

Fall 2009

UMD

Geological

Sciences

## Geological Sciences Newsletter for Alumni &amp; Friends



## News from the Department Head - Ron Morton



How about the spiffy, new look to the newsletter? After 15 or more years of the same format and style we thought it was time for a make-over. As you read through the newsletter, I hope you approve of the changes; either way I would appreciate your opinion, so don't hesitate to e-mail me.

The newsletter is not the only change in the department. Because Howard Mooers has taken on the administrative responsibility of the UMD honors program, I find myself head of the department. Forsooth and gad-zooks I might say - certainly a rather unexpected turn of events. I was anticipating being able to retire without having to do this job - almost made it!

I am very pleased to tell you that the University honored two of our faculty during the past year. Vicki Hansen received the Chancellor's Distinguished Research Award for her work on rocky planets (especially Venus) and for her exceptional contributions to student research. Tom Johnson was selected Regents' Professor, which is the highest university recognition for faculty. It is given to those individuals who have made unique contributions to the quality of the University of Minnesota through exceptional research and teaching. There have only been two Regents' Professors from UMD, and I am pleased to say both have come from Geological Sciences (Rip Rapp was the first). Also, Dr. Wanda Taylor (B. S. 1982) was selected as our outstanding alumnus this year and inducted into our college's Academy of Science and Engineering. Wanda is the sixth recipient of this very special award, and each year the faculty has great difficulty choosing an awardee because we have so many outstanding alumni!

Speaking of outstanding alumni, I had the pleasure of visiting with several of you this fall when you stopped by the department on your trips to Duluth. You are always welcome in the department, which I hope you still consider *your* department. It is your generous donations that allow us to maintain the vitality and diversity of our program and to support our undergraduate and graduate students in ways other departments cannot. In these difficult economic times, with continued University budget cuts, I thank you all so much for your continued support. We gave out over \$20,000 in scholarships to our undergraduate and graduate students, including paying for our students' field camp tuition as well as subsidizing field trips to the Sedona, Arizona, area and to Iceland.

We are also adding a new option to our B. S. degree. It is a mining and mineral exploration option, in which students will take our core curriculum plus additional courses in economic geology, exploration geology, geological maps and, with the Civil Engineering department, engineering geology and mine design and operation. They will also take a mineral processing course offered through the Chemical Engineering department. I find this addition exciting. Not only is it a valuable collaboration between departments, it also continues our long tradition of "practical geology," while achieving our ultimate goal of preparing our graduates for work in industry or graduate school.

As for me, I'm teaching the Introductory Geology course (240 students) and half of Economic Geology, as well as trying to figure out how to be a department head. Other than that I continue to write (a sequel to Talking Rocks called Ancient Earth and the First Ancestors), cook, and hike with our eleven-month old Brittany spaniel.

Overall life is pretty darn good, and I sincerely hope this finds you with the same outlook on the past and coming year. Take care, have fun, and stay healthy.

## Fall 2009 UMD Geological Sciences

### To Our Donors:

The Department of Geological Sciences would like to warmly thank the following alumni and friends who supported our students and programs with a charitable gift in the past year. Listed below are the names of individuals and organizations who donated to the Geological Sciences Department funds. Thank you for your generous contributions.

Anderson, Curtis	Fiskness, Andrew	Jones, Jeffrey	Nash, Mary E.	Thole, Jeffrey T.
Bacig, Edward	Fitz, Thomas III	Jongewaard, Peter	Niendorf, Christopher	Tieberg, James E.
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Beaudet, Nancy	Frantes, Thomas J.	Lang, Nicholas P.	Ojakangas, Dennis & Eileen	Wahlstrom, Robert
Breckenridge, Andy	Gasser, Michael M.	Larson, Phillip & Katie	Ojakangas, Richard & Beatrice	Welsh, James
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Cartwright, Alyson	Granley, Melinda & Jered	Mattson, Peter	Ridnour, Jennifer	Williams, Telford
Christensen, Odin	Grant, James	McLimans, Roger	Ripley, Edward	
Costello, Joanne H.	Gravel, Louis P., III	McManus, Jeffrey	Scheafer, Stephen J.	
Crain, William C.	Green, John C.	Miller, Marsha	Sellner, Linda Ross	3M Foundation, Inc.
DeLong, Stephen	Hjerpe, John (family fund)	Mohn, Patrick	Skelly, Michael F.	Chevron Texaco
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Everett, Jack	Holst, Timothy	Morton, Penelope	Switek, Elizabeth	MN Section SME
Everett, Karl & Kerry	Hudak, George	Munter, James	Swor, Terrance E.	Shell Oil Co. Foundation
Fashbaugh, Earl	Johnson, Beth	Murray, Gloria & George	Syversen, Kent M.	US Steel Foundation, Inc.

### Student Scholarships , Awards and other Mentions for 2008-2009

#### Outstanding Graduate Student Award:

Sally Goodman, Phil Larson

#### James R. Frantes Graduate Fellowship:

Jakob Wartman

Rubesch, Dan Rangitsch, Bill Troolin, Nick Watkins

#### Outstanding Graduate Teaching Assistant Award:

Shelby Frost

#### Field Camp Scholarships:

**R.C. Bright Field Camp:** Mike Anderson, Lexi Beadell

**Lempi M. & John W. Pagnucco:** Mike Anderson, Lexi Beadell, Mike Beyer, Lucas Lundgren, Megan (Pierce) Rubesch, Dan Rangitsch, Bill Troolin, Nick Watkins

#### Outstanding Senior Award:

Megan (Pierce) Rubesch

**Robert L. Heller Field Camp:** Mike Anderson, Lexi Beadell, Mike Beyer, Lucas Lundgren, Megan (Pierce) Rubesch, Dan Rangitsch, Bill Troolin, Nick Watkins

**Estwing Geology Field Methods Award:** Adam Salzer

#### Hugh Roberts Scholarship, Outstanding Junior Major:

Kathleen Grigg

**“Rip” Rapp Field Camp:** Mike Beyer, Lucas Lundgren, Megan (Pierce) Rubesch, Dan Rangitsch, Bill Troolin

**Iceland Field Camp Scholarships:** Mike Anderson, Teddy Berg, Lexi Beadell, Kirsti Hakala

#### SME Tools-Of-The-Trade Award:

Julia Halbur, Kathleen Grigg and Adam Salzer

**Charlie Matsch Field Camp:** Mike Anderson, Lexi Beadell, Mike Beyer, Lucas Lundgren, Megan (Pierce)

**The American Association of Petroleum Geologists (AAPG) Foundation Award:** Melissa Berke; AAPG Grants-in-Aid for individual research for (2009)

#### Roderick Syck Field Camp Scholarship:

Megan (Pierce) Rubesch

### Undergrad Student Presenters & Contributors

#### 2009 Spring UMD UROP Showcase

#### University of Minnesota Duluth 2009

**Johnson, Grace**—“The Importance of Shields on Venus”

**Rubesh (Pierce), Megan**—“Core scanning of Lake Chalco sediments in Mexico City”

**Leitheiser, Cara**—“Age and Morphology of Neoglacial Moraines, Skaptafell, Iceland

**Stifter, Eric**—“Igneous Mesocycles at Spirit Mountain”

**Lundgren, Lucas**—“Lake Malawi Mineralogy”

## Grad Student Presenters & Contributors

### 55th annual Institute on Lake Superior Geology 2009

#### Ely, Minnesota

**Costello, D.E.**, "Geology of the Tuscarora Intrusion, northeastern Minnesota, and its relationship to the Anorthositic Series of the Duluth Complex"

**Dayton, R.N.**, Miller, J.D. Jr., and Vervoort, J.D., "Quantifying Assimilation vs Fractional Crystallization using Sm-Nd, Lu-Hf and Pb Isotope Systems: The Geochemical Evolution of Sonju Lake Intrusion, Finland, Minnesota"

### American Geophysical Union 2009

#### San Francisco, California

**Berke, M.A.**, Johnson, T.C., Werne, J.P., Schouten, S. Sinninghe Damste' J.S., "The Thermal history of the East African Rift lakes Region Since the Last Glacial maximum Using TEX86 Paleothermometry"

**Gary, J.L.**, Wattrus, N.J., Colman, S.M., **Voytek, E.B.**, "Characterizing the Discharge Features of Glacial Lake Agassiz during the Post-Marquette Period Using Marine Seismic-Reflection Methods"

**Petrick, B.F.**, "A Sub-annual-resolution record of East African Climate from Lake Malawi for the past ~1200 years"

### Geological Society of American 2009

#### Portland, Oregon

**Costello, D. E.**, & Miller J.D. Jr., "Bedrock geologic map of the Tuscarora Intrusion, of the Duluth Complex, northeastern Minnesota; An investigation into the petrogenetic relationship between the layered series" and the anorthositic series

**Hoaglund, S.A.**, Miller, J.D., Crowley, J. I., and Schimtz, M., "U-Pb zircon geochronology of the Duluth Complex and related hypabyssal Intrusions: Investigating the emplacement history of a large multiphase intrusive complex related to the 1.1 Ga Midcontinent Rift"

**Stifter, E.A.**, and Miller, J.D., "Cyclical phase layering in the Duluth Complex at Duluth: Evidence for periodic magma venting from a shallow staging chamber"

### Gordon Research Conference 2008

#### New London, New Hampshire

**Berke, M.A.**, "The Holocene thermal history of East Africa: TEX 86-based sediment records from Lakes Turkana, Albert, and Malawi"

### International Meeting of Organic Geochemistry 2009

#### Bremen, Germany

**Berke, M.A.**, "Temperature Reconstructions of the East African Rift Lakes Region"

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## Current Faculty News

### Erik Brown

**Research** - I'm continuing to develop new projects using our x-ray fluorescence core scanner (still one of two instruments of this type in the US). Basically, you can put a 1.5 m sediment core section into the device and after a few hours have mm-scale measurements of a suite of a dozen or more elements (for example, Al, Si, S, Ca, K, Ti, Mn, Fe, Rb, Sr, Zr, Pb). I have been working to finish up projects that use the XRF for evaluation of drill core taken in East Africa (in collaboration with Tom Johnson) and in western China (with Steve Colman), but I have just received new funding for projects examining the climate history of southwestern North America (very relevant for water resource usage in this country).

**Travel** - I traveled to China for a week in August to work on wrapping up the initial publications from the Lake Qinghai drilling project. I spent a week in Germany in February (cold, dark and damp) working with colleagues on time series analyses of some of the East African climate records, and a week in Mexico in June working to spin up a new project on Lake Chalco.

**Family** - We try to get to the cabin with the kids (Andrew, 13; Lianna, 11; and Matthew, 7) most weekends from June through August. Now that the school year has started, we are finding out about the fun of coordinating the lives of three kids attending three different schools!

Two students working with me completed their masters degrees this year: Marian Kramer (WRS M.S.) Holocene climate and environmental change inferred from White Owl Lake sediments, White River Plateau, Colorado and Benjamin Petrick (Geology M.S.) A sub-annual record of East African climate for the past 1200 years from Lake Malawi laminated sediments.

## Steve Colman

As I look over the past year, it seems like it flew by. Teaching Glacial Geology with Howard Mooers took a lot of my attention in the spring, capped off by an overnight field trip challenged by spring weather. Field work this year included seismic surveys on Lake Superior, Elk Lake, Minnesota, and Mono Lake, California, interspersed with various other kinds of travel. The highlight of the summer was a trip to China, where I gave lectures in Beijing and Lanzhou. Grad student Xiuju Liu accompanied me, and we met up with Erik Brown in Xi'an to work with our Chinese colleagues on the NSF-supported Lake Qinghai Drilling Project. We'll have a great paleoclimate story if we can ever get our chronology straight. Miao Du is finishing a related M.S. project on the paleoclimate record of Peiku Co, a lake in Tibet. Our NSF project (with Nigel Wattrus) to look for evidence of Glacial Lake Agassiz discharge into the Superior basin is progressing, with grad students Jessica Gary finishing her M.S. and Emily Voytek in her second year. Other activities include collaborations such as the Elk Lake and Mono Lake projects, and an invited lecture at the Gustavus Adolphus 45<sup>th</sup> Nobel Conference, a meeting attended by more than 5,000 people, which was truly impressive. Outside UMD, I continue my work with the National Geographic Committee for Research and Exploration, and I have recently joined the Scientific Steering Committee of PAGES (the Past Global Changes project of the International Geosphere-Biosphere Programme), whose Open Science Meeting I attended in Corvallis, Oregon in July. In my spare time, I try to keep LLO from bursting at the seams, since we now have ten faculty, five postdocs and research associates, and twenty-nine graduate students. We all seem to keep busy.

## Christina Gallup

The major accomplishment of the last year has been the birth of our twins, Max and Sophie, on May 31st. Everyone tells you how much things will change once the babies arrive, but there is no way to truly prepare for such a life changing experience. The twins are a delight and Chris and I are enjoying them every day. We thank the Geological Sciences Department for their incredible support throughout my pregnancy and maternity leave.



## John Goodge

I was on sabbatical leave the past school year and relished in the quiet time to focus on lab work, research proposals, and writing. I'm somewhat caught up in getting manuscripts out the door, which I couldn't have done without that big block of time. Antarctica continues to be my main line of research, focusing on both the ice-covered Precambrian shield of East Antarctica and the Ross Orogen mountain belt. Because some 98% of the East Antarctic shield is hidden, my colleagues and I have taken several approaches to uncover information about its structure, composition and age: through-the-ice geophysics (mainly gravity, magnetics and radar), sampling of glacial debris stranded in the Transantarctic Mountains (which represent material eroded from the ice-covered interior), and sampling of glacial-marine deposits from drill-core, piston core and dredging that contain materials eroded from inland areas and deposited on the continental shelf. Our petrologic, geochemical and U-Pb age data from the glacial and glacial-marine sediments expand our understanding of the on-land geology, allow us to track changing glacial sediment outputs through time, and strengthen geotectonic connections between East Antarctica, southern Australia and southwest Laurentia.

With Bryan Bandli we're still fine-tuning the SEM for quantitative analysis of mineral compositions and micro-diffraction analysis of textures using a tool called EBSD. Now that the SEM is almost two years old, it turns out we'll be moving it sometime in 2010 after we construct new lab space in the MVAH building where we will combine instrumentation from Geology and Chemistry under one roof. The idea is to house a number of instruments for imaging and analysis of materials in a central lab with open access to both UMD and outside users. During sabbatical I also had extended time to work with colleagues and collect new data in Colorado, Washington and Australia, and to attend meetings in Scotland and Chile.

Aside from that, my son Casey and I both got our open-water scuba certifications and have some future targets in mind. We made some dives off Cozumel last spring and then tried Lake Superior a couple of times over the summer, but we think we'll be looking for something warmer next time!

With the start of a new year, I'm excited to be back in the classroom teaching Advanced Petrology, Petrology and Tectonics.

## Karen Gran

Greetings! The exciting news this year has been a return to Mount Pinatubo after seven years away from the Philippines. In the early 2000's, I was involved in tracking channel evolution and sediment transport in rivers that were hit hard by the 1991 eruption. I recently received funding from NSF and from a U of M Grant-in-Aid to return to the same locations and continue the work from earlier this decade. I was able to take two UMD undergraduates and one graduate student over to Pinatubo for a month this August. It was amazing to see how much change had occurred, and most exciting was the return of vegetation to the braidplain. I am starting up a new project with a colleague in France, Michal Tal, investigating the interactions between the vegetation and braided river dynamics in this highly energetic aggradational system. Emily Dunn is working on aspects of this for her M.S. work at UMD. In January, I will be heading over with Emily and two more undergraduates for an additional two weeks of field work. I'm looking forward to spending some time there in the dry season for a change.

My project in central Minnesota investigating sediment sources and transfer in the Le Sueur River basin continues. Andrea Johnson, who is finishing her M.S. soon, has been studying the Late Pleistocene-Holocene history of the valley and its effect on modern sediment loading through an analysis of hundreds of terraces that have developed in the basin. I also have two Ph.D. students that I am co-advising in the Twin Cities working on bluff erosion and bedrock strath terrace development. They all keep me busy!

I always try to keep a few "science in your backyard" projects going locally. Liz Minor and I have been sampling storm events on Amity Creek in east Duluth tracking patterns and rates of sediment and carbon fluxes out of the system. Unfortunately, it was a dry year, which makes storm research tricky. I also got a chance to set up some survey lines on the upper Sucker River, at a site slated for habitat improvement work. This project is designed to both track the effectiveness of restoration techniques in a North Shore stream while providing a great site for my fluvial geomorphology students to work on class projects.

## Tom Johnson

The year started out with a bang, with an expedition to Lake Malawi, East Africa (what, again??). Three undergrads (Ryan Birke-meier, Ehren Inkel and Meg (Pierce) Rubesch) and two grad students (Melissa Berke and Brittany Kruger) accompanied me on the trip, and learned about the challenges of working overseas – clearing cargo through customs, living and working on an African trawler, overcoming seasickness, modifying a sediment corer to work better – as well as reaping the awards in the off hours – snorkeling among schools of brightly colored cichlids, rock climbing, and night life in the village of Chilumba! The January cruise was a success and the undergrads followed on with undergraduate research projects, analyzing the sediment cores brought back to Minnesota. Brittany Kruger (Chemistry Ph.D. student advised by Liz Minor) will be analyzing different organic compound groups for their carbon-13 and -14 content to determine the relative contributions of land and lake derived organic matter to the offshore sediments.

We continue to analyze the long drill core from Lake Malawi, mainly for geochemical signals of past climate change. Thanks to Ph.D. students Martijn Woltering (Chemistry) and Melissa Berke (Geology and Geophysics), we now have records of temperature and drought that extend back 150,000 years. These are the longest, continuous records of climate variability from anywhere in Africa, and they provide a fascinating environmental backdrop to the cultural development and dispersal of our species out of Africa during that interval.

Perhaps the most exciting event of the year was the arrest of my graduate student, Kelly Wendt, in Brazil last June! Kelly is doing a M.S. thesis on some Minnesota lake cores. He has become a master corer in the field, and because of this he was asked to help out on a lake coring project in Brazil run by the University of Arizona. Kelly accepted the invitation and not long after arrival in the country, was arrested along with two Arizona grad students and two Brazilian students under suspicion of illegal collection and trafficking of mineral resources. The Brazilians were released on bail within a day, but the three American students were kept imprisoned for over a week, then released without passports, requiring them to remain in the country for another two to three weeks before they were finally allowed to return to the U.S. Many at the Universities of Arizona and Minnesota were in daily contact with Brazil, our congressmen, families of the students, and the international science community, working to resolve the issue. Way to go, Kelly!

## Jim Miller

2009 has been a busy and rewarding year as a second year faculty member of the department and director of the Precambrian Research Center. In the spring term, I got to delve into my specialty by teaching Igneous and Metamorphic Petrology for the first time. I filled in for John Goodge, who normally teaches the class, while he was on sabbatical. It was a lot of work putting together three lectures and two labs each week, but thankfully John provided me with lots of resources, especially on the metamorphic side. It was also great that the seventeen students were a very engaged and enthusiastic group. The highlight of the class was a weekend trip to the UP. Last spring I also taught Geologic Maps for the second time and this time without the assistance of Vicki Hansen, who was also on sabbatical. This fall term, I am co-teaching Advanced Petrology with John Goodge to six of our current graduate students. Speaking of graduate students, I am currently advising seven students: three in the writing phase, two in the soon-to-be-writing phase, and two new students who are just developing their projects. All six are working in some aspect of mafic layered intrusions, particularly the Duluth Complex. I hope Chris White, Brian Goldner, and Dan Costello will be able to defend by year's end or early in the new year.

While my teaching responsibilities kept me more than busy last spring, added to these were my duties as PRC director. The PRC played host to the 2009 Institute on Lake Superior Geology held in Ely last May. With the help of my PRC co-directors, George Hudak and Dean Peterson, and NRRRI staff, we put on a pretty good meeting that had the third highest attendance (214) in the institute's 55-year history. Spring also involved planning and registering students for the third Precambrian Field Camp, which was also a rousing success. We had nineteen students from seventeen different schools attend. Three of these students are new graduate students in the department. If you would like see some photos and the maps produced from the past three years of the field camp, visit: <http://www.d.umn.edu/prc/fieldcamp/>. This fall, I was the principal organizer of the PRC's second Professional Workshop. The workshop dealt with field, petrographic and mineralization characteristics of mafic layered intrusions and was attended by nineteen participants and involved seven instructors. Check out the workshop website at: <http://www.d.umn.edu/prc/workshops/F09workshop.html>. Finally, I would be remiss in my duties as PRC director if I didn't ask that you check out the PRC membership page <http://www.d.umn.edu/prc/memberships/> and consider becoming a supporter. Thanks, and have a great 2010.

## Howard Mooers

Greeting's earthlings. Yes, I am still teaching astronomy and serving as director of the Marshall Alworth Planetarium. However, you probably noticed that I am no longer department head. I stepped down because I was asked to take over as director of UMD's Honors Program. The Honors Program has about 200 students across the five colleges. We just hired a half-time staff person, Jessica Saxton, and we have an office complex (that might be a bit of a strong statement) in 120 Montague Hall.

Despite my responsibilities at the Planetarium and the Honors Program, I still have an active research program. I return to England at least once a year to continue my project on the spatial and temporal distribution of acid rain during the Industrial Revolution. Our work on monument corrosion has led to some interesting results. I fully expected to find that industry was the main contributor to acid precipitation; however, it appears that residential burning of coal may have had a far greater impact. We have now extended the study to heavy metal uptake by trees. On this continent, I still have several active graduate students. John Quinn (Ph.D. working on geostatistical modeling of glacial sediments) and Irv Mossberger (M.S. working on ground-water flow and slope stability in the Nemadji River watershed) have given me advanced drafts of their theses and Jason Aronson (M.S. impacts of groundwater flow on lake hypolimnion oxygen budgets) and Heather Arends (M.S. landforms and till variability of the Des Moines lobe till) are making great progress.

On the teaching front, in addition to teaching introductory astronomy, I also teach observational astronomy. This spring I will (once again) have students in my kitchen until 2:00 a.m. every clear night as my home observatory is set up for digital imaging and stellar spectroscopy. Of course I am still teaching hydrogeology and last May I (with Phil Larson and Penny Morton) took 14 students to Iceland. That was the third time I have taught/co-taught the geology and culture of Iceland course and my fifth trip to Iceland.

I hope this note finds you all well, and if are ever on the UMD campus please stop in.



Students on the rift in Iceland

## Penny Morton

Daylight saving comes to an end—and thus it must be time to write my news! I have had a very interesting year. I am now 50% time in the dean's office (Interim Associate Dean) so my teaching load has been decreased somewhat. I am team teaching Economic Geology with Ron and leading our Graduate Professional Issues class this fall, but that is it. Tami Diedrich took over Mineralogy for this year— but I do indeed miss teaching it. The worst job that I have to do in my new position is “student dismissal”. However, by neatly arranging to go on field trips, I got out of that last year (won't happen this year). Last January the Geology Club went to Sedona, Arizona for a week and I went along. It was a wonderful trip. I finally got to see Meteor Crater!! Then in May, I joined Howard Mooers and Phil Larson on their field trip class to Iceland. All geologists need to go to Iceland – put it on your "Bucket List". As for our graduate program, it is really doing well. We had more applicants last year than ever, and we now have more grad students in residence than we have ever had, and all funded, too! We are in our third year of our GK-12 grant—and I am learning more about teaching than ever before. It supports four geology graduate students this year (and six from other programs), and they are all assigned to middle and/or high schools in Duluth. It is a rude shock for them to see teenagers in action! I continue to also manage the NAGT/USGS Summer Internship. If any of you were ever nominated for the program, please e-mail me. We are trying to see where all our previous interns are now. Even if you were not an intern, please e-mail me and let me know what you are doing.

## John Swenson

I hope this message finds everyone well. My life seems to be racing by at a typically frenetic pace. I am busy teaching Sedimentology and Stratigraphy and Earth's Resources. Both are proving quite exciting. Spring semester will see me co-teaching Well Hydraulics (with Howard Mooers). In addition, I am looking forward to teaching a new class with Karen Gran on Tectonic Geomorphology, which is the study of how tectonics and climate combine to shape evolving mountain belts.

My research interests continue to focus on distributary channel systems and clinofold dynamics. I am one year into a three-year, NSF-funded project to develop a theoretical framework for distributary channel morphodynamics on wave-influenced deltas. This project funds an undergraduate, William Troolin, to conduct independent research and assist me with gathering data and mapping satellite images of modern deltas. My NSF-funded MARGINS grant ended last summer, with my post-doctoral research associate, Matt Wolinsky, moving on to 'greener' pastures with Shell Oil Company in Houston. Meanwhile, Lisa Marlow continues her Ph.D. work on the stratigraphic and thermal evolution of the Levantine Basin (offshore Lebanon), and Marsha Patelke is working hard to finish her Masters thesis on a genetic model for iron formation in northern Minnesota. The new face in the lab belongs to Josh Allen, who just started his Ph.D. work on some very exciting and highly abstract ideas about hysteresis and path dependence in linked depositional systems.

Finally, both Sarah and I 'celebrated' our 40th birthdays last spring. We have a few more aches and pains, but overall everything continues to work quite well, so I guess we cannot complain too loudly (though we will). After recent back surgery and the ensuing rehab, I finally was 'cleared' to put in a full winter of skate skiing and a full summer on the road bike; I am no longer 25 years old, but I was pleased with my return performance! As I write this, Sarah and I are frantically trying to finish remodeling our current house so we can move four blocks down the road to occupy my childhood home, which, after 43 years, is being vacated by my parents. With any luck, we will not move again for a very long time!

## Nigel Wattrus

The past year has been a busy one, as usual, but for a change, it hasn't involved international travel! This summer saw Jessica Gary, who has been working on her M.S. with Steve Colman and me, complete and defend her thesis on the evidence for Lake Agassiz overflow events into Lake Superior during the deglaciation of the region. This was work that was funded by the National Science Foundation as part of the study that Steve and I have been working on for the last couple of years. Jessica has been admitted to the Ph.D. program in Geophysics at the University of Minnesota-Twin Cities. She will continue to work with me as her advisor. She is planning on working on imaging near-surface properties using seismic interferometry. She was awarded a very prestigious SMART fellowship (the first one at UMD) by U.S. Department of Defense for her Ph.D. studies. As part of this fellowship she will spend summers at the U.S. Army Cold Region Research and Engineering Laboratory (CRREL) in New Hampshire.

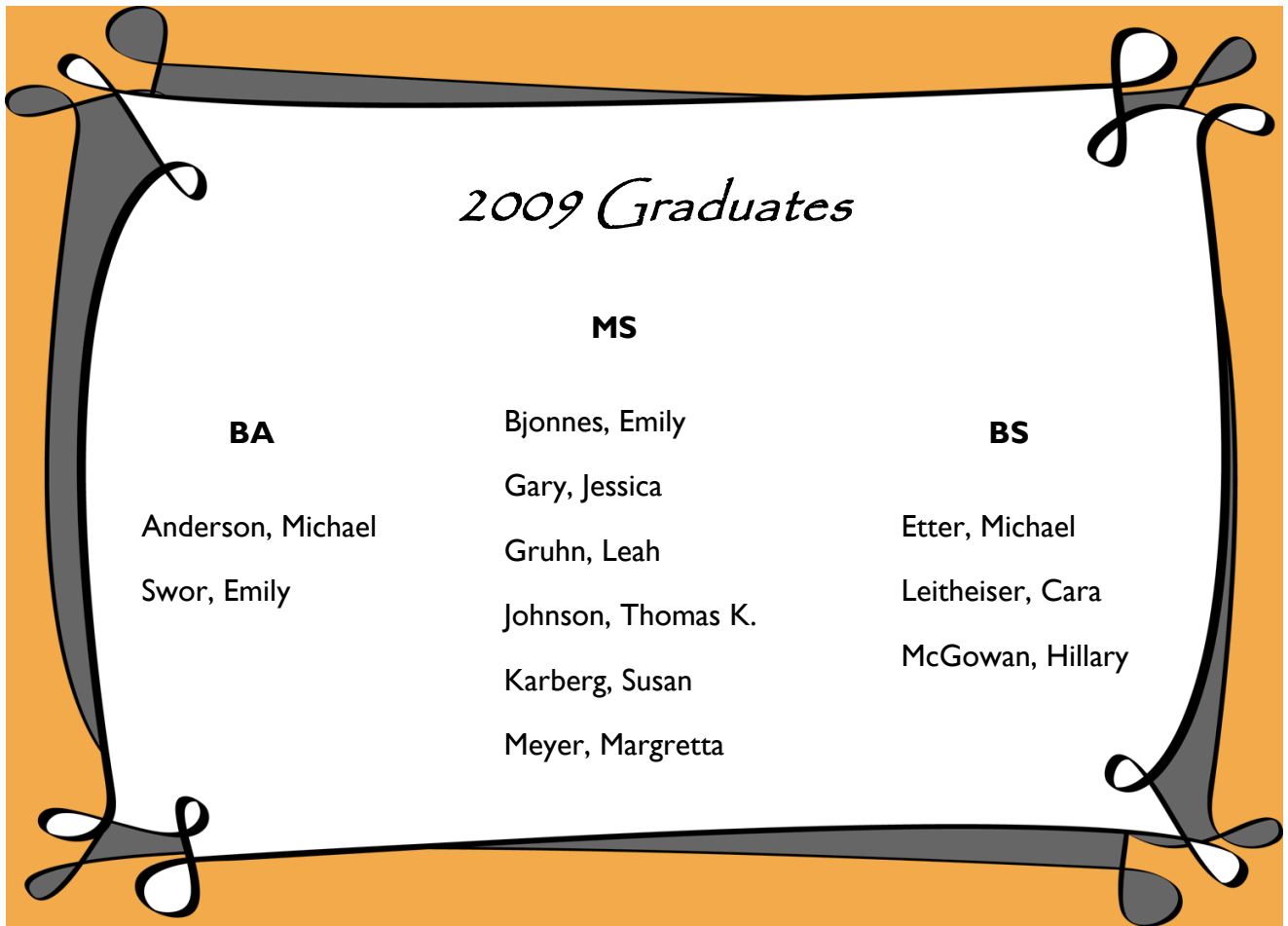
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(Wattrus, continued from previous page)

Emily Voytek, who is working on her M.S. with Steve and myself on the Lake Agassiz project, spent the summer working for the USGS on Cape Cod as a summer intern. She worked on a very interesting project that used measurements of resonance in ambient seismic noise to determine depth to bedrock. She is now busily wrapping up her M.S. thesis that is looking at the evidence for pre-Marquette overflows from Lake Agassiz into Thunder Bay. These would have ultimately made their way to the North Atlantic where it has been proposed they were responsible for triggering the Younger Dryas cooling event in northern Europe 12,800 to 11,500 years ago. We will be presenting a poster describing our work at the AGU meeting in San Francisco later this year.

We undertook one final Blue Heron cruise for the Lake Agassiz project this summer. I took the opportunity to bring along my new M.S. thesis student Dan Gustafson who joined my group this summer after completing his B.S. at Western Illinois. Dan will be investigating the origin of Lake Superior's "infamous" lake floor rings. During the cruise we were able to collect a very nice suite of acoustic data and a sediment core for geotechnical characterization of the area.

I have continued my work with fisheries scientists at the University of Wisconsin-Milwaukee to understand lake trout spawning behavior in the Great Lakes. These fish used to support a commercial fishery in the Great Lakes but were almost wiped out by overfishing and the introduction of sea lamprey to the Great Lakes after World War II. Since then, efforts to re-establish a naturally reproducing population of these fish have been largely unsuccessful. My colleagues and I are trying to understand what makes a piece of the lake floor a successful spawning site for these fish. My contribution to this effort is to use our multibeam sonar to map the shape and composition of these sites. This summer I mapped potential spawning sites in both Lake Michigan and Lake Superior. Our Superior cruise was particularly interesting in that we were able to use an ROV to look at the sites we mapped with multibeam. This work will continue in coming years.





## EMERITUS FACULTY

Jim Grant

Greetings from Lake Nebagamon! In January I submitted my paper on “Thermocalc and experimental modeling of partial melting of pelite, Morton Pass, Wyoming”, and sure enough it appeared in the *Journal of Metamorphic Geology* in August. Roughly one page per year since I started it, which may be a record. It is the first time that a quantitative model for partial melting of mudrocks had been tested against experimental data, and I certainly learned a lot in the process. What started out as an application of the scientific method ended up rather as a test of internal consistency. I’ve had lots to do on isocons this year, in the form of reviewing several papers thereon. It is good that the outcome of not understanding a UMD thesis is still in vogue.

On the home front, we did our annual trip to Baja in January, and to Park City for some skiing in February—introduced Alex (age 2½) to the mountains, and he loved it. Then we decided to mark our 45th anniversary in style, with a small-boat cruise in Alaska-Juneau-Glacier Bay-Sitka-Juneau, with Cruise West. It was completely spectacular, and worth the many pennies it took to go. I even gave a lecture on crustal processes looking at the results in Tracy Arm, and the captain took the ship right up to the face of the fjord so folk could pet these neat rocks!

Just before this, Christabel had surgery on her right thumb, due to arthritis, and I’m happy to say it’s doing well. But this month she goes in to have surgery on her right foot for the same reason, so she expects to be waited on hand and foot for the foreseeable future, I suppose. Meanwhile, Ian has been garnering a lot of publicity thanks to his show “The Relic Hunter” on the Travel Channel, which is very gratifying. However, they’re not going to continue the show - too much culture and not enough outrageousness for that channel. Maybe another channel? Lisa and Alex won’t be sorry to have him home rather than filming in Ruritania, or other fabled places. Fiona and her Mum have enjoyed working together for the Sheltering Arms Foundation, and Fiona and Ravi and Tara may be spending a while in Europe in the near future, courtesy of Siemens. So perchance this will be an excuse for us to go over again?

As we get close to the Christmas season, we wish you all a good final quarter to 2009 and a happy and healthy and more prosperous New Year.

John Green

I’m still dabbling in some North Shore-related geological projects, such as teaching short-courses at the North House Folk School in Grand Marais, advising the Minnesota Geological Survey in their ongoing program of bedrock quadrangle mapping, and preparing an educational booklet on the geology of the Grand Marais harbor area for a local group. Another interesting activity is “putting myself up for bid” at fundraising silent auctions for some North Shore nonprofits. What the winner gets is a “Geological Evaluation” of their North Shore property, after an appropriate site visit. It works well – my nonprofits get some funds, the landowners learn about their (world-famous) geology, and I get a trip up the Shore and meet some nice people.

Our usual spring mud-season getaway trip this year was a bit different, heading ESE through some less-familiar geologic provinces (Allegheny Plateau, Valley and Ridge, Blue Ridge, Piedmont, and Atlantic Coastal Plain) to the Outer Banks of North Carolina. Jan and I rendezvoused with our daughter Sarah and family from Vermont at Jefferson’s Monticello, hit a couple of Civil War battlefields, and enjoyed the wild (and locally incredibly overbuilt) beaches before we drove back along a largely different route. North Carolina and Kentucky are long! Later we had our usual summer family visit to New England in July, and will be returning for Thanksgiving.

I’m continuing to help scout the Superior Hiking Trail’s route as it makes its way southwest through the hills from north of Two Harbors to Duluth. It’s so cool to hike the completed sections after just seeing the terrain by bushwhacking through the puckerbrush (as well as some beautiful open maple woods)!

Sarah continues to enjoy country life in Vermont (lots of homegrown chickens and veggies) while developing a home craft business in sewing and design. Martha continues to work as a hydrogeologist for the USGS in Maine, along with her soccer-mom duties. Jan is deep into birding-and-environment activities, particularly the Hawk Ridge Bird Observatory (Board secretary) and the Minnesota Breeding Bird Atlas (a five-year project where she is a Regional Coordinator). She’s also on our Duluth Township Planning Commission, with a big responsibility for protecting Lake Superior and North Shore trout streams.

Hope you all have a more prosperous, healthy, and safe 2010!

## Charlie Matsch

I continue to enjoy retirement and a home base in Duluth, with the North Shore as my major playground. I enjoy sharing my favorite places with visitors and friends, via field trips and hiking. My outdoor-based activities are keeping me fit and trim. Trips away from Duluth included an April visit to southeast Arizona, based in Tucson, and forays with my friend Rip Rapp into the surrounding beautiful mountain ranges and foothills. In late May I revisited Horicon Marsh Wildlife Area in southeastern Wisconsin to “assay” the local and migrating birds. September saw me on a nostalgia trip to Utah. Hiking in old haunts from field camp days took me to such places as Park City, Big Cottonwood Canyon, Mount Timpanogos, Bald Mountain and Mirror Lake in the High Uintas, as well as places new to me like Antelope Island, where waterfowl and shorebirds by the thousands were feeding in the brine shrimp-rich waters of Great Salt Lake.

Looking back: On November 4, 1979 Dick Ojakangas and I boarded a plane in Duluth for the first leg of a trip that would take us to the Ellsworth Mountains in West Antarctica. That was thirty years ago today as I write this. What ensued was a great adventure in my life. Another great adventure was the cumulative excitement and satisfaction of being associated with UMD and the Geology Department for over thirty years. What a ride that was! Have a great holiday season.

## Dick Ojakangas

Another busy but interesting year has passed too quickly! During spring term, I taught a course for University for Seniors – “Rocks, Peoples and Penguins: A Geological Mosaic”.

In May, I attended the Institute on Lake Superior Geology in Ely. It was a pleasure to co-lead a field trip to the eastern Mesabi with several UMD grads, including Mark Severson, Peter Jongewaard, Doug Halverson, and Bill Everett, plus others who were not UMD grads.

In June I drove a colleague from India and his wife on a ten-day tour of southern Minnesota, Badlands, Black Hills, Devil’s Tower, and Yellowstone.

In August I was in Finland and then on to Russian Karelia for ten days of studying “shungites”, two Ga-old carbon-rich metamorphosed black shales that appeared to have constituted a super-sized oil field. Where remobilized by mafic sills, there are veins that are 98% carbon!

September and October Peach and I lectured on an 18-day Vancouver-Japan cruise. (The “Old Prospector” accompanied us and also spoke.) In October and November I was in India for five weeks, presented a paper at an IGCP Conference in Kolkata on Paleoproterozoic Supercontinents and doing field work on continuing projects on the Archean Dharwar Craton.

However, the high point of the year was sending in the final edited manuscript for *Roadside Geology of Minnesota*! Charlie and I were first asked by Mountain Press of Missoula, Montana, about doing a roadside for Minnesota way back in 1988! Charlie declined, and so did I. However, the idea fermented (is that the right choice of words?) in the back of my mind for years. Eventually, I enlisted daughter, Susanna, who graduated from UMD in Geology and Composition and knew computing drafting, as co-author. But when I was finally ready to really get going on the project, after retiring, she was a busy mother and real estate agent, so I ended up doing the book by myself. Meanwhile, this fall Peaches’ 27<sup>th</sup> cookbook (*Petite Sweets*) was published. AM I SLOW OR WHAT?

Here’s wishing all of you a Merry Christmas and a great New Year!

## Rip Rapp

Rip Rapp’s update always reads like it was copied directly from the blurbs from previous years. It is just that he does the same thing every year: writes journal articles and books on his archaeological geology projects [coastal change in the Aegean, Shang archaeology in China, and archaeological native copper in North America] one article and one book out so far in 2009, three articles in press. This is boring for others but fun for him. Living most of the year in sunny southern Arizona Rip is able to live an outdoor life—always looking forward to Charlie Matsch’s visit every April and also to a month in the Arrowhead region during June and July.



## Tom Johnson named Regents' Professor



Tom Johnson, former director and founder of the Large Lakes Observatory (LLO) at UMD, was recently named Regents' Professor. Regents' Professor is the highest honor that can be bestowed on faculty by the University of Minnesota reflecting Tom's exceptional contributions to the University of Minnesota in teaching and research. Tom was a tenured associate professor in Geology and Geophysics at the Twin Cities campus, but left in 1981 to accept the role of Associate Professor of Geology and Director of Limnology at UMD. The move brought him closer to his research program on Lake Superior and provided resources that were not otherwise available. However, his growing reputation in paleoclimate research and his developing research emphasis on the east African great lakes brought him national attention. Duke University recruited Tom as Director of the Duke/UNC Marine Laboratory. During his tenure at Duke University Tom emerged as "...one of the leading limnogeologists of his generation" (Dr. Michael R. Talbot, University of Bergen, Norway). This accolade is shared by all who have come in contact with Tom.

Dr. Peter deMenocal of the Lamont-Doherty Earth Observatory at Columbia University regards Tom as "...**the** leading world expert on the paleolimnology of the East African Lakes," and Dr. Eric Odada, Professor, University of Nairobi, Kenya, and Regional Director of Global Change Research in Africa says "He [Tom] is an internationally respected scientist, who has pioneered and inspired novel methods and approaches in lake and paleoclimate research in Africa and other parts of the world."

It is this reputation that Tom Johnson brought back to UMD in 1994 as founding Director of the LLO. By 2004, the LLO was recognized as the largest, multi-disciplinary limnological program at any American university with only a handful of peer research centers around the World. Tom and the faculty at the LLO built a world-class research institute from scratch with numerous major instrumentation grants funded by the National Science Foundation. In addition, to support research activities on the Laurentian Great Lakes, Tom was awarded funding from the National Science Foundation and the Minnesota Legislature to purchase and refit the Research Vessel R/V Blue Heron, the only University-National Oceanographic Laboratory System (UNOLS) research vessel on the Great Lakes.

Tom's accomplishments over the years are many. Tom was co-founder and past Chair of the Limnogeology Division of the Geological Society of America and co-founder of International Decade of East African Lakes (IDEAL). Tom has served the scientific community in nearly every capacity including scientific editor of leading journals, member and chair of national and international committees, he has served on countless National Science Foundation panels, and he currently serves on the Board of Directors of the non-profit corporation Deep Observation and Sampling of Earth's Continental Crust, Inc. For his service to the community Tom has received numerous awards including the prestigious W.H. Bradley Medal from the International Association of Limnogeologists, the highest award for excellence in research and service to the discipline. In addition, Tom has contributed over 100 papers in peer-reviewed journals including six in the journal *Science*.

But it's not just about the science says Professor Odada, who has worked closely with Tom for nearly twenty years relates, "Tom is a very strong advocate for capacity building, particularly in the regions where he carries out his research. Tom has always sought to have attached to his research projects young scientists from developing countries. From Kenya alone, Tom has directly supervised or advised at least five students who have obtained their Ph.D. degrees, and several other students have gone on to complete their Masters and Ph.D. degrees at local universities, using materials obtained from the IDEAL project efforts. Tom has also made equipment donations to the National Museums of Kenya Palynology Laboratory, as well as to other institutions in the region."

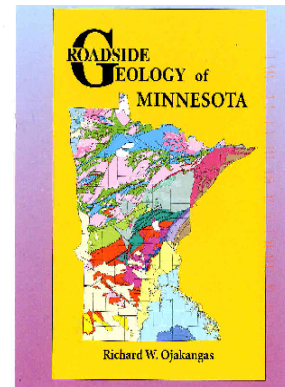
## Vicki Hansen receives Chancellor's Distinguished Research Award



The Department of Geological Sciences takes great pride in congratulating Professor Vicki Hansen for receiving the Chancellor's Distinguished Research Award for spring semester 2009. This considerable honor is given each semester in recognition of a faculty member who has been identified for their excellence in research, for their scholarly contributions to their respective field, and for exceptional contributions to student research in education. Vicki's research focuses on tectonics and structural geology, here on Earth and throughout the Solar System. She is particularly interested in how rocky and icy planets lose heat throughout their geologic history and how a planet's ever-changing thermal state affects its rheology and ability to support large-scale tectonic processes. Vicki has published several recent articles that address the thermal evolution of Earth and Venus and the potential role of bolides in triggering plate tectonics.

Prior to joining our department in 2002 as the McKnight Presidential Professor of Earth and Planetary Sciences, Vicki was on the faculty of Southern Methodist University (SMU), where she was awarded Full Professorship in 1997. While at SMU, she received the Sigma Xi Outstanding Research Award and the Phi Beta Kappa Perrine Prize. Since arriving at UMD, Vicki has made tremendous contributions to our department, the university, and the broader scientific community. She served on editorial boards for *Geology* and the *Geological Society of America Bulletin* and on review/advisory panels for the American Geophysical Union, Geological Society of America, Lunar and Planetary Institute, National Science Foundation, NASA, and Smithsonian Institution. She currently serves as Associate Editor for the *Journal of Geological Research*. She is a Geological Society of America Fellow, and member of AGU, Phi Beta Kappa, and Sigma Xi. Over the span of her career, Vicki has authored or co-authored over 60 refereed papers and book chapters, 11 geologic maps, and over 130 conference presentations, many with students. Again, we congratulate Professor Hansen for this prestigious award.

**Congratulations to Dick Ojakangas** on his recent book "Roadside Geology of Minnesota" published by MP Mountain Press.



**George "Rip" Rapp**—Presented the opening plenary address at the International Conference on Geoarchaeology and Archaeomineralogy held in Sofia, Bulgaria 29-30 October 2008. The paper was titled, "Should Archaeomineralogy Now Follow Geoarchaeology Into The Family Of Organized Scholarly Fields?" This paper was published in *Geoarchaeology and Archaeomineralogy, Proceedings of the International conference*, P.13-14, edited by R. Kostov, B. Gaydarska, and M. Gurova., published by St. Ivan Rilski, Sofia.

## Dr. Wanda Taylor named Outstanding Alumnus



Our outstanding alumnus this year is Dr. Wanda Taylor, Professor of Geology at the University of Nevada Las Vegas (UNLV). She graduated from our department in 1982; earned her M.S. in structural geology from Syracuse University in 1984, where she worked on the Sevier orogenic belt in the Northern Mormon Mountains of Nevada. She received her Ph.D. from the University of Utah in 1989. Her research focused on the faulting and timing of extension in eastern Nevada and its relationship to volcanism. In 1989, she came to UMD to teach sedimentology, structural geology, and field methods as a one-year replacement. She left the Midwest to join the Geoscience faculty at UNLV where she has been since 1991. From 2004 to 2007 she served as chair of the Department of Geoscience; since 2007 she has served as Interim Dean of the College of Sciences.

Wanda is recognized as one of the leading authorities on the tectonic history of the Great Basin of western US. She, along with her students and colleagues, has made many contributions to our understanding of the geologic history of this region, from 250 million years ago up to the present time. Her research focuses on rocks that exhibit ductile deformation as well as brittle deformation, including both studies of very small-scale structural features as well as large-scale structural features that show the behavior of rock over vast regions. This has involved unraveling histories of folding, faulting, volcanism, and intrusion of igneous bodies. She has worked with geochemists and volcanologists in the careful reconstruction of the timing of geologic events. While some of this work has been on compressional deformation of older rocks in the Great Basin, much of what Wanda has been involved in has concentrated on extensional tectonics. It is in this latter realm that the contributions of Wanda, her students and co-workers, have gone well beyond simply understanding the geologic history of the Great Basin; rather, it has allowed them to extend our understanding of the processes involved when other areas of the earth undergo stretching (i.e. extensional tectonics).

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## *ALUMNI NEWS*

Gulbranson, Erik, BS 06, is proud to announce an addition to the family. Anders Bentley Gulbranson was born June 4, 2009. Congratulations!

Halbakken, Emily (Swor), BA 08, has joined the Wyoming Dinosaur Center in Thermopolis, Wyoming as a paleotechnician and acting director of this non-profit organization.

Hoffman, Adam, MS 07, November, 2008 had some big changes for Adam and Jess, as Adam was laid off from Cemstone's due to the poor economy and Jess was transferred from Medical Thoracic unit to the Cardiac interventional unit. They still enjoy winters in Northern Wisconsin and summers in Hayward exploring the Chippewa Flowage.

Norton, Kevin, MS 02, PhD 08, has been doing a post-doc at the German Research Center for Geoscience in Potsdam, Germany. Kevin has also accepted a two year post-doc at the University of Bern in Switzerland. He will be continuing to work in the realm of surface processes using cosmogenic nuclides, GIS, and numerical modeling.

Pohl, Diana (Kniebush), BS 04, MEd 2008, Diana married last year and now resides with her husband in Stillwater, Minnesota. She is currently teaching science at Chisago Lakes High School.

Rose, Nicole (Lang), BA 02, and her husband, Peter, welcomed a baby boy, Kodiak, on March 1, 2009. Nicole is currently employed at Capella University.

Wenz, Zach, BS 02, is in his second year at the University of Missouri working on his PhD studying the Ozark MVT deposits.

Zigich, Dan, BS 77, has been working for the last 25 years as a hydrogeologist evaluating and remediating contaminated soil and groundwater at sites throughout the west. He and his wife, Kristy, and their two children live in Golden, Colorado.

## Undergrad Arizona Trip 2009



Bridgette Eischens, Lexy Beadell, Cara Leitheiser, Hillary McGown, Grace Johnson, Mike Anderson, Eric Stifter, Adam Johnson, Mike Beyer, and Penny Morton at the Grand Canyon.

During the winter months here in Duluth there are times when it seems that warmer weather just will not come, whether it's above 32° or even hoping for above 0° when it's time to go start up the car. Luckily for some of the

club members fortunate enough to be in town during winter break, we went on our own little vacation to Sedona, Arizona. Courtesy of the Geology Club, we quickly flew out of the fridge and into the sand box for a week.

After an early flight out of the Twin Cities, the road trip from Phoenix to Sedona was pretty low key with the exception of the multitudes of roundabouts. Pulling into Sedona with the famous red rocks all around and completely different topography made it impossible to sit still. Still in awe of the landscape alone, we pulled up to our hotel. Actually, hotel does not justify this place. Thanks to Prentice Beadell (Lexy's mother) we were able to use a time share at the Summit Resort. This was definitely one of those jaw-dropping moments. With the magnitude and compiling of events, it was sure to be the most memorable experience I have ever had. Our first day we just hiked around, got our bearings, found the pools and hot tubs (which we used extensively during our stay).

The second day was our first event, a tour of the Red Rock Canyon. Naturally, this was pretty cool since it was our first look at the local geology. Not too much to say since it was a general tour but definitely a must see place for anyone in the area. The following day we went to a small ghost town named Jerome which a select few of us would end up saying was the best stop of the week. "A ghost town is a ghost town but being on the side of a mountain is what made it." says Adam. Truly a unique location with an overly adventurous drive up the side of the mountain to get to.

Next was our trip to the Grand Canyon, because what is a trip to Arizona without seeing one of the most famous holes? Getting up early once again, we had a tour from Sedona all the way to the southern tip of the Grand Canyon. Along the way we also stopped at Wupatki National Monument to see some Wupatki Pueblos. The Grand Canyon itself is really something to be in awe of when seen for the first time.

Hiking around Sedona is always an adventure. The topography ranges from easy to expert in a single trail. After an hour and a half, we finally arrived at our destination. The views of landscape were incredible, we saw some animals, and even tried our hand at rock climbing.

With one day left we traveled north a bit to visit Montezuma's Well and Castle, the Petrified Forest, and lastly Meteor Crater. For those who have never seen Montezuma's Castle in person, I would highly recommend the trip if you're in the area; pictures don't do it justice. The Petrified Forest is much the same. Meteor Crater is one of the rare tourist traps which make you pay, though I would happily pay to see it again. It really is spectacular.

Back at the resort on our last night we packed up, made one last dinner, and got ready for our long trip back to the Phoenix airport. I am confident in saying that this was an experience in which everyone involved will never forget. Easily one of the best times in my life so far and probably the best in my whole college career. This shared experience with my good friends is something I hold dear, and this trip was definitely one for the books.

by Mike Beyer

## Undergrad Field Trip to Wasatch-Uinta Field Camp 2009



We used Jacob Staffs to measure the thickness of the Ankareh formation. During this project we were on a very skinny ridge as high up as we could go!

Last summer eight UMD students took part in Wasatch-Uinta Field Camp in Park City, Utah. Graduates and current undergraduate students included Nick Watkins, Lucas Lundgren, Meg Rubesch, Mike Beyer, Bill Troolin, Mike Anderson, Dan Rangitsch, and Lexy Beadell. Together we had a lot of fun driving to Park City with stops at Badlands National Park, Medicine Bow National Forest, and Flaming Gorge National Recreation Area. We enjoyed bonfires, camping, and (multiple) incidents trying to back up a van with a trailer.

At “base camp” in Park City we usually spent six days a week from 7:30 to 4:00 mapping formations, faults, and folds with a partner. Our mapping took place usually on very hot days, or in the first week on very frigid rainy days at high altitude. Mapping generally involved a lot of walking around in circles, up and down the same hill multiple times, and wondering ‘what is this?’. Even though it involved a lot of second-guessing and tiredness, I think everyone would agree that we learned an incredible amount of knowledge in those six weeks, as well as, had more fun than we should have. By the end of field camp we all learned how to read rocks and interpret the stories that they tell us, so that questions such as, ‘what is this?’ turned into ‘I know this!’. Besides mapping we took field trips around the area. One field trip was to the San Rafael Swell in Southeastern Utah with former UMD professor, Tim Demko. On this trip we camped at spectacular sites in Goblin Valley State Park and at The Wedge, a recreational area. We learned a lot about stratigraphic sequences and sedimentary structures by visiting textbook perfect locations throughout the area. He also informed us about career opportunities with ExxonMobil. Over Fourth of July weekend we travelled to Tetons National Park where we were able to hike up the Tetons to drink glacial water and dangerously (with great risk!) tube down a mountain stream. Thankfully, all of us survived. Another field trip took us to Newmont Mining Company near Elko, Nevada. We took a tour of the mine, enjoyed the best meal of field camp, saw a big explosion, and logged core. Some of us even had the opportunity to interview for positions with Newmont.

On the weekends we enjoyed whiffle ball tournaments on the lawn, the No Name Bar, floating in the Great Salt Lake, long boarding, hiking in the mountains, and lots of just plain good fun. All of us really enjoyed the experience at field camp, and often we say, “I miss field camp!” or “Wouldn’t it be cool to go back to Park City?” Although we made a lot of good memories and had a lot of fun, most importantly, field camp gave us the tools, experience, and confidence to become geologists.

by Meg (Pierce) Rubesch

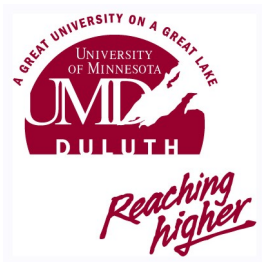
## Fall 2009 UMD Geological Sciences

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Can you guess who these Geology Faculty members are?

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Degree earned and graduation year

A short paragraph with your news