

Carleton Geology Newsletter

Volume XXXVI

2011

Person For Scale



T-Shirt Design for 2011

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The cover drawing is the 2011 Geology T-shirt design by Andrew Walters '11

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Department of Geology

Carleton College
One North College Street
Northfield, MN 55057

June 2011

Dear Alumni, Friends and Parents,

As we end the 2010-2011 academic year, it is time for both reflection and anticipation. While still striving to improve numerous aspects of the Department, the faculty is always busy and productive in their research, teaching and services. You will find detailed accomplishments of each faculty in the pages that follow. Many honors were bestowed upon the Department in the past year. A few of our former and current students won highly competitive National Science Foundation Fellowships, Fulbright and College wide Scholarships and Fellowships. Many of the class of 2011 have been accepted to graduate schools and are ready to pursue their graduate degrees. A number of our current students received several internships and are dispatched to different places to conduct research.

Last April, Tim Vick retired after 36 years of service. The Department applauds Tim's years of service. Tim is a truly valued member of the Geology Department and we wish him the best in his retirement. In addition to the celebrations that have happened already, on Monday October 10, 2011, a big bash timed to coincide with the Fall 2011 Geological Society of America Meeting (GSA) in Minneapolis will be happening. So, keep the date in mind, and we hope many of you plan to join the Department at this event.

The Department is proud to welcome our new Technical Director, Jonathon Cooper. Jonathon is a graduate of Western Washington University. After he earned his Bachelors in geology and geophysics, he worked as a logging geologist in Sacramento, CA and then moved to the Smithsonian's National Museum of Natural History in Washington, D.C., where he worked in the Mineral Science Department. We know Jonathon's role is critical in fulfilling the mission of our Department, especially staying in touch with all of you. So, please, write, email, call or stop by and acquaint yourself with Jonathon.

As always, we are eager to keep the lines of communications open with our loyal friends, alumni and parents. In addition to this newsletter, you can keep abreast of the activities of the Department at our website. Please send along any news or images to Ellen Haberoth or to Jonathon Cooper. If you are in the Twin Cities, please drop by the Department. We are always happy to see you and show you around, reintroduce you to the Department. We hope to see you here sometime soon.

In closing, we want to thank all those who contributed to this Newsletter, especially to Ellen and Jonathon who brought it all together. We hope you will enjoy this annual snapshot of the Department.

Bereket Haileab
Carleton College

Geology Technical Director Tim Vick Retires

To all my Carleton friends,

As I embark on the retirement phase of my life, I search for some profound and meaningful comment to make about my experience at Carleton over the past 36 school years. But if I were a profound person I would have been a philosopher or a theorist rather than a technical director, so maybe I should just keep it simple. I have enjoyed my work at Carleton immensely. The place, the people, and the subject of geology have all been interesting and rewarding.

I am leaving the Carleton Geology Department in good hands, and I know that the faculty, Jonathon Cooper as the new Technical Director, Ellen Haberoth, and the current and future students all will take good care of the Geology Department and help it thrive into the future.



There is absolutely no question that the very best part of my experience in all these years has been getting to meet and work with well over a thousand wonderful people at Carleton. We have a full thousand geology students and alums plus hundreds of Carleton staff and faculty who have been the best possible work-mates. What a great group of motivated, kind and caring people! What little I have been able to accomplish in my career at Carleton is attributable as much to all of you as it is to me.

Accomplishments which I am pleased with include establishing the template of professional-level support people in the science departments at Carleton, helping the Geology Department run smoothly with the benefit of well-managed facilities and equipment for many years (it was different when I arrived in 1975), the opportunity to work with faculty and students



on many interesting original geology research projects, a long tradition of well-managed field trips, and developing the Carleton Geology Newsletter and more recently creating interesting and distinctive content for the Geology departmental web site. The Dacie Moses House still thrives and serves students as a “grandma’s house” away from home, staffed and maintained by Carleton students, 30 years after Dacie passed away and bequeathed her home to Carleton. And, the Geology Department enjoys the reputation of being open and accepting to a wide variety of people thanks to many things and many people including our faculty, which is unusually diverse for a small college geology department, and the Carleton Geology LGBT Alumni Network.

Some special highlights of my time here included geophysics research projects mapping out the buried river valleys associated with the Cannon River system, participating in two Keck research projects, and the visits to off-campus programs including the Italy program and the SEA Semester in 1999.

I remain eternally grateful to Eiler Henrickson, Ed Buchwald and Shelby Boardman for going along with my proposal to volunteer in 1975 until the concept of the Technical Director position could

be formally established the following year. Both I and the Geology Department had something the other needed, and the relationship has worked out extremely well for both sides.

As to what activities I'm looking forward to in the next phase of my life, well, I would like to do more of the things I've enjoyed as sidelines for all these years such as music, visiting friends and relatives, and camping excursions around the Midwest and other places in North America. As volunteer service, I have made some plans to take a chamber music trio and a fiddle music group (featuring Glenn Lee '78) to some of the local retirement homes on a monthly basis; do some web site development work for the geology department at my alma mater, Beloit College; and work on a city committee called the Arts And Culture Commission whose goal is to nurture the arts community in Northfield. And, I have indulged in the purchase of not one but two boats, a runabout for day use and a larger one you can camp on, for exploring lakes and rivers wherever I can find them.

Many thanks to all of you for your fantastic support and kind words and thoughts over the years. I think of retirement as I do graduation - a bend in the road rather than the end of the road - and I look forward to seeing you all again soon!

Wishing you all the best,
Tim



Pictures from Tim's all campus faculty/ staff retirement celebration in February and the alumni reception in June



DEPARTMENTAL NEWS

FACULTY UPDATE - CLINT COWAN

I continue to teach Paleobiology, and Sedimentology-Stratigraphy every year (although next year I am on sabbatical!). This past Winter Term I taught a new course at the Intro-level: Paleoclimatology. The course was a lot of fun. We did two 5-week projects. The first project was in conjunction with Amy Myrbo and colleagues at The University of Minnesota LacCore Laboratories, and we got to core a lake and analyze the sediment (composition and time-calibrated with C-14 dating) for climate signals and for evidence of human-impact on the surrounding landscape. The students were enthusiastic and hearty— coring required spending a cold day in January out on a frozen lake handling wet and muddy pipe. Our second project involved thin-sectioning and analyzing mussel shells from the Cannon River (killed in the big flood last fall). We interpreted the growth rings in the shells and collected micro-drilled powders from the shells to analyze for stable Oxygen isotope ratios (as a proxy for water temperature). The mussels are quite large (up to 8 inches long) and can live for decades (possibly for a hundred years). This was a very interesting exercise, and the students appreciated the local aspect of both projects. Bernard Seitman from the Minnesota DNR helped us with some background on the mussels and their ecology. I learned a great deal, and hope to offer this course again in 2013.

This year I also helped with the logistics and planning for Mary and Sarah to set up the 2012 New Zealand Geology Seminar. This was rewarding, and also required about a month on the North and South Islands showing them what we did on the program last year, and helping them alter and tweak the sites and content to make it their own for next Winter. It's going to be great.

My research continues to focus on the Cambrian-Ordovician strata of the Upper Mississippi Valley, and I work closely with folks at the Minnesota Geological Survey (Tony Runkel) and the University of Minnesota (David Fox), as well as with students. My latest publication was the co-authored cover story in the November issue of *GSA Today*. This work is controversial, in that it suggests we need to completely re-think the climate character of the Late Cambrian (from extreme hothouse, to a climate that saw sea-level ice at the equator). This is because shoreline intraclasts in the local Jordan Sandstone appear to have been cemented by ice. That work was an outgrowth of a comps project with Tyler Mackey '08 who is co-author, and is now in graduate school at UC Davis studying microbial communities on lakebeds in Antarctica (yes,

he SCUBA dives beneath the ice of Antarctic lakes—he's fearless as well as smart). So I continue to enjoy working closely with a few students each year (Hannah Fariss and Andrew Walters this past year—see the comps titles in the Newsletter), and hope that they benefit from these collaborations as much as I do.

FACULTY UPDATE - SARAH TITUS

This, incredibly, is my fifth year at Carleton. I had a delightful sabbatical last year, which included time for attending meetings across the country, field work in Washington, California, and Cyprus, and even a full-fledged vacation in Turkey. After re-adjusting back to the academic schedule, I have had a busy and productive year in terms of research and teaching.

Because of all the time I had to think and write during sabbatical, I was able to wrap up a number of research projects with manuscripts. Two were focused on understanding deformation in the San Andreas fault system: one with Mark Dyson '07, which represents the culmination of his fifth year internship project in 2007-2008, and one with Zack McGuire '08 and Sarah Crump '10. A third paper examines deformation in an ophiolite in New Caledonia, which was a relief to finally finish since I originally collected the field data in 2004. The fourth was a collaboration with Joshua Davis, my sweetheart and general mathematics go-to-guy, about computational techniques for structural geologists.

I also had a bumper crop of research students this year, who really helped me with my newer projects. Chelsea Scott '10 stayed to continue her thesis research as a fifth year intern. Her project is trying to characterize deformation from a fault in Cyprus using field data and modeling methods. She also helped me advise senior Lilly Betke-Brunswick on a similar style of project but transported to Iceland. (I think I can safely say that Chelsea's Mathematica skills were a boon to both Lilly and I.) I also worked with two students in a new part of central California, near Coalinga. After some extremely hot field work in July last summer, seniors Alice Newman and Amanda Yourd analyzed rocks and structures developed in the actively growing Kettleman Hills anticline, which is also an active oil field (see picture).

I've also enjoyed getting back into teaching. Lots of interesting teaching gadgets were developed by students in Tectonics this year. Examples include the Isostasy Illustrator (with more than 100 tiny wooden blocks attached to

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springs) and the Focal Mechanism Orb (a see-through ball used to show first motions from a simulated earthquake). My Structural Geology students visited the Salton Trough in February, and had the opportunity to map interesting and deformed rocks away from cold Minnesota and its boring, flat-lying sediments. And in Introductory Geology, students have been braving our harsh spring to learn about the local rocks. I had forgotten how interesting (and difficult) questions can be from Intro students – it makes me appreciate all the wonder that is generated by learning the basics of earth science.



Amanda Yourd and Alice Newman at Kettleman Hills, California. If you've never worn snake chaps in July in the Central Valley, then you've never fully imagined how hot your calves can become.



Here, we're discussing folds that develop at Durmid Hill, near the San Andreas fault. The trip is funded by alumni donations and I could not be more thankful for the opportunity to take students to such an interesting place as part of a class.

FACULTY UPDATE - MARY SAVINA

First bit:

For a few years, I've been keeping an approximate record of the impact of Carleton graduates on part of the geosciences profession by maintaining a spreadsheet of numbers of articles in three journals of the Geological Society of America (*GSA Bulletin*, *Geology*, and *GSA Today*) with Carleton students and graduates as co-authors. Keep in mind that a) many Carleton grads, including those in geosciences, don't publish in geoscience professional journals; b) those Carleton grads who do publish do so in many different journals – it just happens that the GSA journals are the ones that cross my desk; c) I don't have comparative information on alums from other schools for comparison; and d) even my own count may not be complete. With all these caveats in place, here are the numbers for 2010 in case you find them of interest. The approximate article totals come from the GSA website: <http://www.geosociety.org/pubs/jmlDescriptions.htm#geology>.

GSA Bulletin publishes an average of about 108 articles each year. In 2010, ten articles had Carleton-grad authors, with 13 grad authors total (some articles have more than one Carleton-grad co-author).

Geology publishes about 276 articles each year. In 2010, 17 articles had Carleton-grad authors, with 19 grad authors total.

GSA Today publishes 11 science articles each year. In 2010 one of those articles included two Carleton-grad co-authors.

Second bit:

As Bereket says in his department chair remarks, I continue to hold down two jobs at the College, one in the geology department and the other in the Dean of the College office, where I am the Faculty Assessment Coordinator. I'm in my second year of a three year position. My main role is to help college departments and programs develop ways to assess student learning of their majors: How do we know what students learn in our programs? How well do our programs educate students relative to college and program goals? These turn out to be challenging questions to answer, particularly at a school like Carleton where we place more emphasis on habits of mind and broad skills like communication and critical thinking than on specific content knowledge. Each department has defined a few important broad learning outcomes and is now working on a plan to assess those outcomes. (For instance, we think students completing the geology major at Carleton should be able to:

1. Frame a geosciences research question.
 2. Observe, measure, collect and interpret data (from field study, databases, experiments, etc.).
 3. Explain geologic features and research questions to less-experienced geosciences students.
 4. Complete a major independent project, tackling a complex problem and communicating in writing, orally, and visually.
- (Note: this list of student learning outcomes is a draft. Do they look right to you? Let us know!)

With the help of Cherry Danielson in the office of Institutional Research and Assessment, I meet with department faculty and offer workshops to help make assessment part of the fabric of each department's annual work. It's rewarding because we de-mystify and simplify what otherwise could be an unrewarding, time-consuming task. As our Carleton assessment program slogan says: "Assess We Can!"

For the last two years, I've also visited other geosciences departments as a leader/facilitator for the "Building Strong Geoscience Departments" program, funded by the National Science Foundation (NSF) and organized through the National Association of Geoscience Teachers (NAGT), whose executive director is Cathy Manduca, based at the Science Education Resource Center (SERC) at Carleton. Yes, I know it's a lot of acronyms. You can read more about the program at this site: <http://serc.carleton.edu/departments/visitingworkshops/index.html>. There's great synergy with my work at Carleton with assessment and it's been great fun visiting other campuses (Humboldt State University, Juniata College, University of Alaska Fairbanks, University of Calgary, Western Washington University).

Third bit:

As you may have heard, the Cannon River flooded in September 2010 (<http://pubs.usgs.gov/sir/2011/5045/>). It was the flood of record in Northfield. Students in introductory geology and Geomorphology had a marvelous case study right on campus (though the flooding did interfere with Isaac Larsen's plans to have geomorphology students measure stream discharge). You can find several short videos of the flooding on campus at https://apps.carleton.edu/news/audio_video/?item_id=670885. The river flooded again in March as a near-record snowfall began to melt. So, it seemed to me that summer 2011 would be a good time to look carefully at if and how the river changed during these floods. Through funds donated by Carleton geology alumni, the department is funding a student, Tony Daza, to work with me. (Tony was a student in my Geology in the Field seminar fall term). Specifically, we will re-

map the area adjacent to the Carleton stadium and practice fields that Kim Elson ('10) analyzed for her comps project to see if the pools and riffles have moved, and if the streambed particle size has changed. Nancy Braker, the Arb director, has also asked us to look at a couple of places downstream of the Spring Creek confluence to assess erosion possibly resulting from the flooding.



Laird Stadium - September 24, 2011

FACULTY UPDATE - BEREKET HAILEAB

We are all doing well here in Northfield Minnesota. Working with students of different backgrounds that have a desire to learn and are willing to grow is worth my time, energy and patience. Students from my classes are busy learning basic geology, conducting research and writing up their findings every year. Many of these “10 weeks” class projects are available in the geology website.

In the summer of 2010, I spent 4 weeks in the field in Northern Ethiopia with Adam Maloof, (1997) and Nicholas Swanson-Hysell (2005). Adam and his group were mapping and collecting samples for isotopic studies and testing the true polar wander hypothesis for global change 800 Ma.

Last May, James Bethune (class of 2010) who was our 5th year intern this year and I have presented an abstract on the Groundwater ages in Rice County. Although hydrologic models indicate that the recharge dates for the Jordan aquifer are on the order of hundreds to thousands of years old, chlorofluorocarbon concentration data date recharge to the 1960s. These ages indicate vulnerability of the main aquifers.

Recent work on the Pliocene volcano-tectonics and paleogeography of the Turkana Basin, Kenya and Ethiopia, helped us understand the paleogeography of the hominid sites in the region. This research with colleagues at the University of Utah can be found Journal of African Earth Sciences.



Bereket with Adam Maloof '97 and Nicholas Swanson-Hysell '05 in Northern Ethiopia.

FACULTY UPDATE - CAM DAVIDSON

It's been a busy, non-teaching year for me thanks to a long-awaited sabbatical. I mostly stayed around Northfield with occasional trips to various places including Alaska, Denmark, California, Colorado, New York, and Arizona, more or less in that order. I'm sure I went to Wisconsin as well, but please don't tell the governor that I had a 2nd grade teacher with me.

My sabbatical year has been very productive. I spent the time ramping up on the geology of the Chugach-Prince William terrane in southern Alaska in preparation for a Keck Geology Consortium research project this summer I'm co-leading with John Garver from Union College. We are taking six students (one Carl), and plan to spend 13 days in Prince William Sound (PWS), and 9 days on Kodiak Island. A logistical nightmare, but it appears to work on paper at least. Google "Keck Alaska 2011" for a brief description of our research goals. John and I also spent most of the fall putting together a proposal for NSF in the hope of continuing this work over the next four years. Regardless of funding, we are both committed to working in southern Alaska for the foreseeable future, so we are keeping our fingers crossed. During the winter, I spent most of my time learning ArcGIS, processing rocks from Alaska, and picking zircons. Finally, spring has been busy with writing up results from the 2009 Keck project in southeast Alaska with Nate Evenson '10 and Jordan Epstein '10, and travel, including a trip to the Laserchron facility at the University of Arizona with Hannah Hilbert-Wolf '12 who will also be going with me to Alaska this summer for her Comps. We spent ~34 hours blasting zircons from PWS and accumulated ~800 U/Pb dates!



Beautiful turbidites of the Valdez Group along Turn-again arm, Alaska.



In addition to the Keck project in Alaska this summer, I'm looking forward our 3rd installment of the Carleton Summer Science Institute (CSSI 2011) which takes place for three weeks in July and August. We had a record number of applicants (>140) for 48 spots composed of rising juniors and seniors in high school who are interested in science. This year, we have four research sections including Neuroscience, Chemistry, Animal Behavior, and, of course, Geoscience. This program has exceeded all our expectations, and I look forward to watching the program grow.

Finally, I'm looking forward to getting back into the classroom in the fall. It will be good to reconnect with our majors and to get to know our newly declared sophomores. However, I'm definitely not looking forward to grading.

I'll be teaching Geology in the Field, an A&I (Freshman) seminar in the Fall, Mineralogy in the winter, and Introduction to Geology in the spring. Should be fun.

Picture above: Unloading our new NSF-funded Pan-Analytical Empyrean XRD. The XRD will be used by Physics, Chemistry, and Geology and will allow the analysis of thin-films and accommodate experiments under non-ambient conditions up to 900°C. Picture below: Looking north toward the Chugach Mountains from Prince William Sound. These mountains have some of the fastest uplift rates on the planet thanks to underthrusting of the Yakutat plate in southern Alaska.



Isaac Larsen '01 returns to teach



It was great to be back in Mudd and Northfield this year. I enjoyed re-connecting with the department and the mid-western landscape. I took a leave from my PhD studies at the University of Washington to teach Geomorphology, Hydrology, and Introduction to Environmental Geology. It was a year of extremes, which made for some great teaching and learning experiences. A record flood on the Cannon River in September provided the perfect backdrop for teaching flood frequency, though it kept us out of the river for the rest of the term, and a big December blizzard made for an exceptional winter snowpack that proved to be ideal for collecting and interpreting snow hydrology data. Other highlights include a trip up the Minnesota River



Valley to ponder the origin of the boulders at Big Stone National Wildlife Refuge, a February pump test at the well field (the wind chill advisory ended a few hours before lab!), a field trip to Mystery Cave to get inside a karst aquifer, and a near perfect spring day at Taylors Falls with my introductory class.

Krista and I will spend most of the summer in Northfield with our baby, Carl James, who was born on June 19th. Carl weighed 9 lbs 1 oz and was 21 inches long.

Nicholas Swanson-Hysell Teaches Sedimentology and Stratigraphy

Nicholas Swanson-Hysell, a former Carleton geology graduate who recently received his PhD from Princeton University will be returning to teach Sedimentology and Stratigraphy for the fall term.

Nick graduated in 2005 and his comps project was entitled “Magnetic Reversal Stratigraphy in the Ebro Basin, near Horta de Sant Joen, Spain”. Following his work at Carleton, Nick moved on to Princeton University to work with Adam Maloof '98. For his dissertation, Nick studied ancient sedimentary and volcanic stratigraphic sequences, and using advanced geochemical and geophysical techniques, he worked at unraveling Earth’s varied and sometimes tumultuous, past.

Nick has a number of recent publications, the following is sampling if his recent work; Swanson-Hysell, N.L., Feinberg, J.M., Berquó, T.S., and Maloof, A.C. Self-reversed magnetization held by martite in basalt flows from the 1.1-billion-year-old Keweenawan rift, Canada. *Earth and Planetary Science Letters*, (2011), 305, 171-184.

Swanson-Hysell, N.L., Rose, C.V., Calmet, C.C., Halverson, G.P., Hurtgen, M.T. and Maloof, A.C. Cryogenian glaciation and the onset of carbon-isotope decoupling. *Science*, (2010), 328, 608.

Geology 5th Year Interns



This year, I had the opportunity to experience the Geology Department and Northfield from a different perspective as one of the department’s fifth year interns. This experience has been challenging, fun, and full of learning.

Most of my time is spent working on a research project with Sarah Titus. We are studying deformation in Cyprus’ Troodos Ophiolite with the goal of numerically modeling deformation near a ridge-transform intersection. Although this project did not take me to the Mediterranean, I learned how to combine paleomagnetic data and mathematical modeling with field data in exciting ways. In addition to this project, I presented work at AGU in San Francisco, TA-ed Structural Geology, helped with a comps project, and went on geology field trips to California and Wisconsin.

This fifth year internship has been particularly valuable for me in choosing what I want to do after Carleton. I found my passion for geophysics and mathematical modeling. I look forward to starting Cornell’s Ph.D. program in geophysics next fall. Although I am excited to move to New York, I will miss the Geology Department and Carleton. The day I stepped into Intro Geology fall term of my freshman year, I did not know the difference between limestone and basalt, but now I have worked on original research studying crustal deformation. I could not have made that journey without the help of the department, and especially Sarah Titus, who have provided me with so many opportunities, support, and kindness. I am truly thankful for the past five years.

Sincerely,
Chelsea Scott ‘10

I don’t know if I can thank the Geology Department enough for this past year, much less the last five. I’m never short of amazed at the opportunities that present themselves at Carleton; I had a wonderful time exploring all that I could. In addition to my duties as Bereket’s post-5pm relaxation partner, I continued a groundwater research project using chlorofluorocarbon concentrations to date water in the Jordan Aquifer. My project took me around the county to collect samples and then down to the University of Utah for gas chromatography analysis. I was able to travel to Denver and Pittsburgh to present this project at the national and regional GSA meetings.

To gain independence from my life at Carleton I moved 5 miles south of town onto a nascent organic vegetable farm. Here I enjoyed the company of chickens and pigs and a half-Australian shepherd, half-slinky farm dog. Other adventures included dog sledding up north, a trip to Baraboo with the department, and almost purchasing Tim Vick’s motorcycle.

After five years of Carleton I’m sad to leave but finally ready to move on. The details of my future are still hazy, yet I greet it with excitement. Graduate school in 2012? Right now I’m bicycling up the west coast to my hometown of Portland, Oregon where I will be actively seeking more adventures.

With love,
Jim Bethune ‘10



Carleton People Present Papers at GSA and AGU Annual Meetings

The following Carleton Geology Department people presented papers in technical sessions at meetings of the Geological Society of America in Denver, Colorado; as well as Geological Society of America regional meetings. The Carleton folks are indicated in bold face type, and students and alums are indicated with their class years. The presentations listed are only those which involved a current Carleton student or employee; many other Carleton alums, too many to list here, also presented papers at the meetings.

Haileab, Bereket, and Bethune, James '10. "Student Led Stream Chemistry Research in Introductory Geology Courses."

Bethune, James '10 and Haileab, Bereket. "Ground-water Ages in Rice County, MN Indicate Vulnerability to Pollution."

Parks, Ben '11, Davidson, Cameron, Henry, Darrel, and Mogk, David. "Evolution of the Precambrian Rocks of Yellowstone National Park (YNP): High Grade Metamorphic Rocks at Granite Hill."

Walker, Barry A. Jr., Grunder, Anita L., **Morson, Alissa '11,** and Klemetti, Erik W. "Crystals Through the Years at the Aucanquilcha Volcanic Cluster: The Thermal Evolution of a Long-Lived Arc System as Constrained by Intensive Parameters."

Hilbert-Wolf, Hannah, L. '12, Simpson, Edward L., Wizevich, Michael C., and Tindall, Sarah E. "The Identification of a Tectonically Controlled Sequence Boundary at the Contact Between the Upper Cretaceous Wahweap and Kaiparowits Formations."

The following Carleton Geology Department people presented papers in technical sessions at American Geophysical Union annual meeting in San Francisco, CA in December. The Carleton people are indicated in bold face type, and students and alums are indicated with their class years. The presentations listed are only those which involved a current Carleton student or employee; many other Carleton alums, too many to list here, also presented papers at the meetings.

"Improving Tsunami Warning with a Rapid Linear Model" Fryer, G. J., **Holschuh, Nickolas D. '11,** Wang, D., Becker, N. C.

"Variations in Advected Heat from Devils Kitchen Hydrothermal Area, Lassen Volcanic National Park, California 1922-2010" **Randolph-Flagg, Noah G. '11,** Mariner, R. H., **Lundstrom, Elizabeth '12,** **Ingebritsen, Steve '78.**

"Modeling the Evolution of a Transform Fault in the Mantle Section of the New Caledonia Ophiolite" **Titus, Sarah J.,** and Davis, Josh R.

"Characterizing Deformation at Kettleman Hills North Dome, Central California Using Paleomagnetism and Structural Analysis" **Yourd, Amanda R. '11,** **Newman, Alice '11,** **Titus, Sarah J.,** Housen, B. A.

"Kinematic Modeling of Deformation Near a Ridge-Transform Intersection in the Troodos Ophiolite, Cyprus." **Scott, Chelsea P. '10,** **Titus, Sarah J.,** Davis, Josh R.



Noah Randolph-Flagg '11 & Liz Lundstrom '12 in California with Steve Ingebritsen '78

Duncan Stewart Fellows for 2011-11

Each year, the geology faculty faces the difficult task of selecting a few students to be Duncan Stewart Fellows. The Duncan Stewart Fellowship was established in 1976 by Daniel Gainey, class of 1949, in honor of Duncan Stewart, professor of geology at Carleton for nearly 25 years.

We select the Stewart Fellows based on a combination of excellence in scholarship, a high level of intellectual curiosity, potential for scientific growth, and involvement in departmental activities. As we make this selection, we realize how fortunate we are to have so many talented, interesting, and impressive students within the department.

We are very pleased to announce that Alice Newman '11, Hannah Hilbert-Wolf '12, Angus Vaughan '12 and Nina Whitney '12, have been named Duncan Stewart Fellows, extending the number of Stewart Fellows over the years to 102. Congratulations and best wishes to all of you!

Carleton Geology Students Awarded NSF Fellowships

We are proud to report that a Carleton Geology major was awarded a National Science Foundation graduate research fellowship. The fellowships provide graduate students with three years of support worth a total of over \$100,000. The fellowships also carry annual stipends of \$30,000 plus a onetime allowance of \$11,500 for education. Among the twelve winners of fellowships this year from Carleton was Gloria Jimenez '07, while Tyler Mackey, '08 received an honorable mention.



Cam Davidson and John Garver Awarded Keck Consortium Grant

Cam Davidson, and John Garver of Union College, have been awarded a grant from the Keck Geology consortium for their proposal, "Tectonic evolution of the Chugach-Prince William Sound terrane, south central Alaska". Cam and John are leading a group of students this summer with six students including Hannah Hilbert-Wolf '12.



Cam standing on the Hidden Bay pluton (38 Ma) in eastern Prince William Sound (PWS). Eocene-age calc-alkaline granodiorite plutons such as this are unexplained by existing plate models for southern Alaska.

2011 Awards

Distinction in Comps

Hannah Fariss	Benjamin Parks
Nicholas Holschuh	Amanda Yourd
Alice Newman	

Mortar Board

Hannah Hilbert-Wolf '12

Phi Beta Kappa

Nicholas Holschuh
Alice Newman

Sigma Xi

Lillian Betke-Brunswick	Noah Randolph-Flagg
Hannah Fariss	Colin Sinclair
Nicholas Holschuh	Analeisha Vang
Alissa Morson	Andrew Walters
Alice Newman	Amanda Yourd
Benjamin Parks	

Steven P. Galovich Prize in Mathematics

Lillian Betke-Brunswick

A. M. Harrison Prize in Economics

Nicholas Holschuh

Fulbright Fellowship

Noah Randolph-Flagg

National Science Foundation Graduate Fellowship

Gloria Jimenez '07

The Allen and Irene G. Salisbury Student Fellowship

Laura Hockenbury '12

Student Departmental Advisors

Analeisha Vang
Andrew Walters

Senior Projects - 2011

Graduating senior geology majors, their hometown and titles of integrative exercise ("comps") projects:

Miki Beavis, Foster City, CA, "Soil Erosion Risk Assessment near Archaeological Sites in Grevena, Northwestern Greece using the Revised Universal Soil Loss Equation (RUSLE) and GIS"

Lillian Betke-Brunswick, Northampton, MA, "Kinematic modeling of dike formation near the Husavik-Flatey fault, Flateyjarskagi, Iceland"

Annie L. Boucher, Brooklyn, NY, "Analysis of geomorphic evidence for a late Wisconsinan alpine glaciation in the Adirondack High Peaks region, New York"

Hannah E. Fariss, Summerland, CA, "Lateral variability in a transgressive systems tract of the Mazomanie Formation at the Boomsite, Stillwater, MN: Evidence for estuarine deposition?"

Nick Holschuh, Moorhead, MN, "An Analysis of Tsunami Sensitivity to Fault Plane Orientation Using a Rapid Linear Model"

Ray McGaughey, Brooklyn, NY, "U-Pb Detrital Zircon Geochronology and Provenance of Hominy Peak, Wyoming and Correlation to the Heart Mountain Detachment"

Alissa M. Morson, Lafayette, MN, "Thermal Evolution of the Aucanquilcha Volcanic Complex, Northern Chile, based on Iron-Titanium Oxide and Titanium-in-Zircon Temperature Models"

Alice C. Newman, Taipei, Taiwan, "Using small-scale structures as a tool for understanding regional deformation: A study of deformation bands and faults at Kettleman Hills, California"

Class of 2012 Geology Majors

- Charolotte Alster, Tucson, AZ
- Kristofer Asp, Plymouth, MN
- Sarah Berry, Downers Grove, IL
- Adam Denny, Marshfield, WI
- Megan Ferre, Louisville, KY
- Hannah Hilbert-Wolf, Allentown, PA
- Laura Hockenbury, Lafayette, CO
- Evan Johnson, Portland, OR
- Elizabeth Lundstrom, Burlingame, CA
- Sarah Marks, Brooklyn, NY
- Ailsa McCulloch, Woodside, CA
- Peter Scheuermann, Pittsburgh, PA
- Kaj Snow, Decorah, IA
- Zachary Stewart, La Crosse, WI
- Angus Vaughan, Minneapolis, MN
- Alex Walker, Edmonds, WA
- Nina Whitney, Bowdoinham, ME
- Griffin Williams, Kalamazoo, MI

Masaru K. Nobu, Fairfax, VA, "The euxinic zone anaerobic phototrophic microbial ecology of meromictic Green Lake as an analogue for Proterozoic ocean microbial ecology"

Benjamin H. Parks, Burlington, CT, "Metamorphic Petrology of Archean Metapelites and Ironstones in the Garnet Hill Area, Yellowstone National Park, USA"

Noah Randolph-Flagg, Kalaheo, HI, "Variations in Heat Advected from Devils Kitchen Fumarolic Area, Lassen Volcanic National Park, California, 1922-2010"

Colin M. Sinclair, Madison, WI, "Glacial processes and the changing landscape of the University of Wisconsin-Madison Arboretum"

Analeisha M. Vang, Esko, MN, "A Pre-Dam Removal Assessment: The Ames Mill Dam, Northfield, MN"

Andrew P. Walters, Marion, OH, "Local versus global control of $\delta^{13}C$ isotope excursions in the Ordovician (Turinian) Platteville Formation, southeastern Minnesota and eastern Iowa"

Adrienne K. Wilber, Sitka, AK, "Late Quaternary climate in the southern foothills of the Brooks Range, Alaska based on stable isotope analysis of lake sediment"

Amanda R. Yourd, Bemidji, MN, "An examination of the development of Kettleman Hills North Dome, central California using paleomagnetic and map-based analysis"

Class of 2013 Geology Majors

- Thomas Birren, Round Lake Park, IL
- Laura Karson, New York, NY
- Taylor LaCasse, Mount Desert, ME
- Schuyler Metcalf, Norfolk, CT
- Lillian Pearson, Madison, WI
- Jenny Piela, Amherst, MA
- Rose Prullage, Evanston, IL
- Nicholas Roberts, Raleigh, NC
- Caroline Scheevel, Austin, TX
- Tyler Schuetz, Tustin, CA
- Andrew Wolter, Elysian, MN



Spring Baragoo Department Field Trip

Professional and Technical Talks Given in the Geology Department This Year

Dale Guthrie, Institute of Arctic Biology at the University of Alaska Fairbanks, his talk focused on Pleistocene large mammal paleobiology, extinctions and climate change.

Allison Burnett, University of Minnesota, "A Speleothem Record From the Guatemala/Belize Border Covering the Last Millennium"

Andrew Luhmann, University of Minnesota, "Classification of Thermal Patterns and Comparison of Tracers in Karst Aquifers"

Laura Vietti, University of Minnesota, "Preliminary Designation of Marine Tetrapod Taphofacies"

John Goodge '80, University of Minnesota Duluth, "Age and composition of the East Antarctic shield by granite and glacial proxy"

Lars Hansen, University of Minnesota, "Deformation Mechanisms in the Upper Mantle: How Nanoscale Defects Control Kilometer-Scale Processes"

Wendy Panero, Ohio State University, COMPRES Distinguished Lecturer Series, "The New Mineralogy and Chemistry of the Earth's Inner Core" and "Water Cycling and Storage in the Earth's Deep Interior"

John Sharry '73, Chief Geologist at Amigos Energy Advisors, "Which Came First? The San Andreas Fault or the Pelona Schist"

Marc Hirschmann, University of Minnesota, "Experimental Petrology at UMN"

Mulugeta Alene, University of Addis Ababa, Ethiopia, "Carbon Isotope Anomalies in Neoproterozoic Limestone of Tigray, Northern Ethiopia: the result of True Polar Wander Events?" and "Geology of the Hominid-Bearing Woranso-Mille Area, Western Afar, Ethiopia"

Gustave I Tolson '82, Bernstein Geologist in Residence

The geology department was pleased to host Dr. Gustave Tolson, visiting from the National University of Mexico, as our 2011 Bernstein Geologist in Residence. Dr. Tolson received his B.A. in Geology from Carleton College in '82, and his senior comps project was titled "A Structural Analysis of a Metamorphic Tectonite". Dr. Tolson then went on to receive his M.S. from the University of Minnesota in '90, and Ph.D. from the National University of Mexico in '98. His research interests are structural geology and petrology at all scales, including the micro-, meso-, and macroscopic for determining the tectonic development of Mexico. Dr. Tolson's talk this year was titled, "Structure development of the Mexican fold and thrust belt, Central Mexico."

Geology Department T-Shirts Available

We have a supply of geology T-shirts available that can be purchased by mail. The cost for a current year shirt is \$10 plus \$4 postage payable to Carleton College, and as a gift we will throw a previous years shirt in for free (it'll be a surprise what shirt from the past you will end up with).

The 2011 shirt is burnt orange with a Carleton College Geology 2010-2011 logo on the front, text is a gray-silver color. The back of the shirt is the text "Person for Scale" and scale bar (see the front cover). As of writing sizes XS (youth L), S, M, L, and XL are available.

There is also a timeless (and priceless!) special shirt available for families with multiple generations attending Carleton. The shirt features a diagram of the interior of the Earth with the core labeled Carleton Faculty, and the layers going upwards toward the surface being Post Docs, Graduate Students, Seniors, Juniors, and Sophomores; the blebs of magma (which melted off the subducting plate) rising toward the surface are "Children that go to Carleton." It is a cardinal red with white ink. Sizes available S, M, and L.

Email Jonathon at jlcooper@carleton.edu, or call at (507) 222-4401 to find if your size is still in stock.

Special Donation Thanks

We would like to express special thanks to Cecilia Warner '83, Ginna Gillerman '75 and Rich Fiore '73, for donations this past year. Cecilia donated a set of rocks and minerals, which included a number of very nice specimens which will be added to the Dana Mineral Set, and used as classroom specimens. Ginna donated several samples from Lemhi Pass in the Beaverhead Mountains, part of the Bitterroot Range, on the Montana-Utah border. The specimens are examples of the Rare Earth Elements that have been discovered in the pass, unique and very unusual occurrences, an amazing set that complements our economic geology collection. Rich donated a significant collection of geology text and reference books to the department that have been integrated into the classroom and lab reference collections, a very useful collection. These gifts are greatly appreciated. Thanks very much, Cecilia, Ginna and Rich.

Tim's Retirement Celebration

There was a good crowd at the Geology reception over reunion weekend to celebrate Tim Vick's retirement! Never one to shy away from things-that-go-bang, Tim was right in the thick of things (no pun intended), giving a long stir to the ice cream being made with liquid nitrogen as a key ingredient. Personal testimonials were offered, poems were read, and we announced the outcome of our fund-raising effort over the spring. As of the reception, we have raised over \$8,100 from 43 individual donations that will go to a new Departmental fund in honor of Tim!! Gifts have come from alums that graduated before Tim was hired, and from the most recent graduates. Thank you!!!

At the reception, Ed Buchwald reminded me about how Tim was initially hired in the department in the mid-70s. Ed and Eiler Henrickson conceived of the idea to hire a technical instructor — someone to help students learn the practical sides of geology in both the field and in the lab, picking up valuable skills such as dishwashing in the field, scraping Badlands mud off your boots, sorting specimens, taking an x-ray diffraction pattern, and making thin sections. Tim quickly became indispensable to the functioning of the Department, and the rest, as they say, is history. In the years since, Tim's range of duties expanded manifold, and his role as an instructor and mentor grew as well.



I have visited or worked in many other geology departments, and any number of them would love to have someone like Tim on staff because of all of the things he does. Without someone like Tim, the Department would be much diminished. But with Tim, the Department is vastly better! Tim, in fact, is the glue in the Department, partly because his office was always in the middle of things. But his role in shaping the alumni database, the newsletters, the website, and so many of the Department's web of activities shows what a focal point he became.

I want to briefly mention a new goal of creating an endowed fund in honor of Tim that will support students well into the future. Based on the generous contributions already received, we have set a larger goal of endowing a fund on Tim's behalf that will create a lasting legacy for geology students in the Department. Our new goal is to raise at least \$50,000 over the next six months so that the fund can become self-sustaining, allowing the Department to use the earnings from that investment on a regular basis. With the funds we have already raised, I think this is within reach. It would only take 8 or 9 people giving \$5,000 each and we'd be there! If you are able to help out with a special gift to this endowment fund, many people will be grateful. Please abide by your class agents' request that any contributions to the Tim Vick fund should be considered in addition to your annual giving to the College. Also, multi-year pledges can be counted toward our goal and corporate matching can help to leverage individual gifts.

Please help us reach our new goal of creating an endowed fund, and encourage your classmates and friends to do so as well. We are off to a great start! If you have ideas about attracting larger donations, please let me know.

And stay in touch! If you're on Facebook, please join the Tim Vick Fan Club or the Carleton Geology Department to help keep up on department activities and personal news.

Cheers,
John Goodge '80 - jwgoodge@gmail.com



NEWS FROM ALUMS

Faculty

The past year has been a good one for our family and we hope that you all have been healthy and prosperous. Cynn timer and I took an 11,000 mile auto-camping trip which was almost a circum-naviga tion of the U.S.A. The best part was that we stuck to secondary roads and never drove more than 300 miles in a day! Most of the time we stayed in national and state parks or forest-service campgrounds. I wish every geologist could get to do this early in one's career.

Otherwise our lives have been pretty routine. Visits to children and grandchildren, canoeing and sailing, volunteering at the hospital and with Boy Scouts. I will complete 43 years as a Scoutmaster in October, still going strong although a sleep disorder has forced me to stop camping in the winter. Cynn timer and I still snowshoe a lot and this year has been magnificent for that. It has been the fourth snowiest winter on record in Northfield.

I am still helping the men's lacrosse club and enjoying the contact with students. We have not figured out how to string together a bunch of victories but we are competitive and exciting to watch even in the snow!

I am beginning to realize the passage of time now that Tim Vick has retired. He was such an important part of the success of geology for so many years. Good luck, have fun in retirement Tim. I hope all alums will give serious thought to reunion weekend. I would love to see and hear from you all.

Ed Buchwald

Mary Savina and Nancy Braker Lead Alumni Trip to Baraboo, WI Alumni Adventures

September 22nd through 25th, 2011

If you cannot live without wild things, please join Nancy Braker '81, Director of Cowling Arboretum & Lecturer in Biology, and Mary Savina '72, Charles L. Denison Professor of Geology and Director of Archaeology, as they explore the landscapes that inspired Aldo Leopold. This area is a beautiful place to explore conservation, restoration, natural history, environmental history, and geology.

From your base in Baraboo, Wisconsin, you'll explore the Aldo Leopold Foundation grounds, including the Shack where A Sand County Almanac was written. You'll tour the Aldo Leopold Legacy Center, rated the "greenest building in the world" because of its design, construction, and use of alternative energy technologies. You'll also visit the International Crane Foundation, which "works worldwide to conserve cranes and the wetland and grassland ecosystems on which they depend." At both sites, you'll be able to hike on the nature trails, view exhibits, and talk with experts.

You'll visit Parfrey's Glen (Wisconsin's first State Natural Area), Devils' Lake State Park, and Van Hise Rock, a monolithic remnant of an ancient mountain chain. (With any luck, there will be a nice fall color display.)

Muffy Barrett '80 and Scott Weber '82 will welcome you to Bluestem Farm, where you'll learn about their restoration and permaculture activities. They've restored prairie, oak savanna, and wetlands, and have grown over a hundred varieties of apples, pears, cherries, plums, and grapes. You'll see how they propagate wildflowers and other native plants, including hardy orchids. For further information please visit the website: http://apps.carleton.edu/alumni/adventures/Baraboo_WI/.

*Devils' Lake State Park
Spring Department
Field Trip 2011*



Kidney Stones
 By *Stu Grubb '85*

This is the remarkable story of two Carleton geo majors who have shared more than just living quarters. Stu Grubb and Glen Carleton were freshmen roommates in 1981. Stu was a geo major from Day 1, while Glen didn't take a geo class until his senior year. After college they both got graduate degrees and pursued careers in hydrogeology. Glen works for the USGS in New Jersey. Stu is a consultant with Northeast Technical Services in Minnesota.

In 2002, Stu was diagnosed with Berger's disease, an immune system disorder that often leads to kidney failure. In 2010, about the time of their 25th reunion, Stu's condition worsened to the point that he was eligible for a kidney transplant. Kidneys can come from two sources – cadavers or living volunteers. The waiting time for a cadaver kidney averages 4-6 years. Transplants from living volunteers can usually be accomplished more quickly and can save the patient from many hours of dialysis and other unpleasant treatments.

Stu does not have any relatives who could spare a kidney, but he is blessed with several friends who offered to be volunteer donors. They included two of his fellow '85 geo majors and a Carleton staff member. Kidney donors and recipients are matched by blood type, blood antigens, gender, body size, occupation, grade point average, and comps topic (just kidding about those last three). Glen turned out to be the best match. That committee that matched us up

freshman year in Nourse 216 really knew what they were doing.

The response from the rest of the Carleton community has been amazing. Together with our other roommate, David Lefkowitz (now a Carleton Art Department professor), we put together a website to collect donations to cover Glen's expenses. We very quickly raised enough money to cover insurance, lost wages, and other expenses. The majority of the donations came from the class of '85, geo department staff, and members of the Minnesota Ground Water Association (Stu is a past president). Other classmates provided plane tickets, a rental car, and accommodations for Glen and his family.

The surgery was November 16 at the Hennepin County Medical Center in Minneapolis. Everything went as planned. Glen and Stu are pretty much back to their normal routines. Stu will have a lot of medications and doctor visits for the rest of his life, but it is better than being on dialysis.

We want to thank everyone who has been supporting us through this ordeal, but especially the Carleton Geology Department and the Class of '85. Needless to say, our feelings of connection to Carleton are stronger than ever, and we hope everyone else feels warm and fuzzy about the help we received. Please feel free to contact us if you want more information about volunteer organ donation or groundwater flow modeling.

Carleton Geology Graduate Nominated for Robert Foster Cherry Award
 (Adapted from Baylor University Press Release)

Heather Macdonald, '73 has been selected as a finalist for Robert Foster Cherry Award. The Baylor University award program is designed to honor great teachers, to stimulate discussion in the academy about the value of teaching and to encourage departments and institutions to value their own great teachers. Individuals nominated for the award have a proven record as an extraordinary teacher with a positive, inspiring and long-lasting effect on students, along with a record of distinguished scholarship.

Macdonald earned her B.A. cum laude in geology from Carleton College in 1976. She received her M.S. in 1979 and Ph.D. in 1984 in geology, both from University of Wisconsin-Madison. Her research interests include geoscience education, carbonate sedimentology and stratigraphy. Heather teaches at the College of William and Mary in Williamsburg, VA.

Congratulations Heather!



Alumni Association Awards the Distinguished Achievement Award to Geology Majors in Class of '61

The Distinguished Achievement Award recognizes alumni for outstanding achievement within a particular field or fields of accomplishment, either professional accomplishments or community service.

Jeff Hanor - Distinguished Achievement in Geochemistry

He is a geologist at Louisiana State University and is considered a world expert on the geochemistry of fluids in sedimentary basins, and the myriad implications that carries for understanding oil fields, limiting contamination from mining, and more. A number of Jeff's papers have led the way for whole fields of additional research across disciplines. In addition, his supporters noted that he brings a kindness, openness, and infectious enthusiasm to his work that "lures all types of students into enjoying science" and is an "oustanding teacher, mentor, and colleague."

Andrew Larsen - Distinguished Achievement in Environmental Education

Based in southeast Wisconsin at the Riveredge Environmental Education Center, Andy began there in 1970 as the sole naturalist, and grew the program to serve thousands of students each year. His efforts have received national recognition, and earned him comparisons with John Muir and Aldo Leopold. Under his guidance, more than 12, 000 middle- and high-school students have participated in a nationally acclaimed program called "Testing the Waters," a real-life study of the ecology of the Milwaukee River; he has also hosted a regional radio show and written a weekly newspaper column to encourage people and communities to participate in ecological preservation and education.



Geology Club

ROW 1: R. Aakley, W. Alvarado, BOH 2: M. Kuntz, D. Davidson, D. Dickson, J. Hanor, E. Fazio, ROW 3: A. Larsen, A. Thompson, M. Grew, BOH 4: D. Clark, Mr. Herrickson, J. Minton.

1938. Mary Hill French: "Discussing Bevan's research and reading papers on meteorite impacts is the closest I get to geology these days. A trip in May to Rochester, NY for a grandson's wedding and a family reunion"

1947. Mrs. Donald P. Dickson: "I have been taking part in a series of lectures (10+) here at Meadow Lakes on the Earth. The 16 ages of Pleistocene up to today. The melting of our polar ice caps. These have been given by a fellow resident and a retired geology professor. I now feel like I've earned a masters degree. It's been fascinating!"

1949. Ed Rudolph: "Nothing new here. I am just getting older every year. Used to run a lot, but I can't seem to remember how. God bless Carleton for the best 3.5 years of my life."

1950. Paul Fossum: "I am still reading the obituaries rather than being in them. On a driving trip to Tucson came back through Sedona! Wonder why Eiler never mentioned the RED ROCKS? I tried calling but he didn't answer so I just did 10 more push ups!"

1954. Marion E. (Pat) Bickford: "After four and a half years my term as Science Editor for Books for GSA has ended and I have closed my editorial office. However, I have been appointed Editor of three "125th Anniversary" books, to be published by GSA in 2013. These books will contain articles that explore "What progress has been made in ----- (e.g., Geochemistry) in the last 50 years." I am "Advocate" for three Topical Sessions at the Minneapolis GSA Meeting next fall. These are "The Archean of North America---The Core of a Continent"; "From Nuna to Rodinia--The Proterozoic Assembly of Laurentia"; and "Exploring Subsurface Terranes and Buried Basins of Eastern and Central North America " Geology, Geophysics, and Geochronology." Further, I will co-lead a post-meeting Field Trip to study the 3.5 Ga gneisses in the Minnesota River Valley. I hope to see a strong Carleton turnout at all of these events. Other than these activities, I continue an active program of research and writing, and

I continue my study of the classical guitar. Retirement is great!"

1955. William D. Bryant: "Nothing new - Thanks for asking"

1956. Richard (Dick) Buchheit: "Retired -- but still pounding rocks! Keeping track of iron ore and metallic mineral activities in Minnesota (not much regard for government regulators!). Much uranium, metals, oil and gas activities in 4-corners area of CO, UT, AZ, and NM. Much relates to time of my first activities in 1960's & 70's. Participate in Dolores County, Colorado Planning and County Board Hearings on Mineral and Energy matters. Looking forward to our 55th class reunion June 16-19!"

1963. Wendell Duffield: On January 1, 2011, I began my second “retirement”. The first occurred in 1997, when I left the US Geological Survey after 30-plus years of chasing volcanoes here and there around the globe. From the Survey, I moved to a spacious office in the Geology Department of Northern Arizona University in Flagstaff as an Adjunct Professor. After thirteen years of giving the occasional classroom lecture, serving on MS thesis committees and generally mentoring students, I decided it was time for another change. So here I am working from an office at home. I’m going on four months of this, and I haven’t yet driven my wife Anne (Carleton class of ’64) bonkers. I have two current projects. One is a book titled “What’s So Hot About Volcanoes”, soon to be published by Mountain Press of Missoula, Montana. My editor for this book is Jenn Carey, another Carleton grad and geology major. Current project number two is being a wet-behind-the-ears “cub reporter” for an e-newspaper/magazine called suite 101. I have nine stories posted as of mid April, and I hope to write a few more as the muse strikes. All of my postings so far are earth science related — a couple of them about the Upper Midwest. You can see what I’m up to by visiting www.suite101.com/profile.cfm/756033 . Anne and I still spend summers at a cabin on Round Lake, near Hayward, Wisconsin. As I type these notes (mid April), we’re packing our little RV for the drive north and east. Even our cat and dog enjoy the annual migration.”

1964. Peter D. Rowley: “I am still working a 40+ hour week as a consulting geologist. Main job is with Southern Nevada Water Authority to provide reports and expert testimony for upcoming Nevada State Engineer hearings to secure water rights for Las Vegas from upstate Nevada. Also geologic mapping of a geothermal prospect for Utah Geological Survey, etc. Still do field work & have my health, wife, dogs, horses ...”

1971. Jane M Willard, PG, CPG: “Other than having finally moved my office home (my employees work from home, too), not much has changed. I am still active with AIPG, serving on the MN section executive committee.”

1976. Philipp Muessig: I have had the good fortune of noticing a striking conglomerate at Weston Beach on Pt. Hobos in California, and then a few days later saw what I later read is a turbidite on the tip of Pt. Reyes, where it also appears thanks to the San Andreas Fault. So my geologic antennae still works!” **Will B Maze:** “I am class of 1976 with not much new to add. Still working for ExxonMobil Upstream Research Company in Houston. Most recently I have been working with a group looking at hyperextended margins around the world. A good exercise. This is our first year of having to live on a “school schedule”, as our 6 year old Alex started Kindergarten last Fall. I am hoping to get to my reunion this year, but have not signed up yet. Better do that soon.”

1977. Eric Simonson: “I just returned from Nepal where I launched my 19th Mt Everest expedition. We have now submitted over 450 people on the 8000 meter peaks of the world. Back home, my 41 year streak of climbing and guiding at Mt Rainier is still intact. Wife Erin and daughter Audrey are doing well. The latter is an aspiring ski racer and can almost beat her dad down the hill on the skis, but not quite...I still have some gas left in the tank.”

1978. Steve Ingebritsen: “I’ve enjoyed working with Noah Randolph-Flagg (2011) and Elizabeth Lundstrom (2012) at USGS/Menlo Park the past couple of years. Also visited Carleton myself in Feb., bringing my youngest daughter Emma (16). It was my first time on campus since 1983 and I had a great time. Emma was sobered by the blizzard that was passing through.”

Dorothy Davis Morrow: “Not much changes except my age! Still enjoying work, love my family - which includes (besides me and my husband), a college junior, a middle schooler and a 3rd grader. Life is full of after school activities. Perhaps I am regressing instead of aging!”

1979. Marie Del Toro: “I’ve had a great year staying busy with home, work, and play. In October, several Carls got together with JoAnn Murashige Gromberg in Los Altos. LeAnne Hogie, Janice Huwe, Chris Brick ‘79 and Georgane Callaizakis ‘79 were in attendance. Lots of laughter and fun times seeing the sites of California.”

1980. Fred Seymour: “After making a record efficiency cadmium telluride solar PV module, General Electric completed the purchase of our company and we are moving forward to build the largest P.V. factory in the U.S. !”

Mindy Bell: “We are off on sabbatical next year to Switzerland and then New Zealand. After 30 years (pew!) of teaching high school science, I will take a break and then see what I can cook up for my “encore” career when we return. Darrell will continue his climate change research and is excited to interact with colleagues in Europe and the southern hemisphere. We’re looking forward to some new adventures!” **Mark Gordon:** “I am still working in Shell’s research lab in Houston. Last year, I went to GSA which is rarity since I have been in industry. I enjoyed the Carleton reception. Otherwise, work has been a mix of field studies and seismic reflection. Ceci and I went to California and Nevada last year for my niece’s high school graduation. We managed to see the waterfalls of Yosemite at their fullest.”

1982. Heidi Wells (Bredenbeck while at Carleton): “The boys are now 17 and 12 and Dylan (the older one) is considering Carleton for college. Let’s hope he can get in! Brad and I have both been re-inventing our work lives. Brad has started a business building housing for the bottom billions and has projects in Sudan, Kenya and Haiti. With flat sales in our book wholesaling company we are re-purposing our building into a co-working/shared spaces

environment that also offers distribution services since we know how to do that and have a big old warehouse. Weird trying to start two new businesses while running the old one. I think I'm too old for this!" **Lisanne Percy:** "I'm continuing my second year of part-time teaching Introductory Geology of the Pacific Northwest at Chemeketa Community College in Salem, Oregon. It's been a huge amount of work getting back into teaching and geology after an 18-year hiatus – What's Powerpoint? – but I'm loving it! I'm also enjoying reconnecting with other Carleton geo majors via GSA and Facebook." **Peter Wiegand:** "Almost one year in Scotland. We survived the move and have settled in here. Have been busy with Dad duty and consulting work on the side. Beautiful country and nice to be close to lots of cool places in Europe. Happy retirement Tim; come and visit!"

1983. Keith Knudsen: "Starting this Fall Annie and I will be empty nesters, with both kids off at college. Thus, we have empty bedrooms for visitors to the San Francisco Bay Area. My son plays for his school's ultimate team, and unlike the teams I played for at Carleton, last year his team went to nationals. I'm 3 months into my new job with the USGS in Menlo Park, helping to run the earthquake program in the west." **Laura Ferguson Jacobson:** "Stay at home Mom" isn't going to fill my job title needs much longer. Launching my second son off to college. One more to go. Still enjoying life and very long winters in Northern Michigan. Best wishes to Tim in his well deserved retirement." **Jeff Pipes:** Jeff ('83) and Florence ('84) write that they are still making wine at Pipestone Vineyards. "We are involved with the soil and geology every day in a way that we never imagined! The wines are good and we invite all Carls (Geology Majors or not) to come visit us on the Central Coast of California!" Jeff writes that he took Grace (2018?) to England last summer. He says "the science guy made a huge mistake by promising to take her to the UK if she increased her reading of the Classics, saying something like, "if you read everything Jane Austen ever wrote...." Well there are only 6 or so novels that Geo majors weren't required to read (I had figured 20 or 30!). Gwen (2021?) is the fastest girl in 7th grade...where did that come from? Hi to all, we'd love to have you visit the winery and vineyard!"

1985. Liz Reading: "After years of watching my children go through the Waldorf School, I'm finally going back to school to get my Waldorf Elementary teaching certificate -- which will qualify me to teach and follow a class from grades 1-8. Lots of responsibility, but pretty exciting as well. Can't wait for 6th grade -- earth science block!"

1986. Sean McKenna: "Looking forward to our 25th Reunion this summer and helping Tim Vick enjoy the start of his retirement. Our daughter, Libby, just made the decision to attend Carleton! She'll be in the class of 2015. I'm

still working in the Geosciences Group at Sandia National Laboratories. A project I have led for the past 6 years to develop online water quality event detection software (CANARY) for the US EPA was recognized with a 2010 R&D 100 Award by R&D magazine - the awards ceremony got me into a tuxedo for the first time since my wedding."

1987. Christopher Carlson: "I have now been working for the US Forest Service in Washington on groundwater policy and management issues for almost six years. I am currently detailed into a management position with responsibilities for management of water and aquatic biota. The administration is very interested in water resources and has clearly made that a priority for the Department of Agriculture (USDA - the parent organization for the USFS). That has resulted in a number of agency and department level efforts underway to improve the management of water on lands influenced by USDA programs - which is much of the rural and some of the non-rural landscape in the country. Opportunities abound for potentially influencing how 193 million acres of public land and many hundreds of millions of acres of private lands are managed. My wife, Martha Anderson (also Carleton '87), and I are having a great time with our 5-year-old son Niklas. He is starting to read and is interested in soccer and music (at least at the moment). Best wishes to all. If you are going to be in the DC area, look us up.

1990. Andrew Garrett: "I have finished my first year in DC, and the job has been challenging and interesting. Amelia is almost 3 years old and we just got back from a great trip to Zermatt, Switzerland- I've always wanted to see the Matterhorn..." **Rebecca Arenson:** "It has been an interesting & difficult month. My supervisor (the other half of our 2 person program) died unexpectedly this month, leaving a big hole & a very shocked, sad office and maritime community. On a more positive note, I'm involved in writing one of the Strategic Action Plans for the National Ocean Policy."

1993. Britta & Kevin Gustavson: "Our daughter, Svea Brook Gustavson, was born on 1/11/11. She's more delightful than we could ever have imagined. We are also enjoying the fruits of our labor from replacing our lawn with native plants and watching Spring rains fill our many rain gardens. Kevin is working for the Oklahoma Conservation Commission promoting and implementing practices for clean water, such as rain gardens. He also teaches in the Environmental Science Graduate Program at OSU."

Beth Pratt-Sitaula: "The family is finally back together again (now in Pullman WA)--I quit my faculty job so that we could all live together after 3.5 years split. I'm having a great time spending more time being Mom and slowing working away at education projects past, present, and future."

1995. Roy B. Luck: "Working on deep water develop-

ment in the Gulf of Mexico in a safe manner, looking forward to vacation in Vancouver BC this summer with family - wife Celestina and sons Gabriel (5, kindergarten), Alex (3, preschool)."

1996. Sara and Dave Mitchell: "Our big news is that Dave and I welcomed daughter Lucy Jean Mitchell into the world on February 1, 2011! Big sister Anna (who turns 3 in August) loves to play in the sand, collect rocks, and learn about dinosaurs." **Karissa Baker:** "Life with our two-year-old daughter Margaret and our five-year-old son Theo is very full! Theo is starting kindergarten in the fall and I have no idea how that is happening already. Where has the time gone? I'm looking forward to seeing many of you at reunion in June!"

1998. Frances Watson Lengowski: "Still enjoying life in Virginia!"

1999. Hig Higman: "I think it's been a little while since I've sent in an update. Still living in Seldovia in a yurt, now with a second kid (girl, Lituya, born 1/1/11, named after the bay famous for the tsunami in 1958). The non-profit I'm involved in running (Ground Truth Trekking) is working on open-source online data presentation software, researching metal mining in Alaska, and planning an expedition that my wife and I will be going on with our 2.5-year-old and 10 month old this fall. We're going to spend 2 months living in a forest that grows on top of a gigantic and rapidly melting glacier. Details on our website (www.GroundTruthTrekking.org)" Sounds like a great adventure!

2000. Deb Goodwin: "I feel incredibly fortunate this year: finished that pesky PhD and started as Oceanography faculty and Chief Scientist at Sea Education Association. Looking forward to sailing with many Carleton students in the coming years!" **Alex Barron:** "I'm still in DC and I've taken a position in the Office of Policy at the EPA. It's an exciting time to be at the Agency; I'm working on policies to reduce emissions of GHGs, Hg, SO₂, NO_x, etc., as well as helping to debunk various misleading claims being made about what we're up to." **Luc Mehl:** "I'm looking forward to getting back in the classroom this fall as a science/math instructor at a small university in Anchorage. I'm taking advantage of the transition period to get a lot of time in the mountains. I've covered over 700 miles so far this year-just finished a 200 mile bike/ski/raft traverse over Denali. Feeling lucky and spoiled!" **Nina Berglund:** "Gus and I welcomed our daughter, Juliet Jean, to the world on 10/09/10. We've recently relocated to Arizona where I am working as an environmental planner for an engineering consulting firm in Tempe."

2001. Carl Tape: "My wife (Elisabeth Nadin) and I enjoyed our first year as new faculty at University of Alaska Fairbanks. Plenty of geophysics and geology opportunities in Alaska -- and plenty of wilderness opportunities as well!"

Our son Leo turned 1 in March and seems to enjoy life in Fairbanks." **Kate Anders:** "After 5 years running the training program for a local Humane Society I've started my own business - Positive training for real families & real dogs. My son just turned two (Anno) and is wild and fun. My husband Andrew and I enjoy running, ultimate & parenting. Life is generally wonderful!" **Kevin Jacobs:** "I just finished my tenth winter of teaching snowboarding in Aspen, Colorado. It's perhaps not the best usage of my Geology degree, but it's a dream job and always a lot of fun. This upcoming summer and fall seasons, I will attempt an end-to-end hiking expedition along the Continental Divide Trail. If successful, I will have completed the "Triple Crown" of long distance backpacking, having thru-hiked the Appalachian Trail in 2002 and the Pacific Crest Trail in 2005. I'll be sure to send a postcard to the Geo department when I'm hiking this summer. Please invite any interested alums to stop by my online journal at; <http://www.trailjournals.com/kjjcdt>. The journal is all preparation work now, but it will get pretty interesting with photos and entries starting on 6/21, just after the reunion. In the meantime, say "hi" to anybody that's still around and still remembers me (Mary, Clint, & Bereket...and Isaac????!! That's so cool, he was my year.).



Nina Berglund 2000 and daughter Juliet Jean

2002. Alyssa Thomas: “I have just started my PhD in environmental studies. I will be looking at illegal resource use in New Zealand marine reserves and what factors influence this behaviour. Other than that I’m still loving life in New Zealand but not looking forward to it being winter already!”

2003. Tiffany Larsen: “I am loving central Oregon! I am enrolled in a GIS certificate program at COCC. My employment at REI complements my outdoor enthusiasm!”

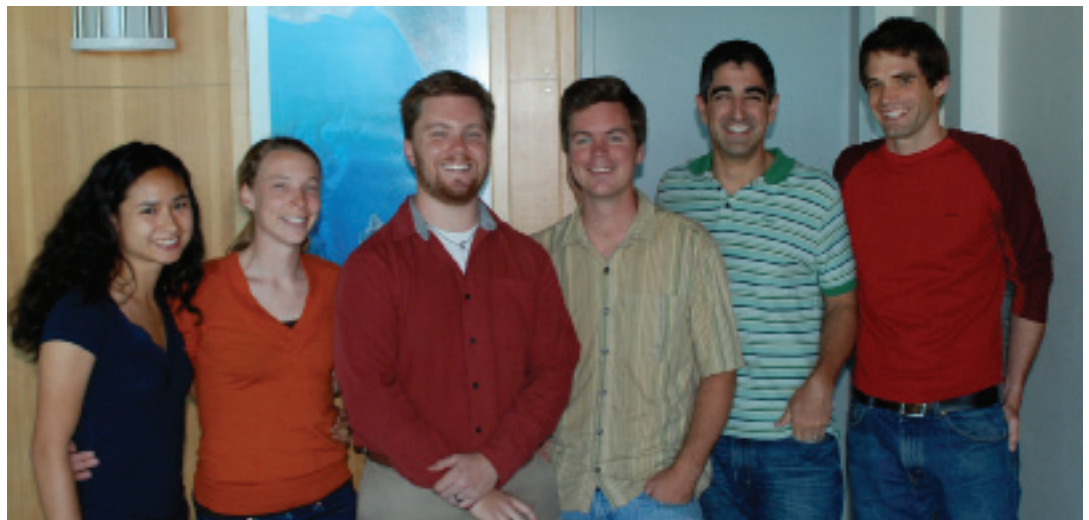
George Tangalos: “Enjoy all the wilderness Utah has to offer - powder skiing to red rock canyons and everything in between.” **Benjamin Harrison & Megan Rohrsen** (‘07): “Ben will hopefully graduate this spring and start up a Post coc at University of Minnesota. Hooray for being back in the Midwest.” **Elizabeth (Liz) Casrel:** “Just finished the year at F & M including teaching a really fun sed/strat class and a dept. field trip to Death Valley. Heading to Austin, TX this fall to start a two year post-doctoral fellowship in the Jackson School of Geosciences, where I’ll be working on western north and south American mountain landscape evolution.”

2004. Bess Koffman: “I’m still working on my PhD at the University of Maine, where I study atmospheric dust in the climate system using the new WAIS Divide deep ice core from Antarctica. Playing fiddle and frisbee in my spare time, and gardening and raising chickens too. Life is good!” **Joseph Graly:** “Having finished my Masters this September, I traveled around the world in the fall including by train from Moscow to Beijing. This January, I started a doctoral program at University of Wyoming, studying under Neil Humphrey, the mad genius of glaciology. In February, my son Thomas was born. So all in all an eventful year.”

2005. William Gallin: “Pam Moeller (2005) and I took a fun trip to Israel, Turkey, and the Romanian airport.”

Karla Knudson ‘05, sent in this photo of Carleton Geology Alums at the Earth and Planetary Science Department at the University of California-Santa Cruz! Karla says “We are all having an awesome time in the mountains and redwoods overlooking the ocean! It doesn’t get much better than this!”

From left to right,
 Karla Knudson ‘05,
 Rachel Brown ‘06,
 Brandon Murphy ‘04, Don Penman ‘07, Noah Finnegan ‘99, Kelsey Dyck ‘06.



2007. Ellen Root: “This past winter, with three other people and twelve dogs, I traveled 900 miles by dogsled across the Northwest Territories of Canada. Along the way we traversed Cretaceous seafloor deposits and Precambrian shield country, with evidence of past glaciation abundant throughout. Unfortunately, most of the rocks were covered by snow. I had fun anyway.” **Susan Schnur:** “I’m just finishing up my MSc in GIS at the University of Zurich. In the Fall I will be heading to Oregon to start my PhD in Marine Geology at Oregon State University, where I will be studying seamounts and hotspots.”

2008. Tyler Mackey: “This past fall was my first field season in Antarctica, spending a couple of months out in the Dry Valleys investigating microbial mats growing in ice-covered lakes. I also had the good fortune to run into Perry Spector in McMurdo after my field season wrapped up. I’m working to finish my masters this summer before continuing for a PhD out here at UC-Davis on the same project.” **John Nowinski:** “I finished a Masters degree at UT Austin last summer and have started working on a PhD. I also had my first papers published, which was very exciting!” **Katie Bovee:** “I’ve ventured out to the West Coast this past winter and now am working as a field science educator at Olympic Park Institute, a campus of NatureBridge, in Olympic National Park. Basically I teach students how to play in the out-of-doors by looking for macro-invertebrates, testing dissolved oxygen levels, measuring all things to do with trees, and climbing mountains.”

2009. Tiffany (Cox) Leonard: “On August 28, 2010, I married Jason Leonard, a childhood acquaintance and newly discovered love of my life. Starting in the fall, I will be entering the PhD program in Seismology at the University of Illinois, Urbana-Champaign. Hopefully the condemned part of the building won’t fall in on us and disrupt our research.”

2010. Nate Ryan: “In addition to freelance photography and photo assisting work in the twin cities I have been working for Minnesota Public Radio as the video intern for the The Current and Classical MPR”



Ellen Root '07 pictures from her dogsled trip across the Northwest Territories of Canada



