

# *UMD Geological Sciences Newsletter for Alumni & Friends*

*Editors: Laura Chapin, Charlie Matsch, Claudia Rock*

Happy holidays everyone. Last year I began my newsletter article with an update on new personnel and this year I have more to add. I am excited to announce that Karen Gran, on a temporary appointment last year, is now a tenure-track assistant professor. Karen is a fluvial geomorphologist with a wide range of interests; she has ongoing research projects here in Minnesota and on Mount Pinatubo in the Philippines. I am equally excited to announce another new member of the faculty, Jim Miller. Many of you know Jim from his 20-year career at the Minnesota Geological Survey. Jim has long wanted to be here at UMD and we were able to make that happen. Jim joined us as a tenured associate professor, and he is director of the Precambrian Research Center, a division of the Natural Resources Research Institute. To round out the changes to the faculty we have hired Qing Zhang on a one-year sabbatical replacement position. Qing taught Earth's Resources this fall and will be teaching Structural Geology and Tectonics for Vicki Hansen and John Goodge, respectively, who are on sabbatical leave.

Last year I announced that John Goodge was successful on a proposal to NSF for the acquisition of a new scanning electron microscope. The system is now set up and running in a newly remodeled lab in the Life Sciences building. We completed a national search for a lab director and hired Bryan Bandli. Bryan and his family came from Duluth (Georgia, that is). The SEM lab will serve UMD and northeastern Minnesota, and Bryan has been working with students and professionals in the community.

To round out the new people, we recently hired Laura Chapin. Laura replaced Cathy Dziuk in the Geological Sciences department office as Cathy moved to the Chemical Engineering department. Laura has been a welcome addition and her first big task has been this newsletter.

One of the pleasures of writing this cover letter for the newsletter is to thank alumni, faculty, and friends of the geological sciences department. You have been quite generous and the number of scholarships that we give each year continues to grow. The scholarship recipients are listed on page 15. In addition, the department is able to support student travel to meetings and other professional activities. This year we have a new scholarship to announce, the Geological Sciences Faculty Emeriti Scholarship. Our emeriti faculty continues to support the department in so many ways. They serve as

professional ambassadors, they work with the public, serve as resources to the current faculty and students, and they have been extremely generous with their financial contributions. Thanks to the emeritus faculty!

OK, so I have been here at UMD for 18 years now. During that time I have looked at the same displays along the east wall in the first floor of Heller Hall. Yes, these are the same displays that you and probably some of your parents walked past when you were students. There are two new displays! One is a marvelous mineral collection donated by Wendell Wilson. These beautiful museum-quality specimens have attracted a great deal of attention. The other new display features a live seismograph feed from a seismometer in the basement of Heller Hall and a variety of interpretive materials. Three LCD monitors and a series of posters monitor and interpret earthquakes from around the world. We would like to continue our updating of additional display cabinets as money becomes available. One idea is to put a large LCD monitor or big-screen TV in one of the cabinets and use it to display current events or news in geology, run informational videos that focus earth and space sciences, and promote career opportunities in geology. If any of you have ideas on how to update our displays, or if you would like to sponsor a display, please contact me.

So the State of the Department is excellent. Our number of majors continues to grow, and we have a large crop of graduate students working on projects from around the world. We now have two field camp opportunities: the familiar Wasatch-Uinta field experience in Park City, Utah, and the Precambrian Research Center field camp based in northeastern Minnesota. Our students are off on field trips throughout the region and we offered a course on coral reef geology earlier this year with a field trip to the Bahamas. In May I will be taking a group to Iceland for two weeks.

In closing I would like to thank all of you for your support of geological sciences at UMD and extend an offer to visit us at any time. If you call ahead I will take you to lunch.



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### *SEM at UMD*

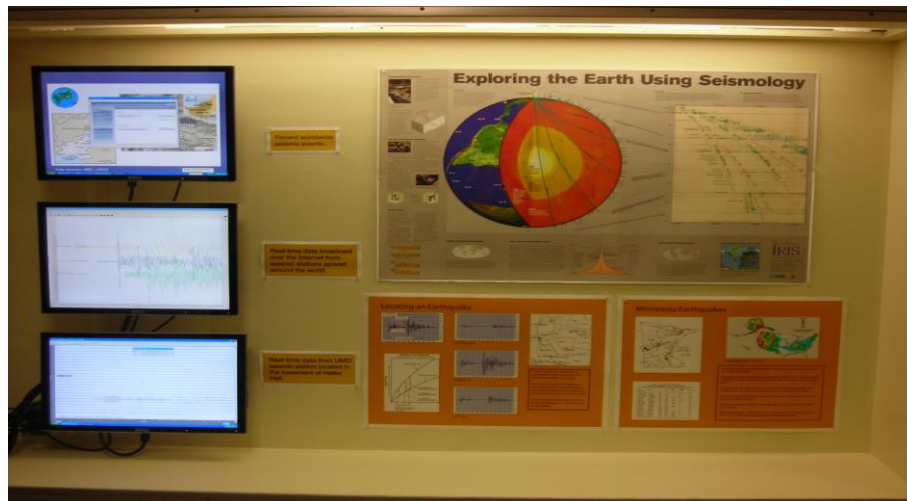
Through a \$400,000 grant from the National Science Foundation, the Department of Geological Sciences has purchased and installed a new scanning electron microscope (SEM) on campus. The new SEM is the only instrument of its kind in northern Minnesota and Wisconsin at a public institution. The SEM will be used both for teaching and research in the departments of Geological Sciences, Biology, Chemical Engineering and Mechanical Engineering, and will be available to outside non-profit and industry groups. The SEM is currently being used by the Natural Resources Research Institute to characterize airborne particulates produced from taconite mining. Look for more news about research being done in the SEM lab in the future!

To facilitate faculty and student use of the lab and to oversee the instrumentation, Bryan Bandli has been hired as laboratory manager. Bryan's background is in geology and mineralogy. He spent the last six years working as a microscopy consultant. As part of the laboratory's outreach program, Bryan is also responsible for managing research projects for groups and companies external to the university. (In the photo to the right, Bryan sits at the controls of the new Scanning Electron Microscope located at 93 Life Science Building at UMD.)



For further information regarding the laboratory and the new microscope, please call Bryan Bandli, SEM Laboratory Manager, at 218-726-7362, or e-mail him at <[bbandli@d.umn.edu](mailto:bbandli@d.umn.edu)>. A web site detailing the capabilities of the new instrument is at [www.d.umn.edu/SEM/](http://www.d.umn.edu/SEM/).

### *What's Shakin' at UMD*



The department recently established a new seismic display in Heller Hall. Located in the heavily traveled main floor hallway, the display shows live data from a seismometer located in the basement of the building. Rather than being displayed on a traditional drum recorder, the data are displayed on a computer monitor. The data are digitally recorded and we expect to use this valuable source of information in the classroom in the future.

In addition to the data coming off the local seismometer, the display also accesses and displays information from seismic systems around the world that broadcast data (in near real time) via the internet. We can also access and display information on recent seismic events, helping to keep the display current and fresh.

Although the location of the local seismometer is rather noisy, we are regularly seeing earthquakes with magnitudes greater than  $M=5$ . When large events occur we issue an announcement to the UMD community. We expect that this new display will raise the awareness of the UMD community to the activities of the department. We are exploring the possibility of posting significant earthquakes recorded by our seismic station on the department's web page.

**ERIK BROWN** Research - The ITRAX x-ray fluorescence core scanner at the LLO continues to be a fun toy. This device allows rapid determination of the inorganic composition of sediments with 0.2mm-scale resolution. Basically, you can put a 1.5m 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). It is one of only two instruments of this type in the US, so we have many colleagues traveling to Duluth (from Brown U, U of Arizona, U of Pittsburgh, UMTC, U of Wyoming, U of Iowa, U of Colorado, and even from Mexico and Spain) for collaborative analytical work. We have completed analyses of the entire 400-m record of Lake Malawi (East Africa) sediments (**Jimmy Shi's** thesis work), which dates back to about 500,000 years ago. Other projects include work on Lake Qinghai Tibet (**Xiuju Liu's** thesis work), and examination of a million-year record from Lake Bosumtwi in West Africa.

**Travel** - This has been a busy travel year as I work on existing projects and try to develop new ones. New lake core has been recovered from Lake Chalco in the Basin of Mexico. We hope that this will provide insights into the climate history of southwestern North America, a region where water supply continues to be a serious issue. Along with Tom Johnson, I am part of a group working toward a new drilling program of lake sedimentary sequences associated with some of the hominid fossil sites of East Africa ("Climate context of hominid evolution"). This is finally culminating in a planning meeting in Addis Ababa, Ethiopia, later this month. With some luck we'll be drilling within a couple of years. I am also working on longer-term projects for future lake drilling. The time from initial discussion to actual funded fieldwork seems to be about ten years, so advance planning is important.

**Cabin** - We try to get to the cabin with the kids (Andrew, 12; Lianna, 10; and Matthew, 6) most weekends from June through August. We actually managed to stay up for a whole week in August. Andrew and I explored the entire lake by canoe, but it was a slow week for fishing.

**Community** - Barbara (mostly) and I have been working hard to keep the kids' ski program at Chester Bowl running in the midst of ongoing city budget cuts and layoffs. So far, so good. Now we just need snow!

**STEVE COLMAN** My year had a spectacular start, with a two-week trip to Vietnam and Cambodia. The trip was part of my duties as a member of the Committee for Research and Exploration of the National Geographic Society (NGS). This is the group that provides small grants as part of the external funding program of NGS. The rest of the year flew by, with administration of the Large Lakes Observatory (LLO) taking more time than I would like, and with a busy research program. Major challenges include the on-going struggle with the University's new financial system. There were short trips to Santa Fe, East Lansing, Madison, San Jose, and State College, and Houghton for everything from NSF workshops to scientific conferences to fund raising. Just to keep things from getting too quiet, my summer included the weddings of both of my children, both to med-school classmates.

My two major NSF-funded projects are now about half done. One, entitled "Tracing the Late Quaternary record of the Asian monsoon system: Paleoclimate history from the Qinghai Lake Drilling Project," with co-PI Erik Brown (Geological Sciences/LLO), is a study of past climates at Lake Qinghai, China. PhD candidate **Xiuju Liu** is in her second year of working on this project, and has passed her written prelims. The other project, entitled "Testing the hypothesis of eastward Lake Agassiz discharge at the beginning of the Younger Dryas using marine seismic-reflection methods," with co-PI Nigel Wattrus (Geological

Sciences/LLO), involves glacial deposits and drainage history of Glacial Lake Agassiz and Lake Superior. Second-year MS candidate **Jessica Gary** and first-year MS candidate **Emily Voytek** are both working on this project, and both participated in our second nine-day research cruise on the Blue Heron in June. I'm working with another new MS candidate, **Miao Du**, to define a thesis project, and I am sponsoring a one-year visit by yet another Chinese grad student, **Shun Xiao**. A bunch of us are going to AGU in San Francisco in December to present early results of these projects.

The work Jay Austin and I were doing on instrumental and historical records of temperature change in Lake Superior is drawing to a close with the publication of our second paper, this one on the century-scale record. Our first paper, on the instrumental record, continues to draw lots of attention and requests for talks and presentations. Jay, always in the lead in this research, is now moving more into the physics and modeling of lake warming and level change. The major results of the Bear Lake paleoenvironmental project, a large (and cumbersome!) collaboration of USGS and university folks, are finally in the process of being published in a massive GSA Special Paper.

LLO is bursting at the seams, with our new faculty hires, several research associates/post-docs, and many new grad students. LLO continue to strive for balance and multidisciplinary approaches, with lots of faculty and grad students working in association with the departments of Biology, Chemistry, Physics, and Geological Sciences. Keeping the Blue Heron funded and operational continues to consume a lot of my time, but so far, we are managing.

**CHRISTINA GALLUP** It is November 3<sup>rd</sup>, and we are on the eve of a historic election and a few days from the thesis defense of

**Kristin Riker-Coleman**, the first PhD student that I have supervised. Kristin started her thesis many years ago at the same time as **Leah Gruhn** started a Master's on a related project on New Guinea corals. Leah will defend by the end of the year. They both have had a long path to the finish line, but have produced high-quality research on fossil corals and their ability to tell us about tectonic rates and past climate change. I am proud of both of them and wish them all the best in the future.

The two undergraduate students who worked on research projects with me last year, **Tyler Carlson** and **Matt Pendelton**, completed some nice work on fossil coral samples from Vanuatu that **Nick Freiburger** collected as a graduate student in 2006. Tyler did U-Th dating of the samples, while Matt did the X-Ray diffraction and thin section work to document the samples' preservation. We are now working with Dr. Fred Taylor at University of Texas Austin to use the samples to determine the tectonic/sea level history of the island.

I am also excited about renewing work in U-Pb dating of Precambrian rocks from right here in Minnesota. **Steve Hoagland** is a new MS student working with Jim Miller and me to refine the chronology of the Duluth Complex using single zircon dating in order to better understand how it was emplaced. It should be a great project.

On a personal note, I married my sweetheart, Chris Kruger, last May. Chris was working on a degree at UWS in elementary education, but this semester decided to switch to UMD to complete a degree in Geography, specializing in GIS. It's nice to have him on campus and to be able to carpool together!

**JOHN GOODGE** I wrapped up teaching classes for the spring semester prior to starting a sabbatical leave in 2008-09. Vicki Hansen and I co-advised several MS students working on petrologic and structural problems related to evolution of

granite-greenstone terrains in the Archean of northern Minnesota, and also worked with Jim Miller and students studying magmatic evolution of the basal Duluth complex and other intrusions of similar age. I continue to work on Antarctic research, and published a paper in *Science* in July that documents petrologic, geochemical and isotopic evidence for tectonic connections between Antarctica and North America during the late Precambrian Period of the Rodinia supercontinent. Part of the evidence for this correlation stemmed from **Devon Brecke's** MS thesis finished in 2007.

My big news this year was the acquisition of a new scanning electron microscope (SEM). I was the lead PI on an NSF proposal to fund the instrument purchase, along with colleagues from Geological Sciences, Biology, Chemical Engineering and Mechanical Engineering. After evaluating instruments in late 2007, we put in a purchase order and took delivery of the instrument in late spring of 2008. We installed a JEOL tungsten-filament microscope, which can operate at both high and low vacuum. We also installed a number of great analytical tools that allow us to see a lot beyond simple imaging. These include an energy-dispersive spectroscopy (EDS) system that enables us to determine the chemical composition of materials, a cathodoluminescence (CL) system to image materials based on subtle variations in composition, and an electron-backscatter diffraction (EBSD) system that allows us to analyze crystallographic information about crystalline materials. Altogether the microscope and its various detectors have a value of about \$500K. The lab is currently up and running, and is used for multidisciplinary research and teaching at UMD. We have also developed interest with a variety of outside users, including NRRI, the EPA, Medical School, outside companies and others. To see more about the SEM lab, visit: [www.d.umn.edu/SEM/](http://www.d.umn.edu/SEM/). We renovated space in the Life Sciences building for the new lab, which houses the new

instrument and also provides space for sample preparation and storage. After a national search conducted in early 2008, Bryan Bandli was hired as the new Lab Manager. Bryan has a BS in geology and MS in mineralogy, and has several years experience working in a commercial lab microscopy setting, doing optical, SEM and TEM studies of everything from forensics, to building materials, to asbestos, to paper. He is a great addition to our Department.

**KAREN GRAN** It's been a great year, and I'm very pleased to have spent it here in Duluth as part of the Department of Geological Sciences. I am teaching geomorphology for the second time this year. I rearranged the schedule to allow us to get out in the field more during the first half of the term, and we were blessed with good weather every Wednesday. What a great place to teach students about surface processes. I am also teaching a graduate-level course in fluvial geomorphology and that has been a pleasure as well.

Work continues on our research project in the Le Sueur River basin in central Minnesota. This project has involved a collaboration between six different institutions, all focused on developing a stronger understanding of erosion, transport, and deposition of sediment in the Le Sueur River watershed now and how these processes have changed throughout the Holocene. The entire project is designed to help state water policy managers better manage turbidity in the Le Sueur and the main stem Minnesota River, and it's nice to have a tighter connection between research and policy development.

My graduate student, **Andrea Johnson**, has been working on reconstructing the Holocene history of incision and terrace development in the Le Sueur watershed. She gave a nice poster at the Binghamton Symposium on Fluvial Deposits and Environmental History in Austin, Texas. Andrea

also has been involved in the GK-12 program and has been assisting with science education at Fond du Lac elementary school. I have gotten involved in more local stream geomorphology projects this year. Liz Minor (LLO/Chemistry) and I have had two auto-samplers out in Amity Creek all summer, sampling storm flows at the top and bottom of Seven Bridges Road. She has been focusing on organic carbon flux to Lake Superior, and I have been focusing on sediment sources and transport through the watershed. I have an undergraduate, **Ryan Huggett**, working on a geomorphic assessment of a future stream restoration site on East Amity Creek. It's been good to get involved in some local Duluth streams, and I found some great sites to bring my students to this fall for labs. I will present the results from this summer's work at AGU this fall.

I've been plenty busy at home, too. Alex started kindergarten this year, and Peter is now a chatty, opinionated toddler. They both dressed up as volcanoes for Halloween again this year. I might have some future geology majors on my hands.

**JIM GRANT** The year started off sadly, with Lisa's mother passing away after a seven-year battle with cancer. Jan was a lovely caring woman right to the end and we miss her. We had a week's skiing at Park City, complete with a not quite three years old Tara taking to the slopes with cries of "More! More! Do it again!!" In February, we went off for a couple of weeks at the tip of Baja, relaxing with the whales and snorkeling in the natural aquarium of the Sea of Cortez. Then we were home until October, except for jaunts to visit the family in Minneapolis, and enjoying our lake place. This includes fending off not only deer, but rabbits and chipmunks, who thought Christabel's flowers and shrubs were for them. I found out that chippies think fences are fun, not a deterrent. Peter Rabbit was not read to the grandkids! It also included

renovating the deck, getting the new compost going (160°F), scouring the area for animals for the grandkids (mooo means a lot more if a cow answers back) and enjoying our new pontoon boat, which has become a floating play-pen for the whole family. In October Christabel and I took off for three weeks in Ireland, researching her family tree. To the surprise of both of us, I got hooked. Just like geology, where some clues are missing, there are a few red herrings and more intriguing questions at the end than when you started. Christabel and I are still involved, as volunteers, at the Bong Heritage Center, but she wonders where she found time to get that show on the road, and we have almost 2000 WWII names up on the Commemorative Wall, which is a great way to honor friends and relatives who served. Christabel and Fiona are still very active in the Sheltering Arms Foundation, which provides grants for organizations helping children in need. As for geology, I'm just about finished with my Thermocalc paper, which I should be doing instead of this. Then on to a spot of isocon analysis, and perhaps I'll even look down a petrographic microscope again. (Sounds very much like what I said last year.)

Fiona's doing a bit more work now that Tara's in school five mornings a week, and quite the activist on her block. Ravi's still trying to solve the electricity distribution in Northern California. Lisa is research director on a new project at CVRx, which is dedicated to keeping people like her father-in-law alive. Alex is 2 ½, and an energizer bunny with a throaty chuckle. And Ian's business has shifted a little to value-added manufacture of tables and objects of art using reclaimed woods such as redwood, teak and mahogany-beautiful stuff. The BIG news is that he's off in Turkey at the moment on the fourth shoot (after Nepal, Kerala and Morocco) for his own series on the Travel Channel, which begins next spring. Don't miss it!

We all look forward to being together for Thanksgiving in Minneapolis. Then Christabel's sister, Niki, comes over for about six weeks,

and we go down to her time-share in Panama, and back up to Nebagamon for our family Christmas. I went out into the woods today and found THE tree, so we're starting to get prepared!

Wishing you all a happy Christmas and the best in the New Year!

**JOHN GREEN** What, newsletter time, already?! The tempus sure has fugited, a good indication that I've been continuing to enjoy my retirement.

I'm doing many of the same geological things – helping to advise the Minnesota Geological Survey's bedrock mapping up the North Shore; teaching short courses on North Shore geology for the North House Folk School in Grand Marais; working on an educational booklet on the geology of the Grand Marais area for the Harbor Friends; and spreading the North Shore geological word by giving talks to the Minnesota Native Plant Society and the Superior National Forest's Wilderness Rangers of the Boundary Waters Wilderness. Otherwise, I'm continuing on the Boards of local nonprofits including Sugarloaf – The North Shore Stewardship Association and the Superior Hiking Trail Association. For the latter, some of the most fun has been scouting for the SHT's route between Duluth and Two Harbors, through the interesting mix of terrain from beautiful old-growth Northern Hardwood forests to cutover County lands, nice stretches of streamside and intriguing bits of ancient logging railroad grades. Even a few previously undiscovered outcrops!

Jan has taken on new challenges as a member of our Township Planning Commission, fighting unwise development projects, and helping to organize the production of a Minnesota Bird Atlas, a multi-year job, along with her various birding-environmental boards and activities. Our daughters, Martha and Sarah, continue to thrive with their

families in Maine and Vermont, respectively. Martha is a hydrogeologist for the USGS and Sarah is developing an exciting home craft business. Their oldest offspring (both boys) are all of a sudden now teenagers!

As usual, we have taken a couple of change-of-scene trips during the year. In April we rendezvoused with Martha's family at Jan's brother's in Los Angeles, where we explored nearby Santa Monica Mountains sights, Malibu Beach birds, the spectacular orange poppy fields of Antelope Valley, and the very impressive museum at the La Brea tar pits, now surrounded by the city. In midsummer we took our usual trek to New England for extended-family get-togethers as well as good visits with Martha and Sarah. In between we had fun exploring Down East into the Bay of Fundy. A highlight was crossing the Bay (a three-hour ferry ride) to Digby, Nova Scotia (scallops a specialty) and Digby Neck, which is a long, cuesta-like ridge made of very familiar-looking flood-basalt flows. But these are only about 200 million years old, part of the Triassic/Jurassic rift system. We found those rocky shores as charming as our North Shore, and decorated with beautiful wildflowers and picturesque lighthouses.

Back home, I've just dug up the rest of my carrots and beets, on the last day before they get frozen in for the winter. With flurries in the air, here it comes!

**VICKI HANSEN** 2007-08 was a busy year for structure/tectonics and planetary studies at UMD. **Erik Tharalson** graduated in December, just after last year's newsletter, and took a job with Encampment soon after graduating. It was hard to see Erik go as he was making major contributions to mapping the Agnesi Quadrangle (V-45) on Venus. But Erik has joined the working ranks, and sounds very happy by all reports. By summer's end (V-45) went off to the USGS for review. In the meantime Niobe (V-23), Greenway (V-24) and Helen Planitia (V-52) are

all in various stages of 'in press', thanks in large part to the hard work and careful attention of co-authors **Nick Lang** and **Ivan Lopez**. Nick has joined the faculty at Mercyhurst College, and Ivan continues on the faculty at Universidad Rey Juan Carlos. Artemis Quadrangle (V-48) sailed through the review process and is under final USGS edit. By the time it is published first author **Roger Bannister** will be married – Congratulations, Roger and Lisa. (At the rate of USGS publications, Roger may well be retired before (V-48) is publicly available.) Undergraduates **Brandon Brayfield** and **Joe Jacobs** completed UROP projects last spring, creating incredibly detailed and instructive geologic maps of two frightfully complex circular lows on Venus. Brandon and Joe left hot, dry Venus to work in chilly, soggy southeast Alaska for the summer. **Grace Johnson**, returning from spring semester in Sweden, moved in to fill the UROP void during fall semester. Grace is busy mapping an extremely challenging ribbon tessera terrain that has been variably overprinted by younger tectonic and volcanic events. On the graduate student front, **Bhairavi Shankar** completed her thesis, but just didn't get enough of planets or graduate school; she is settled into working on her PhD at Western Ontario University. **Susie Karberg** defended her thesis and took a job in Oklahoma City, addressing our nation's energy appetite. **Emerald Erikson** also defended and moved back to the west coast and the Seattle area. **Sally Goodman** followed suit, defending her thesis, and then gave birth to young Arthur, who held off just long enough to allow Sally to wrap up all the loose ends. Sally, Matt and Arthur are settled in near St. Cloud, where Matt has a job putting his GIS skills to good use addressing the nation's 911 calls. **Jenny Koester**, now Jenny Goldner, worked logging core before tying the knot with Brian at a lovely ceremony in September. **Emily Bjornes** moved south to the Houston area, where she took on a job, and is busy writing up her thesis. She plans to defend any day now, wrapping up her degree this

semester. The Shear Zone Ladies presented talks at ILSG last May, presenting an interesting alternative to terrain accretion tectonics for Archean assembly of the Superior Province. **Tom K. Johnson** (a bit taller and younger than the other Tom Johnson in the department) stepped up to determine the structural and kinematic history of the Murray Archean shear zone with implications for gold deposition. The Murray, like the other Archean shear zones in the Superior Province begs careful analysis to understand potentially unique Archean tectonic processes. Unlike the other Archean shear zones (to date!), the Murray has showings of gold. Like the Shear Ladies, Tom was extremely successful in securing outside funding for his project from the GSA, SEG, ILSG, the UM-graduate school, and the PRC. Tom was also able to partake in an economic geology trip to Chile last winter. Summer 2008 found John and me traveling north to Canada for a one-week GSA-sponsored field forum on Archean Abitibi Province. It was fantastic to see rocks that we had, to date, only read about in the literature. I had hoped to travel to South Africa for a conference, but changed plans as a result of political unrest. This fall has found me on short trips to California and Arizona for panel review and workshops. Mostly I am keeping my head down, hiding away, fighting Arc GIS and GIS Globe, both of which keep me and my ignorance on a very steep learning curve. It is very exciting to see years and years of Venus mapping come together on our virtual spherical Venus, thanks to contributions in years past by **Duncan Young**, **Roger Bannister**, and all the students involved in mapping ribbon tessera terrain. Steve Graham, new addition to UMD GIS Laboratory, based in the Geography Department, has also been very helpful in helping navigate the GIS environment, as have folks from USGS Flagstaff.

On a completely different front, Co-Investigators Tim Holst (Associate Dean of SCSE, and Structural Geologist), Deborah Petersen-Perlman (Office of Equal Opportunity Director and Department of Communications), and Bilin Tsai (Professor of Chemistry and Biochemistry) and I received a two-year \$200K grant from the National Science Foundation designed to assess the climate for women in the Science Technology Engineering and Mathematics (or 'STEM') fields. UMD was one of only nine institutions to receive such a grant, and we are thrilled to have the opportunity. The goal of the NSF grant is to formulate a plan to help work toward achieving sustainable work-life balance at UMD, as well as other similar institutions across the country. It promises to be an interesting endeavor to use a data based approach to try and understand key factors that contribute to nurturing a rich and healthy environment for scientific research. It has been wonderful to meet all sorts of great folks across several colleges, schools, and even between campuses. A year ago the women Full Professors in SCSE joined with women Professors from the Medical School to create a Women's Mentoring Group for SCSE (the Medical School/Pharmacy School Group has been active for years). We have brought in speakers and sponsored events aimed at increasing communication and cutting down barriers of isolation for women faculty. The activities have included students, faculty and staff, and have served to broaden communication across several groups within the greater UMD community.

**TOM JOHNSON** Kate and I woke up on New Year's Day 2008 on the night train from Sapa to Hanoi in Vietnam, half way through a two-week tour of the country with daughter, Heidi, son-in-law, Neil, and grandson, Jonas, who live in Shanghai, and our niece, Erin, from Boston. I never would have

imagined wanting to tour this country in my earlier years, but times change! We returned to the U.S. just in time for the new semester, and teaching Earth History and Global Climate Change, both of which kept me off the streets and nose to the proverbial grindstone. My research continues to be focused on analyses of the Lake Malawi (East Africa) drill core in collaboration with Erik Brown and Joe Werne and our students, **Melissa Berke**, **Junmin Shi**, and **Martijn Woltering**. Martijn defended his MS thesis in Water Resource Science in April, dealing with a new temperature record for the Malawi basin that extends back 70,000 years and displays some fascinating surprises. Melissa is carrying out organic geochemical analyses of sediment cores not only from Lake Malawi, but also from Lakes Turkana, Albert and Victoria, to put together a more coherent picture of past rainfall and temperature in the East African Rift Valley over the past 20,000 years. Both Martijn and Melissa presented research results during the past year at the Fall AGU in San Francisco and at a Gordon Conference in New Hampshire this past summer. Junmin is working on scanning XRF data of the Malawi drill core, focusing on the cyclic recurrence of drought that shows up in the alternation of calcareous and non-calcareous sediments. My other research project for the year has been advising MS student **Kelly Wendt** in his acquisition of sediment cores from three Minnesota lakes, extending from the prairie of southwestern Minnesota to the boreal forest of the Boundary Waters. Kelly is applying our new technologies of scanning XRF and organic geochemical approaches to re-examine the conditions of the warm (?) middle Holocene and Medieval Warm Periods – were they perhaps warmer than present? Kelly organized coring expeditions to these lakes, and had to withstand my participation on two of them – one a character-building winter outing of coring through the ice, complete with bone-chilling driving wind and snow, and the other a more civilized adventure on pontoon boat last summer. I am also presently

trying to iron out the charter of a boat on Lake Malawi for a January 2009 expedition funded by the Petroleum Research Fund, in collaboration with Liz Minor and Joe Werne (LLO/Chemistry) and Erik Brown. Two of the three boats that are possible contenders for the coring operations are not presently functional, and communication regarding the third is proceeding at a snail's pace. We may be held back until next year's weather window if the stars do not align within the coming two weeks.

In addition to my research activities, I have been serving on a fascinating committee of the National Research Council during the past year, dealing with the Earth System Context for Hominid Evolution. The committee is charged with recommending to the National Science Foundation a bold new research initiative that couples the fields of paleoclimatology and paleoanthropology in a manner that will provide an improved understanding of the environmental conditions surrounding the physical and cultural evolution of our ancestors. I have been teaching Geological Limnology this fall semester, with 13 graduate students from Geological Sciences, Biology and Water Resource Sciences, a nice-size class for this advanced topic. I also participated in an international workshop on global monsoons in Shanghai in late October and a workshop in Addis Ababa (Ethiopia) in November, along with Erik Brown, for a new drilling initiative in East Africa to spin up in about 2011. The meeting in Addis was especially satisfying because "UMD" was mentioned frequently in this meeting of five international participants as the place to go for state-of-the-art analyses of lake sediment cores.

The family is doing well. Heidi and Neil continue to teach elementary grades at Shanghai Community International School, and five-year old Jonas speaks Chinese fluently with his playmates in the park. Son Ryan continues in



software engineering with Collins Electronics, based in Newport Beach, California. He is a frequent participant in triathlons, and is now a first lieutenant in the U.S. Army National Guard. Kate's paintings have been receiving ever more attention in juried shows and auctions in the region, and she now has a web site where you can see examples of her work at [www.katewhittaker.com](http://www.katewhittaker.com). For my part, I have been forced to cut back on hockey and running due to a persistently arthritic right knee, but I am enjoying the cabin as often as I can, an occasional ride on the bike, and the rare but pleasing outing in the kayak. So it has been a busy, interesting and rewarding 2008, and I am looking forward to what lies ahead in 2009.

**CHARLIE MATSCH** Hello, everyone! Just checking in with you. I'm doing fine, keeping as busy as I want to be, and staying in shape out and about on hiking trails centered on Lake Superior. I interrupted my wintering in Duluth with a couple of trips to warmer climates. In February I spent about ten days along the central Texas coast, headquartered in Rockport, not far from Corpus Christi, my first visit there. (The year before, I explored the lower coast along the Rio Grande River.) I finally got to Padre Island, but too early in the season to witness the Spring Break circus. Great weather, excellent birding, and good seafood. A couple of highlights were visiting Aransas National Wildlife Refuge, with a winter population of over 200 wild Whooping Cranes; and the legendary King Ranch near Kingsville. I had first heard of the ranch while I lived, in the early '60s, in West Texas, within the context of its vast petroleum reserves and their development by Humble Oil Company, now ExxonMobil. I worked for Standard Oil Company, now Chevron. Parts of the 825,000 acre spread are open to the public, and I joined a day-long birding tour in a fifteen-passenger van with an expert guide. Hunting (with

binoculars) was excellent. How can you miss a flock of over 2,000 Black-bellied Whistling Ducks? April found me back in Southeastern Arizona, enjoying the spring weather, and hiking with Rip Rapp in the Santa Catalina Mountains, Madera Canyon, and the San Pedro River Valley near Sierra Vista.

I spent the summer pretty close to home, and I enjoyed taking many visitors on both geologic and scenic tours, mostly along the shore of Lake Superior. I ended the summer with a nostalgic trip to western Minnesota, revisiting the southern outlet of Lake Agassiz in the Browns Valley area, and then along the path of Glacial River Warren, now the Minnesota River Valley. It was here that I began the fieldwork that would result in the completion of a Doctoral dissertation that qualified me for a job at UMD. If you took my Glacial and Quaternary Geology class in the 1970's or 1980's, you might remember some great times camping out along Big Stone Lake.

During the school year I'm frequently in my office or around UMD somewhere. I'm invited to give a guest lecture or requested to lead a field trip once in a while, and I enjoy doing those things. Having a continuing relationship with UMD is important to me and things are going very well. Happy Holidays to everyone. My best to you all.

**JIM MILLER** It's taken a while, but I have finally realized my long sought goal of becoming a faculty member of the Department of Geological Sciences at UMD. Although I can't remember the exact year (1980?), I vividly remember my first encounter with the faculty here. As a graduate student from the "southern campus", I came up to meet with John Green and discuss some aspect of Mid-continent Rift geology. At midmorning, OJ stuck his head in John's office and asked if we were ready. Ready? For what? I was soon to discover the longstanding tradition of the faculty gathering for coffee each and every morning at Griggs. Everyone was there - John, OJ, Jim Grant, Charlie, Dave Darby, Tim Holst, Ron and Penny. Rather than

feeling like an interloper, I was made to feel like I was just one of the gang. There was lots of chatter, lots of joking, gentle teasing, and most of all, great collegiality. I knew right there and then that I wanted to be part of this group.

After getting on with the Minnesota Geological Survey (MGS) in 1983, I paid many more visits to John, who quickly became my mentor. If the timing was right, most of these visits involved taking coffee with the faculty. When John retired in 1999, I held out hope that I could be appointed to fill his position and carry on his work on the igneous rock of northeastern Minnesota. Unfortunately, the college decided to hold the position because of decreased enrollment. In 2000, Dave Southwick, the MGS director at the time, gave me permission to move to Duluth and unofficially serve as the "northern branch" of the survey. The Natural Resources Research Institute (NRRI) kindly gave me an office and the department gave me an adjunct appointment with graduate advisor status. Being able to set MS students loose on various topical problems I had discovered during MGS mapping projects was very rewarding. Moreover, I began to feel like an integral part of the department. In 2006, Dean Peterson and I hatched the idea for the Precambrian Research Center, which sought to rejuvenate the department's long-standing tradition of Precambrian field studies. Ultimately, the success of the PRC led the NRRI and the college to support me in a joint appointment to the NRRI, as co-director of the PRC, and to the department, as an associate professor. I was officially brought on staff in January of this year.

In my half-time teaching position in the department, I will teach a couple courses each year and advise graduate students. This year, I will teach Petrology for the first time (filling in while John Goodge is on sabbatical) and Geologic Maps, which Vicki



Hansen and I co-taught last year for the first time (Vicki is on sabbatical this year, too). At present, I am advising five graduate students on various projects dealing with Midcontinent Rift geology. Two, **Chris White** and **Brian Goldner**, are working to finish their theses while fully employed with mineral exploration companies in the area. Three others, **Dan Costello**, **Ryan Dayton**, and **Steve Hoaglund**, are in their second years of study. I will likely be advising several new graduate students next fall as well. There is no shortage of projects to set them on to, but I hope I can give them all the attention they need and deserve.

The other half of my appointment is taken up as administrative director of the Precambrian Research Center. We finished our second season of Precambrian field camp this past summer with 10 students. We are working to get our numbers up to the capacity of 20 students. In fact, I am writing this from Milwaukee where I gave a talk about the camp to the geology students there. This past October, we ran our first professional workshop for 15 geologists. The workshop, which was taught by Ron Morton, George Hudak, Dean Peterson, and Harold Gibson (Laurentian U), included a short course on the physical volcanology, structure, alteration, and mineralization of Archean greenstone belts and a field trip to Sturgeon Lake and Rainy River, Ontario, and the Lake Vermilion area of Minnesota. For next fall, we are planning a workshop on the physical characteristics of mafic layered intrusions. Corporate fundraising has gone well this year with over \$60,000 raised to support student research. Check out the PRC website for more information on this and other PRC activities: [www.d.umn.edu/prc/](http://www.d.umn.edu/prc/) and look for our 2008 annual report that will be published in February.

Finally, I have been actively involved this year in a committee looking to develop a new curriculum option for undergraduate students

who are looking to focus on mining and mineral exploration. The committee has been meeting with the new faculty of the Civil Engineering Department, staff from the NRRI involved in mineral processing, and general managers from Cleveland Cliffs to discuss the content of this option. We believe this will make our students extremely marketable in the current boom in the minerals industry. Stay tuned for how this all turns out.

With how busy I've been, I am constantly reminded of the saying – be careful what you wish for, it might come true. But, I wouldn't want it any other way. I am fulfilling an enduring dream and I am very happy and proud to be here.

**PENNY MORTON** Daylight saving has gone away, the fog is rolling in and we are expecting snow for deer opener this weekend. Sound like normal? Life here in the department and in Duluth is still pretty good, by anyone's standard. I am still teaching mineralogy and still really enjoying it. I did get one course release because this fall I was asked by the dean to help out in the dean's office, so I have a ¼ time position as Assistant Dean. Somehow of late, the ¼ time has taken a little more. But I am enjoying it. I do like to organize.

This last summer was my first complete summer in Duluth since 1991—and it was a beautiful summer. I did spend two weeks here in town with our GK-12 Fellows and Teachers for our grant and another two weeks teaching with Jim Miller. We ran a field inquiry-based workshop for earth science teachers. The latter was a lot of fun. At home, I got Ron and my father-in-law to build a deer-proof fence so that I could have a garden. It worked. We had more runner beans than I want to see for awhile. I am now hoping this fence is snow-proof as well as deer-proof. Next summer I am planning to spend a few weeks at field camp, so I have to get in shape. As an older human being—it takes a little more work to get ready for trekking through the mountains.

I was at GSA this fall in Houston, but I didn't see very many of you — I think because of the early

time frame and perhaps because of the location, fewer of our alums came to the meeting. So, if you are in the neighborhood, please stop by and visit.

**RON MORTON** An enjoyable and relaxed year, which of course means I have little to write about! Last fall I did co-teach economic geology with Penny and we had a very wet field trip up to Sturgeon Lake in northwestern Ontario. She has since informed me that the next time we do the course we are going to Sudbury! This fall the volcanological short course was run for the first time in many years. It was sponsored by the Precambrian Research Center with George Hudak, Dean Peterson, and Harold Gibson (Laurentian University in Sudbury) as co-presenters, and attracted 18 exploration geologists from Canada, South America, and the U.S. The course ended with a three-day field trip to Sturgeon Lake (still wet), Rainy River Gold near Fort Francis, and the Vermillion District.

I have finished my third (and last?) book on the North Shore. This one is titled "The North Shore of Lake Superior on Scenic Highway 61: Beaches, Overlooks, Waysides, and Short Walks", and will be published in the spring of 2009. Currently, by popular demand, I am working on a sequel to "Talking Rocks" (published in 2000). With Carl Gawboy as co-author, this book, titled "Ancient Earth and the First Ancestors: A Cultural and Geological Journey", is due for publication in the fall of 2009.

My summer was great as I did very little but write and hang out on our 25 acres (we bought the 15 acres next to us this spring). I figure I alternated between being a country gentleman and a common laborer! I did a lot of tree cutting, wood chipping, path making, and vegetable planting (although Penny is the one who is really good at growing things, her flower gardens this year were fantastic!). We also had an old cabin on our new land

remodeled and added onto so we now have a cabin for guests and for my Dad when he visits.

Let's see—what else? Chris and Megan are both still in Duluth and doing fine (Megan is now a senior cost engineer with Endbridge Energy, and Chris is a computer scientist with a small start-up company), our geothermal heating system is better and more efficient than I could have imagined, and I am still having fun driving my Mini Cooper. I am teaching the introductory geology course this fall and have 230 students taking it! Meaning I now have to start reading the extra credit I let them do on volcanic hazards – I should be old enough to know better than to do such silly things. So, before volcanic hazards and Intro, I once again hope this finds everyone healthy, active, and enjoying life. All the best, Ron.

**DICK OJAKANGAS** Another busy year! Peach and I were tourists in southern India for two weeks in November 07. She flew home and I stayed for another three weeks, giving nine talks and doing a week of field work on a Proterozoic basin.

I was the Expedition Leader on two cruises to the Antarctic Peninsula and the Falkland Islands in January and February. Peach came on one cruise and my brother, Dennis, accompanied me on the second.

I attended ILSG at Marquette, and did NOT need to have surgery after! The 200+ geologists were a bimodal group because of a couple decades with few hires. Members of the younger group were mostly in jeans and T-shirts, whereas members of the older gray-haired set were generally in sport coats and even ties. But the most noticeable attribute of the older set was that most were limping because of hip or knee replacements and other effects of the rough life that we geologists have led.

Miscellaneous: I led a UW Madison group on a four-day field trip in northern Minnesota, gave talks on "The Contributions of Dr.

Ralph W. Marsden" at a Mining History Association Conference at Ironworld, and gave talks on "How the Iron Ranges Came To Be" at two teacher workshops on Building America. At FINNFEST USA 2008 in Duluth, I gave two talks: "Was North America Once Part of Finland?" and "Rocks of Finland: Vanha, Varied and Valuable". I visited our son, Greg, and family in Springfield, Missouri, and gave two talks at Drury University where Greg teaches. Grandma and Grandpa Ojakangas also hosted grandchildren in Duluth for two weeks. We went to New Orleans for Peach's International Association of Culinary Professionals annual conference — good food and a tour of Katrina's devastation. Peach and I also spent a few days in the Sonoma Valley of California — food and wine!

I gave up my office and rock storage space in the Department, due to space needs. Our barn is now a new rock repository, complete with rock saws. A basement bedroom has been converted to a petrographic laboratory, geology library, and office. I WILL finish a bunch of research projects! Don't retire unless you want to be busier than ever!

Peach, the cookbook writer, says she has no job to retire from. So, she just keeps on writing. Her 26th cookbook, **THE BEST CASSEROLE COOKBOOK EVER** (With 500 Recipes), was just published by Chronicle Books of San Francisco. She is already working on her next book, **PETITE SWEETS**.

Family news: Daughter Cathy, a UMD grad, and her family live a block from the Obama's in Chicago, and Malia Obama is in grandson, Tomas's, 5th grade class. Her classmates are all being very nice to her, hoping that they will all be invited to the White House. Cathy is a researcher and Assistant Professor in Neurosciences, mainly studying the brain. Greg, a UMD grad in Geology and Physics, is busy at Drury in Missouri, and will send some of his undergrad physics students up in NASA's "vomit comet" zero-gravity flight to test a robotic arm that he devised. He spent part of last summer at NASA on an orbital debris project. Susanna, a UMD grad in

Geology and English, is the Technical Editor at Bay West, an engineering/environmental firm in the Twin Cities.

My best news is that the manuscript for **ROADSIDE GEOLOGY OF MINNESOTA** has been completed!! It will be published by Mountain Press next fall.

**RIP RAPP** As the author of the only book on archaeomineralogy, Rip Rapp was asked to give the opening plenary address at the first international conference on archaeomineralogy held in Sofia, Bulgaria on 28 October 2009. The morning he left for Bulgaria he finished proof reading the page proofs for the Second Edition of *Archaeomineralogy* [Springer-Verlag] due out in February 2009. Now it is on to a book on the Bronze Age Coasts of Greece and Aegean Turkey, and a book on his long-term project in China on the Shang. 'Retirement' is well worth it if measured in 'pages'.

**JOHN SWENSON** After a year long sabbatical, I am very happy to be back in the classroom at UMD. The break from teaching and service responsibilities gave me some much-needed time to focus on exploring new research areas. I feel reinvigorated and am having a great time teaching; in particular, I am excited to finally have the opportunity to teach the introductory course in Sedimentology and Stratigraphy. The students are great and have been very patient as I iron out the bugs in this new course. While a litany of family health issues kept me from traveling extensively during my sabbatical leave, I did manage to spend some time visiting colleagues in Japan, Ireland, and several stateside locations.

On the research front, my post-doc, **Matt Wolinsky**, is finishing his modeling work for our NSF MARGINS project on the Waiapoa River System in New Zealand. Matt will soon begin a new job with the research division of Shell Oil, where he will focus on

developing models of fluviodeltaic systems. While the New Zealand project wraps up, a new project on delta distributary networks spins up. This NSF-sponsored grant focuses on developing a theoretical framework for the morphodynamics of distributary channels on wave-influenced deltas. The research is in collaboration with my close friend and colleague, Doug Jerolmack, at the University of Pennsylvania. We have three years of funding for a PhD student at Penn and several undergraduate research assistants at UMD. I recently hired one of our undergraduates, **Bill Troolin**, to work on establishing some basic scaling relationships for how wave energy suppresses distributary channel avulsions. This is an exciting project that should yield some basic insight into how deltaic systems operate.

Things have changed considerably at home: Sarah and I, our two dogs, my mother-in-law, and her two cats all moved into a lakefront home, only four blocks from where I grew up (and my parents still live). It is very nice to have all our surviving parents in such close proximity. Though the house, which was built in 1885, is a black hole of usable time and money, I am extremely happy to be living on the lake once again. Somewhat ironically, I once again live atop the same volcanic flow—an Icelandite flow, according to John Green — from my youth: I spent my childhood exploring the vesicular top of this flow; I now spend my time at the base of the same thick flow. It is late November, and I am still paddling my kayak every day the wind will allow.

**NIGEL WATTRUS** This year, for once, I haven't been taken overseas by my research. At least not outside of North America! My

major research cruise on the R/V Blue Heron this summer was an eight-day seismic cruise to collect high-resolution data in Thunder Bay and off Isle Royale. This was the second field season of the project that Steve Colman and I are conducting to investigate the possibility that Glacial Lake Agassiz catastrophically overflowed through Lake Superior on its way to the Atlantic Ocean during the Younger Dryas (ca. 12000 calendar years BP). It has been proposed by other workers, that this event led to the shutdown of thermohaline circulation in the North Atlantic, triggering a cooling of the climate in northern Europe. This year we were joined in our cruise by our new graduate student, **Emily Voytek**, who comes to us from Tufts University. We presented some preliminary results from this project at the AGU meeting in San Francisco last December. **Jessica Gary**, the other graduate student working on this project, is presenting some of her work from the project at the upcoming AGU meeting this year. One of the things I really enjoy about being at the University is the opportunity it brings for getting involved in research outside of my general area of expertise. This summer I spent a week in Milwaukee, working with fisheries researchers from the WATER Institute at the University of Wisconsin-Milwaukee on a study to investigate fish spawning behavior on an artificial reef constructed in Lake Michigan off Milwaukee. My contribution to this effort was to provide high-resolution bathymetric and sidescan sonar images of the structures and to map the composition of the lake floor from my acoustic data. This information is needed to characterize the spawning site. Surprisingly, much is not known about what makes a particular piece of the lake floor attractive to spawning fish, or what characteristics make it a

productive site. I have done several of these types of studies in the past and it looks like I'll be doing more of it in the future, as I will be returning to Milwaukee to do similar work next year. I've also recently been funded by Minnesota Sea Grant to conduct some deep water surveys in eastern Lake Superior on sites where deep-water lake trout (siscowit) are believed to be spawning. Something which we know nothing about! These surveys, although they are not funded for geological reasons, always bring up interesting geological information. Much of the lake floor off Milwaukee, for example, appears to be covered with drumlins dating to the most recent glaciation of Lake Michigan.

On the departmental side of things, I have been heavily involved with the set-up and operation of the department's new seismic display (more about this elsewhere in the newsletter). It has been operational since the beginning of the semester and we are getting interesting events just about every week.

On the personal side, this summer saw some major changes in my household. My daughter, Sally, graduated from East High School and is now midway through her first semester at Augsburg College in Minneapolis. She appears to have made the transition to college well and is loving life at college in the "big" city. My son, Sam, is also enjoying being "king" of the house, now that his big sister has gone. He's at East High School and enjoying all the "opportunities" that high school brings! He's playing bass guitar in a band, and they've played several gigs at local coffee shops. It's an eye-opening experience watching your "rock-star" son.

### *Faculty News and Awards from the Geological Sciences Department*

**Vicki Hansen** received the 2008-2009 Chancellor's Award for Distinguished Research. Faculty who receive this award are honored for their excellence in research, scholarly contributions to their field and for their dedication to student research in education.

**John Goodge** is being recognized as an Exceptional Reviewer for 2008 by the Geological Society of America, awarded by the editors of the Geological Society of America Bulletin.

**Howard Mooers** has been awarded the Sabra & Dennis Anderson Teacher Scholar Award in 2008 for exemplary teaching and research activities as a Professor in the Swenson College of Science and Engineering.

## Wasatch-Uinta Field Camp 2008

This last summer six UMD (among 50) students took part in the Wasatch-Uinta field camp based in Park City, Utah, including graduates Gina Raymond, Waylon Hirst and Andy Shireman, and current students Cara Leitheiser, Mike Etter and Hillary McGown. We spent three days driving to Park City through the South Dakota Badlands and a visit to Flaming Gorge National Recreation Area, which was all very spectacular!

For the trip, we were advised by a certain field camp expert to run up 21<sup>st</sup> Avenue East daily to prep for the strenuous hikes, which we laughed at. In the end, we found this to be an underestimate of the amount of hiking required. We spent every day from 7:30 to 4:00 in the intense sun and altitudes hiking and mapping, drinking water, and hiking and mapping. We spent our time in and near Park City doing things like geologic mapping, rock identification and outcrop mapping. (FYI, Geologic Maps is a VERY useful course to take before attending field camp!) We also spent the Fourth of July using Jake staffs and having snowball fights. It was very surprising to see snow covering the ground on our second day in Utah. We took three field trips, one of which was led by Tim Demko, a former UMD professor, to the San Rafael Swell. We were expertly taught stratigraphic sequences and identifying sedimentary structures. Another UMD professor, Matt Kuchta, was also there to help for roughly three weeks. Unfortunately, Matt was unable to attend our trip to the Tetons, which were a few relaxing days off from mapping. Our final trip was to Midas, Nevada, to the Newmont mining company, and where we saw the Carlin gold trend. We also had the opportunity to interview for internship positions with Newmont.

Field camp was not only about learning field methods, but also camaraderie in sharing the intense experience. Our little free time was spent doing things like making a slip-n-slide with plastic sheeting and baby shampoo, or going to the local street fair on Sundays. Naturally, we spent just a little bit of time at the favorite No Name bar (or the Alamo, for you old guys). Although six weeks seems like a short time, it was long enough to make friends for a lifetime.

*UMD camp participants Cara Leitheiser and Hillary McGown*



## Precambrian Research Center Field Camp 2008

The second year of the Precambrian Research Center's field camp was a huge success. Jim Miller, Dean Peterson, and George Hudak led the camp, and ten students represented ten different institutions. Despite students not knowing each other prior to camp, we formed a tight-knit group that encouraged learning and, of course, fun. Through long field days and late nights, we learned how to make detailed observations, listen to the rocks, interpret what they told us, and create geologic maps of glaciated Precambrian terranes.

The course consisted of four segments, each with its own exercises and locations. For the first two weeks, we were based out of Duluth completing North Shore Volcanic Group mapping exercises by canoe, and then it was off to Ely and the surrounding area for two weeks. After familiarizing ourselves with the Biwabik Iron Formation and its various zones, and measuring stratigraphic sections and logging drill hole cores, we created a hung stratigraphic section throughout part of the Biwabik. For the remainder of the time, we mapped a mineralized portion of the Duluth Complex's basal contact, spent time in the greenstone belts, and had a project looking at both glacial and bedrock features with Howard Mooers and Phil Larson.

The fifth week of camp was the one we'd been waiting for: the capstone project which involved eight days in the Boundary Waters mapping poorly defined areas of the Duluth Complex and its Archean footwall. One group met up with Mark Jirsa to map part of the now well-exposed Cavity Lake Fire Area. The other two groups ended up merging to produce one finalized bedrock geologic map of the Ima and Disappointment Lakes Area.

Returning to Duluth for one last week of camp, and using Arcview, Illustrator, Surfer, and GoCad to digitize the data we collected, we created publishable bedrock geologic maps and powerpoint presentations for our graduation day.

As suddenly as it started, our six weeks together were over. I think we all walked away with an invaluable skill set, a few more friends, and half a summer's worth of good memories. Most importantly, though, we gained the necessary confidence to make the best geologic interpretations we can with data available. We gained that extra ounce of self-assurance required to stick by our results in the face of doubt and say "yeah, I did that, and it's right."

*UMD camp participant Eric Stifter*

## ALUMNI NEWS

**Allison, Daniel**, BA 00, is currently working for American Engineering Testing in Duluth.

**Bertsch, Benjamin**, BA 95, MS 02, works for Ecolab, Inc. in Duluth. Ben's new address is 2731 East 7<sup>th</sup> Street, Duluth, MN 55812.

**Karberg, Susan**, MS 08, defended her dissertation this summer. She has also been mentioned in a press release with Dr. Vicki Hansen for assisting in the Intel ISEF pre-college science competition.

**Dott, Eric**, BS 81, has a new address, 424 Lakeview Avenue, Duluth, MN 55812.

**Erickson, Emerald**, BS 05, University of Washington, MS 08, defended her dissertation this summer. Her e-mail is <emeralderickson@hotmail.com>

**Everett, Jack**, BS 47, plans on retiring next year after 61 years of being a mining geologist involved with exploration and mine development. For those of you who are unfamiliar, Jack has worked all over Canada and the USA and with projects in Central and South America. His last projects were a gold mine going into production in Mexico and an iron ore project in India. Jack spends the winter in Arizona and can be found at 3996 N 150<sup>th</sup> Lane, Goodyear AZ 85395. His e-mail address is <jackeverett@msn.com>

**Everett, Karl**, BS 75, is in Strasburg, Virginia, as Senior Manager for Environmental, Health and Safety for the eastern operations for Oglebay Norton Company. Last news heard was they were waiting to see about Carmeuse (a Belgium Mining Company) interested in purchasing the company.

**Gamble, Valerie**, MS 08, defended her dissertation this summer. Valerie's new address is 502 Sparkman Avenue, Duluth, MN 55803.

**Hudler, Abbey**, BS 04, returned from an extensive trip overseas and is looking for permanent residency in Park City, Utah. Her e-mail address is <orchisocean@yahoo.com>

**Jongewaard, Peter**, BS 86, MS 89, now resides at 7009 Three Lakes Road, Canyon, MN 55717.

**Karberg, Susan**, BS 06, Ohio State, MS 08, has joined Sandridge Energy in Oklahoma City. Her address is 5513 Sandoval Drive NE, Rio Rancho, NM 87144.

**Flater-Kort, Jill**, BS 03, works for Aquila Resources, Inc. in Stevenson, Michigan as a geologist.

**Goodman, Sally**, BS 02 Lawrence University, WI, MS 08, and her husband, Matt, welcomed their son, Arthur, on September 12, 2008. Congratulations to both Matt and Sally! Sally has been busy, indeed. She just defended her thesis and finished a year as a high school science/math teaching fellow for the National Science Foundation. Sally's husband, Matt, started working for GeoComm of St. Cloud in June as a GIS Specialist.

**Granley (Zapp), Mindy**, MS 04, is UMD's new Campus Sustainability Coordinator. She has been busy indeed. She previously worked as a coastal nonpoint specialist for the Minnesota DNR Lake Superior Coastal Program, was a senior conservation specialist for South St. Louis Soil & Water Conservation District, as well as a research specialist for the UWS Lake Superior Research Institute, and a researcher for the city of Superior Environmental Services.

**Gunderson, Jay**, BS 84, is happily married with five children. He is working as a Senior Research Geologist, Coal / CBM for Montana Bureau of Mines & Geology. His e-mail is <jgunderson@mtech.edu>

**Heinzel, Chad**, BS 96, MS 99, PhD Northern Illinois University, has accepted a position in the Department of Earth Sciences at the University of Northern Iowa in Cedar Falls. We wish Chad, Linda, Lily and Stella the best.

**Johnson, Leif**, MS 03, is currently working for Barr Engineering Company in the Twin Cities as a geologist. Check out their website: <http://www.barr.com>

**Johnson, Joel**, BS 96, is currently at the University of New Hampshire as Assistant Professor. Joel's e-mail is <joel.johnson@unh.edu>

**Larson, Phil** BS 93, PhD 08, and **Katie (Puekart)** BS 94, are celebrating some very special events; Phil's PhD and Katie's new hire with Golder Associates, Inc., a consulting company that specializes in geotechnical & enviro-engineering, and the birth of their second son, Harri Niklas Larson, born March 19, 2008. Little Harri had some help from the Duluth Fire Department Hook & Ladder #23. Mom and baby were fine.

**Liverseed, David**, BS 94, has joined Opus Corporation in Minnetonka, Minnesota as an Environmental Analyst. The web address is [www.opuscorp.com](http://www.opuscorp.com), or you can e-mail David at <david.liverseed@opuscorp.com>

**Michaud, Joshua**, BS 02, and **Patty (Crawford) Michaud**, BS 04, announced the birth of a baby girl on August 8, 2008. Congratulations to both Josh and Patty!

**Miller, Marsha**, BS 82, has a new address: 19732 W Pasadena Avenue, Litchfield, Park, AZ 85340.

**Norton, Kevin**, MS 02, PhD 08, University of Hannover, Germany, defended his PhD in August. You can reach Kevin through e-mail: <k.norton@mineralogie.uni-hannover.de>

**Petersen, Dean M**, BS 87, PhD 01, joined Duluth Metals as the Senior Vice President of Exploration, starting his appointment on October 1, 2008. Dean will be primarily responsible for the overall direction of the company's exploration programs, and will focus on advancing geologic exploration, modeling, and interpretation of the Nokomis Deposit and surrounding Maturi Ext Properties.

**Riker-Coleman, Kristin**, BA 97 College of Wooster, OH, MS 00 Ohio State, PhD 08, defended her thesis on the Twin Cities campus this fall.



**Shankar, Bhairavi**, BSc 06 University of Toronto, MS 08, is currently at the University of Western Ontario as a PhD student.

**Smith, Deb (Duprey)**, BS 96, and her spouse, Jonah, welcomed a new daughter, Ripley Smith. Congratulations!

**Strom, Denne**, BS 96, stopped by the Department in November with his three beautiful children to say "Hi". His address is 5302 St. Stephen Street, Mounds View, MN 55112, and his e-mail is <dsstrom1@comcast.net>

**Swor, Terry**, BA 66, received the American Council of Engineering Companies of Minnesota's "Tom Roche Lifetime Achievement Award". This award recognizes Terry for his

contributions to the engineering profession, the council and the community. Terry is the president and founder of American Engineering Testing, Inc. in St. Paul.

**Tharalson, Erik**, BS 07, has a new address - 530 N. 12<sup>th</sup> Avenue East, Apartment 1, Duluth MN 55805.

**Van Alstine, Jon**, BS 04, MS 06, now lives at 4949 Maxwell Road, Duluth, MN 55804

**Richard Peterson, Jr**, BS 81, passed away December 10, 2007.

### LOOKING FOR A JOB?

Our electronic service for individuals seeking jobs in the geology field is working well. As we receive announcements about new employment opportunities, we will forward the notices to you electronically. It's fast and easy! To add or remove your name to our jobs email list, go to <http://lists.d.umn.edu/mailman/admin/geol.jobs>, click on [Geol.jobs](#), and fill out the short online form provided. You can subscribe or unsubscribe at any time. If you need assistance with this process, please e-mail Laura at <geol.d.umn.edu>

## Undergraduate Student Presenters and Contributors

### 54<sup>th</sup> Annual Institute on Lake Superior Geology Marquette, MI

**Putz, Amanda J.**, 2008, "Capstone" Geologic Mapping Near Gabimichigami Lake, Boundary Waters Canoe Area Wilderness.

**Wendland, C.**, 2008, Bedrock Geology of the Footwall to the Soudan Iron Formation South of Twin Lakes, St. Louis County, Northern MN.

**Tharalson, E.**, 2008, Geological Map of the Nickel Lake Macrodike and Northern Bald Eagle Intrusion: Lake County, Northern MN.

## Graduate Student Presenters and Contributors

### 54<sup>th</sup> annual Institute on Lake Superior Geology Marquette, Michigan

**Costello, Daniel E., Hoaglund, Steven A.**, "Capstone" Geologic Mapping Near Gabimichigami Lake, Boundary Waters Canoe Area Wilderness, By Students of the Precambrian Research Center's 2007 Field Camp.

**Erickson, Emerald**, Hansen, V. L., Structural and Kinematic Analysis of the Archean Shagawa Lake Shear Zone.

**Frost, Shelby, J.**, Student Capstone Map from the UMD Precambrian Research Center's Field Camp; Bedrock Geology Map of Homer Lake and Adjacent Areas, Cook County, MN.

**Goodman, Sally**, Structural and Kinematic Analysis of the Kawishiwi Shear Zone, Superior Province, Northeastern, MN.

**Johnson, T.K.**, Bedrock Geology of the Footwall to the Soudan Iron Formation South of Twin Lakes, St. Louis County, Northeastern MN.

**Karberg, Susan**, Structural and Kinematic Analysis of the Mud Creek Shear Zone, Northeastern MN; Implications for Archean (2. Ga) Tectonics.

**Koester, J. N.**, Goodge, J.W., Hansen, V. L., Structural and Metamorphic History of the Burntside Lake Shear Zone with Possible Implications for Archean Granite-Greenstone Formation.

### American Geophysical Union San Francisco, California

**Shi, Junmin**, presentation on "Precessional Variability in Southeastern African Aridity During the Past Few Hundred Thousand Years". (December 2007)

### 2008 Binghampton Symposium Austin, Texas

**Johnson, Andrea**, and Grand, K., Belmont, Patrick, and Jennings, Carrie, "Timing and pattern of valley excavation, Le Sueur River, south-central Minnesota, USA.



## Scholarships, Awards and Other Notable Mentions

The *Outstanding Graduate Student Award* recognizes a geology graduate degree candidate for the greatest overall contribution to the Geological Sciences Department, including scholarship. This award is given in memory of Ralph W. Marsden, who was respected the world over as a scientist and person. He was head of the Geology Department from 1967 to 1974 and retired from UMD in 1980. It is also in memory of Randy Seeling, who was a graduate student in Geology at UMD and completed his Master's degree in 1977. He met an untimely death in May 1979 in an accident while touring Europe. This year there were two recipients of this award, **Riyad Ali-Adeeb** (MS), **Isla Castaneda** (PhD).

The *Outstanding Graduate Teaching Assistant Award* for the 2007-08 academic year was presented to **Jennifer Koester** in the amount of \$200.

The *Outstanding Senior Award* (Ralph W. Marsden Fund and the SME) is a \$750 award given to the outstanding graduating senior on the basis of scholarship. This year's recipient was **Brandon Brayfield**.

The **Hugh Roberts Scholarship** is an award given to the outstanding junior geology major, determined by scholarship. This award is given in memory of Hugh Roberts who was an internationally known consulting geologist from Duluth. **Eric Stifter** was the 2008 recipient of the \$600 scholarship.

The *SME Tools-Of-The-Trade Award* is given to outstanding sophomores in the form of \$300 worth of geological field gear. **Alexandria Beadell, Lucas Lundgren and Matthew Pendleton** were presented this award at the 2008 SME Minnesota Section Mining Symposium luncheon.

The *Roderick Syck Field Camp Scholarship* is awarded each summer to the UMD student with the highest achievement at field camp. Andrew Shireman (Wasatch-Uinta Field Camp) and **Eric Stifter** (PRC Field Camp) were each awarded \$500 for their efforts in 2008.

Undergraduate student **Lucas Lundgren** was selected to receive a rock hammer donated by Estwing for his exceptional performance in Geologic Field Methods.

The *James R. Frantes Graduate Fellowship* is an award established a few years ago in remembrance of one of our graduate students. Funding for this fellowship came primarily from the Frantes family and our own faculty. All interest from this fund is matched by the 21<sup>st</sup> Century Graduate Fellowship Fund. Scholarships for 2008 went to **Thomas K. Johnson** and **Emily Voytek**. Students continue to use these funds in any way in pursuit of their graduate degree. We anticipate that we will be able to continue to offer two to three scholarships each year.

The *Jill and Terry Swor Scholarship* was established by generous donations from Terry Swor and is given alternately to students in Geological Sciences and in Civil Engineering. This year two awards of \$1000 were given to Eric Stifter and Hillary McGown.

**Field Camp Scholarships.** All UMD students attending field camp in 2008 received \$1500 in scholarships, which covered the entire tuition portion of their expenses! The scholarships and recipients are shown below:

**R.C. Bright Field Camp Scholarship** – Michael Etter, Waylon Hirst, Cara Leitheiser, Hillary McGown and Eric Stifter

**Robert L. Heller Field Camp Scholarship** – Waylon Hirst, Gina Raymond, Andrew Shireman and Eric Stifter

**"Rip" Rapp Field Camp Scholarship** – Michael Etter, Cara Leitheiser, Hillary McGown and Gina Raymond

**Charlie Matsch Field Camp Scholarship** – Michael Etter, Waylon Hirst, Cara Leitheiser, Hillary McGown, Andrew Shireman and Eric Stifter

**Lempi M. & John W. Pagnucco Scholarship** – Michael Etter, Waylon Hirst, Cara Leitheiser, Hillary McGown, Andrew Shireman and Eric Stifter

### 2008 Graduates

<u>BA</u>	<u>BS</u>	<u>MS</u>	<u>PhD</u>
Anderson, Ashley	Brayfield, Brandon	Erickson, Emerald	Larson, Phillip C.
Brewer, Adam	Fritz, Aaron Lee	Gamble, Valerie	Riker-Coleman, Kristin
Putz, Amanda	Gurske, Amanda	Goodman, Sally	
Raymond, Gina Rene	Hirst, Waylon	Shankar, Bhairavi	
Shireman, Andrew	Jacobs, Joseph	Sharpe, Andrew	
Vosen, Victor	Kiffmeyer, Terra	Woltering, Martijn	
Wendland, Corey	Tharalson, Erik	(WRS)	

