northern New York and the role of local tectonics in producing multiple depositional basins along the Laurentian margin of Iapetus at this time. I am coming from Colorado where I ran a Leadership Development program for the Southwest Conservation Corps. I received my BS from SUNY Potsdam in the winter of 2010. While there I was involved in sedimentary research along the coast of the Bay of Fundy in Nova Scotia. I am looking forward to the next couple of years here at UVM and where this experience will bring me in the future. Email: Ryan.Brink@uvm.edu



Ben DeJong: I'm a student employee with the USGS working on a doctorate here in beautiful Vermont. My research is focused around the very flat Eastern Shore of Maryland, where a complex stratigraphy awaits. This area presents many challenges to field mapping, the worst of which being the utter lack of exposure. So I spend my time in the field drilling sequences and grabbing samples for multiple analyses, one of which being cosmogenic nuclide dating, which I will begin this year in Paul Bierman's lab. We'll figure it out; it's just like the drillers say, "if it were easy, everyone would be doing this". Email: bdejong@uvm.edu



Kathryn Dianiska: Howdy, ya'll! I graduated from The University of Texas at Austin with a B.Sc. degree in general geology. This is where I found my research interests in structural geology, tectonics and petrography. Originally hailing from Sugar Land, Texas, I have come to brave the winters of Vermont and work with Dr. Keith Klepeis. Along with my fellow graduate students, Alice Newman and Mike Ingram, our team is working in Fiordland, New Zealand to understand the complex processes of lower crustal ductile deformation. I am greatly anticipating our field season in January and working on the project. Other than school, I keep busy by taking dance classes, reading, and enjoying Vermont's scenery!

Tentative thesis title: Title: Structural evolution and deformation of the lower crust: Insights from microstructural analysis and geochronology of Vancouver Arm and Crooked Arm in Fiordland, New

Zealand. Email: Kathryn.Dianiska@uvm.edu



Patrick Dyess: Hello! I am a new Master's candidate working with Laura Webb. I am working with the TITANIQ method of thermobarometry; looking at how the percentage of TITANIUM In Quartz and how that relates to temperature. Specifically, I am working on refining how it works or where it needs to be modified to work in the medium high temperatures of biotite grade rocks in the Eastern Green Mountains. I finished up my B.S. in Earth Sciences at Montana State University in Bozeman, Montana. I'm looking forward to a great change in pace here out east. Any time I'm not working on things here in Delehanty, I can be found hiking, climbing, skiing, and just plain old enjoying being outside in the beautiful New England woods! Email: Patrick.dyess@uvm.edu



Angel Garcia: Hola! Greetings! I come from the Caribbean island of Puerto Rico. I did my undergraduate major in Environmental Science and a minor in Marine Biology at the Universidad Metropolitana, San Juan, Puerto Rico. I'm in my first year of a Master's program. I participated in four national and international summer research internships in places like South Carolina, Arizona, Costa Rica, and Vermont. Actually, I'm part of the Vermont EPSCoR Fellowship for graduate studies. I really enjoy hiking and scuba diving across the world. I'm working with geochemistry in Yellowstone National Park. Email: agarcia2@uvm.edu



Steven Gohlke: I am a second-year graduate student from Texas (Hook 'em!) supervised by Dr. Char Mehrtens. We are working on a collaborative project called "Desert Eyes," and its goal is to determine the origin of large-scale structures located in remote regions of Egypt's western desert. These can be studied using the latest satellite imagery, which has 1m/pixel resolution. My role in the project involves combining field data (macroscale observations) and SEM data (microscale observations) in order to develop a relative timing sequence for my study area along the Seiyal Fault near Aswan. Ultimately, this model will be applied to other areas that cannot be easily studied. My main areas of interest are sedimentology/stratigraphy, structural geology, and petroleum systems. Email: steven.gohlke@uvm.edu



Michael Ingram: Hello! I am a current graduate student working under Dr. Keith Klepeis on an exciting project in Fiordland, New Zealand. My project is exploring the role of heterogeneity in the lower crust and its implications to strain partitioning and fabric development during post orogenic extension. I completed my undergrad here at UVM after gaining interest to geology from my stonemason experience. After a little time in the consulting industry I decided to pursue my masters. I grew up in the NEK (Northeast Kingdom) of Vermont where the pace of life is pleasantly relaxing. During my free time I like to golf during the summer (Jay Peak is my favorite course even though I have only played it once), play racquetball year round, and float my Polaris 500 through fresh powder in the winter. My working thesis title is: "The effects of heterogeneity in the lower crust on strain partitioning and fabric development during post orogenic extension, Doubtful Sound, New Zealand" Email: Michael.Ingram@uvm.edu



Ashliegh Kollmer: I graduated in 2012 from State University of New York at New Paltz with a bachelor's of science in Geology. I'm originally from Long Island, New York, and so far I like Vermont much, much more! I'm currently working on my master's degree under my advisor Andrea Lini. Our research consists of limnology of Lake Champlain and the transition between the Champlain Sea and Lake Champlain. My hobbies are knitting, crocheting, and tea. I also love adventures, hiking, taking road trips to new places, playing with rocks, and growing a fruitful garden. Email: Ashliegh.Kollmer@uvm.edu



Jacob Menken: I am from Westchester, New York and moved to Vermont in 2008 to attend the University of Vermont where I earned a B.A. in Geology and a B.S. in Environmental Science. I have continued my studies and research here at the University of Vermont under the guidance of Dr. John Hughes with whom I study mineralogy and x-ray crystallography; I am particularly interested in the mineral Tourmaline and its variable chemistry and structure. When not teaching or in the laboratory, I can be found filling my time by volunteering as an Emergency Medical Technician and on the ski slopes. I look forward to continuing my research with Dr. Hughes and spending another two years in the Burlington community.
Email: jmenken@uvm.edu



Alice Nelson: Hi, I graduated from Williams College in 2010 with a bachelor's degree in Geology. I spent a year split between Switzerland and Montana before coming to UVM last fall. In my first year at UVM, I took classes, learned the ways of cosmogenic sample processing, read up on Greenland Ice Sheet history - and also found time to coach young ski racers with the Mansfield Nordic Club. I had an amazing field season in Greenland this past June and I have been busy processing samples ever since. I'm looking forward to another winter in Vermont, and hopefully this year we will get some more snow! Alice Email: ahnelson@uvm



Thomas Neilson: I grew up in Maine, and attended Colorado College as an undergraduate majoring in geology. After graduating in 2010 I took a year to travel and pursue whitewater kayaking on rivers across the country and throughout the world, before moving to Portland, Oregon to teach whitewater kayaking. During this time I also worked as an Assistant Scientist teaching oceanographic science, sampling techniques and seamanship aboard sailing research vessels for an undergraduate study abroad program called SEA. My research interests include marine geology and oceanographic sciences and landscape evolution and river systems.

Working thesis title: Determining impacts of land use on sediment yield in Southwestern Chinese Rivers using ^{10}Be and short lived isotopes. Email: Thomas.Neilson@uvm.edu

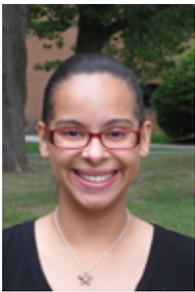


Alice Newman: I am a first year graduate student working with Keith Klepeis on understanding the structure and deformational history of an expanse of lower crustal rocks exposed in Fiordland, New Zealand. This coming January, our team (which includes graduate students Michael Ingram, Kathryn Dianiska, myself, and Keith) will be exploring the remote fiords of Fiordland by boat in search of good outcrops from which to measure and sample. Although born and raised in Taiwan, I completed my undergraduate degree in geology in 2011 at Carleton College in Northfield, Minnesota, where I learned to enjoy cold and snowy winters. I am looking forward to our field season in New Zealand as well as enjoying Vermont through all its seasons.
Email: acnewman@uvm.edu



Megan Scott: Hi, I came out to Vermont to work with Char Mehrtens on a project involving some Ordovician carbonates near Middlebury. This past summer was filled to the brim with fun experiences including a productive field season in Middlebury Vermont. My fieldwork involved studying the structural and sedimentological features present in the Middlebury Formation, a Middle Ordovician limestone. The goal of the project is to examine the lithofacies and determine what environment the sediments composing the Middlebury limestone were deposited in. When I wasn't in the field or in the rock room, I was most likely spending time in my garden or on a bike ride. In the garden this year I planted tomatoes, beans, peas, peppers, eggplants, summer squash, carrots and a handful of other vegetables. As fall is now upon us and the semester is in full swing I have added class and a teaching assistantship to my schedule but continue to work on the Middlebury limestone project. Most recently I attended The New England

Intercollegiate Geological Conference, which was a great opportunity to go on numerous field trips in Vermont. Despite the rainy weather we had fun and were able to see some beautiful outcrops! Email: mtscott@uvm.edu



Veronica Sosa-Gonzalez: Hi. I grew up in Puerto Rico, where I got my B.S. in Environmental Sciences at the University of Puerto Rico. I came to UVM in 2010 to work on my M.S. in Natural Resources at the Rubenstein School. My M.S. thesis was on the determination of long-term erosion rates in Panama using ^{10}Be , under the advice of Dr. Paul Bierman. I started my PhD in the Fall of 2012, working in a project to understand the connections between land management, soil erosion and sediment yield in large river basins. Field work will take place in Western China. Working thesis title: Deciphering connections between land management, soil erosion and sediment yield in large river basins. (NOTE: this is the NSF proposal title).

Email: vsosago1@uvm.edu



Ana Vang: I am a second year graduate student at UVM, and I am working with Paul Bierman on the Landscape Change Project (<http://www.uvm.edu/landscape/>) and more specifically on the Vermont Interstate System. I spent the majority of this summer exploring and photographing all over Vermont to try and determine how both the cultural and physical landscape has changed since interstate construction. Email: avang@uvm.edu

Staff



Robin Hopps: UVM Geology is a great department in which to work with outstanding students, staff and faculty. At present, the Department has 13 graduate students, 2 PhD students, 42 majors, and 17 minors. Stop in to Delehanty Hall, to visit, or re-visit staff and faculty, as well as the Perkins Museum. Feel free to stay in touch by sending an email to geology@uvm.edu.

You can also see the list of lectures for the Geology Seminar Series on the UVM Geology website at "News and Events." I enjoy my ten-month position in the office, as well as being out of the office from mid-June to mid-August for my landscaping business.

Email: robin.hopps@uvm.edu visit: <http://www.uvm.edu/perkins/>



Srebrenka Sehovic: Since May 16th 2008 I have worked as department administrative coordinator in the Geology Department, and I love working here. It is a real pleasure to work with every single person in the Department. Being around young, educated people and watching them develop makes me feel good. I am always glad to assist them when they need help. My husband and I are fortunate to have four daughters; two of them graduated from UVM and the younger twins are second-year students at UVM so I am happy to see them on campus now. Also, I am a grandmother, my four-year old grandson brings me joy on a daily basis.

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Gabriela Mora-Klepeis, Senior Research Technician: 2012 has been a busy year, full of personal and professional activities. Since late last year I've had the chance to interact with colleagues that were affected by the tropical storm Irene as the department was trying to accommodate their research needs. In April I was happy to attend the unveiling ceremony of the most recent edition of the State's bedrock map. The event took place at the State House in Montpelier and Gov. Shumlin presented the map. During the summer I finished a triathlon and I also competed in my first Colchester triathlon. It was a great experience that I was happy to share with Jack Drake! The Fall semester has been equally busy and bringing new opportunities. I have been appointed to the President's Commission on the Status of Women at UVM. This year I also had the chance to meet with some Australian colleagues and friends. If you are in the area, please stop by for a building tour, I'll be happy to show you around!

Email: Gmora@uvm.edu <http://www.uvm.edu/~geology/?Page=faculty/mora-klepeis.php>



Finish Line, with Jack Drake, – Colchester Triathlon, July



The kayak leg, Colchester Triathlon, July 2012

Emeriti Faculty



Barry Doolan: Greetings to all Geology Alums.

Hello to all alums and friends. 2011 has been a great year in retirement...travel, golf and bit of geology. Sandy and I spent some time in Charleston, SC enjoying sun, surf and golf. Char and I ran an interesting field trip for the UVM OLLIE program earlier this summer visiting field stops in the Champlain Valley for very interested adult learners. Heard from a few alums.

Congratulations to Jeremy Hourigan on the birth of his first daughter this year; Hello from Laura Mallard who is doing well at Appalachian State in Boone NC. Watch out Laura we're back to NC next month!

Older daughter Kristan (UVM Geology '92) is doing well in nearby Bakersfield running Does Leap Farm (organic goat cheese and kiefer and more recently pork and goat sausage) with her family. Grandkids Zoe and Peter continue to be a source of joy and inspiration for us. We are fortunate to have them close by.

We still live in Fletcher Vermont (since 1981) and welcome any visits you may make to Vermont. Just put in 27 Cambridge Road, Fletcher Vermont in your GPS. Looking forward to hearing from past grads. Drop an email or visit us in Fletcher when you're in the area.

Best wishes to all

Barry



Barry and crew near Oaxaca Mexico, Spring 2010



Jack Drake: Life continues to smile on us. We enjoy our camp on Lake Champlain (east shore of South Hero) during the summer with many related aquatic and biking activities. During the fall semester Ruthie and I continue auditing courses here at UVM. This year it is "Political Parties and Elections" (very relevant!!!) plus another Spanish course for me and an "Historical Preservation/Architecture" course for Ruthie. In the past several years we have audited "History of the Muslim world to 1453", "The History of Egypt, Iran and Turkey" and "Modern History of the Middle East". However, the real treat this fall was reading and compiling the alumni news received from many of you. Your lives have certainly taken many interesting twists and turns!!

This winter we are again heading to California for 4 months, visiting our sons and granddaughters (ages 5 and 7) along the way. We have some good friends in California so it is almost like a second home now. This past summer a couple from CA came to visit us here in VT and we did some serious bicycling around Lake Champlain. We also got to entertain our grand daughters for a week here in VT, trying to introduce them to Green Mountain State life.

So, for us, life is good. We just have to keep reminding ourselves how lucky we are considering all the trials, tribulations and problems that exist in the world today.

Best to you all, you have provided many fond memories of my years here at UVM.

Jack

Email: john.drake@uvm or jcdrakevt@gmail.com.



David Bucke: The past year at the Bucke household has been eventful, fortunately in a positive way. The homestead at Sleepy Hollow Road has experienced both downsizing and upsizing. A significant 2-story addition has been added and some interior reworking has created a reasonably spacious "apartment". Why all this? Our youngest daughter, Katherine, along with her husband and 2 daughters (3 and 4 years old) are now sharing the living space. We have the option to "retreat" to our downsized area or just be one big family. This arrangement is working very well and allows us to remain secure at our home for the future rather than searching for "antiquity quarters" somewhere else.

We continue to do RV traveling, primarily in September and October. This year we logged about 8,000 miles heading across the north concentrating on North Dakota, Montana, Arizona, and especially Utah. We thought of Jack Drake's Regional Geology as we watched rafters going through the Grand Canyon. The return east included the Gulf Coast barrier islands at North Padre Island (Texas) and Ft. Pickens across the sound from Pensacola (Florida panhandle). Donna and I continue to enjoy paleoenvironmental analyses of all the sedimentary rocks of the Colorado Plateau, the phenomenal topography, and evidence of recent (<1000 yr bp) volcanic hiccups. Ahh, great memories of Regional Trips with Allen Hunt! We enjoy visiting the National Parks but much of our time is spent "boondocking" in undeveloped National Forest and BLM land. Staying on federal land plus an occasional Walmart keeps our camping costs minimal -- about \$2.60/night. Gasoline is another story! In late February we enjoyed some decadent vacationing in Jamaica as a break from the Vermont winter.

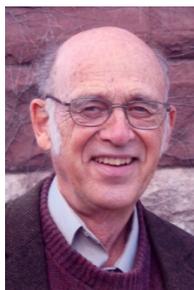
We hope all is well with the UVM family!

Dave Bucke

Donna & I extend our warm best wishes to all of you

Our new email address is: ddbucke@gmail.com

I think my UVM mail still works & flips into the gmail box -- but maybe not.



Allen Hunt: Greetings from Bakersfield where we still live on Prospect Hill Farm. Last Spring we sold our herd of registered Angus cattle to reduce our responsibilities. Our three sons are scattered across the country. Edwin, our eldest, is single and lives in Nevada. Harry, our middle son, is an architect and lives in Stowe with his wife and two children -- a girl and boy. Jesse continues to live in Park City, Utah, with his wife and three children -- two girls and a boy. We no longer have an excuse for not traveling except that we love our farm in Vermont. Other than an occasional family trip west or to our cottage in Maine, we are home and enjoy visitors who may be traveling in our area.

Email: anhunt@wildblue.net Telephone: 802-827-441

Recent Publications

(UVM Geology faculty in **bold**, UVM students in *italics*)

Bierman, P. R., *Corbett, L.*, Finkel, R., *Graly, J.*, **Hughes, J.M.**, **Lini, A.**, **Neumann, T.**, and Rood, D. (2011) Ancient, slowly-eroding soil preserved beneath the summit of the Greenland Ice Sheet. Geological Society Annual Meeting, Minneapolis, MN, October, 2011.

Portenga, E.W., **Bierman, P. R.**, Rizzo, D M., Rood, D. H. (in press). Low rates of bedrock outcrop erosion in the central Appalachian Mountains inferred from in situ ^{10}Be . Geological Society of America Bulletin.

Reusser, L. J., *Corbett, L. B.*, and **P. R. Bierman** (2012), Incorporating concept sketching into teaching undergraduate geomorphology. Journal of Geoscience Education, v. 60, p 3-9.

Bacon, A. R., Richter, D., **Bierman, P. R.**, and Rood, D. H., (2012) Coupling meteoric ^{10}Be with pedogenic losses of ^9Be to improve soil residence time estimates on an ancient North American interfluvium. Geology, v. 40; no. 9; p. 1-4; doi:10.1130/G33449.1

West, N., Kirby, E., **Bierman, P. R.**, Rood, D. (2011) Preliminary estimates of regolith generation and mobility in the Susquehanna Shale Hills Critical Zone Observatory, Pennsylvania, using meteoric ^{10}Be . Applied Geochemistry. doi:10.1016/j.apgeochem.2011.03.053

Portenga, E. and **Bierman, P. R.** (2011). Understanding Earth's eroding surface with ^{10}Be . GSA Today, v. 21, n. 8, p. 4-10.

Corbett, L. B., Young, N.E., **Bierman, P. R.**, Briner, J. P., Neumann, T.A., *Graly, J.A.*, and Rood, D. H. (2011) Paired bedrock and boulder ^{10}Be concentrations resulting from early Holocene ice retreat near Jakobshavn Isfjord, western Greenland Quaternary Science Reviews, doi:10.1016/j.quascirev.2011.04.001.

Graly, J., *Reusser, L.*, and **Bierman, P. R.**, (2011). Short and long-term delivery rates of meteoric ^{10}Be to terrestrial soils. Earth and Planetary Science Letters, v. 302, Issues 3-4, p. 329-336, doi:10.1016/j.epsl.2010.12.02

Kampf, A.R., **Hughes, J.M.**, Marty, J., and Nash, B. (2012) Postite, $\text{Mg}(\text{H}_2\text{O})_6\text{Al}_2(\text{OH})_2(\text{H}_2\text{O})_8(\text{V}_{10}\text{O}_{28})\cdot 13\text{H}_2\text{O}$, a new mineral species from the La Sal Mining District, Utah: Crystal structure and descriptive mineralogy. *Canadian Mineralogist* 50 45-53.

Ertl, A., Schuster, R., **Hughes, J.M.**, Ludwig, T., Meyer, H.-P., Finger, F., Dyar, M.D., Ruschel, K., Rossman, G.R., Klotzli, U., Brandstatter, F., Lengauer, C.L., and Tillmanns, E. (2012) Li-bearing tourmalines in Variscan granitic pegmatites from the Moldanubian nappes, Lower Austria. *European Journal of Mineralogy*, 24, 695-715.

Ertl, A., Kolitsch, U., Dyar, M.D., **Hughes, J.M.**, Rossman, G.R., Pieczka, A., Henry, D., Pezzotta, F., Prowatke, S., Lengauer, C., Körner, W., Brandstätter, F., Francis, C.F., Prem, M., and Tillmanns, E. (2012) Limitations of Fe²⁺ and Mn²⁺ site occupancy in tourmaline: evidence from Fe²⁺- and Mn²⁺-rich tourmaline. *American Mineralogist*, 97, 1402-1416.

Kampf, A.R., **Hughes, J.M.**, Marty, J., and Nash, B. (2011) Gunterite, Na₄(H₂O)₁₆(H₂V₁₀O₂₈)·6H₂O, A new mineral with a doubly-protonated decavanadate polyanion: Crystal structure and descriptive mineralogy. *Canadian Mineralogist*, 49, 1243-1251.

Hughes, J.M., Derr, R.S., Cureton, F., Campana, C.F., and Druschel, G. (2011) The crystal structure of cavansite: Location of the water molecules and hydrogen atoms in Ca(VO)(Si₄O₁₀)4H₂O. *Canadian Mineralogist*, 49, 1023-1027.

Kampf, A.R., **Hughes, J.M.**, Marty, J., Gunter, M.E., and Nash, B. (2011) Rakovanite, Na₃{H₃[V₁₀O₂₈]}·15H₂O, a new pascoite family mineral with a protonated decavanadate polyanion: Crystal structure and descriptive mineralogy. *Canadian Mineralogist*, 49, 889-898.

Hughes, J.M., Rakovan, J., Ertl, A., Rossman, G.R., Baksheev, I., and Bernhardt, H.-J. (2011) Dissymmetrization in tourmaline: The atomic arrangement of optically sectoral-zoned triclinic Ni-bearing Mg-rich tourmaline. Invited paper, *Canadian Mineralogist*, 49, 29-40.

Luo*, Y., Rakovan, J. Tang*, Y., Lupulescu, M., **Hughes, J.M.** and Pan, Y. (2011) Crystal chemistry of Th in fluorapatite. *American Mineralogist*, 96(1), 23-33.

Tewksbury, Barbara J., Hogan, John P., Kemp, Stephen Michaels, Keren, Tucker T., Tewksbury-Christle, Carolyn M., Schultz, Richard A., and **Mehrtens, Charlotte**, 2010, Deformation bands and the expression in siliciclastic cover rocks of slip on basement faults in southern Egypt: Geological Society of America, abstracts with programs, v. 41, no. 7.

Barbara J. Tewksbury, John P. Hogan, Tucker T. Keren, Carolyn M. Tewksbury-Christle, **Charlotte J. Mehrstens**, 2012, Deformation Bands and the Expression in Siliciclastic Cover Rocks of Slip on Long-Lived Basement Faults in Southern Egypt, Geological Society America, abstracts with programs, vol. 43, no. 7

Webber, J.R. and K.A. **Klepeis**, 2012, FRY3D: a new educational open-source computer tutorial designed for the collection, manipulation, and visualization of three-dimensional strain data at the undergraduate level, Structural Geology and Tectonics Forum June 14 – 16, Williams College, Williamstown, MA.

Ruksznis, A., 2012, *Integration of Structural Analysis, EMI and GPR Surveys, and Hydrogeology in the Plainfield Quadrangle, Central Vermont*, UVM Student Research Conference (SRC), University of Vermont, Burlington, VT.

Ruksznis, A., Kim, J., Klepeis, K., Webb, L., 2012, Structural analysis, an EMI survey, and hydrogeology in the Plainfield Quadrangle, central Vermont II, Vermont Geological Society. The Green Mountain Geologist, v. 39 (2).

Schroth, A. W., J. Crusius, F. Chever, B. C. Bostick, and O. Rouxel (2011), Glacial influence on the geochemistry of riverine iron fluxes to the Gulf of Alaska and effects of deglaciation, *Geophys. Res. Lett.*, doi:10.1029/2011GL048367. (Additional Press: Featured online in the AGU blog GeoSpace)

Crusius, J., **Schroth, A.W.**, Gasso, S., Moy, C.M., Levy, R.C. and Gatica, M.* (2011), Glacial flour dust storms in the Gulf of Alaska: Hydrologic and meteorological controls and their importance as a source of bioavailable iron, *Geophys. Res. Lett.*, doi:10.1029/2010GL046573. (Additional Press: Featured on cover of this issue and highlighted in Eos)

Leech, M.L., and **Webb, L.E.**, 2012, Is the HP-UHP Hong'an-Dabie-Sulu orogen a piercing point for offset on the Tan-Lu fault? *Journal of Asian Earth Sciences*, DOI: 10.1016/j.jseaes.2012.08.005.

Spear, F., *Ashley, K.T.*, **Webb, L.E.**, and Thomas, J., 2012, Ti diffusion in quartz inclusions: implications for metamorphic time scales, *Contributions to Mineralogy and Petrology*, DOI: 10.1007/s00410-012-0783z.

Baldwin, S.L., Fitzgerald, P.G., and **Webb, L.E.**, 2012, Tectonics of the New Guinea region, *Annual Review of Earth and Planetary Sciences*, v. 40, p. 495-520, doi: 10.1146/annurev-earth-040809-15254.

Heumann, M.J., Johnson, C.L., **Webb, L.E.**, Taylor, J.P., Jalbaa, U., and Minjin, C., 2012, Paleogeographic reconstruction of a late Paleozoic arc collision zone, southern Mongolia, *Geological Society of America Bulletin*, doi:10.1130/B30510.1.

Webb, L.E., Johnson, C.L., and Minjin, C., 2010, Late Triassic sinistral shear in the East Gobi Fault Zone, Mongolia, *Tectonophysics*, doi: 10.1016/j.tecto.2010.09.033.

Webb, L.E., Baldwin, S.L., Little, T.A., and Fitzgerald, P.G., 2008, Can microplate rotation drive subduction inversion? *Geology*, v. 36, p. 823–826.

Baldwin, S.L., **Webb, L.E.**, and Monteleone, B.D., 2008, Late Miocene coesite-eclogite exhumed in the Woodlark Rift, *Geology*, v. 36, p. 735–738.

Wright, S.F., 2011, Ice retreat across the Green Mountain foothills: Bolton and Jericho, Vermont; in West, D.P., ed., *Guidebook for Field Trips in Vermont and Adjacent New York*; New England Intercollegiate Geological Conference, 103rd Annual Meeting, pp. A2 1–18.

Presentations at Recent Meetings

UVM student authors indicated in *italics*, faculty in **bold**

Tewksbury, Barbara J., Hogan, John P., Kemp, Stephen Michaels, Keren, Tucker T., Tewksbury-Christle, Carolyn M., Schultz, Richard A., and **Mehrtens, Charlotte**, 2010, Deformation bands and the expression in siliciclastic cover rocks of slip on basement faults in southern Egypt: Geological Society of America, abstracts with programs, v. 41, no. 7.

Barbara J. Tewksbury, John P. Hogan, Tucker T. Keren, Carolyn M. Tewksbury-Christle

Charlotte J. Mehrrens 2012, Deformation Bands and the Expression in Siliciclastic Cover Rocks of Slip on Long-Lived Basement Faults in Southern Egypt, Geological Society America, abstracts with programs, vol. 43, no. 7

Ashley K.T., **Webb, L.E.**, Spear, F.S., and Thomas, J.B., 2012, P-T-D Histories and Reequilibration of Ti in Quartz: Using the TitaniQ Thermobarometer in Poly-Deformed Tectonic Terranes, Goldschmidt Conference, Montreal, Quebec, Canada.

Spear, F.S., *Ashley K.T.*, **Webb, L.E.**, and Thomas, J.B., 2012, Tectonic implications of short metamorphic episodes, Goldschmidt Conference, Montreal, Quebec, Canada.

Ruksznis, A., Kim, J., **Klepeis, K.**, and **Webb, L.E.**, 2012, Integration of structural analysis, EMI, and GPS surveys, and hydrogeology in the Plainfield quadrangle, central Vermont, (Geological Society of America Northeastern Section – 47th Annual Meeting).

Hughes, J.M., Nekvasil, H., Ustunisik, G., Lindsley, D.H., and Woerner, W.R. (2012) Solid solution in the fluor-chlor apatite anion column. 2012 *Geological Society of America Annual Meeting*, Charlotte, NC, November, 2012.

Kampf, A.R., **Hughes, J.M.**, Marty, J., and Brown, F. (2012) Wernerbaurite, $\{[\text{Ca}(\text{H}_2\text{O})_7]_2(\text{H}_2\text{O})_2(\text{H}_3\text{O})_2\} \{ \text{V}_{10}\text{O}_{28} \}$, a new mineral. Report to the *International Mineralogical Association Commission on New Minerals, Nomenclature and Classification*.

Kampf, A.R., **Hughes, J.M.**, Marty, J., and Brown, F. (2012) Schindlerite, $\{[\text{Na}_2(\text{H}_2\text{O})_{10}](\text{H}_3\text{O})_4\} \{ \text{V}_{10}\text{O}_{28} \}$, a new mineral. Report to the *International Mineralogical Association Commission on New Minerals, Nomenclature and Classification*.

Kampf, A.R., **Hughes, J.M.**, Marty, J., and Brown, F. (2011) Nashite, $\text{Na}_3\text{Ca}_2([\text{V}^{5+}9\text{V}^{4+}_1]\text{O}_{28}) \cdot 24\text{H}_2\text{O}$, a new mineral. Report to the *International Mineralogical Association Commission on New Minerals, Nomenclature and Classification*.

McNiff, C., **Klepeis, K.A., Webb, L.**, Kim, J., 2012, Geometric Variability and Spatial Extent of an Acadian Dome and Basin Fold Interference Pattern in NW Vermont, Geological Society of America *Abstracts with Programs*, 44(2), Abstract No: 200767.

Klepeis, K.A. Stowell, H., *Odom Parker, K. and *Webber, J., 2012, Magmatism and the evolution of high strain zones in the lower crust during lithospheric extension and orogenic collapse, Fiordland, New Zealand, Geological Society of America *Abstracts with Programs*, 44(2), Abstract No: 200289 (INVITED).

Kim, J., **Klepeis, K.A.**, 2012, From Isoclinal Folds to Sheath Folds: The Preservation of Intermediate-Stage Structures along an Ordovician Thrust Zone, Waterbury Reservoir, Central Vermont, Geological Society of America *Abstracts with Programs*, 44(2), Abstract No: 199752.

Rukszni, A., Kim, J., **Klepeis, K.A., Webb, L.**, 2012, Integration of structural analysis, EMI and GPR surveys, and hydrogeology in the Plainfield Quadrangle, central Vermont, Geological Society of America *Abstracts with Programs*, 44(2), Abstract No: 199746.

Betka, P.B., Klepeis, Mosher, 2012, Reactivation and Inversion of Rifted Margins: Implications for Mountain Belt Formation, AGU annual meeting, December.

Betka, P., Mosher, S., Klepeis, K.A., 2012, Decoupling along a high strain zone during the tectonic inversion of a back-arc basin and formation of the Patagonian Andes, Chile, Geological Society of America *Abstracts with Programs*, Charlotte, NC.

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Schroth, A.W., Crusius, J, Kroeger, K.D., Hoyer, I.R., Osburn C.L. (2012-Invited) Seasonal fluctuation and estuarine removal of riverine iron fluxes to the Gulf of Alaska AGU Fall Meet. Suppl. Abstract

Moy, C.M., Crusius, J., **Schroth, A.W.**, Nichols, J.E., Peteet D.M., Kenna, T.C., Giosan L., Eglinton, T.I., and Santiago Gassó, S. (2012) Eolian deposition of glacial flour dust to the Gulf of Alaska during the Holocene Eos Trans. AGU Fall Meet. Suppl. Abstract

Crusius, J., **Schroth, A.W.**, Campbell, R.W., Cullen, J., Resing, J. (2012) Seasonal control of surface-water dissolved iron concentrations by suspended particle concentrations on the Northern Gulf of Alaska continental shelf and slope AGU Fall Meet. Suppl. Abstract

Schroth, A. W., Crusius, J., Campbell, R. W., Kroeger, K. D., Osburn, C. L., Hoyer, I. R. (2012) Seasonal fluctuation and estuarine removal of riverine iron fluxes to the Gulf of Alaska AGU Ocean Sciences Conference

Crusius J., **Schroth, A. W.**, Campbell, R. W., (2012) Possible climate change impacts on supply of micronutrient iron to the Gulf of Alaska AGU Ocean Sciences Conference

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Wright, S.F., 2012, Subglacial drainage, glacial lake history, and subsequent stream incision history, Miller Brook Valley, Northern Vermont; Geol. Soc. Am. Abstracts w. Programs, Vol. 44, p. 51.

Cronauer, S. and **Wright, S.F.**, 2012, Miller Brook incision history, Northern Vermont; Geol. Soc. Am. Abstracts w. Programs, Vol. 44, p. 50.

RECENTLY COMPLETED M.S. GEOLOGY THESES

Go to <http://www.uvm.edu/~geology/?Page=gradresearch.html&SM=oppmenu.html>
to access copies of theses and progress reports

2012

Christine Downs McNiff - The Characterization of Ductile Deformation in the Upper and Lower Plates of the Hinesburg Thrust Fault Through Detailed Geometric Analysis of Selected Outcrops.

Johanna Palmer - A Paleolimnological Study of Holocene Sediments in St. Albans Bay, Lake Champlain

Merril Stypula – U-Pb Zircon Dating of Metamorphic Tectonites from Tavan Har, Southeast Mongolia: Implications for the Role of Tectonic Inheritance in Intraplate Shear Zones

Jeff Webber – Advances in Rock Fabric Quantification and the Reconstruction of Progressive Dike Emplacement in the Coastal Batholith of Central Chile

2011

Kyle T. Ashley - Titanium thermobarometry of fabric development in the Strafford Dome, Vermont: Linking microstructures to orogenic processes.

Lee Corbett – Investigating the timing of deglaciation and the efficiency of subglacial erosion in central-western Greenland with ^{10}Be and ^{26}Al

Eric Portenga – Using ^{10}Be to constrain erosion rates of bedrock outcrops globally and in the central Appalachian Mountains

2010

Joseph L. Graly - Ice sheet modeling and paleoclimate of Greenland

Janelle McAtamney – Structural evolution and basin analysis of the Magallanes Basin, southern Patagonia, Chile

2009

Will Hackett – Modeling of the hydrologic impacts of highway construction and climate change in Vermont

Lydia Smith – Organic phosphorus cycling, mobility and bioavailability for cyanobacteria in sediments of Missisquoi Bay, Lake Champlain

Julie Rumrill - Using GPS to assess the spatial and temporal variation of seasonal velocity changes on the Greenland ice sheet, near Swiss Camp Greenland.

THIS YEAR'S OUTSTANDING GRADUATE TEACHING ASSISTANT WENT TO

Christine McNiff and Merrill Stypula

HURRAY FOR THE LIBERAL ARTS!!

RECENT
UNDERGRADUATE AWARD WINNERS!

NEW UNDERGRADUATE SCHOLARSHIP IN GEOLOGY!

Thanks to a donation to UVM by Claire and Arthur Heiser, the Geology Department is able to offer the Joseph Tinker Award to an outstanding senior majoring in Geology. Mr. Tinker, the father of Mrs. Heiser, was a Vermont resident, farmer and amateur geologist. The 2012 recipient was:

Abigail Ruksznis

CHARLES DOLL AWARD

Sandra Cronauer

Congratulations to 2012 Charles Doll Award winner!!

DAVID P. BUCKE AWARD

The 2012 David P. Bucke award for the outstanding student in introductory Geology went to:

Derek Vines

HAWLEY AWARDS and MUDGE AWARDS

Congratulations to recipients of **Hawley Awards** and **Mudge Awards** to support undergraduate research:

Fall 2012 Hawley Awards

Sandra Cronauer and Amanda Northrup

Spring 2012 Hawley Awards

Jeff Tinklepaugh, Douglas MacLeod, Elizabeth Olliver, Eric Weber

Spring 2011 Hawley Awards

Sandra Cronauer, **Changing Glacial Environments: Miller Brook Valley, VT**

Amanda Northrop, **Determination of the age of the Middlebury Formation using conodont stratigraphy**

Fall 2011 Hawley Awards

Sandra Cronauer, **X-ray diffraction analysis of silty ice from GISP2 Ice core**

Spring 2011 Mudge Awards

Maggie McMillan, **A survey of microstructures across a major lithotectonic boundary in the town of Craftsbury, Northern VT**

Fall 2011 Mudge Awards:

Maggie McMillan

Spring 2012 Mudge Awards:

Catherine Jenkins, Taylor Kravits, Emily Aldrich, Abigail Ruksznis, Elizabeth Olliver

2012 Pieratti Award

Samuel Hellman

COME SEE US AT THE FOLLOWING EVENTS:

NATIONAL GSA Meeting:

27-30 October 2013, Denver, CO

NORTHEAST SECTIONAL GSA Meeting:

18-20 March 2013, Bretton Woods, NH

National AGU Meeting:

3-7 December 2013, San Francisco, CA

9-13 December 2013, San Francisco, CA

<http://www.agu.org/meetings>

NEIGC 2013: Tentatively scheduled for central Maine, headquartered at Millenocket Lake. Check for information, dates and specific location at <http://w3.salemstate.edu/~lhanson/NEIGC/>

Alumni/Reunion Weekend at UVM!!!! (Note that this coming year it is in the fall!)

check <http://alumni.uvm.edu/reunion> for more information

Make sure that you get in touch with us so we can show you around!!

Visit our website for links to more department information and activities

<http://www.uvm.edu/geology/> and <http://www.uvm.edu/perkins>

Regional Geology in recent years



Colorado Regional Geology class (2011) stymied by snow in the South Lottis Creek Valley. From left to right: Sam Hellman, Sam Kleh, Parker Richmond, Doug MacLeod, Abi Ruksznis, Ryan Stredny, Jo Palmer (TA), Hank Ainley, Sandra Cronauer, Abby O'Donnell, Emily Siegel, and Elizabeth (Ollie) Olliver.

**Regional Geology
Iceland, 2010**





2009 Regional geology students: Matt Bansak, Ben Henry, Greg Parrish, Will Hackett (TA), Maggie McMillan, Tyler Vendituoli, Holly Crimmins, Mary Snyder, Mike Ingram, and Shane Snyder at the base of a weathered Tertiary lava flow near Del Norte, Colorado.

**Regional Geology, Italy,
2008**





Regional Geology, Colorado, 2007: Pat Niggel, Gary Peters, Pat Tobin, Corey Coutu (TA, partially hidden), Jessica Schechter, and Kirsten Stokes studying the contact relationships between Paleozoic carbonate rocks and Laramide intrusive rocks near Cumberland Pass, Colorado



**Regional Geology Class enjoying the good life in Italy
Summer 2006**



Regional Geology 2005 in front of the “Maroon Bells” near Aspen, Colorado



**Iceland Crew enjoying summer sun
August 2004**



Regional Geology 2003 enjoying the Maine coast

**Last but not least, a “blast from the past”
Regional Geology 1986, Newfoundland
Who can you identify? Send answers to geology@uvm.edu**



And to conclude . . .

***Read the transcribed handwritten letter mailed to the
UVM Department of Geology from the
First University of Vermont Geology Graduate Student and Teaching Assistant***

This is a voice from the past, more specifically, the start of the graduate program. I am Lawrence B. Cline, MS in Geology, graduated in 1960.

I graduated from Middlebury College in the mid 50's with, of all things, a BA in psychology. I took a geology course in my senior year and loved it. Two years in the army got me the GI bill so I enrolled at UVM as a special student and I took all the courses required of a geology major. The year I finished UVM announced the opening of the MS in geology program. I enrolled and I was the first student in the program. I also was the first teaching assistant.

The faculty consisted of Dr. Charles Doll, chairperson and state geologist and Dr. Robert Dotch. The department was housed in a surplus WWII building used for a military training program.

I and *another guy* were the first 2 graduates. He enrolled the year after I did but was full time while I had an assistantship so it took me 2 years.

The name of your newsletter is the Champlain Thrust. I well remember field trips to the Champlain overthrust.

After UVM I did all the course work for a PHD at RPI. I didn't get the degree since I couldn't show a reading ability in German or Russian.

I went to the University of NY at Albany where I taught general science. After 7 years I had to leave; no PHD, no tenure. I then went to Schenectady county college where I stay for 23 years teaching geology and geography classes which I developed.

Not getting a PHD was one of the best things I ever did, it sent me to SCC where I belonged-in front of a class of 20+students who took my courses because they liked them and me. That was my place in life; the classroom and not in a lab or out in the field.

My compliments to the planners and managers at UVM who decided that the time had come for a MS program in geology. That opened the door for me and Dr. Doll invited me to come through the door.

I am delighted to share this with you and I wish you all the very best.

Larry

Lawrence B. Cline '60
11 Lawnridge Ave.
Albany NY, 12205
(518) 482-1733

Handwritten letter by Lawrence B. Cline from Albany NY, date stamped Dec 14, 2005.

Cline, Lawrence B. - *The Origin of Talc at Johnson, Vermont, and the Geology of its Occurrence*

"another guy": Ogden, Duncan G. - *Geology and Origin of the Kaolin at East Monkton, Vermont*

Student Research: <http://www.uvm.edu/~geology/?Page=gradresearch.html&SM=oppmenu.html>