

UMD Geological Sciences Newsletter for Alumni & Friends

Editors: Cathy Dziuk, Charlie Matsch, Claudia Rock

Happy holidays everyone. There have been many events and changes over the past year that I would like to share with you. First, Penny Morton's term as department head is over, and she is spending the year in England. Penny is serving as director of UMD's Study in England Programme, and apparently is enjoying her new role. As many of you know, Penny was actually born in England, so in a sense she returned home for a visit. I took over as department head in July and am trying to settle into the administrative role. One of my first official duties was to say goodbye to Colleen Wergin. Colleen and her family moved to New Richmond, Wisconsin, to pursue other opportunities; we will miss Colleen immensely. However, our search for Colleen's replacement brought us Cathy Dziuk (pronounced Jook, rhymes with book). Cathy worked for the Edina School District for three years, and she and her husband recently moved to Duluth. Welcome, Cathy!

We have another impending personnel change to report. After four and one-half years, Tim Demko will be leaving our department and returning to ExxonMobil from whence he came. As you all know, the petroleum industry is booming again, and with record profits come an active and aggressive exploration program. Over the past year, ExxonMobil has been recruiting the best scientists in the world to train their exploration staff. The company decided that Tim would be a valuable asset. Tim, Laura and Noah will be returning to Houston in January. We will miss them terribly. I guess that if you are leaving Duluth, January is a good time to go. During his time at UMD Tim has served as our sedimentologist, stratigrapher, and paleontologist. He has energized our undergraduates with his enthusiasm, advised the Geology Club, and started a local chapter of Sigma Gamma Epsilon, the National Honor society for the Earth Sciences. Tim has served as advisor to numerous graduate students, taught at the Wasatch-Uinta field camp, and has involved many undergraduates in dinosaur fossil excavations in Wyoming as part of an NSF-sponsored Research Experience for Undergraduates.

The past year has seen great improvements to our undergraduate teaching labs. We now have two newly remodeled teaching laboratories in the Chemistry Building that are used for the large-enrollment introductory classes and upper division required and elective courses. In addition, the mineralogy/petrology lab has been completely renovated, including all new microscopes. This state-of-the-art microscope lab was made possible by the generosity of many individuals. There is a complete description of the lab and recognition of the donors later in the newsletter.

In addition to the generous donations in support of the microscope lab, we also have two new scholarship funds to report. The Charlie Matsch Glacial Geology Fellowship fund for research in glacial geology was established with a generous gift from Charlie himself. The fund will provide research support for graduate students studying aspects of glacial geology or glacial processes. The UMD Jill and Terry Swor Scholarship was established by another generous gift from Terry Swor in memory of his late wife. Terry received his BA in geology from UMD in 1966, and this fund will provide scholarships for undergraduates in geology and will be expanded in the future to include civil engineering at UMD. The annual payout provided by these gifts is matched dollar for dollar by two University initiatives: Charlie's gift is matched by the 21st Century Graduate Fellowship Fund and Terry Swor's gift by the UMD Reaching Higher Scholarship.

One last item to mention; the Wasatch-Uinta field camp celebrated its 40th birthday this year. The field camp was started in 1967 by Bob Bright, professor in the Twin Cities. The original members of the field camp were University of Minnesota-Duluth, University of Minnesota-Twin Cities, University of Wisconsin, University of Utah, and the University of Iowa. Membership in the camp has evolved over the years, but UMD has always been one of the cornerstones. Happy birthday Wasatch-Uinta field camp!



NEW MICROSCOPY LAB

Good equipment stands the test of time, as is apparent to a generation of you who used the same petrographic microscopes for more than 30 years! These microscopes did their duty, but they were clearly showing signs of wear and replacement parts were becoming increasingly hard to find. Now the Department has installed a new lab from the ground up.

As you recall, last December I included an appeal in this newsletter for contributions to purchase microscopes for a new student lab we wanted to build. By April of 2006 we had a tremendous response from alumni, emeritus faculty and other friends of the Department. In all, some \$85,000 was raised by this group! The complete list of donors, including some corporate matches, is included in the Giving section of this newsletter. These donors provided funds needed to purchase new student microscopes and a research-grade instruction microscope. With your donations and additional funds from the Department as a seed, we received \$37,000 in matching funds from the College of Science and Engineering for purchase of video, projection and other electronic equipment needed to complete the new lab. The University provided funds for a complete room renovation in Heller Hall, bringing the total cost of the new lab to about \$175,000. I am very pleased to report that with your generous support we were able to begin construction over the summer and the lab is now operating as of October!



The new lab includes 15 high-quality binocular student microscopes equipped with some of the best optics available, a research-quality microscope for instruction and student projects, a digital imaging system, a computer for acquisition and processing of images, a video system to network all of the student scopes to a live display, dual video projectors, and new furnishings for the work areas.

The lab room itself was remodeled from top to bottom, much needed after decades since the building's last major update. Each step in the installation of new equipment required custom construction, creating a student microscopy lab virtually without peer. The configuration will encourage students to work in small-group clusters,

rather than a traditional lab table arrangement. Video images from any one of their microscopes can be projected instantly through a video projection system so that they can learn from each other. A second projection system allows images from an instructional microscope or computer presentation software to be projected side-by-side with the student image. Image-capture and image-processing software will enable students to create graphical material for reports or conduct morphometric analysis of their samples. Not only will this truly state-of-the-art lab provide students with good microscopes that will last another generation, but it will provide them an environment that stimulates group learning, classroom interaction, and use of different types of imaging technology.

Despite the great progress in establishing a solid foundation for transmitted-light microscopy, there is still more we can do. Additional donations will be used to purchase additional microscopes to put into rotation, and also to purchase accessories needed for reflected-light microscopy. It's not too late to consider additional gifts.

It's still hard for me to believe what great progress we made in under a year! To all of you, many heartfelt thanks. This year's students are already excited about the opportunity to use new microscopes, and I'm sure the equipment will make a significant contribution to the quality of our Department's education program for years to come.

John Goodge



DONORS TO MICROSCOPY LABORATORY

MICROSCOPE DONORS

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Gerry H Heller in memory of
Robert L Heller,
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ERIK BROWN The big excitement here is the new toy for my lab: an x-ray fluorescence core scanner. This device, one of only two in the United States (the other is at Woods Hole Oceanographic Institution in Massachusetts), allows rapid determination of the inorganic composition of sediments with 0.2mm scale resolution. Basically, you can put a 1.5 m 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). This type of rapid analysis is critical for evaluation of the hundreds of meters of sediment recovered from recent lake drilling operations on Lake Malawi (East Africa) and Qinghai (China). We can do as much analytical work in a week as would have taken six months before. Not surprisingly, we are setting up collaborative projects for studies of sediments from all over the world. We are even playing around with using it for evaluating tree rings and speleothems from caves.

This past spring semester the whole family headed off to Birmingham (UK) where I taught in UMD's Programme in England (seems to be becoming a Departmental tradition). The kids had a great time learning more about Richard III and the War of the Roses (Andrew, 10), Robin Hood (Lianna, 8), and trains (Matthew, 4), as well as Cadbury World (all three). We had a great April holiday in Gozo (a tiny Mediterranean island next to Malta) where I worked to interest the kids in the Globigerina limestones!

STEVE COLMAN After two years at UMD, I'm finally beginning to feel at home as a member of the faculty of Geological Sciences, mostly because, for this year's newsletter, I don't have to introduce myself or my vision for

the Large Lakes Observatory. Administration of LLO continues to take a large amount of my time, especially because we've broken in two new faculty members in LLO this past year, and we may be adding as many as three new faculty members next fall. I also continue to give presentations about LLO and its research (featuring some of the work of our Geological Sciences faculty) at various venues both local and afar.

I got back into teaching last fall by taking over Tom Johnson's Global Climate Change course while he was away on sabbatical. In terms of research, I'm just finishing up publications on my paleolimnology project at Bear Lake, Utah-Idaho. I continue to work on various aspects of the Lake Qinghai (China) Scientific Drilling Project, and I've been doing a variety of preliminary research on Lake Superior and its history. In support of the latter two projects, I've recently received two major NSF grants. 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 and LLO), is a study of past climates at Lake Qinghai, China. The other, entitled "Post-glacial lake-level changes, isostatic deformation, and paleo-hydrology in the Lake Superior basin," with co-PI Nigel Wattrus (Geological Sciences and LLO), involves glacial deposits and drainage history in Lake Superior.

Outside UMD, I serve on the Committee for Research and Exploration at the National Geographic Society, the committee that reviews research proposals submitted to NGS. In addition to several one-day meetings at NGS headquarters in Washington each year, the Committee goes on site visits to areas where we've funded research in the past. In the last few years, we've gone to Madagascar,

China, and Honduras, and next January, we will be going to Egypt.

Field work and presentations at scientific meetings, in addition to the NGS travel, certainly keep my travel schedule full. But such is the life of a geologist.

CHRISTINA GALLUP My group has had a busy year. **Nick Freiburger** went to Barbados in January to finish up field work for his Master's thesis on U-Th dating of fossil corals from the Last Interglacial terrace to document past sea level change. He will finish his thesis this fall semester. **Valerie Gamble, Erin Endsley,** and I traveled to Guatemala in February to participate in the very successful drilling of Lake Peten-Itza. Valerie is doing her Master's on U-Th dating of the numerous gypsum layers found in these drill cores and on isochron dating of carbonate-bearing layers from the Lake Malawi drill cores. Both of these efforts will provide important geochronological constraints to the paleoclimate records preserved in these tropical lakes. Erin traveled to Mexico in August, with David Hodell and Mark Brenner from the University of Florida, to collect speleothem samples to work on for her Master's thesis. She is currently dating the speleothem collection and will choose one to work on for her thesis. She will do both oxygen-isotope analyses and U-Th dating on her chosen sample and discover the paleoclimate record preserved in the speleothem. This month, **Kristin Riker-Coleman** published her work on documenting tectonic uplift in New Britain, Papua New Guinea, with U-Th dating of subaerially exposed fossil corals in *Geophysical Research Letters*. She is now writing a paper on the timing of the end of the penultimate glaciation based on U-Th dating of submerged fossil

corals off the coast of Hawaii. This winter she plans to finish a third paper on the drowned corals from Huon Gulf, Papua New Guinea, that we collected in 2001 and defend her PhD thesis by the end of the academic year.

I just returned from a research cruise to Hawaii to collect more drowned fossil corals offshore of Hilo. I was thrilled to dive twice in the Hawaiian Undersea Research Laboratory's submersible Pisces IV, first to look at the seafloor between 1550 and 1050 m and second to 550 to 350 m water depth. It was truly awe inspiring to be in a three-person submarine at the bottom of the ocean and see the strange fish that live almost a mile deep in the ocean and the beautiful gold coral that lives at 300-400 m water depth. I will continue to work with an international team of scientists to determine how Hawaiian reefs have responded to and help to document past sea level change. What a wonderful job to have interesting and active projects in so many different parts of the world!

JOHN GOODGE About this time last year I was just getting "off the ice" in Antarctica. With MS student **Devon Brecke**, we were sampling glacial moraine and till deposits along the Transantarctic Mountains edge of the Antarctic ice cap in order to determine what kinds of basement rocks occur below the ice. Despite some minor delays coordinating flights to sample sites, we were able to get to most of our target sites. We were in the field much earlier than normal in October and November – early spring in Antarctica – which meant it was quite cold at times. One particularly memorable day with streams of snow blowing across the surface from the plateau, we had a measured wind chill of -105 °F – that's cold for working long outside! Devon and I are now busy picking apart the petrology, geochemistry and geochronology of

materials in these deposits as part of our provenance study to see what the ice has brought in.

Although I have three Antarctic projects in various stages of completion, I'm eager to get research started in the Precambrian of Minnesota and nearby areas of the Superior Province. Together with Vicki Hansen and several new graduate students, we are planning work on the petrology, structure, and tectonics of the granite-greenstone belts and other sub-belts of the Superior Province. New research in this area will tie in nicely with launching of the new Precambrian Research Center in the coming year. This summer I also coordinated renovation of our departmental Microscopy Lab, which I write about separately in this Newsletter. With this new lab, our undergraduate and graduate students will have a state-of-the-art lab supporting both education and research in many areas, including mineralogy, hard-rock petrology, structural geology, sedimentary petrology, and ore petrology. Special thanks go out to all alumni and friends of the Department who contributed donations to the lab development. Next time you're on campus, please stop by for a tour!

JIM GRANT This year's event was the birth in August of grandson Alex, courtesy of Ian and Lisa. He came a bit early, via an emergency C-section. This really brought home to us that giving birth is not to be taken lightly. But Lisa and Alex and Ian came through it very well, and Alex is by now about 12 lbs and doing fine. Granddaughter Tara thinks he's a living doll, and it should be a real pleasure to see them grow up together.

Early in the year, we had a trip to Vail, during which I did not encounter aspens, and we had a great time, complete with Ian and Lisa and about-to-be Alex. Again we decided to stay on Lake Nebagamon over the summer, with our new Bennington

pontoon boat. We traded in the old ski boat and lift with pleasure (both lemons), and found the new boat to be superb for relaxation and entertaining.

In the fall, after the magnificent peak of the colors, we took off for Scotland for a family wedding – in the village of Cawdor (as in Macbeth) with the reception at an old haunt of Charlie Chaplin in Nairn. After that we headed for the far north-west to visit our friend Nina MacAulay, and a revisit to some of the remote spots where dad and I went fishing in days gone by, on the American side of the Moine Thrust. Lovely unspoiled beaches and spectacular scenery still far from the tide of tourists further south. Then back to England to visit cousins I hadn't seen for a few years. Concluded with Julius Caesar at Stratford, and a viewing of some old and libelous films from 60 years ago, taken by an uncle who was the sort of relative everyone should have.

On getting home we realized that I still had to winterize our place. I had to get the pontoon boat out, and then the dock in, and the DNR had decided to close the public landing for repair. Happily the weather cooperated and we are now ready for winter

Meanwhile, I'd been asked to review the paper from my pals in Melbourne, which was what I'd been working for the past two years. They came through with the goods, with a much improved model for melt compositions and a first appearance of orthopyroxene and melt that jibes with experimental data. So now THERMOCALC is ready for work, and I'm well on the way to reconciling their model with my experimental melting results from Wyoming.

We end the year with another event: Christabel has resigned as director of the Bong WWII Heritage Center, and her replacement starts today! She has

poured her energy into the Center over the past eleven years and it shows: it is a first class facility, and we are so proud of what she has accomplished. Till the end of the year, she is going to overlap with the new director, who is qualified and experienced in running a museum, and was their first choice in a national search. Then she will probably volunteer in the areas of fund raising and grant writing, which she is good at. (She has lots of practice keeping this Grant right.) I hope to continue with the commemorative tile wall, which now honors over 1500 veterans of WWII. To see a family come in and find their special tile is quite moving, and shows we've done something worthwhile.

After Thanksgiving in Minneapolis with the next couple of generations, we all head for Curacao, and snorkeling and grandchild-sitting and relaxing for a week, followed by Christmas at Lake Nebagamon.

Best wishes to all for a happy Christmas and a superb New Year!

JOHN GREEN This cool, but un-stormy fall (so far) finds my activities pretty similar to last year's, including a couple of North Shore short-courses for the North House Folk School in Grand Marais and for "Sugarloaf – the North Shore Sustainability Association" (its new name) in Schroeder. I'm continuing to collaborate with the Minnesota Geological Survey's bedrock mapping program on the North Shore, and I helped to lead field trips for both an international Paleolimnology Conference and the Minnesota Minerals Education Workshop. Along with more scouting in the hills for the future Superior Hiking Trail (SHT) between Duluth and Two Harbors (construction scheduled to begin next year), much of my time has been committed to working up my 48-page booklet on the natural

history and geology along the SHT through Duluth. That project is in its last throes, and it should be out early in 2007. Here in the Department it's exciting to see the beautiful, high-tech new microscope lab in operation, thanks to so many of you.

But being retired means more opportunity for travel, and I got in two family trips to New England last summer, an exploration/birding trip to Lake Agassiz Plain of northwestern Minnesota, and a grand early-spring tour of the northern half of the Colorado Plateau, most of which neither Jan nor I had experienced before. Although we got snowed out of the Mesa Verde N.P. and nearly experienced satiation with red landscapes, it was a great trip and included a visit with old Duluth/Las Vegas geology friends Wanda Taylor and Gary Olson. Charlie Matsch came with us for the first few days.

Jan continues her workaholic involvement in bird studies and environmental matters, with the addition of joining our local Township Planning Commission.

Now with the leaves off the trees and snow buntings starting to decorate the roadsides, it's time to hunker down for the winter.

VICKI HANSEN Time flies, as do students! This past year **Nick Lang** and **Roger Bannister** graduated; each moving south. Nick to Nashville, where he is a post-doc with Hap McSween. Nick not only moved south, but he also jumped planets, landing soundly on Mars. Roger moved twice, once to Houston to enjoy a summer internship with an energy company, venturing out to the Gulf and into 3D-4D space using seismic data. Roger then moved east to Blacksburg, Virginia where he is quickly making himself invaluable as a geologist and GIS expert for an environmental firm. Despite Nick and Roger's departures the Lab was

a hopping place this summer. Dr. Ivan Lopez visited from Madrid (Spain, not MO), for about a month, just missing Nick and Roger. Nick, Ivan and I got three Venus quadrangles off to USGS for review and publication. What a collective sigh as these projects finally left the lab! (Roger and I still need to get the Artemis quadrangle off). Undergraduates **Taylor Nordberg**, **Erik Tharalson**, and **Kirsti Hakala** (each with UROP projects) settled into the lab over the summer and made major contributions toward a global map of Venus ribbon tessera terrain, and early stages of Monte Carlo modeling. Much thanks to Roger for bringing GIS Globe into the lab, allowing us to compile true global views of Venus, sidestepping all sorts of projection issues that we have been fighting for years (we traded projection issues for technology frustration!). Taylor and I presented exciting early results at the GSA meeting in Philadelphia, and hope to put together a paper soon. In a nutshell, the new data make catastrophic resurfacing of Venus extremely difficult (read, impossible). In fact, burying early-formed craters (even slowly) appears at serious odds with our results. We have lots of mapping still to do (Venus is after all almost the same size as Earth!), but we are extremely excited about the snippets of her past Venus seems more and more willing to share. MS students **Emily Bjonnes** (Rutgers University) and **Bhairavi Shankar** (University of Toronto) joined the group, each planning to conduct Venus MS research.

August 2005 found me in Scotland at an AGU Chapman conference on plumes. As a result of that meeting I was invited to write an article on LIPs (Large Igneous Provinces) on Venus, so Venus LIPs, will be coming to an issue of the Journal of Chemical

Geology—pick up a copy at your local newsstand! Independently I was asked to contribute a chapter on Venus to Earth's Oldest Rocks. Both of these contributions provided me the opportunity to reflect more seriously about Venus-Early Earth connections, which I have puzzled about for many years now. It has been lots of fun, and surely will continue to be so. I have my fingers crossed that next August will find me touring about the Pilbara in Australia—perhaps making first-order Venus-early Earth comparisons in the field. In the meantime, I look forward to finally getting back to Earth in UMD's own backyard, the Archean Superior Province. As luck would have it, three wonderful new graduate students arrived in August to begin work on shear zones in the Superior Province: **Emerald Erickson** (University of Washington), **Sally Goodman** (Lawrence University, via Grand Marais), and **Susie Karberg** (University of Ohio). To round out a renewed Precambrian effort here, **Jenny Koester** (Winona State) and **Chris White** (UW-Oshkosh) will pursue MS projects involving metamorphism-tectonics, and the Duluth Complex, respectively. John Goodge and I meet weekly with this group of five students with the goal of bringing all of us up-to-date on Precambrian puzzles. Plate tectonics or no? Plumes possible? Subduction or sagduction? No shortage of questions... and curiously some similarities with Venus! Tune in next year for our versions of some answers.

This past year Taylor and Roger each presented talks at GSA (that was in Salt Lake), and Roger and Nick presented posters at the Lunar and Planetary Science Conference in Houston in March. Taylor presented a second paper at GSA just this past October in Philadelphia.

We made also a few

additions to the planetary lab, including two huge (!) Cintiq write on monitors, and a Dell (Windows-yikes!) workstation. The monitors provide us with unprecedented views of Venus' surface, and the Dell allows us to run GIS Globe, which in turn allows us to hang our mapping in a global view—very cool! On the terrestrial side, we just added a large format petrographic scope that will be absolutely invaluable for microstructure analysis. Tune in next year to see where investigations have brought us!

TOM JOHNSON Kate and I started out the calendar year in Cambridge, England, where my sabbatical year continued. I was appointed an Overseas Visiting Fellow in St. John's College, one of the 30+ residential colleges that make up Cambridge University, and straight out of Harry Potter. We lived in the upstairs of a stone cottage overlooking "The Backs," expansive lawns with hedges and trees along the River Cam. Life in Cambridge was rich in all respects – telescope night on Maddingly Rise, Richard Thompson in concert at the Corn Exchange, Beethoven's 9th in King's College chapel, and more. I carried out textural analyses on Lake Malawi sediments in Nick McCave's lab in the Department of Earth Sciences, finding an intriguing but subtle signal of changing mean size in the sortable silt fraction. This led to an investigation of the processes responsible for sediment of this grain size being transported some 40 km offshore to the core site, which has to involve resuspension events by surface and internal waves that lead to near-bottom transport of the course material to farther offshore. With this understanding, can a clear tie be made between the grain size signal and climate forcing, for example, in terms of river delivery of sediment to the basin or of the factors that generate high wave energy in the lake? We do not yet have an answer, but are drawing

comparisons between the grain size signal and other signals of past climate change that we are extracting from of the sediments. While I was in Cambridge I remained in frequent e-mail contact with my grad students, and participated by ITV in the MS thesis defense of **Jon Van Alstine**, co-advised by Steve Colman. Jon did a very nice study of the variability in sedimentation around the ring structures in the offshore basins of Lake Superior. Jon finished his MS program in less than two years and now works for the EPA in Duluth.

Kate and I left Cambridge on April 1st and flew to Auckland, New Zealand, for a spectacular month of sightseeing, from the subtropical seas of the northern end of North Island, to the glaciers and fjords of South Island. We kayaked the waters of Stewart Island south of South Island, and tramped the rain forests of North Island. We could not have been more impressed by the beauty of the land and coast, the wonder of the country's geology and botany, and the great attitude of the many New Zealanders we met in our travels.

The first of May brought me back to working mode, when we flew to Perth to finish up the sabbatical year in the Centre for Water Research at the University of Western Australia. The Centre is run by Jorg Imberger, who is an internationally renowned aquatic engineer with specialty in modeling the physical, chemical and biological processes at work in lakes and reservoirs. Jorg and I collaborated on the circulation dynamics of Lake Malawi, focusing on the generation of internal waves in response to the wind field, shedding additional light on the processes that move sediments around in this deep, tropical rift lake. Two modelers in the Centre are continuing to refine the circulation models, which

should lead to publications sometime next year. Kate and I lived in a row house just a block away from a beautiful beach on the Indian Ocean, and we managed to travel around a bit of Western Australia, including the wine country of Margaret River to the south of Perth, and Shark Bay and Ningaloo Reef to the north. On the latter trip, we were accompanied by our son, Ryan, who flew down for a week of sightseeing and snorkeling. Kate and I finished off our stay in Australia with a brief trip to the Bungle Bungles in northeastern-most Western Australia, in the Kimberly region. What spectacular geology throughout or travels! And wild kangaroos! Snakes!

We stopped in Shanghai for a few days en route back to the U.S. in early August, to visit our daughter, Heidi, son-in-law Neil, and grandson, Jonas, who had just moved there for two years of teaching in an American – run international school. We had a fascinating few days of sightseeing in and around Shanghai and, after the heat, humidity and crowds of southeastern China, were good and ready to get back to Duluth! We considered sneaking our grandson into our luggage (Shanghaied in Shanghai?), but reluctantly left him with his parents, but only on the condition that they promise to visit for several weeks on their home leave next summer.

So here we are, back to business as usual at UMD, after an incredible year of exposure to new ideas, new colleagues, and new horizons. My PhD student, **Isla Castaneda**, is on track to finish up next March, and already has a post-doc lined up at the premier organic geochemistry lab in Europe, in the Netherlands Institute for Sea Research. I welcomed two new graduate students this fall, **Melissa Berke**, most recently from the U.S. Geological Survey in Reston, and **Junmin Shi**, who recently finished

a Master's degree at Peking University. Both are working on the drill core we recovered from Lake Malawi in early 2005, with promise of unraveling important new insights into the nature of climate variability in the African tropics and how it relates to global climate patterns. It's great to be back.

CHARLIE MATSCH I continue to enjoy the simple life of a Professor Emeritus. Snowshoes helped me get out on some winter trails, and an early spring trip to Nevada and Utah with John and Jan Green helped to shake any winter blues that might have settled in. We had a great time with Wanda Taylor and Gary Olson in and around Zion National Park, and I returned with them to their home in Las Vegas for a few days of exploring the geology, birding, and visiting some of the architectural wonders of the city, including the Bellagio's art gallery. In April I headed out to Tucson for some hiking with Rip Rapp, and a few days of birding in and around Madera Canyon and the Portal area.

Summer was a whirlwind of fun centered around good old Lake Superior. Lots of visitors to tour around and enjoy the scenery, geology, and trails. I ended the summer, not by going to Maine as was my custom, but instead headed west to the Pacific shores of northern Oregon and Washington. It was a thrill to cross the path of the Lewis and Clark expedition at Cape Disappointment at the mouth of the Columbia River where the entourage wintered over before dispersing on their return journeys. A foray along the Hoh River into Olympic National Park and the Hoh Rain Forest was impressive, not only for the big trees, but for the big slugs as well. The return trip to Oregon included an excursion up the Toutle River Valley to Mt. St. Helens. Johnston Ridge. At night. Rising lava dome. Glowing in the dark. Awesome!

So, things are going well for me. The department has made all of

us emeriti welcome as colleagues, and it's great to have a continuing relationship with UMD. If you come to visit, you are likely to find at least one of us old timers to chat with, and we all love the opportunity to catch up on how you are doing. My best to you all.

PENNY MORTON News from across the pond. As you can see by the front page of the newsletter, I am no longer department head. That job has been ably taken over by Howard. So now I am Director of Studies in England with 45 students, none of whom are geology majors (but maybe some will change), living and working in Birmingham. The weather has been unseasonably warm this fall but rather foggy and rainy. I never leave the house without my broolly!

Ron and I have taken two trips to date: one to Scotland to Speyside (those of you who drink single malt scotch will know of this area). We hiked the Glenlivet estate. It was truly beautiful. We also discovered Scottish smoked salmon. If you haven't had any, it is worth trying. We also visited Siccar Point, the angular unconformity that helped influence Hutton's thoughts on the age of the earth. We have also just come back from the Sarlat area in SW France. We visited four caves with prehistoric paintings and etchings. The reproduction of Lascaux is remarkable. The original cave was discovered in 1942 and was opened to the public, but damage to the paintings was so great it was closed in 1962. The French then reproduced the caves and paintings. It took 11 years for one artist to paint them all. They are absolutely amazing; the originals were painted 17,000 years ago.

We have taken two trips with the students: four days in the Lake District and two in London. No geology on those trips. We are going to Edinburgh in early

November and Ron will take his geology class to Siccar point-weather permitting.

I would like to thank all of you who gave generously to our drive for our new mineralogy/petrology lab. Your generosity allowed us to redo a lab in less than a year. John Goodge did an absolutely outstanding job at spearheading it. I only wish I was there to use it right now. Jim Miller will be teaching optics in it instead of me!

I wish you a good year, and if any of you are traveling to England in the next nine months, plan to stop and visit!

RON MORTON Birmingham in late October and every night of late we have been serenaded with the bangs and booms of nearby fireworks. Apparently it gets louder and brighter up to November 5th (Guy Fawkes Day) but continues right through to Christmas. We have been here since the first of August and the weather never changes-partly cloudy with sharp showers, totally cloudy with blustery showers, or foggy with wetting mist. The temperature has yet to change as well, in the 60s or 70s every day; so, no frost and the flowers are still very nice. Birmingham boasts a huge market where one can purchase everything from jellied eel and calf's brains to blood sausage and tripe. I stick to the fresh vegetables and line-caught salmon, but the real treat is the great number of languages you hear and the different way people dress- really neat, and I would say 90% of the people at the market are not English.

We have managed two extended trips. One to northern Scotland to hike in the Cairngorm Mountains (and visit a few distilleries) and to southern France with friends from Duluth on a tour I call corks, cuisine, caves, and chateaus! Also a short trip to the

Pembrookshire Coast to hike on the National Trail and stare in amazement at the anticlines, synclines, overturned folds, monoclines, beaches, and wonderful mussels served in garlic broth!

Dragging my thoughts away from the U.K., by big news of the year was the publication, in late July, of my book (with Judy Gibbs) on the natural history of the Superior Hiking Trail. Two years in the making and a whole lot of fun doing it has exceeded my wildest expectations and looks like it will have to be reprinted next spring! Currently I am working on a companion volume dealing with the natural history of the walking trails in the state parks along the north shore-we did hikes over the summer. Publication date for this book is next June.

Megan is nicely settled in Duluth adding porches, skylights, and extra rooms to her house and Chris is living in and looking after our house while we are in England. Tracy was fortunate to get a job as an epidemiologist with Douglas County, and Chris continues do his computer thing from the house (we did have to get satellite internet). Both of our children will be here in Birmingham for Christmas, so we are looking forward to a real "Dickens" of a holiday.

I am teaching the introductory geology course to 26 students, and two weeks from now we are going to Edinburgh and hopefully we will go to Siccar Point to see the angular unconformity that helped shape Hutton's ideas on the "oldness" of planet earth. The students have already been exposed to William Smith, Charles Lyell, Erasmus Darwin, along with a few more notable British geologists, so teaching geology here does have its pluses.

The sun is shining (yahoo!) and so I'm off for my run around a nice park close to our flat called Canon Hill-end of October and I

can still run in shorts and a long sleeved shirt. Well, that's about it for now from jolly, if crowded and traffic congested, Birmingham. So good cheer to you and a tankard of Rev. James ale to keep you warm (it's a Welsh beer and is very, very nice).

DICK OJAKANGAS It has been another busy year and I haven't yet finished "Roadside Geology of Minnesota". Evidently four cruises this past year (60 days at sea) have further diminished the workings of my one-track mind. Peaches and I cruised the eastern Caribbean, South America/Antarctica, the Baltic, and the Panama Canal. It was fascinating to see the Canal, after spending MUCH time developing a lecture on its history. Regarding cruising, Peaches says, "Too much. The scenery (water) is always the same!" I am beginning to agree with her--no cruises on our future agenda (yet). However, doesn't someone have to help educate that commonly geologically ignorant public?

In February, I spent nine days in Helsinki: (1) Teaching in their National Graduate School; (2) Giving the keynote address for the dedication of a new Elsevier volume on "Precambrian Geology of Finland: Key to the Evolution of the Fennoscandian Shield"; and (3) Giving two lectures--The World's Oil and The World's Uranium--in a national energy symposium. Also wrote an article on the latter subjects that was published by the Geological Society of Finland. I attended ILSG at Sault Ste. Marie, ON. Went on a diamond field trip, and later in the summer, on an ILSG field trip to the Slate Islands in northern Lake Superior (shatter cones!). I co-conducted a four-day short course on iron-formation (with field trips) for Cleveland Cliffs geologists. Led a two-day field trip on the North Shore for

the Geological Society of Minnesota. Also led a three-day field trip to northern Minnesota for AIPG. "The Old Prospector" talked on "Gold Is Where You Find It" for a Minnesota Teachers Workshop. Taught an eight-week (two hours/week) course for University for Seniors--"Geologic Potpourri".

Miscellaneous: Found time for volunteer work at First Lutheran Church and Lutheran Social Service, and to sing Verdi's Requiem in the Duluth-Superior Symphony Chorus. And all the while, I am the chief taster of recipes for Peaches' next cookbook, "500 Casseroles". (Can you believe that "foodies" on our east and west coasts have never heard the Minnesota word "hotdish"!?) A significant event for the OJs--Peaches and I celebrated our 50th wedding anniversary in June. Time really goes fast when you are having fun! And to all of you out there in the working world, I will repeat a message that I undoubtedly have given to you before -- "Don't retire! You will be busier than ever!"

RIP RAPP From his comfortable 'retirement' [winters in southern Arizona, summers in Duluth and abroad with projects in China, Greece, and France] continues to pursue his geoarchaeological interests. The second edition of his book; *Geoarchaeology*, Yale University Press, with UMD grad Christopher Hill came out last spring. He also has a book on his work in the eastern desert of Egypt with two of his former PhD students that should be out before next spring. Other than field projects and publishing, he just bikes, hikes, swims, and says, "Why didn't I retire earlier?"

JOHN SWENSON For the first time in several years, I am not writing my yearly summary from an airplane! This is somewhat ironic, given that I traveled more in 2006 than any year since coming to

UMD, but more on that below. On the home front, this year was marked by medical and tenure adventures. I had surgery in early March to repair a ruptured disc (L5/S1 laminectomy, for those who have had the pleasure!) that was severely hindering (understatement) my ability to simply sit at my desk and, more importantly, to participate in my favorite pastimes of skate skiing, biking, and trail running. Surgery was a great success, but my recovery has involved two hours per day of resistance work to increase my core strength. In the end, I learned a valuable lesson about the importance of balancing aerobic activities with strength training.

From a professional perspective, 2006 was yet another busy year. Despite my best efforts, UMD promoted me to Associate Professor with indefinite tenure. On the research front, while my work with the Office of Naval Research came to a close, my work with the National Science Foundation's MARGINS Source-to-Sink program ramped up. I and colleagues from the Virginia Institute of Marine Sciences recently began a three-year study of the Waipoa River in New Zealand. Our work will combine field observations and mathematical modeling in an effort to decipher the Holocene evolution of the Waipoa fluviodeltaic system. In terms of local personnel, **Jere Mohr** defended his MS thesis on the role of subaqueous sediment transport in controlling large-scale fluvial sedimentation. Jere's conceptual model and supporting flume experiments provide an excellent example of long-distance teleconnection in linked depositional systems. **Michael Taylor** continues his thesis research on the ubiquitous occurrence of shallow, saline groundwater in the Lake Superior basin. Michael is testing a conceptual model that calls upon subglacial recharge during the last glaciation as a mechanism for flushing deep brines in the

Midcontinent rift sedimentary basin to the margins of what is now the Lake Superior basin. Finally, I recently hired a post-doctoral Research Associate, **Matthew Wolinsky**, to work on the aforementioned MARGINS project. Matt is constructing mathematical models of coupled fluvial and shallow-marine sediment transport and strata formation.

As always, the year was filled with considerable travel to meetings and for collaborative research. Of particular interest, I spent a week at Imperial College in London, England, working with a colleague, and a week in Fukuoka, Japan, where I presented a pair of talks at the 17th International Sedimentological Congress. Furthermore, I recently returned from a week-long MARGINS Source-to-Sink workshop in California, where I gave a keynote presentation on teleconnections in the source-to-sink system. Currently, I am preparing a talk for the annual American Geophysical Conference in San Francisco, where I am co-chairing a special session on autogenic processes in landscape dynamics. Finally, in addition to all the work-related travel, my partner, Sarah, and I fit in enjoyable trips to Connecticut and the Mexico-Belize border.

NIGEL WATTRUS In last year's newsletter I described a reconnaissance seismic survey we undertook last summer on Great Slave Lake in northern Canada. The objective of this work is to test a hypothesis that during the last glaciation of North America, there was a subglacial lake in this area. This would presumably have had significant impact on the ice dynamics of the ice sheet. The data we collected in last year's survey were presented at a workshop in France earlier this year and has generated a lot of interest. The National Science

Foundation (NSF) funded a proposal we wrote to support more work on the lake, and my colleagues (from the University of California-Santa Cruz and the University of Aberystwyth in Wales) and I returned to Great Slave Lake this summer to collect a more complete dataset that included two types of seismic data, multibeam sonar bathymetry and even some gravity cores! We are still wading through the data we collected but it is even more spectacular than the data we collected last summer. We will be presenting some of our preliminary results at the upcoming AGU meeting in San Francisco.

As usual I spent quite a lot of time on Superior this past year, collecting data with our new state-of-the-art CHIRP sidescan sonar and sub-bottom profiler. Steve Colman accompanied me on one of these cruises. We collected a beautiful set of seismic data over the lake-floor moraines off Isle Royale using the CHIRP profiler

and a small air gun. Steve and I will be out there again next summer, as we recently received funding from NSF for a proposal we submitted to test the hypothesis that the Marquette Readvance of the Laurentide Ice Sheet closed easterly overflows into the Great Lakes from Glacial Lake Agassiz. In this study, we will collect high resolution seismic, multibeam and sidescan sonar data in Northwestern Lake Superior.

I also did some work off our little research boat, R/V Noodin. This summer we took it down to Crystal Lake just north of Chicago to collect some high resolution seismic data in the small lake that gives the city its name. It's always an adventure taking the Noodin on the road, but she did us proud – no fires this year!

The Wattrus family was busy traveling this summer. My daughter Sally traveled to Italy with a high school group. They traveled the length of the country and by all

accounts had a great time! Not to be outdone, my son Sam was invited to attend a Junior Youth Leadership Conference in Washington D.C. This was quite an honor that he was nominated for. He had a fantastic time. Finally, I got to “experience” what its like to be a spouse of a conference attendee. My wife, Jane, was invited to present a paper at a roundtable conference at Oxford University in July on the conflict between evolution and intelligent design. I tagged along for the ride, although I didn't have the opportunity to stay “in college” with Jane. Instead I helped my parents plan changes to their new home that they had just bought. I did however get to see what life was like at Oxford – wow!!! Jane had a great week, made a lot of new friends, including some Oxford dons! I, on the other hand, picked out new bathroom fixtures!



"The rocks are the final court of appeal" Francis Pettijohn

The Precambrian Research Center – A New Institute for an Old Tradition

by Jim Miller, Dean Peterson, John Goodge, Vicki Hansen, and Howard Mooers

Precambrian field geology is back at UMD in a big way. The Precambrian Research Center (PRC) is a new research institute being established here as an integrated teaching and research center focused on geological mapping of Precambrian rocks. The PRC is a result of an identified and urgent, long-term need within the private and public sectors of the geological community, both locally and internationally, for geoscientists skilled in geological mapping and the study of Precambrian geology. Ancient shield areas that form the cores of the present-day continents are important scientifically in terms of early Earth history and crustal evolution, and they are extremely important to global society because they host a very large percentage of the world's ore deposits.

A primary mission of the PRC will be to address the new demand for professional field geologists by providing training and support to upper-level undergraduate students, graduate students, and professional geologists in modern methods of geological mapping and map-making in glaciated Precambrian terrains. The concept for such a center evolved as a result of collaboration between three geosciences institutions within the University of Minnesota system: the Natural Resources Research Institute (NRRI), Minnesota Geological Survey (MGS), and UMD Department of Geological Sciences. Field and visualization training will be provided by a consortium of professional field geologists and University of Minnesota faculty (from NRRI, MGS, and UMD) in addition to geosciences faculty from other Midwest colleges and universities. The PRC will also provide a vehicle for synergistic collaboration between the public sector and private industry. Our conceptual model for the PRC has received very strong support from the geological community in the US and Canada, including executives and geoscientists within the minerals industry, geological surveys, geological societies, and academia. The PRC will be guided by an advisory board of industry and academic geoscientists to assist the PRC in

meeting its initial goals and to provide advice on how best to meet the future needs of the applied geosciences. Initial funding for the PRC is provided by the State of Minnesota, the University of Minnesota, and several private companies.

Our goal to train geoscientists in the field study of Precambrian terranes involves five basic program elements, designed to provide specialized training at several levels:

1. A new summer geology field camp in the Precambrian of northeastern Minnesota, primarily aimed at undergraduate students.
2. Research assistantships and grants for field-based graduate and undergraduate research on Precambrian geology.
3. Continuing education in the form of professional workshops, short courses and field experiences in advanced methods of field-based research in Precambrian terranes.
4. Upper-level geology courses at UMD in the areas of advanced field geologic mapping, digital map-making, and 3D and 4D visualization.
5. Other education, outreach, mentoring and student career planning activities that will foster a culture in which geological mapping and Precambrian geology can flourish.

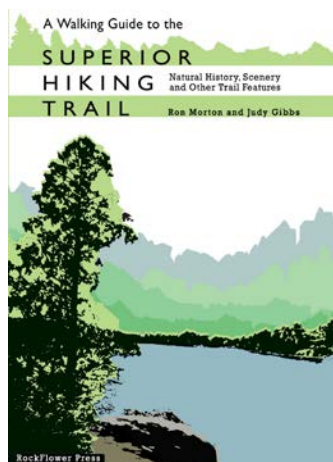
Thanks to the financial support of the College of Science and Engineering and the Natural Resources Research Institute, we have been busily planning, promoting, and fundraising since the early summer. Our activities have primarily focused on planning and preparing for the Precambrian field camp, which will begin on July 15, 2007 and run for six weeks. The camp will take up to 24 students from throughout North America and will be taught by various UMD faculty and staff from the MGS and NRRI. It will be based out of UMD and Vermilion Community College in Ely. For the first four weeks, students will be involved in small mapping projects in various Precambrian terranes where they will learn basic mapping skills. In addition, students will be introduced to techniques that are uniquely important to mapping in glaciated Precambrian shield areas - interpreting geophysical data, mapping surficial material, and logging drill core. The fifth week of the camp, the students will be involved in what we are calling the capstone mapping project. Here, the class will break out in to small parties of 4-6 students and a field-experienced instructor to do a detailed mapping project in an area (often a wilderness setting) that has not previously been mapped in detail. Next summer, five capstone mapping projects are scheduled: Ely Greenstone led by George Hudak (UW-Oshkosh); basal Duluth Complex led by Dean Peterson (NRRI), Saganaga Granite led by Mark Jirsa (MGS), eastern Duluth Complex led by Jim Miller (MGS), and North Shore Volcanics led by Terry Boerboom (MGS). In the final week of camp, the students will digitally compile their field data and create a geologic map. It is hoped that many of the best students coming out of this camp will choose UMD for their graduate studies.

Another major focus of our planning activities that we are just getting underway is fundraising. With mineral exploration companies potentially being the largest beneficiaries of the PRC's activities, by having access to well-trained field geologists and by participating in professional workshops, we are looking to these companies to serve as its prime benefactors. Many companies have expressed enthusiasm for the PRC's mission and we expect that they will follow through with financial support when we come calling in the coming months. The primary use of these corporate gifts will be to fund research assistantships at UMD for graduate students who choose to do a field-based thesis project on Precambrian geology of the Lake Superior area. Ideally, we would like to offer four graduate research assistantships per year. We also hope to offer smaller grants to undergraduate and graduate students conducting field-based research on Precambrian geology.

For more information about the PRC or to stay current with our progress during our inaugural year, check out our website at www.d.umn.edu/prc/. We hope to report to you on our great success in next year's newsletter.

UMD Gets X-Ray Fusion (XRF) Analyzer

This past semester, the Geology Department at Michigan State University (MSU) donated a Rigaku S/MAX X-Ray fusion (XRF) analyzer to the UMD Department of Geological Sciences. The instrument was shipped earlier this year and is housed at the Natural Resources Research Institute. In October, a service technician from Omni Scientific successfully installed a new X-ray tube and checked the operation and calibration of the instrument. In January or February, Tom Vogel, who operated the instrument at MSU, will be conducting a training session for interested UMD faculty, staff and students. Very soon, it looks as though homegrown whole rock analyses will become a routine part of geologic research here at UMD.



NEW BOOK ON SUPERIOR HIKING TRAIL

Ron Morton, in the Department of Geosciences, and naturalist Judy Gibbs have written a book titled “*A Walking Guide to the Superior Hiking Trail: Natural History, Scenery, and Other Trail Features.*” This walking guide details the natural history, scenic vistas, trail conditions, and interesting historical places seen and/or encountered along the more than 200 miles of the Superior Hiking Trail. Dividing the hiking trail into 32 individual walks, Morton and Gibbs have highlighted each walk with numerous, easily recognizable waypoints that mark interesting or unusual geological, botanical, scenic, historical or geographic features. Between waypoints the authors give detailed accounts of trail conditions, topographic changes, and the natural history of the landscape.

This packable book includes all of the popular loop walks as well as descriptions of the fall forest; it also contains extensive glossaries that explain geological terms and describe the wildflowers seen at the various walk waypoints. For more information visit the publishers’ web site at www.rockflowerpress.com. This 332 page book is available from local and regional booksellers. GPS waypoints for the walks can be uploaded from the publishers’ website.

NEW CHAPTER OF SIGMA GAMMA EPSILON (SGE) The National Honor Society for the Earth Sciences Honor Society

During the Spring Semester of 2006, the undergraduate and graduate students in the department submitted a successful petition to start a new chapter of Sigma Gamma Epsilon, the national honor society for the Earth Sciences. Criteria for membership in SGE include a GPA of 3.0 or above in Earth Sciences and related classes, and overall GPA of 2.67 and above. In February, SGE National President Rick Ford from Weber State University visited the department and interviewed students, faculty, and members of the administration, along with touring the department and campus facilities. Dr. Ford recommended that the petition be put forward for voting to the active chapters of SGE. In May, after gaining the necessary votes, the new chapter, Eta Omicron, was initiated at a ceremony conducted by SGE National Vice-president John Hogan from the University of Missouri-Rolla, current SGE members Dr. Tim Demko and graduate student Marsha Patelke, emeritus professors John Green and Charlie Matsch, and CSE Advisory Board member Kevin Bohacs from ExxonMobil. Pictures of the initiating students from last spring and the new initiates from the fall are included below.



LOOKING FOR A JOB?

Our new 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 the geology 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 contact Cathy at geol.d.umn.edu

ALUMNI NEWS

Albers, Paul, MS 06, defended his thesis on August 30, 2006—The Geology and Petrology of the Leveaux Prophyritic Diorite Intrusion: Investigating Possible Magmatic Relationships to the Anorthositic Series of the Duluth Complex, Cook County, Minnesota. He is employed at Polymet Mining Corporation. Paul's email address is albe0167@d.umn.edu

Alwin, Bevan, MS 76, is Exploration Manager, North American – New Plays for Pioneer Natural Resources USA, Inc. in Irving, Texas. His email address is bevan.alwin@pxd.com

Beer, Joe, MS 05, is working as a geologist at EnCana Oil & Gas in Denver, Colorado. He enjoys his job, but is surprised at how much more he needs to learn about the industry. Joe's email is joseph.beer@encana.com

Carlson, Wade, BS 84, started an environmental consulting firm in October 1997. ProSource Technologies, Inc. has been very successful, employing nearly 50 people with offices in Coon Rapids, Duluth, and Chicago. He has hired several UMD geology graduates including Jim Crowl, Jill Keefe (Thorkildson), and Chris Loch. ProSource Technologies is located at 9219 East River Road NW, Coon Rapids, MN 55433. Wade's email address is wcarlson@prosourcectech.com

Dark, Joshua, BS 05, started his first year of graduate school at Miami University in Oxford, Ohio. Last year he worked with Americorps helping teens from low income households. Josh and his wife, Heather, celebrated the birth of their son, Jonas Hamilton Dark on November 17, 2006.

Eschenbacher, Alan BS 96, attended graduate school at New Mexico Institute of Mining and Technology. Alan is currently working at URS Corporation in Minneapolis. He is willing to share his experience on life and jobs after UMD. He can be contacted at 612-370-0700 or 612-373-6518.

Frazer, Chris, BS 05, was accepted and is currently a student at the UMD College of Pharmacy. His email address is fraz0036@d.umn.edu

Gilbertson, Crystal, BA 04, is working at Liberty Mutual in Orlando, Florida. Her address is 2420 Lake Vista Ct, Apt. 304, Casselberry, FL 32707.

Gonsior, Zac, BS 03, finished his MS in March at Oregon State University and is currently working at Chesapeake Energy in Oklahoma City, Oklahoma.

Hager, Keri, BS 01, is completing her final year of residency for Pharmacy School in Florida. Keri and her husband, Jeff, live in Park Point, Florida.

Hoffman, Adam, BS 02 (University of Iowa), will defend his thesis at the University of Minnesota Duluth on November 30, 2006. He is employed at Newmont Mining Corporation. Adam's email address is hoff0578@d.umn.edu

Matt Heizler, BS 82, (PhD UCLA) received a NSF grant that allowed him and his wife, **Lynn (Riley)**, BS 83, to go to Edinburgh over the summer to work with a noted feldspar mineralogist. Matt is currently working with the New Mexico Bureau of Mines and Mineral Resources in Socorro, New Mexico. His email address is matt@nmt.edu

Holmes, Mark, MS 99, is working for the Town of Chino Valley in north-central Arizona, as the town's Water Resource Manager. His email address is mholmes@chinoaz.net

Hovis, Steve, MS 01, is working at Kennecott Exploration in Salt Lake City, Utah. Steve's address is 327 West 200 South, #305, Salt Lake City 84101. His email address is steven_hovis@earthlink.com

Huff, Melinda, BA 02, received her MS in Water Resource Science from UMD in May 2006. She started a new position fall 2006 at Northeastern Oklahoma A&M College, Geology & Physical Science faculty. Melinda and husband celebrated the birth of Morgen Kali Huff on April 4, 2006. Melinda's address is 2315 McConnell Avenue, Joplin, MO 64804. Email is mhuff@neoam.edu

Johnson, Beth, BS 91, and family, are living in Mound, Minnesota. Beth went to grad school at Iowa State University, and is now working at Geomatrix Consultants, Inc. as a project hydrogeologist. She passed two professional geology exams in 2005 and is now a licensed PG in Minnesota. Her email address is bjohnson@geomatrix.com

Karl, Carrie, BS 99, is currently employed with the National Park Service, working in Big Cypress National Preserve in South Florida in the winter, and Acadia National Park in Maine in the summer.

Kelly, Ben, BS 05, is married and living in Minnetonka, Minnesota. Ben is currently working for an environmental firm in the Twin Cities. His email address is bkelly@d.umn.edu

Lapensky, Adam, BS 00, is employed as a pilot at US Airways Express/Air Wisconsin in Washington DC. He is currently living in the District of Columbia but will be moving again soon. Adam's mailing address is 9811 Dakota Road, Bloomington MN 55438, and email is alapensky@yahoo.com

Larson (Peukert), Katie, (BS 94) is working at Golder Anchorage in Alaska. Golder is looking for more people from Minnesota to work in Alaska. They need environmental and field staff, as well as civil engineers. Including Kathryn, there are currently nine alumni working in Alaska – Phil Larson, Beth and Karl Sharpe, Pauline Schulte (now Ruddy), Rob Ellefson, Jan Deick, Mike Griffin, and Jim Munter. Katie's work address is 1750 Abbott Road, #200, Anchorage, AK 99507. Email is Katie_Larson@golder.com

Markeson, Keith, BS 00, is employed as a Mine Geologist at The Doe Run Company in Missouri. Keith and wife **Carrie Heiling**, BA 01, spent January-March working in Peru on an exploration project for Doe Run Peru, hiking the Andes to 13,500' collecting rock and soil samples. Doe Run is currently seeking geologists to work in the mines. Keith can be reached at kmarkeson@doerun.com

Norton, Kevin, MS 00, is currently residing in Germany, working on his PhD at the University of Hannover. His home address is 30952 Ronnenberg, Germany. Email is k.norton@mineralogie.uni-hanover.de

Olson (Gunderson), Donna, BS 97, is employed with the USDA Forest Service – North Central Research Station. Donna and husband, David, welcomed baby Matthew in 2005.

Roem, Erik, BS 83, is President and General Manager of Geobruag North America, LLC in Santa Fe, New Mexico. He lives in Albuquerque with his wife and three children. His address is 9352 Night Sky Lane, Albuquerque, NM 87122. Erik's email address is erik.roem@geobruag.com

Roth, David, BS 85 (PhD Colorado State/Chemistry), is in his 15th year at the USGS Water Resources Division as a Research Chemist. His wife, Steffanie, and three children reside in Lyons, Colorado. David and his family enjoy fishing and hiking in Rocky Mountain National Park. David's address is P O Box 1651, Lyons, CO 80540. His email is daroth@usgs.gov

Sadofsky, Seth, former UMD adjunct faculty, is living in Germany with his wife and three year old son, Joel. Seth's email address is sethsadofsky@mac.com, or ssadofsky@ifin-geomar.de

Sampson, Tom, BS 89, resides north of Grand Rapids, Michigan, working as a consultant for Timmermans, Inc. as a Senior Hydrologist. He currently resides at 6086 Belshire NE, Belmont, MI 49306, and his email address is t.sampson@comcast.net

Scheidel, Eric, BA 05, is teaching science at the junior high level in Lakeville, Minnesota. He was married on June 10, 2006, and resides at 1956 St. Claire Avenue, St. Paul, MN 55105

Swanson, Brian, BS 78, is employed at EOG Resources, Inc., Fort Worth Division as a geologist drilling well and lateral wells for oil companies. His work address is 420 Throckmorton Street, Suite 1200, Ft. Worth, TX 76102. His email address is brian_swanson@egoresources.com

Stone, Dave, MS 80, was named Worldwide Exploration Manager for Marathon Oil Company. Dave previously held the position of Onshore North America Exploration Manager. Dave's wife, Pat (BS 80), is a Naturalist with the Houston Arboretum. Dave's email address is djstone@marathonoil.com

Syverson, Kent, BS 86 (PhD UW-Madison) is a professor at University of Wisconsin Eau Claire. He has been conducting glacial geologic research in western Wisconsin and Maine during his 14 years at UWEC. Kent and his wife have three children. His email is syverskm@uwec.edu

Timp, Matthew, BS 02, is attending medical school at the College of Osteopathic Medicine in Kirksville, Missouri. Matt's wife, Huong, finished her OB-GYN rotation and will be doing her six-week ER rotation at Hennepin County Medical Center in Minneapolis. Matt's address is 803 North Osteopathy Street, Kirksville, MO 63501.

Zwiebel-Risdal, Zandy, BS 92, is currently working on her Masters in Environmental Education. Her thesis work is concentrated on community perspective and a direction for community education related to water quality issues in Northeastern Minnesota. She is employed part-time with the University of Minnesota Sea Grant Program. Zandy and husband, Matt, are the proud parents of Alexandra Jean Risdal, born September 27, 2004. Zandy's email address is zwie0029@d.umn.edu

Kevin Hayner, BS 78, passed away in September 2006. He was 54 years old.

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 \$1,000 award, **Joseph Beer** (MS) and **Andrew Breckenridge** (PhD).

Outstanding Graduate Teaching Assistant Awards for the 2005-06 academic year were presented to **Riyad Ali-Adeeb** and **Ryan Erickson** 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 **Katherine Brosch**.

The *SME Tools-Of-The-Trade Award* is given to outstanding sophomores in the form of \$300 worth of geological field gear. **Brandon Brayfield**, **Joseph Jacobs** and **Blake Lemcke** were presented this award at the 2006 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. **Taylor Nordberg** was awarded \$500 for his efforts at Wasatch-Uinta Field Camp in 2006.

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

Field Camp Scholarships. All UMD students attending field camp in 2006 received \$1,500 in scholarships, which covered the entire tuition portion of their expenses! The scholarships and recipients are shown below:

R.C. Bright Field Camp Scholarship - **Erik Haroldson**

Robert Heller Field Camp Scholarship – **Eric Quigley** and **Erik Haroldson**

"Rip" Rapp Field Camp Scholarship – **Taylor Nordberg**

Charlie Matsch Field Camp Fund – **Taylor Nordberg**

Lempi M. & John W. Pagnucco Scholarship – **Kevin Olsonawski**

Descriptions of these funds, as well as information on how to make a donation to the Department, can be found on our website at www.d.umn.edu/geology/

Glenn B. Morey (BS 1957) was recognized as an outstanding Alumnus at the Fifth Annual Academy of Science and Engineering Dinner and Award Ceremony held at UMD Friday, September 29, 2006. The Academy of Science and Engineering was established to give public recognition to distinguished alumni and special friends of the College of Science and Engineering, who have brought distinction to themselves through their participation, commitment, and leadership in their chosen profession.

Riyad Ali-Adeeb (graduate student) received an American Association of Petroleum Geologists Grants-in-Aid award for his individual research. This year 102 grants were awarded with over 282 applicants.

Alyson Cartwright (undergraduate student) received a Differt Scholarship in the amount of \$2,000. The recipients of this award must be majoring in the areas of mathematics and the sciences with high scholastic merit and potential.

Devon Brecke (graduate student) was awarded \$1,500 by the Geological Society of America for her MS research.

Tim Demko (Assistant Professor) was recipient of the College of Science and Engineering Young Teacher Award given to outstanding faculty members of CSE.

Undergraduate Student Presenters and Contributors

Geological Society of America

Philadelphia, PA

Nordberg, T., and Hansen, V. L.: Global mapping of Venus' ribbon tessera terrain: distribution patterns and implications for resurfacing hypothesis.

Hansen, V.L., **Nordberg, T.**, and Lopez, I.: Venus was not catastrophically resurfaced.

Cartwright, Alyson M., Demko, Timothy M., Bodenbender, Brian E., Peaslee, Graham: Rare Earth Element Comparison of Vertebrate Assemblages in the Morrison and Cloverly Formations.

Rocheford, Kat, Mathisrud, C.L., Demko, Timothy M. Upchurch, G.R. Jr.: Reconstructing the Late Jurassic Paleoenvironment Through Chronostratigraphic Correlation of Morrison Formation Subsurface Well Logs, Outcrops, and Fossil-Bearing Layers in the Eastern Bighorn Basin, Wyoming.

Goode, J. W., Famming, C. M., **Brosch, K. M.**, and **Curelli, D.K.**: Composition and Age of East Antarctic shield in Wilkes Land determined by proxy samples of Oligocene-Holocene glaciomarine sediment. Invited for Theme Session T138: "Using Detrital Zircon Geochronology to Answer Geologic Questions We Formerly Could Not Ask".

Mooers, Howard D., Sames, Tony, and **Putz, Amanda J.**: Sensitivity of Monument Corrosion For the Determination of The Spatial and Temporal Distribution of Acid Rain, Birmingham, England.

Anderson, Ashley K., Bylsma, A.L., Etter, M.D., Gray, C.J., Ochoa, R.I., Pels, S.D., Riese, D.J., Stack, K.P., Walton, K.A., and Wismer, M.A.: Taphonomy and Paleoenvironmental Analysis of the Red Canyon Ranch Dinosaur Site, Upper Jurassic Morrison Formation, Shell, Wyoming.

Graduate Student Presenters and Contributors

Geological Society of America

Philadelphia, PA

Arends, Heather and Mooers, Howard D.: Des Moines Lobe Till Composition and Texture as an Indicator of Flow Dynamics.

Gordon Research Conference on

Organic Geochemistry

Holderness, New Hampshire

Castañeda, Isla S., J.P. Werne, T.C. Johnson: Environmental change in Lake Malawi (East Africa) during the past 750 years: a molecular and isotopic record.

American Geophysical Union

Fall Meeting

San Francisco, California

Castañeda, Isla S., J.P. Werne, T.C. Johnson: Wet/arid phases in the southeastern African tropics out-of-phase with the equatorial and northern tropics during the Holocene.

10th International

Conference on Paleolimnology

Duluth, Minnesota

Castañeda, Isla S., J.P. Werne, T.C. Johnson: A 750-year molecular and isotopic record of environmental change from Lake Malawi, East Africa.

Lunar and Planetary Science Conference

Houston, Texas

Lang, Nicholas P., **Bannister, Roger A.**, Hansen, V.L., Swenson, J.B.: Can Venusian channels form by subsurface thermal erosion?

Bannister, Roger A., and Hansen, V.L.: Geologic Analysis of deformation in the interior region of Artemis (Venus, 34°S 132°E)

2006 Graduates

BA

Katherine Brosch
David Demmer
Kevin Olsonawski

BS

Nicholas D' Aloia
Erik Gulbranson
Erik Haroldson
Brennan Mears (*Summer 05*)
Alan Phillips
Marc Veillet

MS

Paul Albers
Roger Bannister
Joseph Beer
Kelly McDaniel
Jon Van Alstine

PhD

Andrew Breckenridge
Julie Klejeski (WRS)
Nicholas Lang
Amy Myrbo
Lindsay Powers (WRS)

